



Test Report issued under the responsibility of:



TEST REPORT
IEC / EN 60598-2-3
Luminaires
Part 2: Particular requirements
Section 3: Luminaires for road and street lighting

Report Number..... : 701588-01/01-M1
 Date of issue : 31. 07. 2017, Amendment No. 1: 2018 December 04
 Total number of pages 13 + 9 (Attachment No. 1)

Name of Testing Laboratory preparing the Report : Elektrotechnický zkušební ústav, s. p.
 Pod lisem 129/2, 171 02 Praha 8 – Troja, Czech republic

Applicant's name : LUG Light Factory Sp.z o.o.
 Address : Ul. Grozowska 11, 65-127 Zilena Góra, Poland

Test specification:

Standard : IEC 60598-1:2014,
 IEC 60598-2-3:2002 + A1:2011
 EN 60598-1:2015,
 EN 60598-2-3:2003+A1:2011

Test procedure : CB, ENEC Scheme

Non-standard test method : N/A

Test Report Form No. : IEC60598_2_3J

Test Report Form(s) Originator.... : Intertek Semko AB

Master TRF : 2014-09

Copyright © 2014 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.


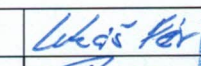
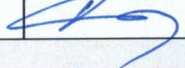
If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

| | | |
|---|--|---|
| Test item description | Luminaires for road and street lighting | |
| Trade Mark |  | |
| Manufacturer..... | LUG Light Factory Sp.z o.o. | |
| Model/Type reference | URBINI LED ED 4700lm/740 | |
| Ratings | 220-240 V; 50-60 Hz; IP66; protection class I 42 W LED; ta 40 °C - URBINI LED ED 4700lm/740 | |
| Responsible Testing Laboratory (as applicable), testing procedure and testing location(s): | | |
| <input checked="" type="checkbox"/> | CB Testing Laboratory: | |
| Testing location/ address | | Elektrotechnický zkušební ústav, s. p. Pod lísem 129/2, 171 02 Praha 8 – Troja, Czech republic |
| <input type="checkbox"/> | Associated CB Testing Laboratory: | |
| Testing location/ address | | |
| Tested by (name, function, signature) | | Lukáš Fér  |
| Approved by (name, function, signature) | | Zdeněk Dvořák  |
| <input type="checkbox"/> | Testing procedure: TMP/CTF Stage 1: | |
| Testing location/ address | | |
| Tested by (name, function, signature) | | |
| Approved by (name, function, signature) | | |
| <input type="checkbox"/> | Testing procedure: WMT/CTF Stage 2: | |
| Testing location/ address | | |
| Tested by (name + signature) | | |
| Witnessed by (name, function, signature) .. | | |
| Approved by (name, function, signature) | | |
| <input type="checkbox"/> | Testing procedure: SMT/CTF Stage 3 or 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):

Attachment No. 1: LED modules for general lighting – Safety specifications (9 pages)

This Amendment Report, Ref. No. 701588-01/01-M1 to the original Report. No. 701588-01/01 contains 11 Report Pages and new photographs.

Summary of testing:

Tests performed (name of test and test clause):

cl.: 10; 12.3; 12.4

Testing location:

Elektrotechnický zkušební ústav, s.p.
Pod lisem 129/2, 171 02 Praha 8 – Troja,
Czech republic

Summary of compliance with National Differences: ---

List of countries addressed

☐ The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)

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.



| | |
|---|--|
| Test item particulars | |
| Classification of installation and use : Luminaires for road and street lighting | |
| Supply Connection : Wires | |
| : | |
| Possible test case verdicts: | |
| - test case does not apply to the test object : N/A (Not applicable) | |
| - test object does meet the requirement : P (Pass) | |
| - test object does not meet the requirement : F (Fail) | |
| Testing | |
| Date of receipt of test item : 10. 09. 2018; 25. 09. 2018 | |
| Date (s) of performance of tests : 06. 11. 2018 - 04. 12. 2018 | |
| 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 <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator. | |
| Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1: | |
| 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) : --- | |
| General product information: | |
| The tested sample was selected in accordance with Annex S of ČSN EN 60598-1. Tested type: see page 4. 220-240 V; 50-60 Hz; IP 66; protection class II | |
| Amendment No. 1 Report: | |
| The original Test Report Ref. No. 701588-01/01, dated 2017 July 31 was modified on 2018 December 04 to include the following changes and/or additions: | |
| New model added: | |
| New model contain new electronic control gear and LED modules. Construction of the luminaire remains same as before. | |

| IEC 60598-2-3 | | | |
|------------------|---|---------------|------------|
| Clause | Requirement + Test | | Verdict |
| 3.12 (12) | ENDURANCE TEST AND THERMAL TEST | | P |
| 3.12.2 (-) | If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13 | | — |
| 3.12 (12.3) | Endurance test: | | P |
| | - mounting-position | On pipe | — |
| | - test temperature (°C) | 50 °C | — |
| | - total duration (h) | 240 | — |
| | - supply voltage: Un factor; calculated voltage (V) | 253 | — |
| | - lamp used | LED module | — |
| 3.12 (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 |
| 3.12 (12.4) | Thermal test (normal operation) | (see Annex 2) | P |
| 3.12 (12.5) | Thermal test (abnormal operation) | (see Annex 2) | N/A |
| 3.12 (12.6) | Thermal test (failed lamp control gear condition): | | N/A |
| 3.12 (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 |
| 3.12 (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 |

| IEC 60598-2-3 | | | |
|-----------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - track-mounted luminaires | | N/A |
| 3.12 (12.7) | Thermal test (failed lamp control gear in plastic luminaires): | | N/A |
| 3.12 (12.7.1) | Luminaire without temperature sensing control | | N/A |
| 3.12 (12.7.1.1) | Luminaire with fluorescent lamp $\leq 70W$ | | 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 ($^{\circ}C$): at 1,1 Un | | — |
| | - measured temperature of fixing point/exposed part ($^{\circ}C$): at 1,1 Un..... | | — |
| | - calculated temperature of fixing point/exposed part ($^{\circ}C$) | | — |
| | Ball-pressure test..... | | N/A |
| 3.12 (12.7.1.2) | Luminaire with discharge lamp, fluorescent lamp $> 70W$, transformer $> 10 VA$ | | N/A |
| | - case of abnormal conditions..... | | — |
| | - measured winding temperature ($^{\circ}C$): at 1,1 Un | | — |
| | - measured temperature of fixing point/exposed part ($^{\circ}C$): at 1,1 Un..... | | — |
| | - calculated temperature of fixing point/exposed part ($^{\circ}C$) | | — |
| | Ball-pressure test..... | | N/A |
| 3.12 (12.7.1.3) | Luminaire with short circuit proof transformers $\leq 10 VA$ | | 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 |
| 3.12 (12.7.2) | Luminaire with temperature sensing control | | N/A |
| | - thermal link | Yes <input type="checkbox"/> No <input type="checkbox"/> | — |

| IEC 60598-2-3 | | | |
|------------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - 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: | | N/A |
| 3.12.1 (-) | Temperature reduction if for outdoor use only | | N/A |
| 3.12.2 (-) | (See above) | | — |
| 3.12.3 (-) | Glass covers used within the thermal limits declared by the glass manufacturer | | N/A |
| 3.14 (10) | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | |
| 3.14 (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 | | |
| | - between current-carrying parts of different polarity : | | N/A |
| | - between current-carrying parts and mounting surface | >110 MΩ | P |
| | - between current-carrying parts and metal parts of the luminaire | >110 MΩ | P |
| | - 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 | | |
| | - between live parts of different polarity.....: | | N/A |
| | - between live parts and mounting surface.....: | >550 MΩ | P |
| | - between live parts and metal parts | >550 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 | >550 MΩ | P |
| | - Insulation bushings as described in Section 5 | | N/A |

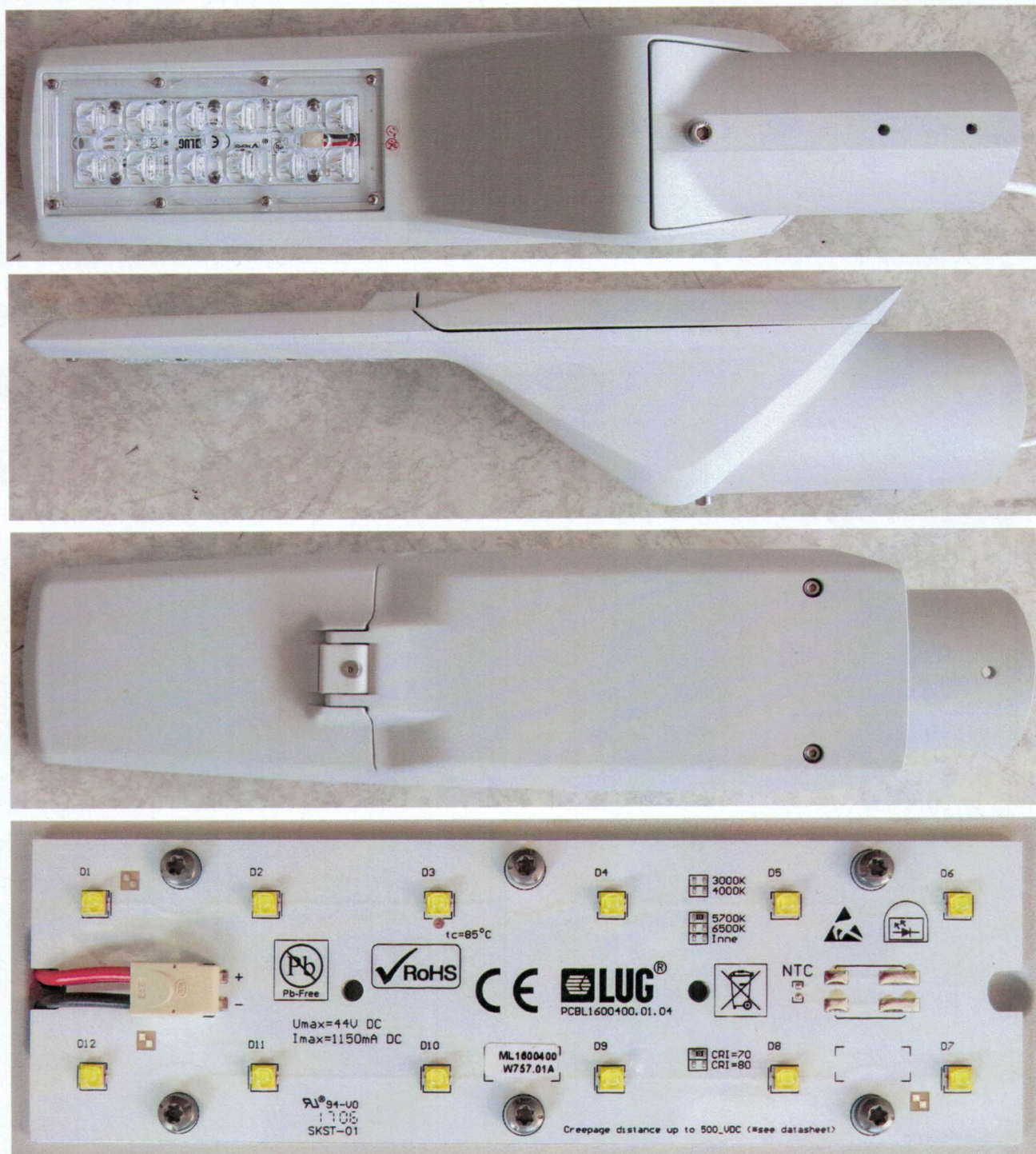
| IEC 60598-2-3 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.14 (10.2.2) | Electric strength test | | P |
| | Dummy lamp | | N/A |
| | Luminaires with ignitors after 24 h test | | N/A |
| | Luminaires with manual ignitors | | N/A |
| | Test voltage (V) | | N/A |
| | SELV | | |
| | - between current-carrying parts of different polarity : | | N/A |
| | - between current-carrying parts and mounting surface | 500 V | P |
| | - between current-carrying parts and metal parts of the luminaire | 500 V | P |
| | - 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 | | |
| | - between live parts of different polarity | | N/A |
| | - between live parts and mounting surface | 1460 V | P |
| | - between live parts and metal parts | 1460 V | 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 | 1460 V | P |
| | - Insulation bushings as described in Section 5 | | N/A |
| 3.14 (10.3) | Touch current (mA) | 0,0025 | P |
| | Protective conductor current (mA) | 0,036 | P |

| ANNEX 1 | | TABLE: Critical components information | | | | | |
|--|------|---|--|--|----------|---|--|
| Object / part No. | Code | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity ¹⁾ | |
| Description: | | LUG URBINI LED ED 4700lm/740 130232.5L221.101.001 | | | | | |
| LED module | B | LUG | ML180400 W757.01A | U _{max} 44 V; t _c 85 °C; I _{max} 1150 mA | 62031 | Tested in equipment | |
| Control gear | B | Philips | Xi FP 40W 0.3-1.0A SLNDAE 230V C123 sXt | 220-240 V; 50/60 Hz, t _c 85 °C | | ENEC 05; DEKRA Certificate no. 31-102115 | |
| Wires LED | B | | LGY | 300/500 V; 0,5 mm ² | IEC227 | --- | |
| Ext. wires | B | MROWIEC | H03VV-F | 3 x 1,0 mm ² | IEC227 | BBJ-SEP; PL 2 0306 | |
| 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 | | | | | | | |

| ANNEX 2 | TABLE: Temperature measurements, thermal tests of Section 12 | | | | | | |
|--|---|---|--------|--------|-------|------------------------|-------|
| | Type reference.....: | LUG URBINI LED ED 4700lm/740 130232.5L221.101.001 | — | | | | |
| | Lamp used | LED module LUG | — | | | | |
| | Lamp control gear used | Philips | — | | | | |
| | Mounting position of luminaire.....: | On pipe | — | | | | |
| | Supply wattage (W) | 41,4 W | — | | | | |
| | Supply current (A).....: | --- | — | | | | |
| | Calculated power factor | --- | — | | | | |
| | Table: measured temperatures corrected for ta = 35 °C: | | | | | | |
| | - abnormal operating mode | Not used; see supplementary information | — | | | | |
| | - test 1: rated voltage | 240 V | — | | | | |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage(230 x 1,06).....: | 243,8 V | — | | | | |
| | - 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, (°C) | | | | | | | |
| Part | Ambient | Clause 12.4 – normal | | | | Clause 12.5 – abnormal | |
| | | test 1 | test 2 | test 3 | limit | test 4 | limit |
| LED module tc | 40,4 | 64,2 | --- | --- | 85 | --- | --- |
| Control gear tc | 40,4 | 78,3 | --- | --- | 85 | --- | --- |
| LED wires | 40,4 | --- | 63,7 | --- | 90 | --- | --- |
| Internal wires | 40,4 | --- | 57,1 | --- | 90 | --- | --- |
| Supplementary information: Temperature marked control gear 120 °C. | | | | | | | |

ANNEX 3

Photo



ATTACHMENT No. 1 TO TEST REPORT 701588-01/01-M1
IEC / EN 62031:2008
LED modules for general lighting – Safety specifications

| | | |
|-----|---|-----|
| | GENERAL REQUIREMENTS | P |
| 4.4 | Integral modules tested assembled in the luminaire | P |
| 4.5 | Independent modules complies with requirements in IEC 60598-1 | N/A |

| | | |
|----------|---|----------------------|
| 5 | GENERAL TEST REQUIREMENTS | N/A |
| 5.5 | SELV-operated LED modules comply with Annex I of IEC 61347-2-13 | (see Annex 1) N/A |
| | General conditions for tests in Annex A | (see Annex A) N/A |

| | | |
|----------|--|---|
| 6 | CLASSIFICATION | P |
| | Built-in module: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | — |
| | Independent module.....: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |
| | Integral module: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |
| | For Integral module; Note to 1.2.1 in IEC 60598-1 applies. | — |

| | | |
|------------|--|----------------|
| 7 | MARKING | P |
| 7.1 | Mandatory markings for built-in or independent modules | |
| | a) mark of origin | LUG P |
| | b) model number, type reference | ML1600400 P |
| | c1) constant voltage module; rated supply voltage and supply frequency | 44 V P |
| | c2) constant current module; rated supply current and supply frequency | 1150 mA P |
| | d) nominal power | 50,6 W P |
| | e) indication of connections, wiring diagram | P |
| | f) value of t_c and place on the module | 85 °C P |
| | g) E_{thr} if required | N/A |
| | h) symbol for built-in modules | P |
| | i) heat transfer temperature t_d | P |
| | j) power for heat-conduction P_d | P |
| | k) working voltage for insulation | 500 V P |
| 7.2 | Location of marking | |
| | - marking of a), b), c) and f) on the modules | P |
| | - marking of d), e), g), h), i) and j) on the modules or data sheet | N/A |
| | - marking of k) in manufactures literature | P |

| IEC / EN 62031 | | | |
|----------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - integral modules a) to g) in literature | | P |
| 7.3 | Durable and legibility of marking | | |
| | - marking of a), b), c) and f) legible after test with water | | P |
| | - marking of d) to j) inspection of compliance | | P |
| 8 | TERMINALS | | P |
| | Screw terminals according section 14 of IEC 60598-1: | | |
| | Separately approved; component list | (see Annex 2) | N/A |
| | Part of the luminaire | (see Annex 3) | N/A |
| | Screwless terminals according section 15 of IEC 60598-1: | | |
| | Separately approved; component list | (see Annex 2) | N/A |
| | Part of the luminaire | (see Annex 4) | P |
| | Connectors according IEC 60838-2-2: | | |
| | Separately approved; component list | (see Annex 2) | N/A |
| 9 (9) | PROVISION FOR PROTECTIVE EARTHING | | N/A |
| 10 (10) | PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS | | 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 (MΩ): | | P |
| | For basic insulation $\geq 2 \text{ M}\Omega$ | >550 MΩ | P |
| | For double or reinforced insulation $\geq 4 \text{ M}\Omega$ | | N/A |
| | Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1 | | N/A |
| 12 (12) | ELECTRIC STRENGTH | | P |
| | Immediately after clause 11 electric strength test for 1 min | | P |
| | Basic insulation for SELV, test voltage 500 V | | N/A |
| | Working voltage $\leq 50 \text{ V}$, test voltage 500 V | | N/A |
| | Working voltage $> 50 \text{ V} \leq 1000 \text{ V}$, test voltage (V): | | |
| | Basic insulation, $2U + 1000 \text{ V}$ | 1088 V | P |
| | Supplementary insulation, $2U + 1000 \text{ V}$ | | N/A |
| | Double or reinforced insulation, $4U + 2000 \text{ V}$ | | N/A |
| | No flashover or breakdown | | P |

| IEC / EN 62031 | | | |
|----------------|---|----------------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1 | | N/A |
| 13 (14) | FAULT CONDITIONS | | P |
| - (14) | When operated under fault conditions the controlgear: | | |
| | - does not emit flames or molten material | | P |
| | - does not produce flammable gases | | P |
| | - protection against accidental contact not impaired | | P |
| | 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 appended table) | P |
| - (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) | (see appended table) | N/A |
| | Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3 | | N/A |
| - (14.2) | Short-circuit or interruption of semiconductor devices | (see appended table) | P |
| - (14.3) | Short-circuit across insulation consisting of lacquer, enamel or textile | (see appended table) | N/A |
| - (14.4) | Short-circuit across electrolytic capacitors | (see appended table) | P |
| - (14.5) | After the tests has been carried out on three samples: | | |
| | The insulation resistance $\geq 1 \text{ M}\Omega$ | >550 M Ω | 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 |
| - (14.6) | Relevant fault condition tests with high-power supply | | N/A |
| 13.2 | Overpower condition | | |
| | Module withstands overpower condition >15 min. | | P |
| | Module with automatic protective device or power limiter, test performed 15 min. at limit. | | P |
| | No fire, smoke or flammable gas is produced | | P |
| | Molten material does not ignite tissue paper, spread below the module | | P |

| IEC / EN 62031 | | | |
|----------------|---|----------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 15 | CONSTRUCTION | | P |
| | Wood, cotton, silk, paper and similar fibrous material not used as insulation | | P |
| 16 (16) | CREEPAGE DISTANCES AND CLEARANCES | | P |
| - (16) | Creepage and distances and clearances in compliance with IEC 61347-1 | (see appended table) | P |
| | Insulating lining of metallic enclosures | | N/A |
| | Basic insulation on printed boards tested according to clause 14 | | N/A |
| | Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in Table 16 | | N/A |
| | Creepage distances not less than minimum clearance | | N/A |
| 16 (-) | Conductive accessible parts in compliance with applicable parts of IEC 60598-1 | | N/A |
| 17 (17) | SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS | | N/A |
| 18 (18) | RESISTANCE TO HEAT, FIRE AND TRACKING | | N/A |
| - (18.1) | Ball-pressure test | | N/A |
| - (18.3) | Glow-wire test (650°C) | | N/A |
| - (18.4) | Needle-flame test (10 s) | | N/A |
| - (18.5) | Proof tracking test | | N/A |
| 19 (19) | RESISTANCE TO CORROSION | | N/A |
| 20 | INFORMATION FOR LUMINAIRE DESIGN | | N/A |
| | Information in Annex D (informative) | | — |
| 21 | HEAT MANAGEMENT | | N/A |

| IEC / EN 62031 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|-------------|---|--|-----|
| 22 | PHOTOBIOLOGICAL SAFETY | | |
| 22.1 | UV radiation | | |
| | Luminous radiation not exceed 2mW/klm | | N/A |
| 22.2 | Blue light hazard | | |
| | Assessed according to IEC TR 62778 | | N/A |
| 22.3 | Infrared radiation | | |
| | Requirements for infrared radiation when required | | N/A |

| | | | |
|----------|------------------------|--|-----|
| A | ANNEX A - TESTS | | N/A |
|----------|------------------------|--|-----|

| | | | |
|----------------|---|--|---------------|
| 13 (14) | TABLE: tests of fault conditions | | P |
| Part | Simulated fault | | Hazard |
| LED | Short-circuit over LED | | NO |

| IEC / EN 62031 | | | | | | | | |
|---|--|-----|-----|-----|-----------------|-----|---------|-----|
| Clause | Requirement + Test | | | | Result - Remark | | Verdict | |
| 16 (16) | TABLES: Creepage distances and clearances | | | | | | P | |
| 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 | | - | - | - | 5,2 | - | - | |
| 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 | | - | - | - | 6,1 | - | - | |
| Required supplementary insulation | | - | 0,8 | 1,5 | 3 | 4 | 5,5 | |
| Measured | | | - | - | - | - | - | |
| Required reinforced insulation | | - | 1,6 | 3 | 6 | 8 | 11 | |
| Measured | | | - | - | - | - | - | |
| Table 4 | Minimum distances (mm) for non-sinusoidal pulse voltages | | | | | | | |
| Rated pulse voltage (peak kV) | | 2,0 | 2,5 | 3,0 | 4,0 | 5,0 | 6,0 | 8,0 |
| Required clearances | | 1,0 | 1,5 | 2 | 3 | 4 | 5,5 | 8 |
| Measured | | - | - | - | - | - | - | - |
| Rated pulse voltage (peak kV) | | 10 | 12 | 15 | 20 | 25 | 30 | 40 |
| Required clearances | | 11 | 14 | 18 | 25 | 33 | 40 | 60 |
| Measured | | - | - | - | - | - | - | - |
| Rated pulse voltage (peak kV) | | 50 | 60 | 80 | 100 | - | - | - |
| Required clearances | | 75 | 90 | 130 | 170 | - | - | - |
| Measured | | - | - | - | - | | | |

| IEC / EN 62031 | | | |
|----------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 18 (18.1) | TABLE: Ball Pressure Test of Thermoplastics | | N/A |
| 18 (18.3) | TABLE: Glow-wire test | | N/A |
| 18 (18.4) | TABLE: Needle-flame test | | N/A |
| 18 (18.5) | TABLE: Proof tracking test | | N/A |

| List of used test equipment: | | |
|----------------------------------|----------|-----------|
| Device: | Type: | Inv. No.: |
| Thermometer | GTH1150 | 00551122 |
| High voltage transformer KIKUSUI | TOS5301 | 00110285 |
| Multimeter Fluke | 1587 | 551734 |
| Power supply KIKUSUI | PCR500M | 00110185 |
| Caliper | MITUTOYO | 551392 |

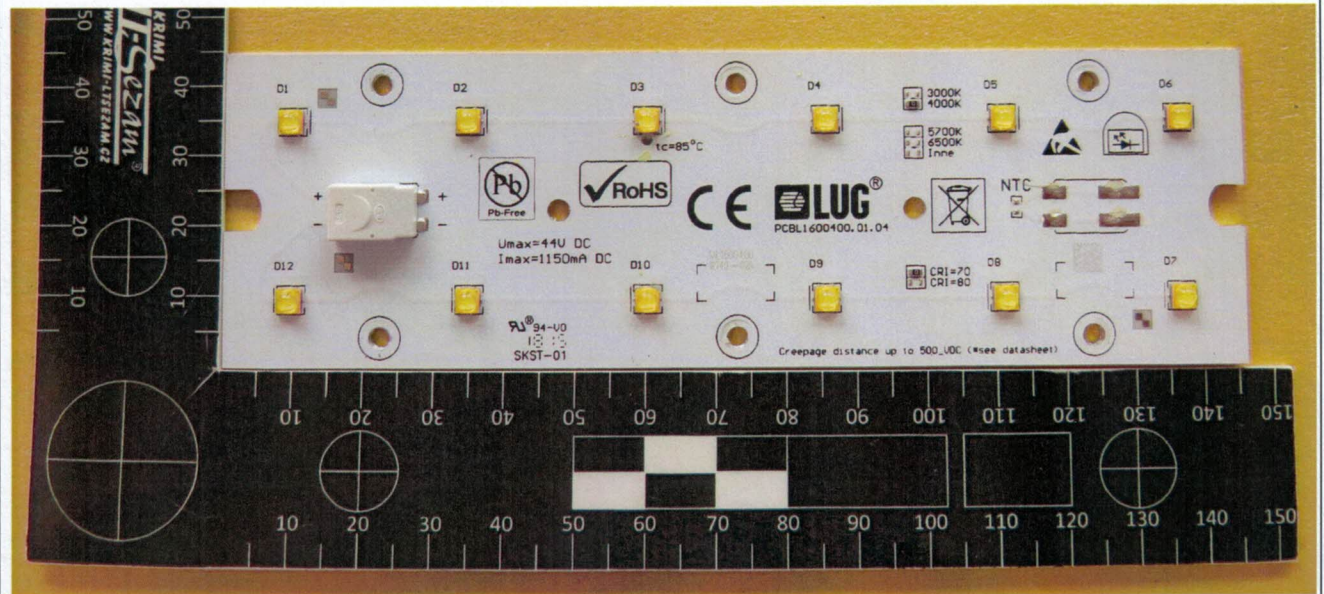
| | | |
|----------------|----------------------------------|------------|
| ANNEX 1 | SELV-operated LED modules | N/A |
|----------------|----------------------------------|------------|

| ANNEX 2 | TABLE: Critical components information | | | | | |
|---|---|--|--------------|---|-----------|-------------------------------------|
| Object / part No. | Code | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity ¹⁾ |
| Description: | LUG ML1701403.W740.01A | | | | | |
| Connector | A | BJB | 46.102 | 9 A; 320 V 0,34 – 0,75 mm ² | IEC 60598 | VDE 40037753 |
| LED | A | Cree | XP-G3 | Max. 2000 mA | --- | UL E349212 |
| AI PCB | A | TAMINGKEE ELECTRONIC TECHNOLOGY (HK) CO.,LTD. | HDMA-210 | --- | --- | UL E500775 |
| 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 | | | | | | |

| | | |
|----------------|--|------------|
| ANNEX 3 | Screw terminals (part of the luminaire) | N/A |
|----------------|--|------------|

| | | |
|----------------|--|------------|
| ANNEX 4 | Screwless terminals (part of the luminaire) | N/A |
|----------------|--|------------|

ANNEX 5 Photo



Tested by: Lukáš Fér

Lukáš Fér