**Test Report issued under the responsibility of:**

# TEST REPORT
# IEC 60598-2-1
# Luminaires
# Part 2: Particular requirements
# Section 1: Fixed general purpose luminaires

| | |
|---|---|
| **Report Number. :** | ETA25020005S-001 |
| **Date of issue :** | February 25, 2025 |
| **Total number of pages :** | 62 pages |
| **Name of Testing Laboratory preparing the Report :** | Hangzhou ETA Testing Technology Co., Ltd<br>8/F., Building A, The Western Science Park, Yuhang District, Hangzhou, Zhejiang, China |
| **Applicant's name :** | Hangzhou Longlux Electronic Technology Co., ltd |
| **Address :** | The Western Science Park, Hangzhou City, China |
| **Test specification:** | |
| **Standard :** | IEC 60598-2-1:2020 used in conjunction with IEC 60598-1:2020 |
| **Test procedure :** | CE-LVD |
| **Non-standard test method :** | N/A |
| **TRF template used :** | IECEE OD-2020-F1:2021, Ed.1.4 |
| **Test Report Form No. :** | IEC60598_2_1I |
| **Test Report Form(s) Originator :** | Intertek Semko AB |
| **Master TRF :** | Dated 2022-08-26 |

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| | |
|---|---|
| **Test item description ..... :** | Triproof Lighting Fixture |
| **Trade Mark(s) ..... :** | Longlux |
| **Manufacturer ..... :** | Same as applicant |
| **Model/Type reference ..... :** | See model list |
| **Ratings ..... :** | 220-240V~, 50/60Hz, Class I, IP65, PF 0,9<br>(more details see model list) |

Mode list

| Model name | Power (W) | Size LxDxH (mm) |
|---|---|---|
| LLX-Triproof-Integrated-18 | 18W | 681*58*62 |
| LLX-Triproof-Integrated-36 | 36W | 1281*58*62 |
| LLX-Triproof-Integrated-50 | 50W | 1581*58*62 |
| LLX-Triproof-Integrated-18-TC | 18W | 681*58*62 |
| LLX-Triproof-Integrated-36-TC | 36W | 1281*58*62 |
| LLX-Triproof-Integrated-50-TC | 50W | 1581*58*62 |
| LLX-Triproof-Integrated-18-TP-TC | 9/18W | 681*58*62 |
| LLX-Triproof-Integrated-36-TP-TC | 18/36W | 1281*58*62 |
| LLX-Triproof-Integrated-50-TP-TC | 25/50W | 1581*58*62 |
| Remark: TC means products with CCT switch, TP means products with Power switch | | |

| | | | |
|---|---|---|---|
| **Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):** | | | |
| ☒ | **Testing Laboratory:** | Hangzhou ETA Testing Technology Co., Ltd | |
| **Testing location/ address.....:** | | 8/F., Building A, The Western Science Park, Yuhang District, Hangzhou, Zhejiang, China | |
| **Tested by (name, function, signature).....:** | | Danny Zhou (Certification Engineer) |  |
| **Approved by (name, function, signature)...:** | | Sean Wan (Reviewer) |  |
| | | | |
| ☐ | **Testing procedure: CTF Stage 1:** | | |
| **Testing location/ address.....:** | | | |
| **Tested by (name, function, signature).....:** | | | |
| **Approved by (name, function, signature)...:** | | | |
| | | | |
| ☐ | **Testing procedure: CTF Stage 2:** | | |
| **Testing location/ address.....:** | | | |
| **Tested by (name + signature).....:** | | | |
| **Witnessed by (name, function, signature) .:** | | | |
| **Approved by (name, function, signature)...:** | | | |
| | | | |
| ☐ | **Testing procedure: CTF Stage 3:** | | |
| ☐ | **Testing procedure: CTF Stage 4:** | | |
| **Testing location/ address.....:** | | | |
| **Tested by (name, function, signature).....:** | | | |
| **Witnessed by (name, function, signature) .:** | | | |
| **Approved by (name, function, signature)...:** | | | |
| **Supervised by (name, function, signature) :** | | | |

**List of Attachments (including a total number of pages in each attachment):**

-Page 1 – 56: test reports;

-Page 57 – 62: photos of the samples

**Summary of testing:**

Some representative samples of the product covered by this report have been tested and comply with the applicable requirements of this standard.

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| Full | Same as previous page. |

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

☒ **The product fulfils the requirements of EN IEC 60598-2-1:2021 used in conjunction with EN IEC 60598-1:2021 + AMD11:2022.**

**Copy of marking plate**

Take model LLX-Triproof-Integrated-50-TP-TC as example:

Model: LLX-Triproof-Integrated-50
220-240V~; 50/60Hz; IP65; Class I; 50W



Hangzhou Longlux Electronic Technology Co., ltd
The Western Science Park, Hangzhou City, China

The height of letters and numerals shall not be less than 2mm.
The height of graphical symbols shall not be less than 5mm.
The height of symbol of WEEE shall not be less than 7mm.

All the labels are the same except the model name and parameters.
The entity (in EU) who put the product on the market must have their name and address on the product.

| | |
|---|---|
| **Test item particulars.....:** | Triproof Lighting Fixture |
| **Classification of installation and use.....:** | IP65, Class I |
| **Supply Connection.....:** | Terminal block |
| **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 .....:** | February 07, 2025 |
| **Date (s) of performance of tests.....:** | February 07, 2025 – February 25, 2025 |

**General remarks:**

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

**Throughout this report a ☒ comma / ☐ point is used as the decimal separator.**

**Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 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 ..... : | ☐ **Yes**<br>☒ **Not applicable** |

**When differences exist; they shall be identified in the General product information section.**

| | |
|---|---|
| **Name and address of factory (ies) ..... :** | Hangzhou Longlux Electronic Technology Co., ltd<br>The Western Science Park, Hangzhou City, China |

**General product information and other remarks:**

The products covered in the report are fixed general purpose luminaire with non-replaceable LED module.

All models have similar construction, except the different size and parameter of respective components in order to achieve different power consumption.

All relevant tests were performed on models LLX-Triproof-Integrated-50-TP-TC, which gives the most unfavourable test result.

Refer to Appendix 1 for the testing of lamp control gear according to EN 61347-1:2015+A1:2021 and EN 61347-2-13: 2014+A1:2017.

Refer to Appendix 2 for the testing of LED modules according to EN IEC 62031:2020+A11:2021.

Refer to Appendix 3 for the testing of photo-biological hazards according to IEC TR 62778:2014.

According clause 4.2.2 of EN 62493:2015+A1:2022, lighting equipment deemed to comply with the requirements of EN 62493:2015+A1:2022 without testing.

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **1.4 (0)** | **GENERAL TEST REQUIREMENTS** | | P |
| 1.4 (0.3) | More sections applicable..... : | Yes ☐ No ☒<br>Section/s: | — |
| 1.4 (0.5) | Components | (see Annex 1) | — |
| **1.4 (0.7)** | **Information for luminaire design in light sources standards** | | — |
| 1.4 (0.7.2) | Light source safety standard ..... : | EN IEC 62031 | — |
| | Luminaire design in the light source safety standard | | P |

| | | | |
|---|---|---|---|
| **1.5 (2)** | **CLASSIFICATION OF LUMINAIRES** | | P |
| 1.5 (2.2) | Type of protection ..... : | Class I | |
| 1.5 (2.3) | Degree of protection..... : | IP65 | — |
| 1.5 (2.4) | Luminaire suitable for direct mounting on normally flammable surfaces ..... : | Yes ☒ No ☐ | — |
| 1.5 (2.5) | Luminaire for normal use ..... : | Yes ☒ No ☐ | — |
| | Luminaire for rough service ..... : | Yes ☐ No ☒ | — |

| | | | |
|---|---|---|---|
| **1.6 (3)** | **MARKING** | | P |
| 1.6 (3.2) | Mandatory markings | | P |
| | Position of the marking | | P |
| | Format of symbols/text | | P |
| 1.6 (3.3) | Additional information | | P |
| | Language of instructions | English | P |
| 1.6 (3.3.1) | Combination luminaires | | N/A |
| 1.6 (3.3.2) | Nominal frequency in Hz | 50/60Hz | P |
| 1.6 (3.3.3) | Operating temperature | | N/A |
| 1.6 (3.3.5) | Wiring diagram | | N/A |
| 1.6 (3.3.6) | Special conditions | | N/A |
| 1.6 (3.3.7) | Metal halide lamp luminaire – warning | | N/A |
| 1.6 (3.3.8) | Limitation for semi-luminaires | | N/A |
| 1.6 (3.3.9) | Power factor and supply current | PF 0,9 | P |
| 1.6 (3.3.10) | Suitability for use indoors | | P |
| 1.6 (3.3.11) | Luminaires with remote control | | N/A |
| 1.6 (3.3.12) | Clip-mounted luminaire – warning | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.6 (3.3.13) | Specifications of protective shields | | N/A |
| 1.6 (3.3.14) | Symbol for nature of supply | ~ | P |
| 1.6 (3.3.15) | Rated current of socket outlet | | N/A |
| 1.6 (3.3.16) | Rough service luminaire | | N/A |
| 1.6 (3.3.17) | Mounting instruction for type Y, type Z and some type X attachments | | N/A |
| 1.6 (3.3.18) | Non-ordinary luminaires with PVC cable | | N/A |
| 1.6 (3.3.19) | Protective conductor current in instruction if applicable | | N/A |
| 1.6 (3.3.20) | Provided with information if not intended to be mounted within arm's reach | | N/A |
| 1.6 (3.3.21) | Non replaceable and non-user replaceable light sources information provided | Non- replaceable light sources | P |
| 1.6 (3.3.22) | Controllable luminaires, classification of insulation provided | | N/A |
| 1.6 (3.3.23) | Luminaires without control gear provided with necessary information for selection of appropriate component | | N/A |
| 1.6 (3.3.24) | If not supplied with terminal block, information on the packaging | | N/A |
| 1.6 (3.3.25) | Luminaires employing light sources emitting UV on mains wiring, information provided | | N/A |
| 1.6 (3.3.26) | Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided | | N/A |
| 1.6 (3.4) | Test with water | | P |
| | Test with hexane | | P |
| | Legible after test | | P |
| | Label attached | | P |
| **1.7 (4)** | **CONSTRUCTION** | | P |
| 1.7 (4.2) | Components replaceable without difficulty | | N/A |
| 1.7 (4.3) | Wireways smooth and free from sharp edges | | P |
| **1.7 (4.4)** | **Lamp holders** | | N/A |
| 1.7 (4.4.1) | Integral lamp holder | | N/A |
| 1.7 (4.4.2) | Wiring connection | | N/A |
| 1.7 (4.4.3) | Lamp holder for end-to-end mounting | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7 (4.4.4) | Positioning | | N/A |
| | - pressure test (N) ..... : | | — |
| | After test the lamp holder comply with relevant standard sheets and show no damage | | N/A |
| | After test on single-capped lamp holder the lamp holder has not moved from its position and show no permanent deformation | | N/A |
| | - bending test (N) ..... : | | — |
| | After test the lamp holder has not moved from its position and show no permanent deformation | | N/A |
| 1.7 (4.4.5) | Peak pulse voltage | | N/A |
| 1.7 (4.4.6) | Centre contact | | N/A |
| 1.7 (4.4.7) | Parts in rough service luminaires resistant to tracking | | N/A |
| 1.7 (4.4.8) | Lamp connectors | | N/A |
| 1.7 (4.4.9) | Caps and bases correctly used | | N/A |
| 1.7 (4.4.10) | Light source for lamp holder or connection according IEC 60061 not connected another way | | N/A |
| **1.7 (4.5)** | **Starter holders** | | N/A |
| | Starter holder in luminaires other than class II | | N/A |
| | Starter holder class II construction | | N/A |
| **1.7 (4.6)** | **Terminal blocks** | | N/A |
| | Tails | | N/A |
| | Unsecured blocks | | N/A |
| **1.7 (4.7)** | **Terminals and supply connections** | | **P** |
| 1.7 (4.7.1) | Contact to metal parts | | N/A |
| 1.7 (4.7.2) | Test 8 mm live conductor | | P |
| | Test 8 mm earth conductor | | P |
| 1.7 (4.7.3) | Terminals for supply conductors | | P |
| 1.7 (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 15.6.2 | | N/A |
| | - electrical test according to 15.6.3 | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - heat test according to 15.6.3.2.3 and 15.6.3.2.4 | | N/A |
| 1.7 (4.7.4) | Terminals other than supply connection | | P |
| 1.7 (4.7.5) | Heat-resistant wiring/sleeves | | N/A |
| 1.7 (4.7.6) | Multi-pole plug | | N/A |
| | - test at 30 N | | N/A |
| **1.7 (4.8)** | **Switches** | | P |
| | - adequate rating | | P |
| | - adequate fixing | | P |
| | - polarized supply | | N/A |
| | - compliance with IEC 61058-1 for electronic switches | | N/A |
| **1.7 (4.9)** | **Insulating lining and sleeves** | | **N/A** |
| 1.7 (4.9.1) | Retainment | | N/A |
| | Method of fixing ..... : | | N/A |
| 1.7 (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 |
| **1.7 (4.10)** | **Double or reinforced insulation** | | **P** |
| 1.7 (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 |
| 1.7 (4.10.2) | Assembly gaps: | | N/A |
| | - not coincidental | | N/A |
| | - no straight access with test probe | | N/A |
| 1.7 (4.10.3) | Retainment of insulation: | | P |
| | - fixed | | P |
| | - unable to be replaced; luminaire inoperative | | P |
| | - sleeves retained in position | | N/A |
| | - lining in lamp holder | | N/A |
| 1.7 (4.10.4) | Protective impedance device | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Basic and supplementary insulation bridged by resistor(s) or appropriate capacitor | | N/A |
| | Double or reinforced insulation bridged by at least two separate resistors in series or appropriate capacitor(s) | | N/A |
| | Capacitors comply with IEC 60384-14 | | N/A |
| | Resistors comply with test (a) in 14.2 of IEC 60065 | | N/A |
| **1.7 (4.11)** | **Electrical connections and current-carrying parts** | | **P** |
| 1.7 (4.11.1) | Contact pressure | | N/A |
| 1.7 (4.11.2) | Screws: | | N/A |
| | - self-tapping screws | | N/A |
| | - thread-cutting screws | | N/A |
| 1.7 (4.11.3) | Screw locking: | | N/A |
| | - spring washer | | N/A |
| | - rivets | | N/A |
| 1.7 (4.11.4) | Material of current-carrying parts | | P |
| 1.7 (4.11.5) | No contact to wood or mounting surface | | P |
| 1.7 (4.11.6) | Electro-mechanical contact systems | | N/A |
| **1.7 (4.12)** | **Screws and connections (mechanical) and glands** | | **P** |
| 1.7 (4.12.1) | Screws not made of soft metal | | P |
| | Screws of insulating material | | N/A |
| | Torque test: torque (Nm); part..... : | | N/A |
| | Torque test: torque (Nm); part..... : | | N/A |
| | Torque test: torque (Nm); part..... : | | N/A |
| 1.7 (4.12.2) | Screws with diameter < 3 mm screwed into metal | | N/A |
| 1.7 (4.12.4) | Locked connections: | | |
| | - fixed arms; torque (Nm) ..... : | | N/A |
| | - lamp holder; torque (Nm) ..... : | | N/A |
| | - push-button switches; torque 0,8 Nm ..... : | | N/A |
| 1.7 (4.12.5) | Screwed glands; force (Nm)..... : | Plastic gland: 3,25Nm | P |
| **1.7 (4.13)** | **Mechanical strength** | | **P** |
| 1.7 (4.13.1) | Impact tests: | | P |
| | - fragile parts; energy (Nm) ..... : | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - other parts; energy (Nm)..... : | 0,35Nm | P |
| | 1) live parts | | P |
| | 2) linings | | N/A |
| | 3) protection | | P |
| | 4) covers | | P |
| 1.7 (4.13.2) | Metal parts have adequate mechanical strength | | N/A |
| 1.7 (4.13.3) | Straight test finger | | N/A |
| 1.7 (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 |
| 1.7 (4.13.6) | Tumbling barrel | | N/A |
| **1.7 (4.14)** | **Suspensions, fixings and means of adjusting** | | **P** |
| 1.7 (4.14.1) | Mechanical load: | | P |
| | A) four times the weight | | P |
| | 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 |
| 1.7 (4.14.2) | Load to flexible cables | | N/A |
| | Mass (kg) ..... : | | — |
| | Stress in conductors (N/mm²) ..... : | | N/A |
| | Mass (kg) of semi-luminaire ..... : | | N/A |
| | Bending moment (Nm) of semi-luminaire ..... : | | N/A |
| 1.7 (4.14.3) | Adjusting devices: | | |
| | - flexing test; number of cycles..... : | | N/A |
| | - strands broken ..... : | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - electric strength test afterwards | | N/A |
| 1.7 (4.14.4) | Telescopic tubes: cords not fixed to tube; no strain on conductors | | N/A |
| 1.7 (4.14.5) | Guide pulleys | | N/A |
| 1.7 (4.14.6) | Strain on socket-outlets | | N/A |
| **1.7 (4.15)** | **Flammable materials** | | **P** |
| | - glow-wire test 650°C ..... : | See Test Table 1.15 (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 |
| 1.7 (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 |
| **1.7 (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 |
| 1.7 (4.16.1) | Lamp control gear spacing: | | N/A |
| | - spacing 35 mm | | N/A |
| | - spacing 10 mm | | N/A |
| 1.7 (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 |
| 1.7 (4.16.3) | Design to satisfy the test of 12.6 | (see clause 12.6) | N/A |
| **1.7 (4.17)** | **Drain holes** | | N/A |
| | Clearance at least 5 mm | | N/A |
| **1.7 (4.18)** | **Resistance to corrosion** | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7 (4.18.1) | - rust-resistance | | N/A |
| 1.7 (4.18.2) | - season cracking in copper | | N/A |
| 1.7 (4.18.3) | - corrosion of aluminium | | N/A |
| 1.7 (4.19) | Ignitors compatible with ballast | | N/A |
| 1.7 (4.20) | Rough service vibration | | N/A |
| **1.7 (4.21)** | **Protective shield** | | |
| 1.7 (4.21.1) | Shield fitted if tungsten halogen lamps or metal halide lamps | | N/A |
| | Shield of glass if tungsten halogen lamps | | N/A |
| 1.7 (4.21.2) | Particles from a shattering lamp not impair safety | | N/A |
| 1.7 (4.21.3) | No direct path | | N/A |
| 1.7 (4.21.4) | Impact test on shield | | N/A |
| | Glow-wire test on lamp compartment ..... : | See Test Table 1.15 (13.3.2) | N/A |
| 1.7 (4.22) | Attachments to lamps not cause overheating or damage | | N/A |
| 1.7 (4.23) | Semi-luminaires comply Class II | | N/A |
| **1.7 (4.24)** | **Photobiological hazards** | | **P** |
| 1.7 (4.24.1) | No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P) | | N/A |
| 1.7 (4.24.2) | Retinal blue light hazard | | P |
| | Class of risk group assessed according to IEC/TR 62778 .....: | RG0 | — |
| | 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 |
| **1.7 (4.25)** | **Mechanical hazard** | | **P** |
| | No sharp point or edges | | P |
| **1.7 (4.26)** | **Short-circuit protection** | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7 (4.26.1) | Adequate means of uninsulated accessible SELV / PELV parts | | N/A |
| 1.7 (4.26.2) | Short-circuit test with test chain according 4.26.3: | | N/A |
| | Supply source ES1 PSE | | N/A |
| | Test chain not melt through | | N/A |
| | Test sample not exceed values of Table 12.1 and 12.2 | | N/A |
| **1.7 (4.27)** | **Terminal blocks with integrated screwless protective earthing contacts** | | N/A |
| | 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 |
| **1.7 (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 (°C) ..... : | | — |
| | 100 cycles between t min and t max | | N/A |
| | Temperature sensing control still in position | | N/A |
| **1.7 (4.29)** | **Luminaires with non-replaceable light source** | | P |
| | Not possible to replace light source | | P |
| | Live part not accessible after parts have been opened by hand or tools | | P |
| **1.7 (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 |
| | At least one fixing means requiring use of tool | | N/A |
| **1.7 (4.31)** | **Insulation between circuits** | | **P** |
| | Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3 | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 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 |
| 1.7 (4.31.1) | SELV or PELV circuits | | N/A |
| | Used SELV/PELV source | | N/A |
| | Voltage ≤ ELV | | N/A |
| | Insulating of SELV/PELV circuits from LV supply | | N/A |
| | Insulating of SELV/PELV circuits from other non SELV/PELV circuits | | N/A |
| | Insulating of SELV/PELV circuits from FELV | | N/A |
| | Insulating of SELV/PELV circuits from other SELV/PELV circuits | | N/A |
| | SELV/PELV circuits insulated from accessible parts according Table X.1 | | N/A |
| | Plugs not able to make any electrical contact with 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 |
| 1.7 (4.31.2) | FELV circuits | | N/A |
| | Used FELV source | | N/A |
| | Voltage ≤ 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 make any electrical contact with socket-outlets of other voltage systems | | N/A |
| | Socket outlets does not admit plugs of other voltage systems | | N/A |
| | Socket-outlets have protective conductor contact | | N/A |
| 1.7 (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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - test according 7.2.3 | | 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 |
| **1.7 (4.32)** | **Overvoltage protective devices** | | N/A |
| | Comply with IEC 61643-11 | | N/A |
| | External to controlgear and connected to earth: | | N/A |
| | - only in fixed luminaires | | N/A |
| | - only connected to protective earth | | N/A |
| **1.7 (4.33)** | **Luminaire powered via information technology communication cabling** | | N/A |
| | Requirements for Class III luminaire | | N/A |
| | Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector | | N/A |
| | Luminaire does not create any hazard from overvoltage | (see Annex 2) | N/A |
| **1.7 (4.34)** | **Electromagnetic fields (EMF)** | | P |
| | No harmful electromagnetic fields | | P |
| **1.7 (4.35)** | **Protection against moving fan blades** | | N/A |
| | Test with a standard test finger | | N/A |
| | Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire | | N/A |
| | Blades rounded with radius ≥ 0.5 mm and: | | N/A |
| | -hardness less than D60 Shore | | N/A |
| | -peripheral speed less than 15 m/s | | N/A |
| | -input power of fan ≤ 2 W at rated voltage | | N/A |
| **1.7 (4.36)** | **Track-mounted luminaires** | | N/A |
| | Test in accordance with Annex A of IEC60570:2003/AMD2:2019 | | N/A |

| | | | |
|---|---|---|---|
| **1.8 (11)** | **CREEPAGE DISTANCES AND CLEARANCES** | | P |
| 1.8 (11.2.1) | Impulse withstand category (Normal category II) | Category II ☒ Category III ☐ | — |
| | Category III according Annex U | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1 | | N/A |
| 1.8 (11.2.2) | Creepage distances for frequency up to 30 kHz | See Test Table 1.8 (11.2) I | P |
| | Creepage distances for frequency over 30 kHz: | | |
| | - Controlgear marked with $\hat{U}_{OUT}$ and $f_{U_{OUT}}$ according IEC 61347-1, clause 7.1, item w | See Test Table 1.8 (11.2) II | N/A |
| | - Requirements according IEC 60664-4 for controlgear not covered by IEC 61347 | See Test Table 1.8 (11.2) II | N/A |
| 1.8 (11.2.3) | Clearances for frequency up to 30 kHz | See Test Table 1.8 (11.2) I | P |
| | Clearances distances for frequency over 30 kHz: | | |
| | - Controlgear marked with $U_P$ | See Test Table 1.8 (11.2) II | N/A |
| | - Requirements according IEC 60664-4 for controlgear not covered by IEC 61347 | See Test Table 1.8 (11.2) II | N/A |

| **1.9 (7)** | **PROVISION FOR EARTHING** | | P |
|---|---|---|---|
| 1.9 (7.2.1 + 7.2.3) | Accessible metal parts | | P |
| | Metal parts in contact with supporting surface | | P |
| | Resistance < 0,5 Ω..... : | 0,013Ω | P |
| | Self-tapping screws used | | N/A |
| | Thread-forming screws | | N/A |
| | Thread-forming screw used in a grove | | N/A |
| | Protective earth makes contact first | | P |
| | Terminal blocks with integrated screwless protective earthing contacts tested according Annex V | | N/A |
| | Protective earthing of the luminaire not via built-in control gear | | N/A |
| 1.9 (7.2.2 + 7.2.3) | Protective earth continuity in joints, etc. | | N/A |
| 1.9 (7.2.4) | Locking of clamping means | | P |
| | Compliance with 4.7.3 | | P |
| 1.9 (7.2.5) | Protective earth terminal integral part of connector socket | | N/A |
| 1.9 (7.2.6) | Protective earth terminal adjacent to mains terminals | | P |
| 1.9 (7.2.7) | Electrolytic corrosion of the protective earth terminal | | P |
| 1.9 (7.2.8) | Material of protective earth terminal | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Contact surface bare metal | | P |
| 1.9 (7.2.10) | Class II luminaire for looping-in | | N/A |
| | Double or reinforced insulation to functional earth | | N/A |
| 1.9 (7.2.11) | Protective earthing core coloured green-yellow | | P |
| | Length of protective earthing conductor | | P |
| 1.9 (7.2.12) | PELV circuit connected to protective earth for functional purpose | | N/A |
| **1.10 (14)** | **SCREW TERMINALS** | | N/A |
| | Separately approved; component list | (see Annex 1) | N/A |
| | Part of the luminaire | (see Annex 3) | N/A |
| **1.10 (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 |
| **1.11 (5)** | **EXTERNAL AND INTERNAL WIRING** | | P |
| **1.11 (5.2)** | **Supply connection and external wiring** | | **P** |
| 1.11 (5.2.1) | Means of connection ..... : | Terminal block | P |
| | Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits ≤ 25 V AC/60 V DC/25 V peak interrupted DC voltage with frequency 10Hz -200 Hz or protected from outdoor environment | | N/A |
| 1.11 (5.2.2) | Type of cable..... : | | N/A |
| | Nominal cross-sectional area (mm²) ..... : | | N/A |
| | Cables equal to IEC 60227 or IEC 60245 | | N/A |
| 1.11 (5.2.3) | Type of attachment, X, Y or Z | | N/A |
| 1.11 (5.2.5) | Type Z not connected to screws | | N/A |
| 1.11 (5.2.6) | Cable entries: | | P |
| | - suitable for introduction | | P |
| | - adequate degree of protection | | P |
| 1.11 (5.2.7) | Cable entries through rigid material have rounded edges | | P |
| 1.11 (5.2.8) | Insulating bushings: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - 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 |
| 1.11 (5.2.9) | Locking of screwed bushings | | N/A |
| 1.11 (5.2.10) | Cord anchorage: | | P |
| | - covering protected from abrasion | | P |
| | - clear how to be effective | | P |
| | - no mechanical or thermal stress | | P |
| | - no tying of cables into knots etc. | | P |
| | - insulating material or lining | | N/A |
| 1.11 (5.2.10.1) | Cord anchorage for type X attachment: | | N/A |
| | 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 |
| 1.11 (5.2.10.2) | Adequate cord anchorage for type Y and type Z attachment | | P |
| 1.11 (5.2.10.3) | Tests: | | P |
| | - impossible to push cable; unsafe | | P |
| | - pull test: 25 times; pull (N) ..... : | 60N | P |
| | - torque test: torque (Nm) ..... : | 0,25Nm | P |
| | - displacement ≤ 2 mm | | P |
| | - no movement of conductors | | P |
| | - no damage of cable or cord | | P |
| | - function independent of electrical connection | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.11 (5.2.10.4) | Luminaire with/designed for use with supply cord with maximum current of 2A: | | N/A |
| | - Ordinary Class III luminaire supplied with SELV ≤ 25V RMS/60V DC | | N/A |
| | - Ordinary Class III luminaire supplied with PELV ≤12V RMS/30V DC | | N/A |
| | - Other than ordinary Class III luminaire supplied with voltage ≤12V RMS/30V DC | | N/A |
| | Pull test of 30N | | N/A |
| 1.11 (5.2.11) | External wiring passing into luminaire | | N/A |
| 1.11 (5.2.12) | Looping-in terminals | | N/A |
| 1.11 (5.2.13) | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | N/A |
| 1.11 (5.2.14) | Mains plug same protection | | N/A |
| | Class III luminaire plug | | N/A |
| | No unsafe compatibility | | N/A |
| 1.11 (5.2.15) | Connectors for Class III luminaires (IEC 60603 or IEC 62680) | | N/A |
| 1.11 (5.2.16) | Appliance inlets (IEC 60320) | | N/A |
| | Installation couplers (IEC 61535) | | N/A |
| | Appliance inlet or connector systems (IEC 61984) | | N/A |
| 1.11 (5.2.17) | No standardized interconnecting cables properly assembled | | N/A |
| 1.11 (5.2.18) | Used plug in accordance with | | N/A |
| | - IEC 60083 | | N/A |
| | - other standard | | N/A |
| **1.11 (5.3)** | **Internal wiring** | | **P** |
| 1.11 (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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - socket outlet loaded (A) ..... : | | N/A |
| | - temperatures ..... : | (see Annex 2) | N/A |
| | Green-yellow for protective earth only | | P |
| 1.11 (5.3.1.1) | Internal wiring connected directly to fixed wiring | | P |
| | Cross-sectional area (mm²)..... : | See Annex 1 | P |
| | Insulation thickness (mm) ..... : | See Annex 1 | P |
| | Extra insulation added where necessary | | N/A |
| 1.11 (5.3.1.2) | Internal wiring connected to fixed wiring via internal current-limiting device | | P |
| | Cross-sectional area (mm²)..... : | See Annex 1 | P |
| 1.11 (5.3.1.3) | Double or reinforced insulation for class II | | P |
| 1.11 (5.3.1.4) | Conductors without insulation | | N/A |
| 1.11 (5.3.1.5) | SELV/PELV current-carrying parts | | N/A |
| 1.11 (5.3.1.6) | Insulation thickness other than PVC or rubber | | N/A |
| 1.11 (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 |
| 1.11 (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 |
| 1.11 (5.3.4) | Joints and junctions effectively insulated | | N/A |
| 1.11 (5.3.5) | Strain on internal wiring | | N/A |
| 1.11 (5.3.6) | Wire carriers | | N/A |
| 1.11 (5.3.7) | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **1.11 (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 |
| **1.12 (8)** | **PROTECTION AGAINST ELECTRIC SHOCK** | | P |
| 1.12 (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 starter holders in portable and adjustable luminaires comply with double or reinforced insulation requirements | | N/A |
| | Basic insulation only accessible under lamp or starter replacement | | N/A |
| | 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 |
| 1.12 (8.2.2) | Portable luminaire adjusted in most unfavourable position | | N/A |
| 1.12 (8.2.3.a) | Class II luminaire: | | N/A |
| | - basic insulated metal parts not accessible | | N/A |
| | - required insulation from live parts in compliance with Table X.1 | | N/A |
| | - glass protective shields not used as supplementary insulation | | N/A |
| 1.12 (8.2.3.b) | BC lamp holder of metal in class I luminaires shall be connected to protective earth | | N/A |
| 1.12 (8.2.3.c) | SELV circuits with exposed current carrying parts: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Ordinary luminaire: | | N/A |
| | - voltage under load/ no-load AC (V)..... : | | N/A |
| | - voltage under load/ no-load DC (V)……..: | | N/A |
| | - interrupted DC voltage (V) ……..: | | N/A |
| | - touch current if applicable (mA) ..... : | | N/A |
| | One conductive part insulated if required | | N/A |
| | Other than ordinary luminaire: | | |
| | - voltage under load/ no-load AC (V)..... : | | N/A |
| | - voltage under load/ no-load DC (V)……..: | | N/A |
| | - interrupted DC voltage (V) ……..: | | N/A |
| | Class III luminaire only for connection to SELV/PELV | | N/A |
| 1.12 (8.2.3.d) | PELV circuits with exposed current carrying parts: | | N/A |
| | Ordinary luminaire: | | N/A |
| | - voltage under load/ no-load AC (V)..... : | | N/A |
| | - voltage under load/ no-load DC (V)……..: | | N/A |
| | Other than ordinary luminaire: | | N/A |
| | - voltage under load/ no-load AC (V)..... : | | N/A |
| | - voltage under load/ no-load DC (V)……..: | | N/A |
| | One pole insulated if required | | N/A |
| 1.12 (8.2.4) | Portable luminaire has protection independent of supporting surface | | N/A |
| 1.12 (8.2.5) | Compliance with the standard test finger or relevant probe | | P |
| 1.12 (8.2.6) | Covers reliably secured | | P |
| 1.12 (8.2.7) | Luminaire other than below with capacitor > 0,5 μF not exceed 50 V 1 min after disconnection | | P |
| | Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection | | N/A |
| | Other luminaires with capacitor > 0,1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection | | N/A |

| | | |
|---|---|---|
| **1.13 (12)** | **ENDURANCE TEST AND THERMAL TEST** | P |
| 1.13 (-) | If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in 1.14 | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **1.13 (12.2)** | **Selection of lamps and ballasts** | | — |
| | Lamp used according Annex B | (Lamp used see Annex 2) | — |
| | Control gear if separate and not supplied | (Control gear used see Annex 2) | — |
| **1.13 (12.3)** | **Endurance test** | | **P** |
| | a) mounting-position ..... : | As normal use | — |
| | b) test temperature (°C) ..... : | 35°C | — |
| | c) total duration (h) ..... : | 240h | — |
| | d) supply voltage (V) ..... : | 264V | — |
| | d) if not equipped with control gear, constant voltage/current (V) or (A) ..... : | N/A | — |
| 1.13 (12.3.1d) | d) Class III luminaires powered via information technology communication cable: | | N/A |
| | - voltage under normal operation (V)……..: | | — |
| | - voltage under abnormal operation (V)……..: | | — |
| | e) luminaire ceases to operate | | — |
| | f) luminaire with constant light output function | | N/A |
| 1.13 (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 |
| **1.13 (12.4)** | **Thermal test (normal operation)** | (see Annex 2) | P |
| **1.13 (12.5)** | **Thermal test (abnormal operation)** | (see Annex 2) | P |
| **1.13 (12.6)** | **Thermal test (failed lamp control gear condition):** | | |
| 1.13 (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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - calculated mounting surface temperature (°C) ..... : | | N/A |
| | - track-mounted luminaires | | N/A |
| 1.13 (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 |
| **1.13 (12.7)** | **Thermal test (failed lamp control gear in plastic luminaires):** | | N/A |
| 1.13 (12.7.1) | Luminaire without temperature sensing control | | N/A |
| 1.13 (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 |
| | - 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 Test Table 1.15 (13.2.1) | N/A |
| 1.13 (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 ..... : | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - calculated temperature of fixing point/exposed part (°C) ..... : | | — |
| | Ball-pressure test ..... : | See Test Table 1.15 (13.2.1) | N/A |
| 1.13 (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 |
| 1.13 (12.7.2) | Luminaire with temperature sensing control | | |
| | - thermal link..... : | Yes ☐ No ☐ | — |
| | - manual reset cut-out ..... : | Yes ☐ No ☐ | — |
| | - auto reset cut-out ..... : | Yes ☐ No ☐ | — |
| | - case of abnormal conditions ..... : | | — |
| | - highest measured temperature of fixing point/ exposed part (°C): ..... : | | — |
| | Ball-pressure test: ..... : | See Test Table 1.15 (13.2.1) | N/A |

| **1.14 (9)** | **RESISTANCE TO DUST AND MOISTURE** | | P |
|---|---|---|---|
| 1.14 (-) | If IP > IP 20 the order of tests as specified in clause 1.12 | | P |
| 1.14 (9.2) | Tests for ingress of dust, solid objects and moisture: | | P |
| | - classification according to IP..... : | IP65 | — |
| | - mounting position during test ..... : | Norma use | — |
| | - fixing screws tightened; torque (Nm) ..... : | 2/3 torque | — |
| | - tests according to clauses..... : | 9.2.2 and 9.2.6 | — |
| | - electric strength test afterwards | | P |
| | a) no deposit in dust-proof luminaire | | N/A |
| | b) no talcum in dust-tight luminaire | | P |
| | c) no trace of water on current-carrying parts or on insulation where it could become a hazard | | P |
| | c.1) For luminaires without drain holes – no water entry | | N/A |
| | c.2) For luminaires with drain holes – no hazardous water entry | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold water jet-proof luminaire | | N/A |
| | e) no contact with live parts (IP 2X) | | N/A |
| | e) no entry into enclosure (IP 3X and IP 4X) | | N/A |
| | e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X) | | N/A |
| | f) no trace of water on part of lamp requiring protection from splashing water | | N/A |
| | g) no damage of protective shield or glass envelope | | P |
| 1.14 (9.3) | Humidity test 48 h | 25°C; 93%R.H. | P |
| **1.15 (10)** | **INSULATION RESISTANCE AND ELECTRIC STRENGTH** | | P |
| 1.15 (10.2.1) | Insulation resistance test | | P |
| | Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... : | Covered by metal foil | — |
| | Insulation resistance (MΩ): | | P |
| | SELV/PELV: | | 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/PELV: | | P |
| | - between live parts of different polarity ..... : | >2000MΩ | P |
| | - between live parts and mounting surface ..... : | >2000MΩ | P |
| | - between live parts and metal parts ..... : | | N/A |
| | - 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 |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.15 (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/PELV: | | 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/PELV: | | P |
| | - between live parts of different polarity ..... : | 1480V | P |
| | - between live parts and mounting surface ..... : | 2960V (Class II construction) | P |
| | - between live parts and metal parts ..... : | | N/A |
| | - 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 |
| 1.15 (10.3) | Touch current (mA)……: | 0,05 (Class II construction) | P |
| | Protective conductor current (mA)……: | | N/A |

| **1.16 (13)** | **RESISTANCE TO HEAT, FIRE AND TRACKING** | | P |
|---|---|---|---|
| 1.16 (13.2.1) | Ball-pressure test ..... : | See Test Table 1.16 (13.2.1) | P |
| 1.16 (13.3.1) | Needle-flame test (10 s)..... : | See Test Table 1.16 (13.3.1) | P |
| 1.16 (13.3.2) | Glow-wire test (650°C) ..... : | See Test Table 1.16 (13.3.2) | P |
| 1.16 (13.4) | Proof tracking test (IEC 60112)..... : | See Test Table 1.16 (13.4) | P |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **1.8 (11.2)** | **TABLE I: Creepage distances and clearances** | | | | | | | **P** |
| | **Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages** | | | | | | | **P** |
| | **Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*** | | | | | | | **P** |
| | **Insulation type **** | **Measured clearance** | **Required** | | **Measured creepage** | **Required** | | |
| | | | **clearance** | ***Table** | | **creepage** | ***Table** | |
| Distance 1: | B | >15 | 1,5 | **11.1.B*** | >15 | 2,5 | **11.1.A*** | |
| Working voltage (V) ..... : | | | | | 220-240V~ | | | — |
| PTI ..... : | | | | | < 600 ☒ ≥ 600 ☐ | | | — |
| Pulse voltage or $U_P$ if applicable (kV) ..... : | | | | | N/A | | | — |
| Supplementary information: Between live parts of different polarity | | | | | | | | |
| Distance 2: | B | >20 | 3,0 | **11.1.B*** | >20 | 5,0 | **11.1.A*** | |
| Working voltage (V) ..... : | | | | | 220-240V~ | | | — |
| PTI ..... : | | | | | < 600 ☒ ≥ 600 ☐ | | | — |
| Pulse voltage or $U_P$ if applicable (kV) ..... : | | | | | N/A | | | — |
| Supplementary information: Between live parts and accessible part | | | | | | | | |
| Distance 3: | | | 3,0 | **11.1.B*** | | | **11.1.A*** | |
| Working voltage (V) ..... : | | | | | 220-240V~ | | | — |
| PTI ..... : | | | | | < 600 ☒ ≥ 600 ☐ | | | — |
| Pulse voltage or $U_P$ if applicable (kV) ..... : | | | | | N/A | | | — |
| Supplementary information: | | | | | | | | |

** Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **1.8 (11.2)** | **TABLE II: Creepage distances and clearances** | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|
| **Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages** | | | | | | | | |
| **Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2** | | | | | | | | |
| **Distances** | **Insulation type **** | **Measured clearance** | **Required** | | **Measured creepage** | **Required** | | |
| | | | **clearance** | ***Table** | | **creepage** | ***Table** | |
| Distance 1: | | | | | | | | |
| Working voltage (V) .....: | | | | | | | | — |
| Frequency if applicable (kHz) .....: | | | | | | | | — |
| PTI .....: | | | | | < 600 ☐ | | ≥ 600 ☐ | — |
| Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....: | | | | | | | | — |
| Supplementary information: | | | | | | | | |
| Distance 2: | | | | | | | | |
| Working voltage (V) .....: | | | | | | | | — |
| Frequency if applicable (kHz) .....: | | | | | | | | — |
| PTI .....: | | | | | < 600 ☐ | | ≥ 600 ☐ | — |
| Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....: | | | | | | | | — |
| Supplementary information: | | | | | | | | |
| Distance 3: | | | | | | | | |
| Working voltage (V) .....: | | | | | | | | — |
| Frequency if applicable (kHz) .....: | | | | | | | | — |
| PTI .....: | | | | | < 600 ☐ | | ≥ 600 ☐ | — |
| Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....: | | | | | | | | — |
| Supplementary information: | | | | | | | | |

** Insulation type: B – Basic; S – Supplementary; R – Reinforced.

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **1.16 (13.2.1)** | **TABLE: Ball Pressure Test of Thermoplastics** | | **P** |
|---|---|---|---|
| **Allowed impression diameter (mm) ..... :** | | 2 | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Test temperature (°C) | Impression diameter (mm) |
| The ends of plastic | See Annex 1 | 75 | 1,0 |
| Plastic enclosure | See Annex 1 | 85 | 1,1 |
| Plastic part under LED driver | See Annex 1 | 125 | 1,2 |
| CCT switch | See Annex 1 | 125 | 1,3 |
| Power switch | See Annex 1 | 125 | 1,3 |
| PCB fixed switch | See Annex 1 | 125 | 0,9 |
| Driver PCB | See Annex 1 | 125 | 0,9 |
| Supplementary information: N/A | | | |

| **1.16 (13.3.1)** | **TABLE: Needle-flame test** | | | | **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 |
| CCT switch | See Annex 1 | 10 | No | 0 | P |
| Power switch | See Annex 1 | 10 | No | 0 | P |
| PCB fixed switch | See Annex 1 | 10 | No | 0 | P |
| Driver PCB | See Annex 1 | 10 | No | 0 | P |
| Supplementary information: N/A | | | | | |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **1.16 (13.3.2)** | **TABLE: Resistance to heat and fire - Glow wire tests** | | | | **P** |
|---|---|---|---|---|---|
| **Object/ Part No./ Material** | **Manufacturer/ trademark** | **GWT (°C) : 650** | | | **Verdict** |
| | | **$t_E$ (s)** | **$t_I$ (s)** | **$t_R$ (s)** | |
| The ends of plastic | See Annex 1 | 0 | 0 | 0 | P |
| Plastic enclosure | See Annex 1 | 0 | 0 | 0 | P |
| Plastic part under LED driver | See Annex 1 | 0 | 0 | 0 | P |
| Ignition of the specified layer placed underneath the test specimen (Yes/No)..... : | | | | | No |
| Supplementary information: N/A | | | | | |

| **1.16 (13.4)** | **TABLE: Proof tracking test** | | | | **P** |
|---|---|---|---|---|---|
| **Test voltage PTI ..... :** | | 175 V | | | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Withstand 50 drops without failure on three places or on three specimens | | | Verdict |
| The ends of plastic | See Annex 1 | YES | YES | YES | PASS |
| Plastic enclosure | See Annex 1 | YES | YES | YES | PASS |
| | | | | | |
| Supplementary information: N/A | | | | | |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| ANNEX 1 | TABLE: Critical components information | | | | | P |
|---|---|---|---|---|---|---|
| **Object / part No.** | **Code** | **Manufacturer/ trademark** | **Type / model** | **Technical data** | **Standard** | **Mark(s) of conformity[1)]** |
| The ends of Plastic | C | Hangzhou Longlux Electronic Technology Co., ltd | -- | Min. thickness: 0.5mm | EN IEC 60598-1 EN IEC 60598-2-1 | Test with appliance |
| Plastic enclosure | C | Hangzhou Longlux Electronic Technology Co., ltd | -- | Min. thickness: 0.5mm | EN IEC 60598-1 EN IEC 60598-2-1 | Test with appliance |
| Terminal block | B | Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd. | TB-7020B | AC450V; 0,5…2,5 mm²; T110; 16A | IEC/EN 60998-1 IEC/EN 60998-2-2 | TUV Rh/ (R 50160873) |
| Alternative | D | Jiang Men Krealux Electrical Appliances Co. Ltd. | P02-. P02-D-. | AC450V; 0,5...2,5 mm²; T110; 24A/16A | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40021964 |
| Alternative | D | BJB GmbH & Co. KG | 46.413 46.414 46.415 | AC450V; T85; 24A/16A; 0,5…2,5 mm² | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40034941 |
| Alternative | D | BJB GmbH & Co. KG | 46.412 46.413 46.414 46.415 | AC450V; T85; 24A/16A; 0,5…2,5 mm² | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40020580 |
| Alternative | D | Putian Hanjiang Fucon Electronics Co., Ltd. | CM-238 | AC450V; 0,5...2,5 mm²; T85; 24A | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40041279 |
| Alternative | D | A.A.G. Stucchi S R L | 1675/. | 450V; 0,5…2,5 mm², T85; 24A | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40024593 |
| Alternative | D | Cixi Dingli Plastic&Rubber Co.,Ltd | DL01-2A/ DL01-3A | 250V, 1,0 mm² or 1,5 mm², T85 | IEC/EN 60998-1 IEC/EN 60998-2-2 | TUV Rh/ (J 50390947) |
| Alternative | D | WAGO-Kontakttechnik GmbH & Co. KG | 294 | 500V; max 24A; T85; 0,5...2,5 mm² | EN 60998-1 EN 60998-2-2 | KEMA/ (2128791.01 ) |
| Alternative | D | Openwise ludustrial Limited | 925 series | 450V; max 24A; T110; 0,5...2,5 mm² | EN 60998-1 EN 60998-2-2 | DEKRA/ (35-107927) |
| Alternative | D | Jiang Men Krealux Electrical Appliances Co. Ltd. | P03 | 450V; max 24A; 0,5...2,5 mm² | EN 60998-1 EN 60998-2-2 | VDE/ 40039033 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | Yueqing Bincheng Electronics Co., Ltd. | B08-2P | 380 V; 10 A; 0,5…2,5 mm²; T90 | IEC/EN 60998-1 IEC/EN 60998-2-2 | Intertek/ (SE-S-1914247R1) |
| CCT switch | C | DONGGUAN LITUO ELECTRONICS CO., LTD. | SS22E01G10 | 50V;0.5A | EN IEC 60598-1 EN IEC 60598-2-1 | Test with appliance |
| Power switch | B, C | HUIYANG ZINGEAR INDUSTRY CO., LTD | ZE-209S | 125V;1A | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E89885 Test with appliance |
| PCB of the switch | B, C | KINGBOARD LAMINATES HOLDINGS LTD | KB-5150 KB-5152 | V-0; thickness≥ 1,0mm | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E123995 Test with appliance |
| Interconnect wire | B | Cixi Hongyu Electric Appliance Co., Ltd. | H07V-K H07V-U | 1x1,5…2,5 mm² | DIN EN 50525-2-31 | VDE/ 40012841 |
| Alternative | D | Ningbo Haoguang Electric Appliance Co.,Ltd. | H07V-K H07V-U | 1x1,5…2,5 mm² | DIN EN 50525-2-31 | VDE/ 126062 |
| Alternative | D | NINGBO HAOGUANG ELECTRIC APPLIANCE CO LTD | 1015 | 13-15AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E192545 Test with appliance |
| Alternative | D | NINGBO HAOGUANG ELECTRIC APPLIANCE CO LTD | 3135 | 13-15AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E192545 Test with appliance |
| Alternative | D | Ningbo Sen Yi Kai Electric Co., Ltd. | H07V-K H07V-R H07V-U | 1x1,5…2,5 mm² | DIN EN 50525-2-31 | VDE/ 40038560 |
| Input wire of LED Driver | B | Cixi Hongyu Electric Appliance Co., Ltd. | H05V-K H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 40012841 |
| Alternative | D | Ningbo Haoguang Electric Appliance Co.,Ltd. | H05V-K H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 126062 |
| Alternative | D | Xiangshan Fahua Electric Wire & Cable Co., Ltd. | H05SJ-K H05S-K | 1x0,5...0,75 mm² | DIN EN 50525-2-41 | VDE/ 40016704 |
| Alternative | D | Ningbo Yirun Electric Appliance Co., Ltd | H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 40021669 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | YUEQING BOYUAN ELECTRONIC WIRE & CABLE CO LTD | 1015 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E203561 Test with appliance |
| Alternative | D | XINGDA ELECTRONICS WIRE & CABLE CO LTD | 1015 3135 1007 3239 | 18-20AWG; 300-600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E187208 Test with appliance |
| Alternative | D | Cixi Hongyu Electric Appliance Co., Ltd. | H03VVH2-F | 2x0,5...0,75 mm² | DIN EN 50525-2-11 | VDE/ 40023417 |
| Alternative | D | Zhejiang Shuangyang Group Co., Ltd. | H03VVH2-F | 2x0,5...0,75 mm² | DIN EN 50525-2-11 | VDE/ 133506 |
| Alternative | D | NINGBO HAOGUANG ELECTRIC APPLIANCE CO LTD | 1015 3135 1007 3239 | 18-20AWG; 300-600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E192545 Test with appliance |
| Alternative | D | RUIAN XINZHOU WIRE & CABLE CO LTD | 1015 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E308748 Test with appliance |
| Alternative | D | Yuyao Kaian Cable Technology Co., Ltd. | 8094 | 18-20AWG | DIN 57250 | VDE/ 40044349 |
| Alternative | D | OMERIN Division POLYCABLE | H05V2-U | 1x0,5 mm² | EN 50525-2-31 | LCIE/ (645058) |
| Alternative | D | NINGBO XUANHUA ELECTRIC CO LTD | 1015 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E341702 Test with appliance |
| Alternative | D | Taizhou Xin Yongli Electrics appliances Co., Ltd | H03VH7-H | 1x0,5 mm² | DIN VDE 0281-8 | VDE/ 136412 |
| Alternative | D | Hong Shun Wire & Cable Fluoroplastics Factory | 3HS2AF | 1x0,5 mm² | DIN 57250 | VDE/ 40017008 |
| Alternative | D | Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd. | (N)6Y6YAF | 1x0,5 mm² | DIN 57250 | VDE/ 40028002 |
| Alternative | D | 3Q WIRE & CABLE CO LTD | 1015 1007 | 18-20AWG; 300-600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E341104 Test with appliance |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD | 3239 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E347603 Test with appliance |
| Alternative | D | Ningbo Jiali Wire & Cable Co Ltd | 3135 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E520289 Test with appliance |
| Alternative | D | Ningbo Jiali Cable Co., Ltd. | H05SJ-K H05S-K | 1x0,5...2,5 mm² | DIN EN 50525-2-41 | VDE/ 40053402 |
| Alternative | D | Zhejiang Jinting Nuclear Cable Co.,Ltd. | H03VVH2-F | 2x0,5…0,75 mm² | DIN EN 50525-2-31 | VDE/ 40013419 |
| Alternative | D | Ningbo Liansheng Wire & Cable Co., Ltd. | H03VVH2-F | 2x0,5…0,75 mm² | DIN EN 50525-2-31 | VDE/ 40022054 |
| Alternative | D | JIANGYIN TIANQI SILICONE RUBBER PRODUCTS CO LTD | 1007 1015 2468 2464 3135 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E225526 Test with appliance |
| Output wire of LED Driver | B | Cixi Hongyu Electric Appliance Co., Ltd. | H05V-K H05V-U | 1x0,75 mm² | DIN EN 50525-2-31 | VDE/ 40012841 |
| Alternative | D | Ningbo Haoguang Electric Appliance Co.,Ltd. | H05V-K H05V-U | 1x0,75 mm² | DIN EN 50525-2-31 | VDE/ 126062 |
| Alternative | D | Xiangshan Fahua Electric Wire & Cable Co., Ltd. | H05SJ-K H05S-K | 1x0,5...0,75 mm² | DIN EN 50525-2-41 | VDE/ 40016704 |
| Alternative | D | Ningbo Yirun Electric Appliance Co., Ltd | H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 40021669 |
| Alternative | D | YUEQING BOYUAN ELECTRONIC WIRE & CABLE CO LTD | 1015 | 18-20AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E203561 Test with appliance |
| Alternative | D | XINGDA ELECTRONICS WIRE & CABLE CO LTD | 1015 3135 1007 3239 | 18-20AWG; 300-600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E187208 Test with appliance |
| Alternative | D | Cixi Hongyu Electric Appliance Co., Ltd. | H03VVH2-F | 2x0,5…0,75 mm² | DIN EN 50525-2-11 | VDE/ 40013419 |
| Alternative | D | Zhejiang Shuangyang Group Co., Ltd. | H03VVH2-F | 2x0,5…0,75 mm² | DIN EN 50525-2-11 | VDE/ 133506 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | NINGBO HAOGUANG ELECTRIC APPLIANCE CO LTD | 1007/1015/ 3135/3239 | 18-24AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E192545 Test with appliance |
| Alternative | D | RUIAN XINZHOU WIRE & CABLE CO LTD | 1015 | 18-24AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E308748 Test with appliance |
| Alternative | D | Yuyao Kaian Cable Technology Co., Ltd. | 8094 | 18-24AWG | DIN 57250 | VDE/ 40044349 |
| Alternative | D | OMERIN Division POLYCABLE | H05V2-U | 1x0,5 mm² | EN 50525-2-31 | LCIE/ (645058) |
| Alternative | D | NINGBO XUANHUA ELECTRIC CO LTD | 1015 | 18-24AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E341702 Test with appliance |
| Alternative | D | Taizhou Xin Yongli Electrics appliances Co., Ltd | H03VH7-H | 1x0,5 mm² | DIN VDE 0281-8 | VDE/ 136412 |
| Alternative | D | Hong Shun Wire & Cable Fluoroplastics Factory | 3HS2AF | 1x0,5 mm² | DIN 57250 | VDE/ 40017008 |
| Alternative | D | Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd. | (N)6Y6YAF | 1x0,5 mm² | DIN 57250 | VDE/ 40028002 |
| Alternative | D | 3Q WIRE & CABLE CO LTD | 1015 1007 | 18-24AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E341104 Test with appliance |
| Alternative | D | DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD | 3239 | 18-24AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E347603 Test with appliance |
| Alternative | D | Ningbo Jiali Wire & Cable Co Ltd | 3135 | 18-24AWG; 600V | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E520289 Test with appliance |
| Alternative | D | Ningbo Jiali Cable Co., Ltd. | H05SJ-K H05S-K | 1x0,5...2,5 mm² | DIN EN 50525-2-41 | VDE/ 40053402 |
| Alternative | D | Zhejiang Jinting Nuclear Cable Co.,Ltd. | H03VVH2-F | 2x0,5…0,75 mm² | DIN EN 50525-2-11 | VDE/ 40013419 |
| Alternative | D | Ningbo Liansheng Wire & Cable Co., Ltd. | H03VVH2-F | 2x0,5…0,75 mm² | DIN EN 50525-2-11 | VDE/ 40022054 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | JIANGYIN TIANQI SILICONE RUBBER PRODUCTS CO LTD | 1007<br>1015<br>2468<br>2464<br>3135 | 18-24AWG; 600V | EN IEC 60598-1<br>EN IEC 60598-2-1 | UL/E225526<br>Test with appliance |
| Earthing wire | B | Cixi Hongyu Electric Appliance Co., Ltd. | H05V-K<br>H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 40012841 |
| Alternative | D | Ningbo Haoguang Electric Appliance Co.,Ltd. | H05V-K<br>H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 126062 |
| Alternative | D | Xiangshan Fahua Electric Wire & Cable Co., Ltd. | H05SJ-K<br>H05S-K | 1x0,5...0,75 mm² | DIN EN 50525-2-41 | VDE/ 40016704 |
| Alternative | D | Ningbo Yirun Electric Appliance Co., Ltd | H05V-U | 1x0,5...0,75 mm² | DIN EN 50525-2-31 | VDE/ 40021669 |
| Plastic enclosure under driver PCB | C | Hangzhou Longlux Electronic Technology Co., ltd | -- | Min. thickness: 1 mm | EN IEC 60598-1<br>EN IEC 60598-2-1 | Test with appliance |
| Driver PCB | B, C | KINGBOARD LAMINATES HOLDINGS LTD | KB-5150<br>KB-5152 | V-0; thickness≥ 1,0mm | EN IEC 60598-1<br>EN IEC 60598-2-1 | UL/E123995<br>Test with appliance |
| Alternative | D | SHANDONG JINBAO ELECTRONICS CO LTD | ZD-68(G)F | V-1; thickness≥ 1,2mm | EN IEC 60598-1<br>EN IEC 60598-2-1 | UL/E141940<br>Test with appliance |
| Alternative | D | SHANGHAI GLOBAL ELECTRONIC MATERIAL LTD | GEM-C3 | V-0; thickness≥ 1,0mm | EN IEC 60598-1<br>EN IEC 60598-2-1 | UL/E224772<br>Test with appliance |
| Alternative | D | GOLDENMAX INTERNATIONAL TECHNOLOGY (HANGZHOU) LTD | CEM-3.0 FR-4.0 | V-0; thickness≥ 1,0mm | EN IEC 60598-1<br>EN IEC 60598-2-1 | UL/E134893<br>Test with appliance |
| Alternative | D | SANWA CHEMICAL INDUSTRIAL CO LTD | CEM-3.0 FR-4.0 | V-0; 130°C | EN IEC 60598-1<br>EN IEC 60598-2-1 | UL/E81336<br>Test with appliance |
| Connector (CN1) | B | Yueqing Dongnan Electronics Technology Co. Ltd. | DN250 | 450V; 0,5-0,75 mm²; T105 | DIN EN 60998-1<br>DIN EN 60998-2-2 | VDE/ 40018566 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | Putian Hanjiang Fucon Electronics Co., Ltd. | CM-250-3.5 | 5A; 450V; 0,5-0,75mm²; T120 | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40037257 |
| Alternative | D | Dongguan Changhe Electronics Co.,Ltd | CS200-00-350 | 500V; 0,5-0,75mm²; T110 | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40022503 |
| Alternative | D | Cixi Kaifeng Electronics Co.,Ltd | KF250A | 500V; 0,5-0,75mm²; T110 | DIN EN 60998-1 DIN EN 60998-2-2 | VDE/ 40048984 |
| Alternative | D | Dong Guan Dieran Electronics Science and Technology Co., Ltd. | DA250 | 300V 8A 105°C 0,75 mm² - 1,5 mm² | EN IEC 60598-1 EN IEC 60598-2-1 | VDE/ 40031801 |
| Alternative | D | Ningbo Max Electronic Technology CO.,Ltd | MX250A-3.5 MX250B-3.5 | 450V;5A; 0.2-0.75 mm² | EN IEC 60598-1 EN IEC 60598-2-1 | TUV SUD/ (B 004887 0002 Rev.00) |
| Fuse | B | Dongguan Better Electronics Technology Co., Ltd. | 932 | 2A, AC250V 1A; AC250V | DIN EN 60127-1 | VDE/ 40033369 |
| Alternative | D | XC Electronics (Shen Zhen) Corp. Ltd. | 5TE | 2A, AC250V 1A; AC250V | DIN EN 60127-1 | VDE/ 40029550 |
| Alternative | D | Zhongshan Lanbao Electronic Co., Ltd. | TR, TB | 2A, AC250V/400V | EN 60127-1 | TUV Rh (J 50420445) |
| Varistor | B | Hongzhi Enterprises Ltd. | HEL10D471K, HEL7D471K, HEL10D511K, HEL7D511K, HEL10D561K, HEL7D561K, HEL10D621K, HEL7D621K | 40/125/21 | DIN EN 61051-1 | VDE/ 40037512 |
| Alternative | D | Cerglass MFG Inc | 10D471K, 07D471K, 10D511K, 07D511K, 10D561K, 07D561K, 10D621K, 07D621K | 40/125/21 | IEC 61051-1 | VDE/ 40028836 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | Xiamen Sino Faith Electronic Technology Co.,Ltd | V-471K-07, V-471K-10, V-511K-07, V-511K-10, V-561K-07, V-561K-10, V-621K-07, V-621K-10 | 40/125/21 | IEC 61051-1 | VDE/ 40047368 |
| Alternative | D | Guangxi New Future Information Industry Co., Ltd. | 10D471K, 07D471K, 10D511K, 07D511K, 10D561K, 07D561K, 10D621K, 07D621K | 40/125/21 | IEC 61051-1 | VDE/ 40030322 |
| Y-capacitor | B | Hongzhi Enterprises Ltd. | X1Y1 | AC400V, 3300pF Max, 25/125/21 | DIN EN 60384-14 | VDE/ 40038760 |
| Alternative | D | JYH HSU (JEC) ELECTRONICS LTD | JD | AC400V, 3300pF Max, 25/125/21 | DIN EN 60384-14 | VDE/ 40038642 |
| Alternative | D | Xiamen Sino Faith Electronic Technology Co.,Ltd | HCY | AC400V, 3300pF Max, 25/125/21 | DIN EN 60384-14 | VDE/ 40034792 |
| Alternative | D | Shantou High-New Technology Dev.Zone Songtian Enterprise Co., Ltd. | CD | Y1, AC 400V, Max.3300pF 125°C | IEC/EN 60384-14 | VDE/ 40025754 |
| Alternative | D | Dongguan Weiqing Electronic Co., Ltd., | WD | Y1, AC 400V, Max.3300pF 125°C | IEC/EN 60384-14 | VDE/ 40045529 |
| X-capacitor | B | Dain Electronics Co., Ltd. | MEX MPX NPX | 0,47uF Max, 275V/310V, 40/110/21 | DIN EN 60384-14 | VDE/ 40018798 |
| Alternative | D | Shenzhen Ruidiwei Technology Co.,Ltd | MKP | 0,47uF Max, 275V/310V, 40/110/21 | DIN EN 60384-14 | VDE/ 40036287 |
| Alternative | D | Hongzhi Enterprises Ltd. | MPX (X2) | 0,47uF Max, 275V/310V, 40/110/56 | DIN EN 60384-14 | VDE/ 40023936 |
| Alternative | D | Zhejiang Qixing Electronics Corp., Ltd. | MPX/MKP | 0,47uF Max, 275V/310V, 40/110/56 | DIN EN 60384-14 | VDE/ 40049209 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative | D | Guangdong JURCC electronics Co., LTD. | MPX/MKP | 0,47uF Max, 275V/310V, 40/110/56 | DIN EN 60384-14 | VDE/ 40034920 |
| Alternative | D | Fuxin Pan Ocean Electronic Ltd. | MPX-X2 | 0,47uF Max, 275V/310V, 40/110/56 | DIN EN 60384-14 | VDE/ 40015756 |
| Heat-shrinkable tubing | B, C | SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD | RSFR-H; RSFR-HPF | 600V; 125ºC | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E123995 Test with appliance |
| Alternative | D | SHENZHEN JDD TECH NEW MATERIAL CO LTD | MRSG | 600V; 125ºC | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E345553 Test with appliance |
| Alternative | D | ZHEJIANG JIAMIN PLASTIC CO LTD | PF2A2-141 | 600V; 125ºC | EN IEC 60598-1 EN IEC 60598-2-1 | UL/E123995 Test with appliance |
| LED PCB | B, C | Hangzhou Longlux Electronic Technology Co., ltd | -- | Min. thickness: 1mm | EN IEC 60598-1 EN IEC 60598-2-1 | Test with appliance |
| LED | C | EVERLIGHT ELECTRONICS CO., LTD | SMD2835 | Ra>80; Tc: 2700- 6500K | IEC TR 62778 | Test with appliance |

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ANNEX 2** | **TABLE: Thermal tests of Section 12** | | P |
|---|---|---|---|
| | Type reference ..... : | LLX-Triproof-Integrated-50-TP-TC | — |
| | Lamp used..... : | Origin LEDs | — |
| | Lamp control gear used ..... : | Integral LED driver | — |
| | Mounting position of luminaire ..... : | As normal use | — |
| | Supply wattage (W) ..... : | 50,7W | — |
| | Supply current (A) ..... : | 0,205A | — |
| | Temperatures in test 1 - 4 below are corrected for ta (°C) ..... : | 25°C | — |
| | - abnormal operating mode..... : | Output short-circuit of driver | — |
| 1.13 (12.4) | - test 1: rated voltage ..... : | N/A | — |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... : | 1,06 x 240V = 254,4V | — |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... : | N/A | — |
| | Through wiring or looping-in wiring loaded by a current of A during the test ..... : | 5A | — |
| 1.13 (12.5) | - test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 130/150% of rated input voltage ..... : | 1,1 x 240V = 264V | — |

**Temperature measurements (°C)**

| Part | Ambient | **Cl. 12.4 – normal** | | | | **Cl. 12.5 – abnormal** | |
|---|---|---|---|---|---|---|---|
| | | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Terminal block | 25 | -- | 52,1 | -- | 110 | -- | -- |
| The ends of plastic | 25 | -- | 48,7 | -- | 90 | -- | -- |
| Plastic enclosure | 25 | -- | 54,2 | -- | 90 | -- | -- |
| CCT switch | 25 | -- | 51,2 | -- | Ref. | -- | -- |
| Power switch | 25 | -- | 55,3 | -- | Ref. | -- | -- |
| PCB fixed switch | 25 | -- | 61,5 | -- | 130 | -- | -- |
| Input wire of LED driver | 25 | -- | 54,1 | -- | 90 | -- | -- |
| Output wire of LED driver | 25 | -- | 57,7 | -- | 90 | -- | -- |
| Interconnection wire | 25 | -- | 67,5 | -- | 90 | -- | -- |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Plastic part under LED driver | 25 | -- | 75,6 | -- | Ref. | -- | -- |
| LED PCB | 25 | -- | 67,2 | -- | Ref. | -- | Ref. |
| MOV1 | 25 | -- | 83,2 | -- | 85 | -- | -- |
| CY1 | 25 | -- | 80,7 | -- | 125 | 52,9- | 125 |
| CX1 | 25 | -- | 78,2 | -- | 110 | 67,3 | 110 |
| L1 | 25 | -- | 85,3 | -- | 130 | -- | -- |
| LF1 | 25 | -- | 88,7 | -- | 130 | -- | -- |
| T1 | 25 | -- | 89,4 | -- | 130 | -- | -- |
| T2 | 25 | -- | 87,6 | -- | 130 | -- | -- |
| EC1 | 25 | -- | 82,4 | -- | 105 | 51,2 | 105 |
| Driver PCB | 25 | -- | 81,5 | -- | 130 | 43,3 | 130 |
| Mounting surface | 25 | -- | 35,2 | -- | 90 | 30,5 | 130 |
| Supplementary information: N/A | | | | | | | |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ANNEX 3** | **Screw terminals (part of the luminaire)** | | **N/A** |
|---|---|---|---|
| **(14)** | **SCREW TERMINALS** | | |
| (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 (mm²).....: | | — |
| (14.3.3) | Conductor space (mm).....: | | N/A |
| (14.4) | Mechanical tests | | |
| (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 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **ANNEX 4** | **Screwless terminals (part of the luminaire)** | | **N/A** |
| **(15)** | **SCREWLESS TERMINALS** | | |
| (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 | | |
| | 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 |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| (15.6.1) | Conductors | | |
| | Terminal size and rating | | N/A |
| 15.6.2 | Mechanical tests | | |
| (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 | | |
| | 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) | | | | | | | | | | N/A |
| | Voltage drop of two inseparable joints | | | | | | | | | N/A |
| | Voltage drop after 10th alt. 25th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV) ..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | N/A |
| | Voltage drop after 50th alt. 100th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV) ..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | N/A |
| | Continued ageing: voltage drop after 10th alt. 25th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV) ..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | N/A |
| | Continued ageing: voltage drop after 50th alt. 100th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV) ..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | N/A |
| | | | | | | | | | | |
| Supplementary information: | | | | | | | | | | |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT**
**IEC 60598-2-1**
**EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**
Luminaires
Part 2: Particular requirements
Section 1: Fixed general purpose luminaires

| | |
|---|---|
| **Differences according to**.....: | EN IEC 60598-2-1:2021 used in conjunction with EN IEC 60598-1:2021 + AMD11:2022 |
| **TRF template used .....:** | IECEE OD-2020-F2:2020, Ed. 1.1 |
| **Attachment Form No**.....: | EU_GD_IEC60598_2_1I |
| **Attachment Originator .....**: | UL(Demko) |
| **Master Attachment**.....: | 2022-05-13 |

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| | | | |
|---|---|---|---|
| | **CENELEC COMMON MODIFICATIONS (EN)** | | **P** |
| **1.6 (3)** | **MARKING** | | P |
| 1.6 (3.2.12) | Note 4 deleted | | N/A |
| **1.7 (4)** | **CONSTRUCTION** | | P |
| 1.7 (4.11.6) | Electro-mechanical contact systems: electric strength test at 1 500 V | | N/A |
| **1.11 (5)** | **EXTERNAL AND INTERNAL WIRING”** | | |
| 1.11 (5.2.2) | Cables equal to EN 50525 (all parts) | | N/A |
| | Paragraph 2 deleted | | N/A |
| | Replace table 5.1 – Supply cord | | N/A |
| **1.13 (12)** | **ENDURANCE TESTS AND THERMAL TESTS** | | P |
| 1.13 (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 |
| (5.2.1) | CY, DK, FI, UK: type of plug | | N/A |
| (5.2.18) | DK: socket-outlets | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **ZC** | **ANNEX ZC, NATIONAL DEVIATIONS (EN)** | | **P** |
| (4 & 5) | FR: Shuttered socket-outlets 10/16A | | N/A |
| | FR: Safety requirements for high buildings<br>(Decree of 30 December 2011 on safety regulations for the construction of high-rise buildings and their protection against fire and panic risks; Section VIII; Article GH 48, Lighting)<br><br>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 |
| | UK: Requirements according to United Kingdom Building Regulation | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| **Appendix 2** | **EN 61347-2-13:2014+A1:2017 used in conjunction with EN 61347-1:2015+A1:2021**<br>**Lamp control gear**<br>**Part 2: Particular requirements**<br>**Section Thirteen – Particular requirements for D.C. or A.C. supplied electronic control gear for LED modules** | **P** |

| | | | |
|---|---|---|---|
| **14 (14)** | **FAULT CONDITIONS** | | **P** |
| - (14.1) | When operated under fault conditions the control gear: | | P |
| | - does not emit flames or molten material | | P |
| | - does not produce flammable gases | | P |
| | - protection against accidental contact not impaired | | P |
| | Thermally protected control gear 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 appended table) | P |
| - (14.2) | Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5) | (See appended table) | P |
| - (14.3) | Short-circuit or interruption of semiconductor devices | (See appended table) | P |
| - (14.4) | Short-circuit across insulation consisting of lacquer, enamel or textile | (See appended table) | N/A |
| - (14.5) | Short-circuit across electrolytic capacitors | (See appended table) | P |
| | Short-circuit or interruption of SPDs | (See appended table) | N/A |
| - (14.6) | After the tests has been carried out on three samples: | | P |
| | The insulation resistance ≥ 1 MΩ ..... : | >199 MΩ | P |
| | No flammable gases | | P |
| | No accessible parts have become live | | P |
| | During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite | | P |
| - (14.7) | Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply (if claimed so) | | — |
| 14 (-) | Temperature declared thermally protected lamp control gear fulfil requirements in Annex C | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **21 (-)** | **MAXIMUM WORKING VOLTAGE (Uout) IN ANY LOAD CONDITION** | | **P** |
| | Not exceed declared maximum working voltage $U_{out}$ in any load condition | | P |

| **14** | **TABLE: tests of fault conditions** | **P** |
|---|---|---|
| Part | Simulated fault | Hazard |
| BD1 | Short-circuited – unit shut down, no flames, no gases, FR opened | No |
| C3 | Short-circuited – unit shut down, no flames, no gases, FR opened | No |
| EC1 | Short-circuited – unit shut down, no flames, no gases | No |
| U1 | Short-circuited – unit shut down, no flames, no gases | No |
| Q2 | Short-circuited – unit shut down, no flames, no gases | No |
| output | Short-circuited – unit shut down, no flames, no gases, recoverable | No |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **Appendix 2** | **Summary of requirements and test clauses of:**<br>**EN IEC 62031:2020+A11:2021 LED modules for general lighting – Safety specifications** | **P** |
|---|---|---|

| | | | |
|---|---|---|---|
| 4.2 | Classification | | **P** |
| | Built-in; Independent; Integral | Integral | P |
| 6 | Marking | | N/A |
| 6.2 | Contents of marking for built-in and for independent LED modules | | N/A |
| 6.3 | Location of marking for built-in LED modules | | N/A |
| 6.4 | Location of marking for independent LED modules | | N/A |
| 6.5 | Marking of integral LED modules | | N/A |
| 6.6 | Durable and legibility of marking | | N/A |
| 7 | Terminals | | N/A |
| 8 | Provisions for protective earthing | | N/A |
| 9 | Protection against accidental contact with live parts | | P |
| 10 | Moisture resistance and insulation | Evaluated in final product. | P |
| 11 | Electric strength | Evaluated in final product. | P |
| 12 | Fault conditions | | P |
| 12.1 | Fault conditions according to IEC 61347-1, cl.14 | | P |
| 12.2 | Overpower conditions | | P |
| 13 | Conformity testing during manufacture | | N/A |
| 14 | Construction | | P |
| | No wood, cotton, silk, paper and similar fibrous material used as insulation | | P |
| 15 | Creepage distances and clearances | Evaluated in final product. | P |
| 16 | Screw, current-carrying parts and connections | Evaluated in final product. | P |
| 17 | Resistance to heat, fire and tracking | Evaluated in final product. | P |
| 18 | Resistance to corrosion | | N/A |
| 20 | Heat management | | N/A |
| 22 | Photobiological safety | Evaluated in final product. | P |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| 14 | TABLE: tests of fault conditions | P |
| Part | Simulated fault | Hazard |
| LED | Short-circuit. No fire, no smoke, no flammable material. | No |
| LED | Opened-circuit. No fire, no smoke, no flammable material. | No |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| **Appendix 3** | **IEC/TR 62778: 2014: The assessment of blue light hazard to light sources and luminaires** | **P** |

| | | | |
|---|---|---|---|
| **7** | **MEASUREMENT INFORMATION FLOW** | | **P** |
| **7.1** | **Basic flow** | | **P** |
| | 'Law of conservation of luminance' applied | | P |
| | Use of only true luminance/radiance values | | P |
| | In case of luminaire:<br>The light source is operated in the luminaire under similar conditions as when tested as a component | | N/A |
| | In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution | | N/A |
| **7.2** | **Conditions for the radiance measurement** | | **P** |
| | Standard condition applied<br>(200mm distance, 0,011rad field of view) | | P |
| | Non-standard condition applied | | N/A |
| **7.3** | **Special cases (I): Replacement by a lamp or LED module of another type** | | N/A |
| | Light source is a white light source | | N/A |
| | Evaluation done based on highest luminance | | N/A |
| | Evaluation done based on CCT value | | N/A |
| **7.4** | **Special cases (II): Arrays and clusters of primary light sources** | | **P** |
| | LED package is evaluated as ..... : | ☒ RG0 unlimited<br>☐ RG1 unlimited | P |
| | $E_{thr}$ of LED package applies to array | | N/A |
| **8** | **RISK GROUP CLASSIFICATION** | | **P** |
| | Risk group achieved: | | P |
| | - .. Risk Group 0 unlimited | | P |
| | - .. Risk Group 1 unlimited | | N/A |
| | - $E_{thr}$ ..... (lx) :<br>Distance to reach RG1 ..... (m) : | | N/A |

| IEC 60598-2-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| | **TABLE: Spectroradiometric measurement** | | **P** |
| | **Measurement performed on:** | ☐ **LED package**<br>☐ **LED module**<br>☐ **Lamp**<br>☒ **Luminaire** | |
| | **Model number**..... | LLX-Triproof-Integrated-50-TP-TC | |
| | **Test voltage (V)** ..... | 240V | — |
| | **Test current (mA)** ..... | / | — |
| | **Test frequency (Hz)**..... | 50Hz | — |
| | **Ambient, t (°C)** ..... | 25,0 | — |
| | **Measurement distance**..... | ☒ 20 cm<br>☐ ... cm | — |
| | **Source size** ..... | ☒ Non-small<br>☐ Small : .... mm | — |
| | **Field of view** ..... | ☐ 100 mrad<br>☒ 11 mrad<br>☐ 1,7 mrad (for small sources) | — |

| Item | Symbol | Units | Result | Remark |
|---|---|---|---|---|
| Correlated colour temperature | CCT | K | - | - |
| x/y colour coordinates | - | - | - | - |
| Blue light hazard radiance | $L_B$ | $W/(m^2 \cdot sr^1)$ | 74 | RG0 |
| Blue light hazard irradiance | $E_B$ | $W/m^2$ | - | - |
| Luminance | L | $cd/m^2$ | - | - |
| Illuminance | E | lx | - | - |
| Supplementary information: N/A | | | | |

Remarks

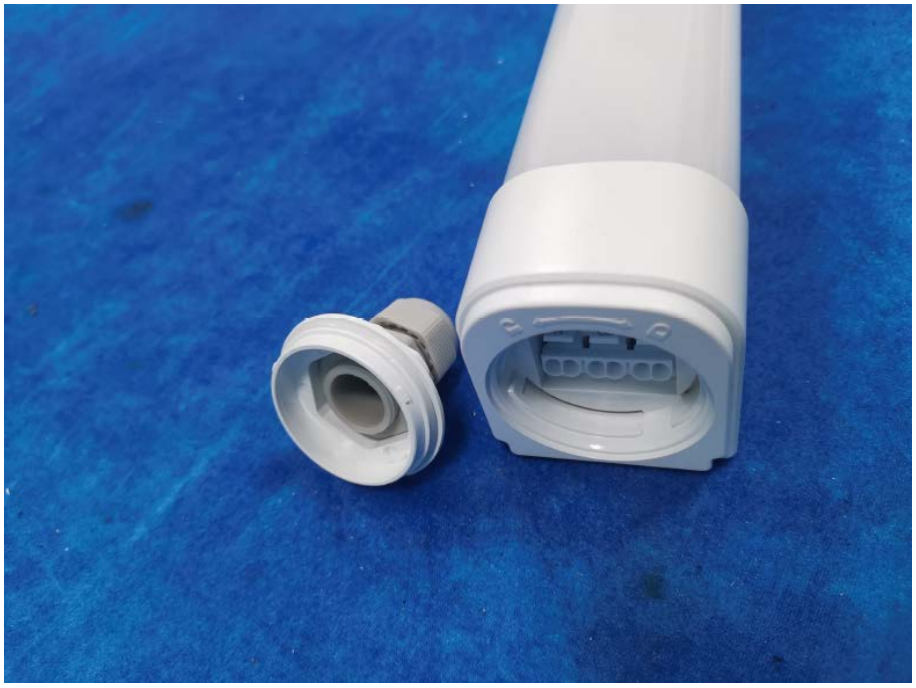
## Overview

For type model LLX-Triproof-Integrated-50-TP-TC





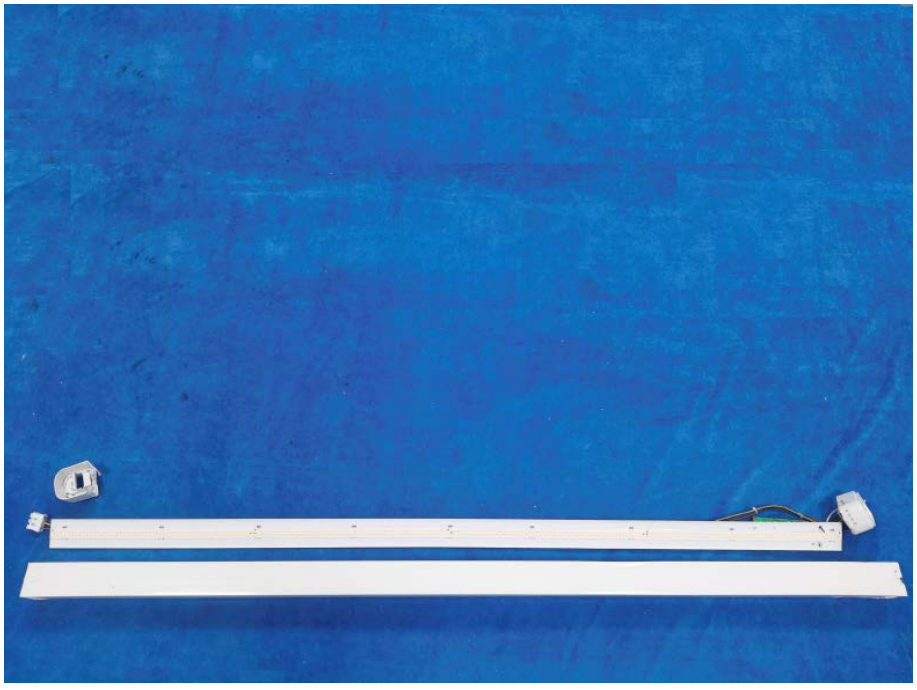
Remarks



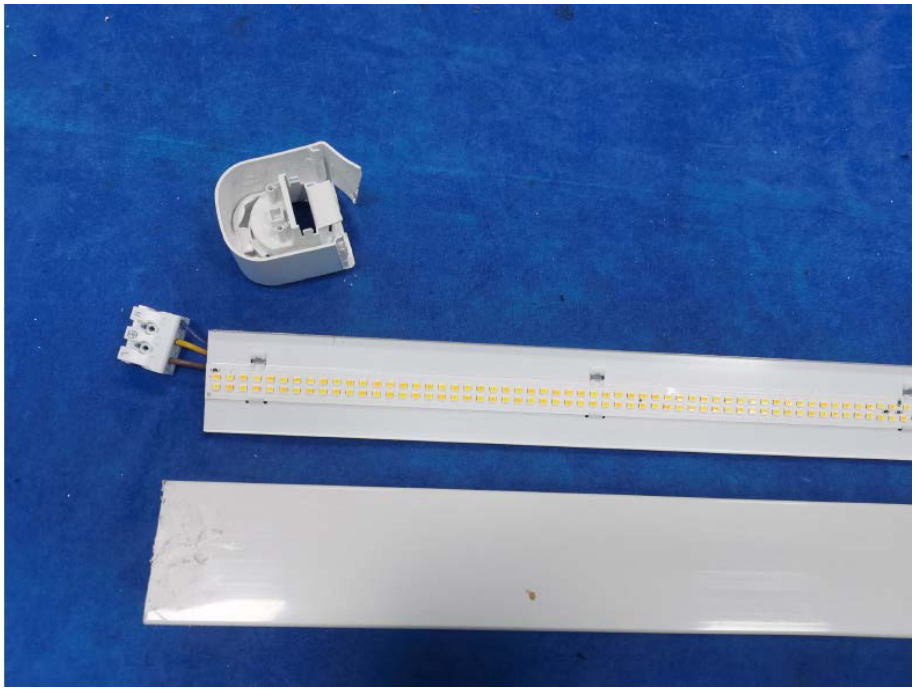


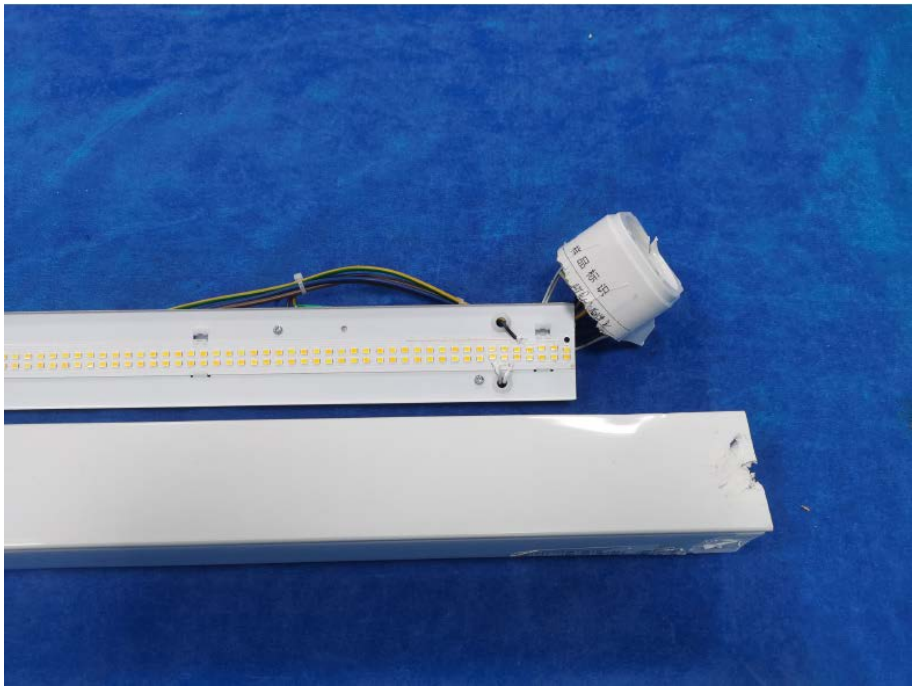
Remarks



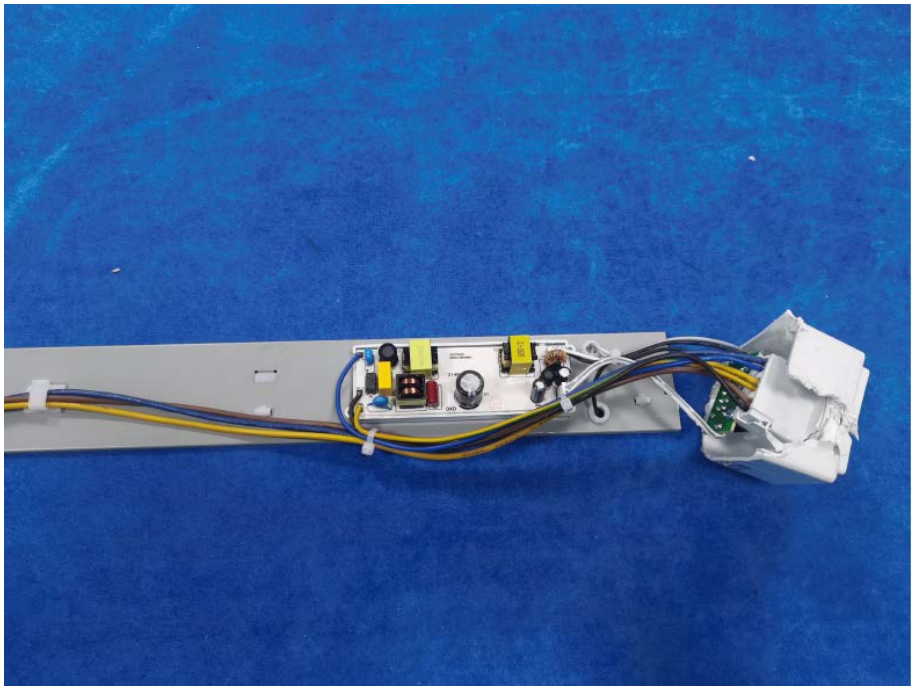



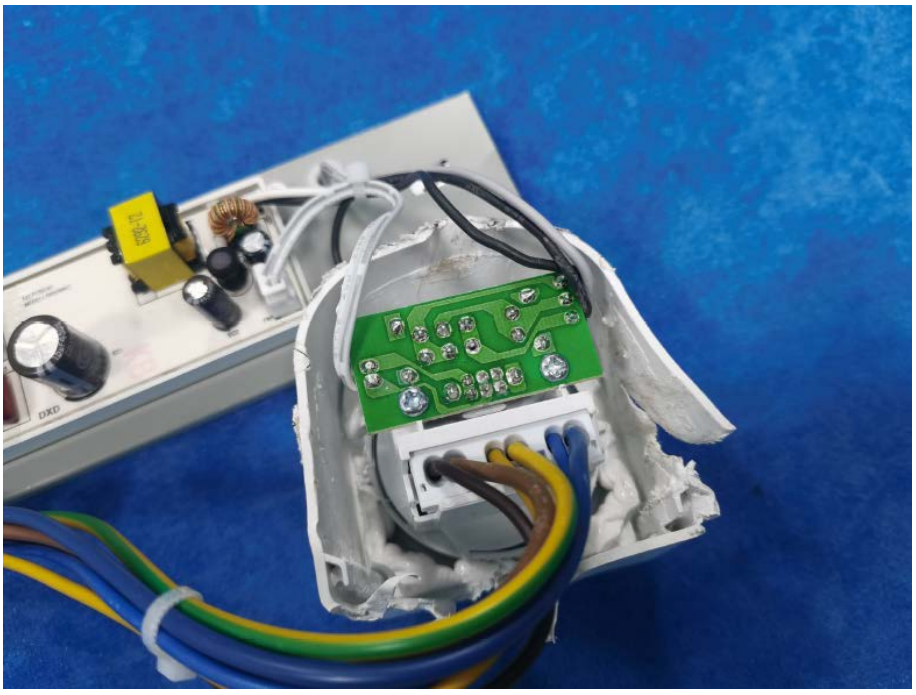
Remarks





Remarks





Remarks

