

# AENOR

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## LICENCE

to use the European Mark



**Licence Nr.** ENEC/001028

**Under the conditions given in the following pages of this document, the licence to use the ENEC Mark in conjunction with the suffix 01, as shown above, has been issued to:**

SCHRÉDER GROUP  
RUE DE LUSAMBO, 67  
B-1190 BRUXELLES (Belgica *Belgium*)

**For the product(s):**

Luminaire for road and street lighting

**Trade name(s):**

SCHRÉDER

**Complying with the following European Standards:**

EN 60598-1:2015; EN 60598-2-3:2003;  
EN 60598-2-3:2003/A1:2011; EN 62262:2002

**Date:** 2017-02-01

**Signature:**

A handwritten signature in blue ink, appearing to read 'Avelino Brito', enclosed within a large, loopy blue oval.

**Name:** Avelino Brito  
**Position:** Chief Executive Officer

This licence has been issued under the presumption and conditional on the fact that the licensee holds all necessary legal rights with regard to the product presented for testing and certification.

AENOR INTERNACIONAL, S.A.U.  
Cl Génova, 6  
28004 MADRID (Spain)

# AENOR

## CERTIFICADO ENEC DE PRODUCTO



Tipo de producto / Type of Product

LUMINARIA PARA ALUMBRADO PÚBLICO

r1) N° Certificado / Certificate n°

ENEC/001028

r2) Fecha Certificado / Date of the Certificate

2017-02-01

r3) N° de Informe de ensayo / Test report n°

2016050306B1

r4) Nombre y dirección del licenciario  
Name and address of the licensee

SCHRÉDER GROUP  
RUE DE LUSAMBO, 67 B-1190 BRUXELLES (Bélgica)

r5) Dirección de la factoría  
Address of the factory

AV ROANNE 66 - PI EL HENARES  
19130 MARCHAMALO (Guadalajara - España)

r6) Referencia de la Norma Española  
Spanish Standard

UNE-EN 60598-1:2015; UNE-EN 60598-2-3:2003;  
UNE-EN 60598-2-3:2003/A1:2011; UNE-EN 62262:2002

r7) Referencia de la Norma Europea  
European Standard

EN 60598-1:2015; EN 60598-2-3:2003;  
EN 60598-2-3:2003/A1:2011; EN 62262:2002

r8) Referencia / Type reference

Ver Anexo I *refer to Annex I*

r9) Marca comercial / Trade mark

SCHRÉDER

r10) Tensión y frecuencia asignadas  
Rated voltage and frequency

230 V-; 50/60 Hz

r11) N° de lámparas x potencia asignada  
N° of lamps x rated wattage

Ver Anexo I *refer to Annex I*

r12) Tipo de lámparas y portalámparas  
Type of lamps and lampholder

LED (module); SMD

r13) Grado de protección / Degree of protection (IP)

IP 66; IK 08

r14) Medios de conexión a la red  
Means for power supply connection

Terminals

r15) Clasif. por material superficie apoyo  
Class. respect supporting material

Suitable for normally flammable surfaces

r16) Protección contra choques eléctricos (clase)  
Protection against electric shock (class)

Class I

r17) Limitaciones / Limitations

Horizontal mounting. Fixed to post or arm. Ta max. = 50 °C. Min. clearance to illum. objects: 0,2 m

r18) Características generales / Technical data

AXIA 2.1 Series. Neutral white

Fecha de caducidad / Date of expiry 2021-06-14

Este certificado anula y sustituye al 007/001028, de fecha 2016-06-14.  
This certificate supersedes certificate 007/001028, dated 2016-06-14.

Original Electrónico

AENOR INTERNACIONAL S.A.U.  
Génova, 6. 28004 Madrid. España  
Tel. 91 432 60 00.- www.aenor.es

Entidad de certificación de producto acreditada por ENAC con n° 01/C-PR275  
Product certification body accredited by ENAC, number 01/C-PR275

# AENOR

## CERTIFICADO ENEC DE PRODUCTO



**ANEXO I AL CERTIFICADO ENEC/001028**  
**ANNEX I TO CERTIFICATE ENEC/001028**

| <b>REFERENCIA</b><br><i>Type reference</i> | <b>Nº DE LÁMPARAS X<br/>POTENCIA ASIGNADA</b><br><i>Nº of lamps x rated wattage</i> |
|--------------------------------------------|-------------------------------------------------------------------------------------|
| AXIA 2.1 16 LED 21 W Cl. I                 | 16 LED; 21 W; 390 mA                                                                |
| AXIA 2.1 16 LED 26 W Cl. I                 | 16 LED; 26 W; 480 mA                                                                |
| AXIA 2.1 16 LED 32 W Cl. I                 | 16 LED; 32 W; 600 mA                                                                |
| AXIA 2.1 16 LED 36 W Cl. I                 | 16 LED; 36 W; 690 mA                                                                |
| AXIA 2.1 16 LED 40 W Cl. I                 | 16 LED; 40 W; 760 mA                                                                |
| AXIA 2.1 24 LED 38 W Cl. I                 | 24 LED; 38 W; 490 mA                                                                |
| AXIA 2.1 24 LED 41 W Cl. I                 | 24 LED; 41 W; 540 mA                                                                |
| AXIA 2.1 24 LED 48 W Cl. I                 | 24 LED; 48 W; 630 mA                                                                |
| AXIA 2.1 24 LED 53 W Cl. I                 | 24 LED; 53 W; 690 mA                                                                |
| AXIA 2.1 24 LED 57 W Cl. I                 | 24 LED; 57 W; 750 mA                                                                |
| AXIA 2.1 24 LED 68 W Cl. I                 | 24 LED; 68 W; 890 mA                                                                |
| AXIA 2.1 4 LED 10 W Cl. I                  | 4 LED; 10 W; 680 mA                                                                 |
| AXIA 2.1 8 LED 13 W Cl. I                  | 8 LED; 13 W; 480 mA                                                                 |
| AXIA 2.1 8 LED 19 W Cl. I                  | 8 LED; 19 W; 690 mA                                                                 |
| AXIA 2.1 8 LED 22 W Cl. I                  | 8 LED; 22 W; 820 mA                                                                 |

*Traducere din limba engleză*  
*[logo AENOR]*

Organism de certificare ENEC, înregistrat sub ID 01. Pentru mai multe informații, vă rugăm să consultați [www.enec.com](http://www.enec.com).

**LICENȚĂ**  
**Pentru utilizarea Mărcii Europene**  
*[logo ENEC 01]*

**Nr. licență: ENEC/001028**

In condițiile date de următoarele pagini ale acestui document, licența pentru folosirea Mărcii ENEC, alături de sufixul 01, așa cum este arătat mai sus, a fost eliberată pentru:

**SCHREDER GROUP**  
**RUE DE LUSAMBO, 67**  
**B-1190 BRUXELLES (Belgia)**

**Pentru produsele:**  
**Aparate pentru iluminat stradal**

**Nume marca:**  
**SCHREDER**

**Sunt conforme cu următoarele Standarde Europene:**

**EN 60598-1:2015; EN 60598-2-3:2003;**  
**EN 60598-2-3:2003/A1:2011; EN 62262:2002**

**Data: 01-02-2017**  
**Semnătura**  
*[semnătură indescifrabilă]*  
**Nume: Avelino Brito**  
**Poziție: CEO**

Licența a fost emisă sub prezumpția și condiția faptului că licențiatul deține toate drepturile legale necesare cu privire la produsul prezentat pentru testare și certificare.

**AENOR INTERNACIONAL, S.A.U**  
**Cl. GENOVA, 6**  
**28004, Madrid, Spania**



**AENOR**  
**CERTIFICAT ENEC DE PRODUS**  
**[logo ENEC 01]**

- Tip produs: aparat de iluminat public
- r1) Nr. Certificat: ENEC/001028
- r2) Data certificat: 2017-02-01
- r3) Raport de testare nr: 2016050306B1
- r4) Nume și adresă a licențiatului: SCHREDER GROUP  
RUE DE LUSAMBO, 67 B-1190 BRUXELLES (Belgia)
- r5) Adresa fabricii: AV ROANNE 66 - PI EL HENARES  
19130 MARCHAMALO (Guadalajara - Spania)
- r6) Standard spaniol: UNE-EN 60598-1:2015; UNE-EN 60598-2-3:2003;  
UNE-EN 60598-2-3:2003/A1:2011; UNE-EN 62262:2002
- r7) Standard European: EN 60598-1:2015; EN 60598-2-3:2003;  
EN 60598-2-3:2003/A1:2011; EN 62262:2002
- r8) Tip referință: vezi Anexa 1
- r9) Marca comerciala: SCHREDER
- r10) Tensiune si frecventa nominal: 230 V~; 50/60 Hz
- r11) Nr. de lămpi x putere nominala: vezi Anexa 1
- r12) Tip de lămpi si soclu: modul LED; SMD
- r13) Grad de protective (IP): IP66; IK08
- r14) Mod conexiune alimentare: terminale
- r15) Clasificare material de baza: potrivit pentru suprafețe cu grad obișnuit de flamabilitate
- r16) Protecție împotriva șocurilor electrice (clasa): clasa I
- r17) Limitări: montaj orizontal. Fixat pe stâlp sau pe braț. Ta max.= 50°C; spațiu minim pentru obiecte iluminate: 0,2 m
- r18) Date tehnice: seria AXIA 2.1. Alb neutru

Data expirării: 14.06.2021

Prezentul certificat înlocuiește certificatul 007/001028 din 2016-06-14

AENOR INTERNACIONAL  
Genova 6, 28004, Madrid, Spania  
Tel. 91 432 60 00 – www.aenor.es

Entitate de certificare produs acreditata de ENAC, numar 01/C-PR275



**AENOR**  
**CERTIFICAT ENEC DE PRODUS**  
*[logo ENEC 01]*

**ANEXA 1 LA CERTIFICATUL ENEC/001028**

| TIP REFERINTA              | NR. LAMPI x PUTERE NOMINALA |
|----------------------------|-----------------------------|
| AXIA 2.1 16 LED 21 W Cl. I | 16 LED; 21 W; 390 mA        |
| AXIA 2.1 16 LED 26 W Cl. I | 16 LED; 26 W; 480 mA        |
| AXIA 2.1 16 LED 32 W Cl. I | 16 LED; 32 W; 600 mA        |
| AXIA 2.1 16 LED 36 W Cl. I | 16 LED; 36 W; 690 mA        |
| AXIA 2.1 16 LED 40 W Cl. I | 16 LED; 40 W; 760 mA        |
| AXIA 2.1 24 LED 38 W Cl. I | 24 LED; 38 W; 490 mA        |
| AXIA 2.1 24 LED 41 W Cl. I | 24 LED; 41 W; 540 mA        |
| AXIA 2.1 24 LED 48 W Cl. I | 24 LED; 48 W; 630 mA        |
| AXIA 2.1 24 LED 53 W Cl. I | 24 LED; 53 W; 690 mA        |
| AXIA 2.1 24 LED 57 W Cl. I | 24 LED; 57 W; 750 mA        |
| AXIA 2.1 24 LED 68 W Cl. I | 24 LED; 68 W; 890 mA        |
| AXIA 2.1 4 LED 10 W Cl. I  | 4 LED; 10 W; 680 mA         |
| AXIA 2.1 8 LED 13 W Cl. I  | 8 LED; 13 W; 480 mA         |
| AXIA 2.1 8 LED 19 W Cl. I  | 8 LED; 19 W; 690 mA         |
| AXIA 2.1 8 LED 22 W Cl. I  | 8 LED; 22 W; 820 mA         |

Genova 6, 28004, Madrid, Spania  
Tel. 91 432 60 00 – [www.aenor.es](http://www.aenor.es)

Entitate de certificare produs acreditata de ENAC, număr 01/C-PR275





MINISTERIO  
DE INDUSTRIA, ENERGIA  
Y TURISMO

L.C.O.E.

LABORATORIO CENTRAL OFICIAL  
DE ELECTROTECNIA



FUNDACIÓN PARA EL FOMENTO  
DE LA INNOVACIÓN INDUSTRIAL



Nº 3/LE/130

# INFORME DE ENSAYOS TEST REPORT

Ensayo N°/Test Report N°: 2016050306B1-M1

|                                                   |                                                                                                                                                                                 |                                                    |                                                                  |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------|
| Solicitante/<br>Applicant's name:                 | SCHREDER Group                                                                                                                                                                  | Fecha recepción<br>Date of receipt of test item:   | 17/02/2016 (M1 –<br>19/07/2016)                                  |
| Domicilio/<br>Address:                            | Rue de Lusambo 71 - 1190 Brussels (Belgium)                                                                                                                                     | Fecha de ensayo<br>Date(s) of performance of test: | 23/02/2016 to<br>30/05/2016 (M1-<br>20/07/2016 to<br>13/09/2016) |
| Aparato/<br>Test item description:                | Luminaires for road and street<br>lighting                                                                                                                                      | Nº total de págs./<br>Total pags. Number:          | 1 + 1 + 68                                                       |
| Marca/<br>Trade mark:                             | Schröder                                                                                                                                                                        |                                                    |                                                                  |
| Modelo/<br>Model:                                 | Axia GEN2 Size 1 and Size 2<br>series – Class I                                                                                                                                 |                                                    |                                                                  |
| Tipo, N° de Ref./<br>Type reference:              | ---                                                                                                                                                                             |                                                    |                                                                  |
| Normas aplicadas/<br>Test Specification-Standard: | IEC 60598-2-3:2002 (Third Edition) + A1:2011 used in conjunction with IEC 60598-1:2014 (Eighth Edition)<br>EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015 |                                                    |                                                                  |

Los resultados de los ensayos están contenidos en las hojas adjuntas/ The tests results are included in the following pages.

Este informe de ensayos anula y sustituye al informe nº 2016050306B1 de fecha 06/06/2016 /This test report cancel and replace to report number 2016050306B1 issued 06/06/2016

Fecha de emisión/Date of issue: 26 de Septiembre de 2016

Ensayado por/  
Tested by,

Firmado digitalmente por Alberto J. Carrasco Santos  
Nombre de reconocimiento (DN): c=ES, cn=Alberto J. Carrasco Santos, email=carascosantos@lcoe.es, serialNumber=0239228V, o=Carasco Santos, givenName=Alberto J. Carrasco Santos, 1.3.6.1.4.1.77326.30.3=GB045231, ou=FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL, ou=LCOE BAJA TENSIÓN, ou=ANALISTA, 2.5.4.13=Qualified Certificate: CAM-PF-2004-095C  
Módulo Ensayado  
Fecha: 2016.09.26 12:32:48 +02'00'

ALBERTO J. CARRASCO SANTOS



Responsable Unidad Operativa/  
Head of business unit,

Firmado digitalmente por Jesús Sánchez Pando  
Nombre de reconocimiento (DN): c=ES, cn=Jesús Sánchez Pando, email=jsp@lcoe.es, serialNumber=080204695, ou=Sánchez Pando, givenName=Jesús, 1.3.6.1.4.1.77326.30.3=GB045231, ou=FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL, ou=LCOE TECNOLOGIA BAJA TENSIÓN, ou=RESPONSABLE TECNICO, 2.5.4.13=Qualified Certificate: CAM-PF-SW-095C  
Fecha: 2016.09.27 09:28:19 +02'00'

JESUS SANCHEZ PANDO

\* Los ensayos se refieren exclusivamente a la muestra ensayada; dicha muestra es la descrita en el informe y corresponde a la muestra originalmente recibida, con las modificaciones que en el transcurso de los ensayos puedan haberse producido, para dar cumplimiento a los mismos. Estas modificaciones están documentadas en los archivos del LCOE y disposición del solicitante u organismo por el autorizado / The test results presented in this report relate only to the object tested; the simple is described in the report and is the originally received with all the modifications that can be made during the testing to comply with the Standard requirements. All of this modifications are reported in the LCOE files available to the applicant or other body authorized by the applicant.

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## TEST REPORT SUMMARY

|                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Reference No.</b> .....                                                                                                                                                                                                                                                                                                                                                                 | <b>2016050306B1-M1</b>                                                                                                                                                      | <br> |
| <b>Date of issue</b> .....                                                                                                                                                                                                                                                                                                                                                                        | 26/09/2016                                                                                                                                                                  |                                                                                                                                                                            |
| <b>Tested by (name + signature)</b> .....                                                                                                                                                                                                                                                                                                                                                         | ALBERTO J. CARRASCO SANTOS                                                                                                                                                  |                                                                                                                                                                            |
| <b>Witnessed by (name + signature)</b> .....                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                             |                                                                                                                                                                            |
| <b>Approved by (name + signature)</b> .....                                                                                                                                                                                                                                                                                                                                                       | JESUS SANCHEZ PANDO                                                                                                                                                         |                                                                                                                                                                            |
| <b>Supervised by (name + signature)</b> .....                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                             |                                                                                                                                                                            |
| <b>Testing Laboratory</b> .....                                                                                                                                                                                                                                                                                                                                                                   | LABORATORIO CENTRAL OFICIAL DE ELECTROTÉCNIA                                                                                                                                |                                                                                                                                                                            |
| <b>Address</b> .....                                                                                                                                                                                                                                                                                                                                                                              | C/ Eric Kandel, 1 · TECNOGETAFE · 28906 Getafe-Madrid (SPAIN)                                                                                                               |                                                                                                                                                                            |
| <b>Testing procedure</b> .....                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> ENEC/CCA-TL <input type="checkbox"/> IEC/IEC/IEC <input type="checkbox"/> TMP <input type="checkbox"/> WMT <input type="checkbox"/> SMT |                                                                                                                                                                            |
| <b>Testing location</b> .....                                                                                                                                                                                                                                                                                                                                                                     | --                                                                                                                                                                          |                                                                                                                                                                            |
| <b>Address</b> .....                                                                                                                                                                                                                                                                                                                                                                              | --                                                                                                                                                                          |                                                                                                                                                                            |
| <b>Applicant</b> .....                                                                                                                                                                                                                                                                                                                                                                            | SCHREDER Group                                                                                                                                                              |                                                                                                                                                                            |
| <b>Address</b> .....                                                                                                                                                                                                                                                                                                                                                                              | Rue de Lusambo 71 - 1190 Brussels (Belgium)                                                                                                                                 |                                                                                                                                                                            |
| <b>Manufacturer</b> .....                                                                                                                                                                                                                                                                                                                                                                         | SCHREDER Group                                                                                                                                                              |                                                                                                                                                                            |
| <b>Address</b> .....                                                                                                                                                                                                                                                                                                                                                                              | Rue de Lusambo 71 - 1190 Brussels (Belgium)                                                                                                                                 |                                                                                                                                                                            |
| <b>Product</b> .....                                                                                                                                                                                                                                                                                                                                                                              | LUMINAIRES FOR ROAD AND STREET LIGHTING                                                                                                                                     |                                                                                                                                                                            |
| <b>Model/Type reference</b> .....                                                                                                                                                                                                                                                                                                                                                                 | Axia GEN2 Size 1 and Size 2 series – Class I                                                                                                                                |                                                                                                                                                                            |
| <b>Trademark</b> .....                                                                                                                                                                                                                                                                                                                                                                            | Schröder                                                                                                                                                                    |                                                                                                                                                                            |
| <b>Ratings</b> .....                                                                                                                                                                                                                                                                                                                                                                              | 230 V; 50 Hz; max 24 led – 66 W (size 1) – max 48 led – 137 W (size 2); IP66; IK08; Ta 50 °C (size 1) and 30 °C (size 2); Class I                                           |                                                                                                                                                                            |
| <b>Certification Scheme</b> .....                                                                                                                                                                                                                                                                                                                                                                 | <input checked="" type="checkbox"/> ENEC <input type="checkbox"/> CCA <input type="checkbox"/> Other: _____                                                                 |                                                                                                                                                                            |
| <b>Standard(s)</b> .....                                                                                                                                                                                                                                                                                                                                                                          | EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015                                                                                                        |                                                                                                                                                                            |
| <input type="checkbox"/> The text of the a.m. European Standard was approved by CENELEC under the Unique Acceptance Procedure and is identical with the corresponding IEC Publication.<br><input checked="" type="checkbox"/> The text of the a.m. European Standard was approved by CENELEC with agreed common modifications and is <u>not</u> identical with the corresponding IEC Publication. |                                                                                                                                                                             |                                                                                                                                                                            |
| This EN test report consists of the following parts:<br><input checked="" type="checkbox"/> <b>IEC TRF No. IEC60598_2_3J</b> .....: Report Reference No .....: <b>2016050306B1-M1</b><br><input checked="" type="checkbox"/> <b>EN Common modifications SNCs and A-deviations</b> .....: Report Reference No.....: <b>2016050306B1-M1</b>                                                         |                                                                                                                                                                             |                                                                                                                                                                            |
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Test Report issued under the responsibility of:

**L.C.O.E.**

LABORATORIO CENTRAL OFICIAL  
DE ELECTROTECNIA

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

Report Number. ....: 2016050306B1-M1

Date of issue .....: 26/09/2016

Total number of pages..... 68

Name of Testing Laboratory preparing the Report.....: LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA (LCOE)

Applicant's name.....: SCHREDER Group

Address .....: Rue de Lusambo 71 - 1190 Brussels (Belgium)

**Test specification:**

Standard .....: IEC 60598-2-3:2002 (Third Edition) + A1:2011 used in conjunction with IEC 60598-1:2014 (Eighth Edition)  
EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015

Test procedure .....: CB 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

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**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.



|                                                                                                   |                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test item description..... :</b>                                                               | <b>Luminaires for road and street lighting</b>                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Trade Mark..... :</b>                                                                          | <b>Schröder</b>                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Manufacturer .....</b>                                                                         | <b>SCHRÉDER SOCELEC S.A.</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Model/Type reference .....</b>                                                                 | Axia GEN2 Size 1 and Size 2 series – Class I                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Ratings .....</b>                                                                              | 230 V; 50 Hz; max 24 led – 66 W(size 1) – max 48 led – 137 W (size 2); IP66; IK08; Ta 50 °C (size 1) and 30 °C (size 2); Class I |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b> |                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/>                                                               | <b>CB Testing Laboratory:</b>                                                                                                    | <b>LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA (LCOE)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Testing location/ address..... :</b>                                                           |                                                                                                                                  | C/ Eric Kandel, 1 – 28906 Getafe (Madrid)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <input type="checkbox"/>                                                                          | <b>Associated CB Testing Laboratory:</b>                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Testing location/ address..... :</b>                                                           |                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Tested by (name, function, signature)..... :</b>                                               |                                                                                                                                  | ALBERTO J. CARRASCO SANTOS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                   |                                                                                                                                  |  <p>Firmado digitalmente por Alberto Javier Carrasco Santos<br/> Nombre de reconocimiento (DN): c=ES, cn=Alberto Javier Carrasco Santos, email=acarrasco@lcoe.etsi.upm.es, serialNumber=02239228V, sn=Carrasco Santos, givenName=Alberto Javier, 1.3.6.1.4.1.17326.30.3=G80455231, o=FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL, ou=LCOE BAJA TENSIÓN, title=ANALISTA, 2.5.4.13=Qualified Certificate: CAM-PF-SW-KPSC<br/> Motivo: Ensayado<br/> Fecha: 2016.09.26 12:33:58 +02'00'</p> |
| <b>Approved by (name, function, signature).... :</b>                                              |                                                                                                                                  | JESÚS SÁNCHEZ PANDO<br>(Technical responsible)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                   |                                                                                                                                  |  <p>Firmado digitalmente por Jesús Sánchez Pando<br/> Nombre de reconocimiento (DN): c=ES, cn=Jesús Sánchez Pando, email=jsp@lcoe.etsi.upm.es, serialNumber=080294995, sn=Sánchez Pando, givenName=Jesús, 1.3.6.1.4.1.17326.30.3=G80455231, o=FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL, ou=LCOE- TECNOLOGIA BAJA TENSIÓN, title=RESPONSABLE TÉCNICO, 2.5.4.13=Qualified Certificate: CAM-PF-SW-KPSC<br/> Fecha: 2016.09.27 09:28:54 +02'00'</p>                                      |



**List of Attachments (including a total number of pages in each attachment):****Annex 1: Components****Annex 5: Additional documentation****Annex 6: Photographs of the test sample****Summary of testing:****Tests performed (name of test and test clause):**

All tests have been carried out on the representative model and most onerous of the serie.

The tests carried out including on the present report are conformity with the Standard applied.

**Testing location:****LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA (LCOE)**

C/ Eric Kandel, 1 – 28906 Getafe (Madrid)

**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:**

|                                                                                                                                                                                                                                                                                               |                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Test item particulars.....:</b>                                                                                                                                                                                                                                                            |                                                                                                  |
| <b>Classification of installation and use.....:</b>                                                                                                                                                                                                                                           | According to the instructions of the manufacturer                                                |
| <b>Supply Connection .....</b>                                                                                                                                                                                                                                                                | Terminal block                                                                                   |
| <b>Possible test case verdicts:</b>                                                                                                                                                                                                                                                           |                                                                                                  |
| - 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)                                                                                         |
| <b>Testing.....:</b>                                                                                                                                                                                                                                                                          |                                                                                                  |
| <b>Date of receipt of test item .....</b>                                                                                                                                                                                                                                                     | 17/02/2016 (M1 – 19/07/2016)                                                                     |
| <b>Date (s) of performance of tests .....</b>                                                                                                                                                                                                                                                 | 23/02/2016 to 30/05/2016 (M1- 20/07/2016 to 13/09/2016)                                          |
| <b>General remarks:</b>                                                                                                                                                                                                                                                                       |                                                                                                  |
| "(See Enclosure #)" refers to additional information appended to the report.<br>"(See appended table)" refers to a table appended to the report.<br><br>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator. |                                                                                                  |
| <b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC60598-2:</b>                                                                                                                                                                                                                         |                                                                                                  |
| 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 checked="" type="checkbox"/> <b>Yes</b><br><input type="checkbox"/> <b>Not applicable</b> |
| <b>When differences exist; they shall be identified in the General product information section.</b>                                                                                                                                                                                           |                                                                                                  |
| <b>Name and address of factory (ies) .....</b>                                                                                                                                                                                                                                                | SCHREDER SOCELEC S.A.<br>AV Roanne 66 - P.I. El Henares<br>19180 Marchamalo (Guadalajara)        |



**General product information:****Amendment 1 Report:**

The original Test Report Ref. No. 2016050306B1, dated 2014 May 21 was modified on July 6, 2016 to include the following changes and/or additions, which were considered technical modifications and representative additional models on the family of products:

New models added:

Axia Gen 2 size 2. The mains differences are the size of the luminaire and the power of the led modules. For the new model is necessary carried out the followings test on the new model included:

Cl. 3 – Marking

Cl. 9 – Resistance to dust, solid objects and moisture

Cl. 10 - Insulation resistance and electric strength

Cl. 12 - Endurance test and thermal test

General Type reference: Axia Gen 2 size 1 and size 2.

This is the product code reference.. (See additional information on Annex 5 to “Axia Gen 2 size 1/2 – SYNOPTIC TABLE WITH STRUCTURED DESCRIPTION”)

**MODEL LIST:****Axia Gen 2 size 1**

| Nº led | Power (W) | Current (mA) |
|--------|-----------|--------------|
| 4      | 8         | 612          |
| 8      | 11        | 432          |
| 8      | 15        | 621          |
| 8      | 18        | 738          |
| 16     | 17        | 351          |
| 16     | 21        | 432          |
| 16     | 27        | 540          |
| 16     | 31        | 621          |
| 16     | 34        | 684          |
| 24     | 33        | 441          |
| 24     | 36        | 486          |
| 24     | 42        | 567          |
| 24     | 46        | 621          |
| 24     | 50        | 675          |
| 24     | 60        | 801          |



**Axia Gen 2 size 2**

| Nº led | Power (W) | Current (mA) |
|--------|-----------|--------------|
| 32     | 51        | 690          |
| 32     | 60        | 860          |
| 32     | 116       | 960          |
| 40     | 69        | 370          |
| 40     | 85        | 410          |
| 40     | 98        | 450          |
| 40     | 47        | 480          |
| 40     | 68        | 760          |
| 40     | 87        | 920          |
| 40     | 110       | 1000         |
| 48     | 56        | 460          |
| 48     | 96        | 530          |
| 48     | 127       | 590          |
| 48     | 79        | 660          |
| 48     | 98        | 730          |
| 48     | 120       | 800          |
| 48     | 137       | 890          |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

|                |                                                   |                                                                                 |   |
|----------------|---------------------------------------------------|---------------------------------------------------------------------------------|---|
| <b>3.2 (0)</b> | <b>GENERAL TEST REQUIREMENTS</b>                  |                                                                                 | - |
| 3.2 (0.1)      | Information for luminaire design considered ..... | Standard<br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | ¾ |
| 3.2 (0.3)      | More sections applicable .....                    | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>             | ¾ |

|                |                                                                             |                                                                     |   |
|----------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------|---|
| <b>3.4 (2)</b> | <b>CLASSIFICATION</b>                                                       |                                                                     | - |
| 3.4 (2.2)      | Type of protection .....                                                    | Class I                                                             | ¾ |
| 3.4 (2.3)      | Degree of protection .....                                                  | IP66 (IK08)                                                         | ¾ |
| 3.4 (2.4)      | Luminaire suitable for direct mounting on normally flammable surfaces ..... | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | ¾ |
| 3.4 (2.5)      | Luminaire for normal use .....                                              | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | ¾ |
|                | Luminaire for rough service .....                                           | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | ¾ |
| 3.4 (-)        | Modes of installation of road or street lighting                            |                                                                     | ¾ |
|                | a) on a pipe                                                                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | ¾ |
|                | b) on a mast arm                                                            | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | ¾ |
|                | c) on a post top                                                            | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | ¾ |
|                | d) on span or suspension wires                                              | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | ¾ |
|                | e) on a wall                                                                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | ¾ |

|                |                                       |                     |     |
|----------------|---------------------------------------|---------------------|-----|
| <b>3.5 (3)</b> | <b>MARKING</b>                        |                     | -   |
| 3.5 (3.2)      | Mandatory markings                    |                     | P   |
|                | Position of the marking               |                     | P   |
|                | Format of symbols/text                |                     | P   |
| 3.5 (3.3)      | Additional information                |                     | P   |
|                | Language of instructions              |                     | P   |
| 3.5 (3.3.1)    | Combination luminaires                |                     | N/A |
| 3.5 (3.3.2)    | Nominal frequency in Hz               | 50 Hz               | P   |
| 3.5 (3.3.3)    | Operating temperature                 | 50 °C; 30 °C        | P   |
| 3.5 (3.3.4)    | Symbol or warning notice              |                     | N/A |
| 3.5 (3.3.5)    | Wiring diagram                        |                     | P   |
| 3.5 (3.3.6)    | Special conditions                    |                     | N/A |
| 3.5 (3.3.7)    | Metal halide lamp luminaire – warning |                     | N/A |
| 3.5 (3.3.8)    | Limitation for semi-luminaires        |                     | N/A |
| 3.5 (3.3.9)    | Power factor and supply current       | On led control gear | P   |



| IEC 60598-2-3  |                                                                             |                                  |         |
|----------------|-----------------------------------------------------------------------------|----------------------------------|---------|
| Clause         | Requirement + Test                                                          | Result - Remark                  | Verdict |
| 3.5 (3.3.10)   | Suitability for use indoors                                                 |                                  | N/A     |
| 3.5 (3.3.11)   | Luminaires with remote control                                              |                                  | N/A     |
| 3.5 (3.3.12)   | Clip-mounted luminaire – warning                                            |                                  | N/A     |
| 3.5 (3.3.13)   | Specifications of protective shields                                        |                                  | N/A     |
| 3.5 (3.3.14)   | Symbol for nature of supply                                                 |                                  | P       |
| 3.5 (3.3.15)   | Rated current of socket outlet                                              |                                  | N/A     |
| 3.5 (3.3.16)   | Rough service luminaire                                                     |                                  | N/A     |
| 3.5 (3.3.17)   | Mounting instruction for type Y, type Z and some type X attachments         |                                  | N/A     |
| 3.5 (3.3.18)   | Non-ordinary luminaires with PVC cable                                      |                                  | N/A     |
| 3.5 (3.3.19)   | Protective conductor current in instruction if applicable                   |                                  | N/A     |
| 3.5 (3.3.20)   | Provided with information if not intended to be mounted within arm's reach  |                                  | N/A     |
| 3.5 (3.3.21)   | Non-replaceable and non-user replaceable light sources information provided |                                  | P       |
|                | Cautionary symbol                                                           |                                  | N/A     |
| 3.5 (3.3.22)   | Controllable luminaires, classification of insulation provided              | Basic insulation                 | P       |
| 3.5 (3.4)      | Test with water                                                             |                                  | P       |
|                | Test with hexane                                                            |                                  | P       |
|                | Legible after test                                                          |                                  | P       |
|                | Label attached                                                              |                                  | P       |
| 3.5 (-)        | Additional information in instruction leaflet                               |                                  | P       |
|                | a) Design attitude                                                          | 5 – 8 m                          | P       |
|                | b) Weight                                                                   | 6,7 kg (size 1); 9,5 kg (size 2) | P       |
|                | c) Overall dimensions                                                       |                                  | P       |
|                | d) Maximum projected area if applicable                                     | 0,054(size1); 0,071 (size 2)     | P       |
|                | e) Cross-sectional area of wires if applicable                              |                                  | N/A     |
|                | f) Suitability for indoors use                                              |                                  | N/A     |
|                | g) Dimensions of the compartment                                            |                                  | N/A     |
|                | h) Torque setting to be applied to bolts or screws                          |                                  | P       |
|                | i) Maximum mounting height                                                  |                                  | P       |
| <b>3.6 (4)</b> | <b>CONSTRUCTION</b>                                                         |                                  | -       |
| 3.6 (4.2)      | Components replaceable without difficulty                                   |                                  | P       |



| IEC 60598-2-3    |                                                                                                                          |                 |         |
|------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause           | Requirement + Test                                                                                                       | Result - Remark | Verdict |
| 3.6 (4.3)        | Wireways smooth and free from sharp edges                                                                                |                 | P       |
| <b>3.6 (4.4)</b> | <b>Lampholders</b>                                                                                                       |                 | N/A     |
| 3.6 (4.4.1)      | Integral lampholder                                                                                                      |                 | N/A     |
| 3.6 (4.4.2)      | Wiring connection                                                                                                        |                 | N/A     |
| 3.6 (4.4.3)      | Lampholder for end-to-end mounting                                                                                       |                 | N/A     |
| 3.6 (4.4.4)      | Positioning                                                                                                              |                 | N/A     |
|                  | - pressure test (N) .....                                                                                                |                 | —       |
|                  | After test the lampholder comply with relevant standard sheets and show no damage                                        |                 | N/A     |
|                  | After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation |                 | N/A     |
|                  | - bending test (N) .....                                                                                                 |                 | —       |
|                  | After test the lampholder have not moved from its position and show no permanent deformation                             |                 | N/A     |
| 3.6 (4.4.5)      | Peak pulse voltage                                                                                                       |                 | N/A     |
| 3.6 (4.4.6)      | Centre contact                                                                                                           |                 | N/A     |
| 3.6 (4.4.7)      | Parts in rough service luminaires resistant to tracking                                                                  |                 | N/A     |
| 3.6 (4.4.8)      | Lamp connectors                                                                                                          |                 | N/A     |
| 3.6 (4.4.9)      | Caps and bases correctly used                                                                                            |                 | N/A     |
| 3.6 (4.4.10)     | Light source for lampholder or connection according IEC 60061 not connected another way                                  |                 | N/A     |
| <b>3.6 (4.5)</b> | <b>Starter holders</b>                                                                                                   |                 | N/A     |
|                  | Starter holder in luminaires other than class II                                                                         |                 | N/A     |
|                  | Starter holder class II construction                                                                                     |                 | N/A     |
| <b>3.6 (4.6)</b> | <b>Terminal blocks</b>                                                                                                   |                 | -       |
|                  | Tails                                                                                                                    |                 | N/A     |
|                  | Unsecured blocks                                                                                                         |                 | N/A     |
| <b>3.6 (4.7)</b> | <b>Terminals and supply connections</b>                                                                                  |                 | -       |
| 3.6 (4.7.1)      | Contact to metal parts                                                                                                   |                 | P       |
| 3.6 (4.7.2)      | Test 8 mm live conductor                                                                                                 |                 | P       |
|                  | Test 8 mm earth conductor                                                                                                |                 | P       |
| 3.6 (4.7.3)      | Terminals for supply conductors                                                                                          |                 | P       |
| 3.6 (4.7.3.1)    | Welded method and material                                                                                               |                 | -       |
|                  | - stranded or solid conductor                                                                                            |                 | N/A     |
|                  | - spot welding                                                                                                           |                 | N/A     |



| IEC 60598-2-3     |                                                                                    |                 |         |
|-------------------|------------------------------------------------------------------------------------|-----------------|---------|
| Clause            | Requirement + Test                                                                 | Result - Remark | Verdict |
|                   | - welding between wires                                                            |                 | N/A     |
|                   | - Type Z attachment                                                                |                 | N/A     |
|                   | - mechanical test according to 15.8.2                                              |                 | N/A     |
|                   | - electrical test according to 15.9                                                |                 | N/A     |
|                   | - heat test according to 15.9.2.3 and 15.9.2.4                                     |                 | N/A     |
| 3.6 (4.7.4)       | Terminals other than supply connection                                             |                 | P       |
| 3.6 (4.7.5)       | Heat-resistant wiring/sleeves                                                      |                 | N/A     |
| 3.6 (4.7.6)       | Multi-pole plug                                                                    |                 | N/A     |
|                   | - test at 30 N                                                                     |                 | N/A     |
| <b>3.6 (4.8)</b>  | <b>Switches</b>                                                                    |                 | N/A     |
|                   | - adequate rating                                                                  |                 | N/A     |
|                   | - adequate fixing                                                                  |                 | N/A     |
|                   | - polarized supply                                                                 |                 | N/A     |
|                   | - compliance with IEC 61058-1 for electronic switches                              |                 | N/A     |
| <b>3.6 (4.9)</b>  | <b>Insulating lining and sleeves</b>                                               |                 | N/A     |
| 3.6 (4.9.1)       | Retainment                                                                         |                 | N/A     |
|                   | Method of fixing .....                                                             |                 | —       |
| 3.6 (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     |
| <b>3.6 (4.10)</b> | <b>Double or reinforced insulation</b>                                             |                 | N/A     |
| 3.6 (4.10.1)      | No contact, mounting surface – accessible metal parts – wiring of basic insulation |                 | N/A     |
|                   | Safe installation fixed luminaires                                                 |                 | N/A     |
|                   | Capacitors and switches                                                            |                 | N/A     |
|                   | Interference suppression capacitors according to IEC 60384-14                      |                 | N/A     |
| 3.6 (4.10.2)      | Assembly gaps:                                                                     |                 | N/A     |
|                   | - not coincidental                                                                 |                 | N/A     |
|                   | - no straight access with test probe                                               |                 | N/A     |
| 3.6 (4.10.3)      | Retainment of insulation:                                                          |                 | N/A     |
|                   | - fixed                                                                            |                 | N/A     |



| IEC 60598-2-3     |                                                          |                            |          |
|-------------------|----------------------------------------------------------|----------------------------|----------|
| Clause            | Requirement + Test                                       | Result - Remark            | Verdict  |
|                   | - unable to be replaced; luminaire inoperative           |                            | N/A      |
|                   | - sleeves retained in position                           |                            | N/A      |
|                   | - lining in lampholder                                   |                            | N/A      |
| <b>3.6 (4.11)</b> | <b>Electrical connections and current-carrying parts</b> |                            | -        |
| 3.6 (4.11.1)      | Contact pressure                                         |                            | P        |
| 3.6 (4.11.2)      | Screws:                                                  |                            | -        |
|                   | - self-tapping screws                                    |                            | P        |
|                   | - thread-cutting screws                                  |                            | P        |
| 3.6 (4.11.3)      | Screw locking:                                           |                            | P        |
|                   | - spring washer                                          |                            | P        |
|                   | - rivets                                                 |                            | P        |
| 3.6 (4.11.4)      | Material of current-carrying parts                       |                            | P        |
| 3.6 (4.11.5)      | No contact to wood or mounting surface                   |                            | P        |
| 3.6 (4.11.6)      | Electro-mechanical contact systems                       |                            | N/A      |
| <b>3.6 (4.12)</b> | <b>Screws and connections (mechanical) and glands</b>    |                            | -        |
| 3.6 (4.12.1)      | Screws not made of soft metal                            |                            | P        |
|                   | Screws of insulating material                            |                            | P        |
|                   | Torque test: torque (Nm); part..... :                    | 5 Nm; External part fixing | P        |
|                   | Torque test: torque (Nm); part..... :                    |                            | N/A      |
|                   | Torque test: torque (Nm); part..... :                    |                            | N/A      |
| 3.6 (4.12.2)      | Screws with diameter < 3 mm screwed into metal           |                            | P        |
| 3.6 (4.12.4)      | Locked connections:                                      |                            | -        |
|                   | - fixed arms; torque (Nm) .....                          |                            | N/A      |
|                   | - lampholder; torque (Nm) .....                          |                            | N/A      |
|                   | - push-button switches; torque 0,8 Nm .....              |                            | N/A      |
| 3.6 (4.12.5)      | Screwed glands; force (Nm)..... :                        |                            | N/A      |
| <b>3.6 (4.13)</b> | <b>Mechanical strength (IK08 according to EN 62262)</b>  |                            | <b>P</b> |
| 3.6 (4.13.1)      | Impact tests:                                            |                            | P        |
|                   | - fragile parts; energy (Nm) .....                       | 5J                         | P        |
|                   | - other parts; energy (Nm)..... :                        | 5J                         | P        |
|                   | 1) live parts                                            |                            | P        |
|                   | 2) linings                                               |                            | P        |
|                   | 3) protection                                            |                            | P        |
|                   | 4) covers                                                |                            | P        |



| IEC 60598-2-3     |                                                                     |                               |         |
|-------------------|---------------------------------------------------------------------|-------------------------------|---------|
| Clause            | Requirement + Test                                                  | Result - Remark               | Verdict |
| 3.6 (4.13.3)      | Straight test finger                                                |                               | P       |
| 3.6 (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     |
| 3.6 (4.13.6)      | Tumbling barrel                                                     |                               | N/A     |
| <b>3.6 (4.14)</b> | <b>Suspensions, fixings and means of adjusting</b>                  |                               | -       |
| 3.6 (4.14.1)      | Mechanical load:                                                    |                               | -       |
|                   | A) four times the weight                                            | 26,8kg size 1; 38 kg (size 2) | 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     |
| 3.6 (4.14.2)      | Load to flexible cables                                             |                               | N/A     |
|                   | Mass (kg) .....                                                     |                               | —       |
|                   | Stress in conductors (N/mm <sup>2</sup> ) .....                     |                               | N/A     |
|                   | Mass (kg) of semi-luminaire .....                                   |                               | —       |
|                   | Bending moment (Nm) of semi-luminaire .....                         |                               | N/A     |
| 3.6 (4.14.3)      | Adjusting devices:                                                  |                               | N/A     |
|                   | - flexing test; number of cycles..... :                             |                               | N/A     |
|                   | - strands broken .....                                              |                               | N/A     |
|                   | - electric strength test afterwards                                 |                               | N/A     |
| 3.6 (4.14.4)      | Telescopic tubes: cords not fixed to tube; no strain on conductors  |                               | N/A     |
| 3.6 (4.14.5)      | Guide pulleys                                                       |                               | N/A     |
| 3.6 (4.14.6)      | Strain on socket-outlets                                            |                               | N/A     |
| <b>3.6 (4.15)</b> | <b>Flammable materials</b>                                          |                               | -       |
|                   | - glow-wire test 650°C .....                                        | See Test Table 3.15 (13.3.2)  | N/A     |



| IEC 60598-2-3     |                                                                  |                              |         |
|-------------------|------------------------------------------------------------------|------------------------------|---------|
| Clause            | Requirement + Test                                               | Result - Remark              | Verdict |
|                   | - spacing <sup>3</sup> 30 mm                                     |                              | N/A     |
|                   | - screen withstanding test of 13.3.1                             |                              | N/A     |
|                   | - screen dimensions                                              |                              | N/A     |
|                   | - no fiercely burning material                                   |                              | N/A     |
|                   | - thermal protection                                             |                              | N/A     |
|                   | - electronic circuits exempted                                   |                              | N/A     |
| 3.6 (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     |
| <b>3.6 (4.16)</b> | <b>Luminaires for mounting on normally flammable surfaces</b>    |                              | -       |
|                   | No lamp control gear ..... :                                     | (compliance with Section 12) | N/A     |
| 3.6 (4.16.1)      | Lamp control gear spacing:                                       |                              | -       |
|                   | - spacing 35 mm                                                  |                              | P       |
|                   | - spacing 10 mm                                                  |                              | N/A     |
| 3.6 (4.16.2)      | Thermal protection:                                              |                              | N/A     |
|                   | - in lamp control gear                                           | 120                          | P       |
|                   | - external                                                       |                              | N/A     |
|                   | - fixed position                                                 |                              | N/A     |
|                   | - temperature marked lamp control gear                           |                              | N/A     |
| 3.6 (4.16.3)      | Design to satisfy the test of 12.6                               | (see clause 12.6)            | N/A     |
| <b>3.6 (4.17)</b> | <b>Drain holes</b>                                               |                              | -       |
|                   | Clearance at least 5 mm                                          |                              | N/A     |
| <b>3.6 (4.18)</b> | <b>Resistance to corrosion</b>                                   |                              | -       |
| 3.6 (4.18.1)      | - rust-resistance                                                |                              | P       |
| 3.6 (4.18.2)      | - season cracking in copper                                      |                              | P       |
| 3.6 (4.18.3)      | - corrosion of aluminium                                         |                              | P       |
| 3.6 (4.19)        | Igniters compatible with ballast                                 |                              | N/A     |
| 3.6 (4.20)        | Rough service vibration                                          |                              | N/A     |
| <b>3.6 (4.21)</b> | <b>Protective shield</b>                                         |                              | -       |
| 3.6 (4.21.1)      | Shield fitted if tungsten halogen lamps or metal halide lamps    |                              | N/A     |
|                   | Shield of glass if tungsten halogen lamps                        |                              | N/A     |
| 3.6 (4.21.2)      | Particles from a shattering lamp not impair safety               |                              | N/A     |



| IEC 60598-2-3     |                                                                                                                                                    |                                                          |         |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------|
| Clause            | Requirement + Test                                                                                                                                 | Result - Remark                                          | Verdict |
| 3.6 (4.21.3)      | No direct path                                                                                                                                     |                                                          | N/A     |
| 3.6 (4.21.4)      | Impact test on shield                                                                                                                              |                                                          | N/A     |
|                   | Glow-wire test on lamp compartment..... :                                                                                                          | See Test Table 3.15 (13.3.2)                             | N/A     |
| 3.6 (4.22)        | Attachments to lamps not cause overheating or damage                                                                                               |                                                          | N/A     |
| 3.6 (4.23)        | Semi-luminaires comply Class II                                                                                                                    |                                                          | N/A     |
| <b>3.6 (4.24)</b> | <b>Photobiological hazards</b>                                                                                                                     |                                                          | -       |
| 3.6 (4.24.1)      | No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)                                                               |                                                          | N/A     |
| 3.6 (4.24.2)      | Retinal blue light hazard                                                                                                                          |                                                          | -       |
|                   | Luminaires with $E_{thr}$ :                                                                                                                        |                                                          | -       |
|                   | a) Fixed luminaires                                                                                                                                |                                                          | N/A     |
|                   | - distance x m, borderline between RG1 and RG2 .. :                                                                                                | 0,215 m; RG2<br>See TRF N° LBE 04 112160-3.0 (LABORELEC) | P       |
|                   | - marking and instruction according 3.2.23                                                                                                         |                                                          | P       |
|                   | 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     |
| <b>3.6 (4.25)</b> | <b>Mechanical hazard</b>                                                                                                                           |                                                          | -       |
|                   | No sharp point or edges                                                                                                                            |                                                          | P       |
| <b>3.6 (4.26)</b> | <b>Short-circuit protection</b>                                                                                                                    |                                                          | -       |
| 3.6 (4.26.1)      | Adequate means of uninsulated accessible SELV parts                                                                                                |                                                          | N/A     |
| 3.6 (4.26.2)      | Short-circuit test with test chain according 4.26.3                                                                                                |                                                          | N/A     |
|                   | Test chain not melt through                                                                                                                        |                                                          | N/A     |
|                   | Test sample not exceed values of Table 12.1 and 12.2                                                                                               |                                                          | N/A     |
| <b>3.6 (4.27)</b> | <b>Terminal blocks with integrated screwless earthing contacts</b>                                                                                 |                                                          | N/A     |
|                   | Test according Annex V                                                                                                                             |                                                          | N/A     |
|                   | Pull test of terminal fixing (20 N)                                                                                                                |                                                          | N/A     |
|                   | After test, resistance < 0,05 W                                                                                                                    |                                                          | N/A     |
|                   | Pull test of mechanical connection (50 N)                                                                                                          |                                                          | N/A     |
|                   | After test, resistance < 0,05 W                                                                                                                    |                                                          |         |



| IEC 60598-2-3       |                                                                                                                                                                                     |                 |         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause              | Requirement + Test                                                                                                                                                                  | Result - Remark | Verdict |
|                     | Voltage drop test, resistance < 0,05 W                                                                                                                                              |                 | N/A     |
| <b>3.6 (4.28)</b>   | <b>Fixing of thermal sensing control</b>                                                                                                                                            |                 | -       |
|                     | 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     |
| <b>3.6 (4.29)</b>   | <b>Luminaires with non-replaceable light source</b>                                                                                                                                 |                 | -       |
|                     | Not possible to replace light source                                                                                                                                                |                 | N/A     |
|                     | Live part not accessible after parts have been opened by hand or tools                                                                                                              |                 | N/A     |
| <b>3.6 (4.30)</b>   | <b>Luminaires with non-user replaceable light source</b>                                                                                                                            |                 | -       |
|                     | If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:                                                                |                 | -       |
|                     | Minimum two fixing means                                                                                                                                                            |                 | P       |
| <b>3.6 (4.31)</b>   | <b>Insulation between circuits</b>                                                                                                                                                  |                 | -       |
|                     | Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3                                                                                                     |                 | P       |
|                     | Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3 |                 | N/A     |
| <b>3.6 (4.31.1)</b> | <b>SELV circuits</b>                                                                                                                                                                |                 | -       |
|                     | Used SELV source                                                                                                                                                                    |                 | N/A     |
|                     | Voltage ≤ ELV                                                                                                                                                                       |                 | N/A     |
|                     | Insulating of SELV circuits from LV supply                                                                                                                                          |                 | N/A     |
|                     | Insulating of SELV circuits from other non SELV circuits                                                                                                                            |                 | N/A     |
|                     | Insulating of SELV circuits from FELV                                                                                                                                               |                 | N/A     |
|                     | Insulating of SELV circuits from other SELV circuits                                                                                                                                |                 | N/A     |
|                     | SELV circuits insulated from accessible parts according Table X.1                                                                                                                   |                 | N/A     |
|                     | Plugs not able to enter socket-outlets of other voltage systems                                                                                                                     |                 | N/A     |



| IEC 60598-2-3 |                                                                                                            |                 |         |
|---------------|------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause        | Requirement + Test                                                                                         | Result - Remark | Verdict |
|               | Socket outlets does not admit plugs of other voltage systems                                               |                 | N/A     |
|               | Plugs and socket-outlets does not have protective conductor contact                                        |                 | N/A     |
| 3.6 (4.31.2)  | FELV circuits                                                                                              |                 | -       |
|               | Used FELV source                                                                                           |                 | N/A     |
|               | Voltage $\leq$ ELV                                                                                         |                 | N/A     |
|               | Insulating of FELV circuits from LV supply                                                                 |                 | N/A     |
|               | FELV circuits insulated from accessible parts according Table X.1                                          |                 | N/A     |
|               | Plugs not able to enter socket-outlets of other voltage systems                                            |                 | N/A     |
|               | Socket outlets does not admit plugs of other voltage systems                                               |                 | N/A     |
|               | Socket-outlets does not have protective conductor contact                                                  |                 | N/A     |
| 3.6 (4.31.3)  | Other circuits                                                                                             |                 | -       |
|               | 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: |                 | -       |
|               | - conductive parts are connected together                                                                  |                 | N/A     |
|               | - test according 7.2.3 of above                                                                            |                 | N/A     |
|               | - conductive part not cause an electric shock in case of an insulation fault                               |                 | N/A     |
|               | - equipotential bonding in master/slave applications                                                       |                 | N/A     |
|               | - master luminaire provided with terminal for accessible conductive parts of slave luminaires              |                 | N/A     |
|               | - slave luminaire constructed as class I                                                                   |                 | P       |
| 3.6 (4.32)    | Overvoltage protective devices                                                                             |                 | -       |
|               | Comply with IEC 61643-11                                                                                   |                 | P       |
|               | External to controlgear and connected to earth:                                                            |                 | -       |
|               | - only in fixed luminaires                                                                                 |                 | N/A     |
|               | - only connected to protective earth                                                                       |                 | N/A     |
| 3.6.1 (-)     | At least IP X3 or X5 respectively. IP .....                                                                | IP66            | P       |
|               | Column-integrated luminaires:                                                                              |                 | -       |
|               | - parts below 2,5 m. IP .....                                                                              |                 | N/A     |
|               | - parts above 2,5 m. IP .....                                                                              |                 | N/A     |



| IEC 60598-2-3 |                                                                                                                         |                                |         |
|---------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|
| Clause        | Requirement + Test                                                                                                      | Result - Remark                | Verdict |
| 3.6.2 (-)     | Suspension on span wires                                                                                                |                                | P       |
| 3.6.3 (-)     | Means for attaching the luminaire or external parts to its support appropriate to the weight                            |                                | P       |
| 3.6.3.1 (-)   | Static load test                                                                                                        |                                | -       |
|               | - drag coefficient.....:                                                                                                | 1,2                            | P       |
|               | - loaded area (m²).....:                                                                                                | 0,054 (size 1); 0,071 (size 2) | P       |
|               | - used load (N).....:                                                                                                   | 67 N (size 1); 105 N (size 2)  | P       |
|               | - measured deformation (cm/m) .....                                                                                     | < 2 cm/m                       | P       |
|               | - no rotation                                                                                                           |                                | P       |
| 3.6.4 (-)     | Adjustable lampholders                                                                                                  |                                | N/A     |
| 3.6.5 (-)     | Luminaires installed above 5 m, glass covers shall be:                                                                  |                                | -       |
|               | a) glass that fractures into small pieces (test according to 3.6.5.1), or                                               |                                | N/A     |
|               | b) glass having a high impact shock resistance (test according to 3.6.5.2), or                                          | IK 08                          | P       |
|               | c) protected by any means to retain glass fragments                                                                     |                                | N/A     |
|               | For tunnel luminaires 3.6.5.1 apply                                                                                     |                                | N/A     |
|               | Method of protection declared by the manufacturer                                                                       |                                | N/A     |
| 3.6.5.1 (-)   | Protection by the use of glass that fractures into small pieces                                                         |                                | N/A     |
|               | - number of particles is more than 40.....:                                                                             |                                | N/A     |
| 3.6.5.2 (-)   | Protection by the use of high impact resistant glass                                                                    |                                | N/A     |
| 3.6.5.2.1 (-) | Glass covers have high mechanical strength                                                                              |                                | N/A     |
|               | Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample |                                | N/A     |
| 3.6.5.2.2 (-) | Glass covers not break into large pieces                                                                                |                                | N/A     |
|               | - test according 3.6.5.1, number of particles is more than 20 .....                                                     |                                | N/A     |
| 3.6.6 (-)     | Connection compartment of column-integrated luminaire                                                                   |                                | -       |
|               | - provides adequate space                                                                                               |                                | N/A     |
|               | - means for attachment                                                                                                  |                                | N/A     |
|               | - means for attachment of metal corrosion-resistant                                                                     |                                | N/A     |
| 3.6.7 (-)     | Compliance with ISO standard or other .....                                                                             |                                | N/A     |
| 3.6.8 (-)     | Doors of column-integrated luminaires:                                                                                  |                                | -       |
|               | - corrosion-resistant                                                                                                   |                                | N/A     |
|               | - opening only possible for an authorized person                                                                        |                                | N/A     |



| IEC 60598-2-3 |                                                                           |                 |         |
|---------------|---------------------------------------------------------------------------|-----------------|---------|
| Clause        | Requirement + Test                                                        | Result - Remark | Verdict |
|               | - impact test 5 Nm                                                        |                 | N/A     |
|               | - sample show no damage                                                   |                 | N/A     |
| 3.6.9 (-)     | Column-integrated luminaire:                                              |                 | N/A     |
|               | - dimension of the cable entry slot (mm) .....                            |                 | N/A     |
|               | - cable path from the slot to the connection compartment (mm) .....       |                 | N/A     |
|               | - cable path free from obstruction that might cause abrasion of the cable |                 | N/A     |

|                 |                                                                        |                                                                                           |   |
|-----------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---|
| <b>3.7 (11)</b> | <b>CREEPAGE DISTANCES AND CLEARANCES</b>                               |                                                                                           | - |
| 3.7 (11.2)      | Creepage distances and clearances .....                                | See Table 3.7 (11.2)                                                                      | P |
|                 | Working voltage (V) .....                                              | 230 V                                                                                     | ¾ |
|                 | Rated pulse voltage (kV) .....                                         | -                                                                                         | ¾ |
|                 | Voltage form .....                                                     | Sinusoidal <input checked="" type="checkbox"/><br>Non-sinusoidal <input type="checkbox"/> | ¾ |
|                 | PTI .....                                                              | < 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>                  | ¾ |
|                 | Impulse withstand category (Normal category II) (Category III Annex U) | Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>     | ¾ |

|                     |                                                                                      |                                 |     |
|---------------------|--------------------------------------------------------------------------------------|---------------------------------|-----|
| <b>3.8 (7)</b>      | <b>PROVISION FOR EARTHING</b>                                                        |                                 |     |
| 3.8 (7.2.1 + 7.2.3) | Accessible metal parts                                                               |                                 | P   |
|                     | Metal parts in contact with supporting surface                                       |                                 | P   |
|                     | Resistance < 0,5 W.....                                                              | 0,140 Ω (size1); 0,147 (size 2) | P   |
|                     | Self-tapping screws used                                                             |                                 | P   |
|                     | Thread-forming screws                                                                |                                 | P   |
|                     | Thread-forming screw used in a grove                                                 |                                 | P   |
|                     | Earth makes contact first                                                            |                                 | N/A |
|                     | Terminal blocks with integrated screwless earthing contacts tested according Annex V |                                 | N/A |
|                     | Protective earthing of the luminaire not via built-in control gear                   |                                 | N/A |
| 3.8 (7.2.2 + 7.2.3) | Earth continuity in joints, etc.                                                     |                                 | P   |
| 3.8 (7.2.4)         | Locking of clamping means                                                            |                                 | P   |
|                     | Compliance with 4.7.3                                                                |                                 | P   |



| IEC 60598-2-3     |                                                                                                                                                   |                 |         |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause            | Requirement + Test                                                                                                                                | Result - Remark | Verdict |
|                   | Terminal blocks with integrated screwless earthing contacts tested according Annex V                                                              |                 | N/A     |
| 3.8 (7.2.5)       | Earth terminal integral part of connector socket                                                                                                  |                 | N/A     |
| 3.8 (7.2.6)       | Earth terminal adjacent to mains terminals                                                                                                        |                 | N/A     |
| 3.8 (7.2.7)       | Electrolytic corrosion of the earth terminal                                                                                                      |                 | N/A     |
| 3.8 (7.2.8)       | Material of earth terminal                                                                                                                        |                 | P       |
|                   | Contact surface bare metal                                                                                                                        |                 | P       |
| 3.8 (7.2.10)      | Class II luminaire for looping-in                                                                                                                 |                 | N/A     |
|                   | Double or reinforced insulation to functional earth                                                                                               |                 | P       |
| 3.8 (7.2.11)      | Earthing core coloured green-yellow                                                                                                               |                 | P       |
|                   | Length of earth conductor                                                                                                                         |                 | P       |
| 3.8.1 (-)         | Attachment prevented from rotation                                                                                                                |                 | P       |
| <b>3.9 (14)</b>   | <b>SCREW TERMINALS</b>                                                                                                                            |                 | -       |
|                   | Separately approved; component list..... :                                                                                                        | (see Annex 1)   | P       |
|                   | Part of the luminaire ..... :                                                                                                                     | (see Annex 3)   | -       |
| <b>3.9 (15)</b>   | <b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>                                                                                             |                 | -       |
|                   | Separately approved; component list..... :                                                                                                        | (see Annex 1)   | P       |
|                   | Part of the luminaire ..... :                                                                                                                     | (see Annex 4)   | -       |
| <b>3.10 (5)</b>   | <b>EXTERNAL AND INTERNAL WIRING</b>                                                                                                               |                 | -       |
| <b>3.10 (5.2)</b> | <b>Supply connection and external wiring</b>                                                                                                      |                 | -       |
| 3.10 (5.2.1)      | Means of connection ..... :                                                                                                                       | Terminal block  | P       |
|                   | Outdoor luminaire has not PVC insulated external wiring if not class III or SELV $\leq 25$ V a.c./60 V d.c. or protected from outdoor environment |                 | P       |
| 3.10 (5.2.2)      | Type of cable ..... :                                                                                                                             |                 | N/A     |
|                   | Nominal cross-sectional area (mm <sup>2</sup> ) ..... :                                                                                           |                 | N/A     |
|                   | Cables equal to IEC 60227 or IEC 60245                                                                                                            |                 | N/A     |
| 3.10 (5.2.3)      | Type of attachment, X, Y or Z                                                                                                                     |                 | N/A     |
| 3.10 (5.2.5)      | Type Z not connected to screws                                                                                                                    |                 | N/A     |
| 3.10 (5.2.6)      | Cable entries:                                                                                                                                    |                 | N/A     |
|                   | - suitable for introduction                                                                                                                       |                 | N/A     |
|                   | - adequate degree of protection                                                                                                                   |                 | N/A     |



| IEC 60598-2-3   |                                                          |                 |         |
|-----------------|----------------------------------------------------------|-----------------|---------|
| Clause          | Requirement + Test                                       | Result - Remark | Verdict |
| 3.10 (5.2.7)    | Cable entries through rigid material have rounded edges  |                 | N/A     |
| 3.10 (5.2.8)    | Insulating bushings:                                     |                 |         |
|                 | - 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     |
| 3.10 (5.2.9)    | Locking of screwed bushings                              |                 | N/A     |
| 3.10 (5.2.10)   | Cord anchorage:                                          |                 | N/A     |
|                 | - covering protected from abrasion                       |                 | N/A     |
|                 | - clear how to be effective                              |                 | N/A     |
|                 | - no mechanical or thermal stress                        |                 | N/A     |
|                 | - no tying of cables into knots etc.                     |                 | N/A     |
|                 | - insulating material or lining                          |                 | N/A     |
| 3.10 (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     |
| 3.10 (5.2.10.2) | Adequate cord anchorage for type Y and type Z attachment |                 | N/A     |
| 3.10 (5.2.10.3) | Tests:                                                   |                 | N/A     |
|                 | - impossible to push cable; unsafe                       |                 | N/A     |
|                 | - pull test: 25 times; pull (N) ..... :                  |                 | N/A     |
|                 | - torque test: torque (Nm) ..... :                       |                 | N/A     |
|                 | - displacement $\pm 2$ mm                                |                 | N/A     |
|                 | - no movement of conductors                              |                 | N/A     |
|                 | - no damage of cable or cord                             |                 | N/A     |



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|-------------------|--------------------------------------------------------------------------------|-----------------|---------|
| Clause            | Requirement + Test                                                             | Result - Remark | Verdict |
|                   | - function independent of electrical connection                                |                 | N/A     |
| 3.10<br>(5.2.11)  | External wiring passing into luminaire                                         |                 | P       |
| 3.10<br>(5.2.12)  | Looping-in terminals                                                           |                 | N/A     |
| 3.10<br>(5.2.13)  | Wire ends not tinned                                                           |                 | N/A     |
|                   | Wire ends tinned: no cold flow                                                 |                 | N/A     |
| 3.10<br>(5.2.14)  | Mains plug same protection                                                     |                 | N/A     |
|                   | Class III luminaire plug                                                       |                 | N/A     |
|                   | No unsafe compatibility                                                        |                 | N/A     |
| 3.10<br>(5.2.16)  | Appliance inlets (IEC 60320)                                                   |                 | N/A     |
|                   | Installation couplers (IEC 61535)                                              |                 | N/A     |
|                   | Other appliance inlet or connector according relevant IEC standard             |                 | N/A     |
| 3.10<br>(5.2.17)  | No standardized interconnecting cables properly assembled                      |                 | N/A     |
| 3.10<br>(5.2.18)  | Used plug in accordance with                                                   |                 | N/A     |
|                   | - IEC 60083                                                                    |                 | N/A     |
|                   | - other standard                                                               |                 | N/A     |
| <b>3.10 (5.3)</b> | <b>Internal wiring</b>                                                         |                 | -       |
| 3.10 (5.3.1)      | Internal wiring of suitable size and type                                      |                 | P       |
|                   | Through wiring                                                                 |                 | P       |
|                   | - not delivered/ mounting instruction                                          |                 | P       |
|                   | - factory assembled                                                            |                 | P       |
|                   | - socket outlet loaded (A) .....                                               |                 | N/A     |
|                   | - temperatures .....                                                           | (see Annex 2)   | P       |
|                   | Green-yellow for earth only                                                    |                 | P       |
| 3.10<br>(5.3.1.1) | Internal wiring connected directly to fixed wiring                             |                 | -       |
|                   | Cross-sectional area (mm <sup>2</sup> ).....                                   | 1               | P       |
|                   | Insulation thickness                                                           |                 | P       |
|                   | Extra insulation added where necessary                                         |                 | N/A     |
| 3.10<br>(5.3.1.2) | Internal wiring connected to fixed wiring via internal current-limiting device |                 | -       |



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|----------------|--------------------------------------------------------|-----------------|---------|
| Clause         | Requirement + Test                                     | Result - Remark | Verdict |
|                | Adequate cross-sectional area and insulation thickness |                 | P       |
| 3.10 (5.3.1.3) | Double or reinforced insulation for class II           |                 | N/A     |
| 3.10 (5.3.1.4) | Conductors without insulation                          |                 | N/A     |
| 3.10 (5.3.1.5) | SELV current-carrying parts                            |                 | N/A     |
| 3.10 (5.3.1.6) | Insulation thickness other than PVC or rubber          |                 | N/A     |
| 3.10 (5.3.2)   | Sharp edges etc.                                       |                 | P       |
|                | No moving parts of switches etc.                       |                 | P       |
|                | Joints, raising/lowering devices                       |                 | N/A     |
|                | Telescopic tubes etc.                                  |                 | N/A     |
|                | No twisting over 360°                                  |                 | N/A     |
| 3.10 (5.3.3)   | Insulating bushings:                                   |                 | -       |
|                | - suitable fixed                                       |                 | N/A     |
|                | - material in bushings                                 |                 | N/A     |
|                | - material not likely to deteriorate                   |                 | N/A     |
|                | - cables with protective sheath                        |                 | N/A     |
| 3.10 (5.3.4)   | Joints and junctions effectively insulated             |                 | N/A     |
| 3.10 (5.3.5)   | Strain on internal wiring                              |                 | N/A     |
| 3.10 (5.3.6)   | Wire carriers                                          |                 | N/A     |
| 3.10 (5.3.7)   | Wire ends not tinned                                   |                 | P       |
|                | Wire ends tinned: no cold flow                         |                 | P       |
| 3.10.1 (-)     | Cord anchorage if applicable                           |                 | P       |
|                | - pull test: 25 times; pull (N) .....:                 | 60              | P       |
|                | - torque test: torque (Nm) .....:                      | 0,25            | P       |

|                 |                                                                                                                |  |   |
|-----------------|----------------------------------------------------------------------------------------------------------------|--|---|
| <b>3.11 (8)</b> | <b>PROTECTION AGAINST ELECTRIC SHOCK</b>                                                                       |  | - |
| 3.11 (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 |  | P |



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|----------------|------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause         | Requirement + Test                                                                                                     | Result - Remark | Verdict |
|                | Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires                        |                 | P       |
|                | Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements |                 | N/A     |
|                | Basic insulation only accessible under lamp or starter replacement                                                     |                 | 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     |
| 3.11 (8.2.2)   | Portable luminaire adjusted in most unfavourable position                                                              |                 | N/A     |
| 3.11 (8.2.3.a) | Class II luminaire:                                                                                                    |                 | N/A     |
|                | - basic insulated metal parts not accessible during starter or lamp replacement                                        |                 | N/A     |
|                | - basic insulation not accessible other than during starter or lamp replacement                                        |                 | N/A     |
|                | - glass protective shields not used as supplementary insulation                                                        |                 | N/A     |
| 3.11 (8.2.3.b) | BC lampholder of metal in class I luminaires shall be earthed                                                          |                 | N/A     |
| 3.11 (8.2.3.c) | SELV circuits with exposed current carrying parts:                                                                     |                 | N/A     |
|                | Ordinary luminaire:                                                                                                    |                 | N/A     |
|                | - touch current .....                                                                                                  |                 | N/A     |
|                | - no-load voltage.....                                                                                                 |                 | N/A     |
|                | Other than ordinary luminaire:                                                                                         |                 | N/A     |
|                | - nominal voltage .....                                                                                                |                 | N/A     |
| 3.11 (8.2.4)   | Portable luminaire have protection independent of supporting surface                                                   |                 | N/A     |
| 3.11 (8.2.5)   | Compliance with the standard test finger or relevant probe                                                             |                 | N/A     |
| 3.11 (8.2.6)   | Covers reliably secured                                                                                                |                 | N/A     |
| 3.11 (8.2.7)   | Discharging of capacitors <sup>3</sup> 0,5 nF                                                                          |                 | N/A     |
|                | Portable plug connected luminaire with capacitor                                                                       |                 | N/A     |



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|------------------|-----------------------------------------------------------------------------------------------------|-----------------------|---------|
| Clause           | Requirement + Test                                                                                  | Result - Remark       | Verdict |
|                  | Other plug connected luminaire with capacitor                                                       |                       | N/A     |
|                  | Discharge device on or within capacitor                                                             |                       | N/A     |
|                  | Discharge device mounted separately                                                                 |                       | N/A     |
| <b>3.12 (12)</b> | <b>ENDURANCE TEST AND THERMAL TEST</b>                                                              |                       | -       |
| 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 |                       | ¾       |
| 3.12 (12.3)      | Endurance test:                                                                                     |                       | -       |
|                  | - mounting-position..... :                                                                          | ON POST               | ¾       |
|                  | - test temperature (°C) ..... :                                                                     | 60/40 ± 2 °C          | ¾       |
|                  | - total duration (h) ..... :                                                                        | 240 h                 | ¾       |
|                  | - supply voltage: Un factor; calculated voltage (V)... :                                            | 253 V                 | ¾       |
|                  | - lamp used..... :                                                                                  | Integrated led module | ¾       |
| 3.12 (12.3.2)    | After endurance test:                                                                               |                       | -       |
|                  | - 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):                                                  |                       | -       |
| 3.12 (12.6.1)    | Through wiring or looping-in wiring loaded by a current of (A) ..... :                              |                       | ¾       |
|                  | - case of abnormal conditions ..... :                                                               |                       | ¾       |
|                  | - electronic lamp control gear                                                                      |                       | N/A     |
|                  | - measured winding temperature (°C): at 1,1 Un .... :                                               |                       | ¾       |
|                  | - 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 ..... :                                                               |                       | ¾       |



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|-----------------|---------------------------------------------------------------------------------|-------------------------|---------|
| Clause          | Requirement + Test                                                              | Result - Remark         | Verdict |
|                 | - 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     |
| 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 ..... :                                         |                         | ¾       |
|                 | Test according to 12.7.1.1:                                                     |                         | N/A     |
|                 | - case of abnormal conditions ..... :                                           |                         | ¾       |
|                 | - Ballast failure at supply voltage (V) ..... :                                 |                         | ¾       |
|                 | - 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 ..... :                                           |                         | ¾       |
|                 | - measured winding temperature (°C): at 1,1 Un ..... :                          |                         | ¾       |
|                 | - measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :     |                         | ¾       |
|                 | - calculated temperature of fixing point/exposed part (°C) ..... :              |                         | ¾       |
|                 | Ball-pressure test ..... :                                                      | See Table 3.15 (13.2.1) | N/A     |
| 3.12 (12.7.1.2) | Luminaire with discharge lamp, fluorescent lamp $> 70W$ , transformer $> 10 VA$ |                         | N/A     |
|                 | - case of abnormal conditions ..... :                                           |                         | ¾       |
|                 | - measured winding temperature (°C): at 1,1 Un ..... :                          |                         | ¾       |
|                 | - measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :     |                         | ¾       |
|                 | - calculated temperature of fixing point/exposed part (°C) ..... :              |                         | ¾       |
|                 | Ball-pressure test ..... :                                                      | See Table 3.15 (13.2.1) | N/A     |
| 3.12 (12.7.1.3) | Luminaire with short circuit proof transformers $\leq 10 VA$                    |                         | N/A     |
|                 | - case of abnormal conditions ..... :                                           |                         | ¾       |



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|------------------|-----------------------------------------------------------------------------------------|-------------------------|---------|
| Clause           | Requirement + Test                                                                      | Result - Remark         | Verdict |
|                  | - Components retained in place after the test                                           |                         | N/A     |
|                  | - Test with standard test finger after the test                                         |                         | N/A     |
| 3.12<br>(12.7.2) | Luminaire with temperature sensing control                                              |                         | N/A     |
|                  | - thermal link..... : Yes <input type="checkbox"/> No <input type="checkbox"/>          |                         | ¾       |
|                  | - manual reset cut-out ..... : Yes <input type="checkbox"/> No <input type="checkbox"/> |                         | ¾       |
|                  | - auto reset cut-out ..... : Yes <input type="checkbox"/> No <input type="checkbox"/>   |                         | ¾       |
|                  | - case of abnormal conditions ..... :                                                   |                         | ¾       |
|                  | - highest measured temperature of fixing point/<br>exposed part (°C): ..... :           |                         | ¾       |
|                  | Ball-pressure test: ..... :                                                             | See Table 3.15 (13.2.1) | N/A     |
| 3.12.1 (-)       | Temperature reduction if for outdoor use only                                           |                         | N/A     |
| 3.12.2 (-)       | (See above)                                                                             |                         | ¾       |
| 3.12.3 (-)       | Glass covers used within the thermal limits declared<br>by the glass manufacturer       |                         | N/A     |

|                 |                                                                                                   |                        |          |
|-----------------|---------------------------------------------------------------------------------------------------|------------------------|----------|
| <b>3.13 (9)</b> | <b>RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE</b>                                             |                        | <b>P</b> |
| 3.13.1 (-)      | If IP > IP 20 the order of tests as specified in clause 3.12                                      |                        | <b>P</b> |
| 3.13 (9.2)      | Tests for ingress of dust, solid objects and moisture:                                            |                        | ¾        |
|                 | - classification according to IP..... :                                                           | IP66                   | ¾        |
|                 | - mounting position during test ..... :                                                           | On post                | ¾        |
|                 | - fixing screws tightened; torque (Nm) ..... :                                                    | Acc instructions sheet | ¾        |
|                 | - tests according to clauses..... :                                                               | 9.2.2 and 9.2.7        | ¾        |
|                 | - electric strength test afterwards                                                               |                        | <b>P</b> |
|                 | a) no deposit in dust-proof luminaire                                                             |                        | <b>P</b> |
|                 | b) no talcum in dust-tight luminaire                                                              |                        | <b>P</b> |
|                 | c) no trace of water on current-carrying parts or on<br>insulation where it could become a hazard |                        | <b>P</b> |
|                 | d) i) For luminaires without drain holes – no water<br>entry                                      |                        | <b>P</b> |
|                 | d) ii) For luminaires with drain holes – no hazardous<br>water entry                              |                        | N/A      |
|                 | e) no water in watertight luminaire                                                               |                        | <b>P</b> |
|                 | f) no contact with live parts (IP 2X)                                                             |                        | <b>P</b> |
|                 | f) no entry into enclosure (IP 3X and IP 4X)                                                      |                        | N/A      |
|                 | f) no contact with live parts (IP3X and IP4X)                                                     |                        | N/A      |



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|------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause           | Requirement + Test                                                                                                              | Result - Remark | Verdict |
|                  | g) no trace of water on part of lamp requiring protection from splashing water                                                  |                 | P       |
|                  | h) no damage of protective shield or glass envelope                                                                             |                 | P       |
| 3.13 (9.3)       | Humidity test 48 h                                                                                                              |                 | P       |
| <b>3.14 (10)</b> | <b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>                                                                              |                 | -       |
| 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 .....                                                    |                 | ¾       |
|                  | Insulation resistance (MW) .....                                                                                                |                 | ¾       |
|                  | SELV                                                                                                                            |                 | -       |
|                  | - 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                                                                                                                 |                 | -       |
|                  | - between live parts of different polarity .....                                                                                | >> 200GΩ        | P       |
|                  | - between live parts and mounting surface .....                                                                                 | 130GΩ           | P       |
|                  | - between live parts and metal parts .....                                                                                      | 130GΩ           | P       |
|                  | - between live parts of different polarity through action of a switch.....                                                      |                 | N/A     |
|                  | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... |                 | N/A     |
|                  | - Insulation bushings as described in Section 5 .....                                                                           |                 | N/A     |
| 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                                                                                                                            |                 | N/A     |



| IEC 60598-2-3 |                                                                                                                                   |                 |         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause        | Requirement + Test                                                                                                                | Result - Remark | Verdict |
|               | - between current-carrying parts of different polarity :                                                                          |                 | N/A     |
|               | - between current-carrying parts and mounting surface..... :                                                                      |                 | N/A     |
|               | - between current-carrying parts and metal parts of the luminaire ..... :                                                         |                 | N/A     |
|               | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : |                 | N/A     |
|               | - Insulation bushings as described in Section 5 ..... :                                                                           |                 | N/A     |
|               | Other than SELV                                                                                                                   |                 | P       |
|               | - between live parts of different polarity ..... :                                                                                | 1500 V          | P       |
|               | - between live parts and mounting surface ..... :                                                                                 | 1500 V          | P       |
|               | - between live parts and metal parts ..... :                                                                                      | 1500 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..... : |                 | N/A     |
|               | - Insulation bushings as described in Section 5 ..... :                                                                           |                 | N/A     |
| 3.14 (10.3)   | Touch current or protective conductor current (mA) :                                                                              | < 0,2 mA        | P       |

|                  |                                              |                              |     |
|------------------|----------------------------------------------|------------------------------|-----|
| <b>3.15 (13)</b> | <b>RESISTANCE TO HEAT, FIRE AND TRACKING</b> |                              | -   |
| 3.15 (13.2.1)    | Ball-pressure test ..... :                   | See Test Table 3.15 (13.2.1) | N/A |
| 3.15 (13.3.1)    | Needle-flame test (10 s)..... :              | See Test Table 3.15 (13.3.1) | N/A |
| 3.15 (13.3.2)    | Glow-wire test (650°C) ..... :               | See Test Table 3.15 (13.3.2) | N/A |
| 3.15 (13.4)      | Proof tracking test (IEC 60112)..... :       | See Test Table 3.15 (13.4)   | N/A |



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

|                                                        |                                                                       |     |     |        |     |     |      |
|--------------------------------------------------------|-----------------------------------------------------------------------|-----|-----|--------|-----|-----|------|
| <b>3.7 (11.2)</b>                                      | <b>TABLES: Creepage distances and clearances</b>                      |     |     |        |     |     |      |
| <b>Table 11.1</b>                                      | <b>Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages</b> |     |     |        |     |     |      |
| RMS working voltage (V) not exceeding                  |                                                                       | 50  | 150 | 250    | 500 | 750 | 1000 |
| <b>Creepage distances</b>                              |                                                                       |     |     |        |     |     |      |
| Required basic insulation, PTI <sup>3</sup> 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                                               |                                                                       |     |     | >> 2,5 |     |     |      |
| Required supplementary insulation PTI <sup>3</sup> 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                                               |                                                                       |     |     |        |     |     |      |
| <b>Clearances</b>                                      |                                                                       |     |     |        |     |     |      |
| Required basic insulation                              |                                                                       | 0,2 | 0,8 | 1,5    | 3   | 4   | 5,5  |
| Measured                                               |                                                                       |     |     | >> 2,5 |     |     |      |
| Required supplementary insulation                      |                                                                       | -   | 0,8 | 1,5    | 3   | 4   | 5,5  |
| Measured                                               |                                                                       |     |     |        |     |     |      |
| Required reinforced insulation                         |                                                                       | -   | 1,6 | 3      | 6   | 8   | 11   |
| Measured                                               |                                                                       |     |     |        |     |     |      |
| <b>Table 11.2</b>                                      | <b>Minimum distances (mm) for non-sinusoidal pulse voltages</b>       |     |     |        |     |     |      |
| Rated pulse voltage (peak kV)                          |                                                                       | 2,0 | 2,5 | 3,0    | 4,0 | 5,0 | 8,0  |
| Required clearances                                    |                                                                       | 1,0 | 1,5 | 2      | 3   | 4   | 5,5  |
| Measured                                               |                                                                       |     |     |        |     |     |      |
| Rated pulse voltage (peak kV)                          |                                                                       | 10  | 12  | 15     | 20  | 25  | 30   |
| Required clearances                                    |                                                                       | 11  | 14  | 18     | 25  | 33  | 40   |
| Measured                                               |                                                                       |     |     |        |     |     |      |
| Rated pulse voltage (peak kV)                          |                                                                       | 50  | 60  | 80     | 100 | -   | -    |
| Required clearances                                    |                                                                       | 75  | 90  | 130    | 170 | -   | -    |
| Measured                                               |                                                                       |     |     |        |     |     |      |



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

|                                          |                                             |                       |                          |     |
|------------------------------------------|---------------------------------------------|-----------------------|--------------------------|-----|
| 3.15<br>(13.2.1)                         | TABLE: Ball Pressure Test of Thermoplastics |                       |                          | N/A |
| Allowed impression diameter (mm) ..... : |                                             |                       |                          | ¾   |
| Object/ Part No./ Material               | Manufacturer/<br>trademark                  | Test temperature (°C) | Impression diameter (mm) |     |
| Terminal block                           | Adels                                       | 125                   | < 2 mm                   |     |
| Terminal block                           | Wieland                                     | 125                   | < 2 mm                   |     |
| Supplementary information:               |                                             |                       |                          |     |

|                               |                                                  |                                                       |                                          |                                    |         |
|-------------------------------|--------------------------------------------------|-------------------------------------------------------|------------------------------------------|------------------------------------|---------|
| 3.15<br>(13.3.1)              | <b>TABLE: Needle-flame test (IEC 60695-11-5)</b> |                                                       |                                          |                                    | N/A     |
| Object/ Part No./<br>Material | Manufacturer/<br>trademark                       | Duration of<br>application of test<br>flame (ta); (s) | Ignition of<br>specified layer<br>Yes/No | Duration of<br>burning (tb)<br>(s) | Verdict |
| Terminal block                | Adels                                            | 10                                                    | No                                       | 0                                  | P       |
| Terminal block                | Wieland                                          | 10                                                    | NO                                       | 0                                  | P       |
| Supplementary information:    |                                                  |                                                       |                                          |                                    |         |

|                                                                                                                                                                               |                                               |                                                       |                                          |                                    |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------|------------------------------------------|------------------------------------|---------|
| 3.15<br>(13.3.2)                                                                                                                                                              | <b>TABLE: Glow-wire test (IEC 60695-2-11)</b> |                                                       |                                          |                                    | N/A     |
| <b>Glow wire temperature ..... :</b>                                                                                                                                          |                                               |                                                       |                                          | 650°C                              | ¾       |
| Object/ Part No./<br>Material                                                                                                                                                 | Manufacturer/<br>trademark                    | Duration of<br>application of test<br>flame (ta); (s) | Ignition of<br>specified layer<br>Yes/No | Duration of<br>burning (tb)<br>(s) | Verdict |
| Terminal block                                                                                                                                                                | Adels                                         | 0                                                     | No                                       | 0                                  | P       |
| Terminal block                                                                                                                                                                | Wieland                                       | 0                                                     | NO                                       | 0                                  | P       |
| Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No) ..... : |                                               |                                                       |                                          |                                    |         |
| Supplementary information:                                                                                                                                                    |                                               |                                                       |                                          |                                    |         |

|                                 |                                               |                                                                          |  |       |         |
|---------------------------------|-----------------------------------------------|--------------------------------------------------------------------------|--|-------|---------|
| 3.15 (13.4)                     | <b>TABLE: Proof tracking test (IEC 60112)</b> |                                                                          |  |       | N/A     |
| <b>Test voltage PTI ..... :</b> |                                               |                                                                          |  | 175 V | ¾       |
| Object/ Part No./ Material      | Manufacturer/<br>trademark                    | Withstand 50 drops without failure on three places or on three specimens |  |       | Verdict |
|                                 |                                               |                                                                          |  |       |         |
| Supplementary information:      |                                               |                                                                          |  |       |         |



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

| ANNEX 1           |      | TABLE: Critical components information |                                              |                                                 |                |                                     |  |
|-------------------|------|----------------------------------------|----------------------------------------------|-------------------------------------------------|----------------|-------------------------------------|--|
| Object / part No. | Code | Manufacturer/ trademark                | Type / model                                 | Technical data                                  | Standard       | Mark(s) of conformity <sup>1)</sup> |  |
| Led control gear  | A    | PHILIPS                                | Xi FP 22W 0,3-1,0A SNLDAE 230V S175 sXt      | 22W 50-60Hz 0,3-1,05A 198-264V Tc=85°C          | IEC 61347-2-13 | DEKRA 2184474.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi FP 40W 0,3-1,0A SNLDAE 230V S175 sXt      | 40W 50-60Hz 0,3-1,05A 198-264V Tc=80°C          | IEC 61347-2-13 | DEKRA 2184474.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi FP 70W 0,3-1,0A SNLDAE 230V C150 sXt      | 70W 50-60Hz 0,3-1,05A 198-264V Tc=90°C          | IEC 61347-2-13 | DEKRA NL-36917                      |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 22W 0,3-1,0A S1 230V S175 sXt          | 22W 50-60Hz 0,3-1,05A 198-264V Tc=85°C          | IEC 61347-2-13 | DEKRA NL-30274                      |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 40W 0,3-1,0A S1 230V S175 sXt          | 40W 50-60Hz 0,3-1,05A 198-264V Tc=80°C          | IEC 61347-2-13 | DEKRA NL-36274                      |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 70W 0,3-1,0A SL 230V C150 sXt          | 70W 50-60Hz 0,3-1,05A 198-264V Tc=85°C          | IEC 61347-2-13 | DEKRA 2183860.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi FP 110 W 0,3-1,0 A SNLDAE 230 V C 150 sXt | 110W 50-60Hz 0,3-1,05A 198-264V Tc=90°C         | IEC 61347-2-13 | DEKRA 2184600.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 110 W 0,3-1,0 A SL 230 V C 150 sXt     | 110W 50-60Hz 0,3-1,05A 198-264V Tc=85°C         | IEC 61347-2-13 | DEKRA 2185572.02                    |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 110 W 0,2-0,7 A SL 230 V C 150 sXt     | 110W 50-60Hz 0,2-0,7 A 198-264V Tc=85°C         | IEC 61347-2-13 | DEKRA 2185572.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 150 W 0,3-1,0 A SL 230 V S 240sXt      | 150W 50-60Hz 0,3-1,05 A 198-264V Tc=90°C        | IEC 61347-2-13 | DEKRA 2183860.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi FP 150 W 0,3-1,0 A SNLDAE 230 V S 240sXt  | 150W 50-60Hz 0,3-1,05 A 198-264V Tc=90°C        | IEC 61347-2-13 | DEKRA 2183840.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi LP 150 W 0,2-0,7 A SL 230 V S 240sXt      | 150W 50-60Hz 0,2-0,7 A 198-264V Tc=90°C         | IEC 61347-2-13 | DEKRA 2183860.01                    |  |
| Led control gear  | A    | PHILIPS                                | Xi FP 150 W 0,2-0,7 A SNLDAE 230 V S 240sXt  | 150W 50-60Hz 0,2-0,7 A 198-264V Tc=90°C         | IEC 61347-2-13 | DEKRA 2183840.01                    |  |
| Led control gear  | A    | OSRAM                                  | OT 40/120-277/1A0 4DIMLT2 E                  | 40W 50-60Hz 120-277V 0,35-1,05A Tc=80°C         | IEC 61347-2-13 | VDE 40022622                        |  |
| Led control gear  | A    | OSRAM                                  | OT 60/170-240/1A0 4DIMLT2 E                  | 60W 50-60Hz 170-240V 0,35-1,05A Tc=85°C         | IEC 61347-2-13 | VDE 40022622                        |  |
| Led control gear  | A    | OSRAM                                  | OT 90/170-240/1A0 4DIMLT2 E                  | 90W 50-60Hz 170-240V 0,35-1,05A Tc=90°C         | IEC 61347-2-13 | VDE 40022622                        |  |
| Led control gear  | A    | OSRAM                                  | OT 50/120-277/800 2DIMLT2 P                  | 50 W – 0.35-0.8A 120-277 V 50-60 Hz, Tc85°C     | IEC 61347-2-13 | UL-DEMKO ENEC-01112                 |  |
| Led control gear  | A    | OSRAM                                  | OT 165/170-240/1A0 4DIMLT2 E                 | 165 W; 170-240 V 50-60 Hz; 0,35 – 1,05 A Tc85°C | IEC 61347-2-13 | VDE 40022622                        |  |



| IEC 60598-2-3           |                    |                 |                                 |                                                               |                      |                                                             |
|-------------------------|--------------------|-----------------|---------------------------------|---------------------------------------------------------------|----------------------|-------------------------------------------------------------|
| Clause                  | Requirement + Test |                 |                                 | Result - Remark                                               |                      | Verdict                                                     |
| Led control gear        | A                  | LG              | PISE-A027M                      | 27W 0,2-1A 120-277V<br>50-60Hz Tc=80°C                        | IEC 61347-2-13       | TUV Rheiland<br>JPTUV-069219                                |
| Led control gear        | A                  | LG              | PISE-A150 D                     | 150W; 0,35-0,7 A<br>120-277V 50-60Hz<br>Tc=80°C               | IEC 61347-2-13       | TUV Rheiland<br>ENEC18<br>HN 69246191                       |
| Surge protection Device | A                  | CITEL           | MLPC1-230L-R                    | 277/Uo10kV, T85                                               | IEC 61643-11         | TUV Rheiland<br>R 50307743                                  |
| Supply connector        | A                  | WIELAND         | GST18i3 SB1 Serie               | 250-400 V; 5 poles; 1-2,5mm <sup>2</sup> ; T70                | EN 61984<br>EN 61535 | VDE<br>3927<br>40018414                                     |
| Terminal block          | A                  | ADELS           | LK980-01                        | 2.5mm <sup>2</sup> , 450V 24A                                 | EN 60998-1&2-2       | VDE<br>40021343                                             |
| Terminal block          | A                  | ADELS           | 900-07/Q                        | 0.5-4mm <sup>2</sup> 450V                                     | EN 60998-1&2-2       | VDE<br>40027360                                             |
| Terminal block          | A                  | ADELS           | AC-166 ST(D)/3                  | 0.5-2,5mm <sup>2</sup> 250-400V                               | EN 61535             | VDE<br>40036416                                             |
| Control Device          | A                  | Owlet           | LuCo ADP                        | 110-277V 50/60 Hz<br>Tmax = 80°C                              | IEC/EN 61347         | EUROFINS<br>DE-6-G5150184<br>DE-6-G5130046<br>DE-6-G5130047 |
| Control Device          | A                  | Owlet           | LuCo NXP                        | 110-277V 50/60 Hz<br>Tmax = 80°C                              | IEC/EN 61347         |                                                             |
| Control Device          | A                  | Owlet           | LuCo P7                         | 110-277V 50/60 Hz<br>Tmax = 75°C                              | IEC/EN 61347         |                                                             |
| Internal connector led  | A                  | TE Connectivity | TE NEMA Socket 7-pin            | Power contacts:<br>15A 480V<br>Dimming contacts:<br>0.10A 10V | -                    | UL<br>28476                                                 |
| Cable                   | A                  | Auxicom         | H07RN-F 3G                      | Rubber 1,5-2,5mm <sup>2</sup><br>OD 10-12mm                   | EN 50525-2-21        | HAR                                                         |
| Cable                   | A                  | Auxicom         | H07RN-F 5G                      | Rubber 1,5-2,5mm <sup>2</sup><br>OD 12-14mm                   | EN 50525-2-21        | HAR                                                         |
| Led Modules (Axia)      | A                  | Zöllner         | 4 Leds 219C NW<br>4000K@680mA   | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm                     | EN 62031             | Checked in the appliance                                    |
|                         |                    |                 |                                 |                                                               | EN 62471             | R-Tech<br>LBE04112160-3.0                                   |
| Led Modules (Axia)      | A                  | Zöllner         | 8 Leds 219C NW<br>4000K@ 820mA  | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm                     | EN 62031             | Checked in the appliance                                    |
|                         |                    |                 |                                 |                                                               | EN 62471             | R-Tech<br>LBE04112160-3.0                                   |
| Led Modules (Axia)      | A                  | Zöllner         | 16 Leds 219C NW<br>4000K@ 760mA | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm                     | EN 62031             | Checked in the appliance                                    |
|                         |                    |                 |                                 |                                                               | EN 62471             | R-Tech<br>LBE04112160-3.0                                   |



| IEC 60598-2-3                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |         |                                  |                                           |          |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------|----------------------------------|-------------------------------------------|----------|-----------------------------|
| Clause                                                                                                                                                                                                                                                                                                                                                                                                                         | Requirement + Test |         |                                  | Result - Remark                           |          | Verdict                     |
| Led Modules (Axia)                                                                                                                                                                                                                                                                                                                                                                                                             | A                  | Zöllner | 24 Leds 219C NW<br>4000K@ 890mA  | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm | EN 62031 | Checked in the<br>appliance |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |         |                                  |                                           | EN 62471 | R-Tech<br>LBE04112160-3.0   |
| Led Modules (Axia)                                                                                                                                                                                                                                                                                                                                                                                                             | A                  | Zöllner | 32 Leds 219C NW<br>4000K@ 960mA  | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm | EN 62031 | Checked in the<br>appliance |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |         |                                  |                                           | EN 62471 | R-Tech<br>LBE04112160-3.0   |
| Led Modules (Axia)                                                                                                                                                                                                                                                                                                                                                                                                             | A                  | Zöllner | 40 Leds 219C NW<br>4000K@ 1000mA | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm | EN 62031 | Checked in the<br>appliance |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |         |                                  |                                           | EN 62471 | R-Tech<br>LBE04112160-3.0   |
| Led Modules (Axia)                                                                                                                                                                                                                                                                                                                                                                                                             | A                  | Zöllner | 48 Leds 219C NW<br>4000K@ 1000mA | RG02@ 200mm<br>RG01@ 215mm<br>RG0@ 2200mm | EN 62031 | Checked in the<br>appliance |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |         |                                  |                                           | EN 62471 | R-Tech<br>LBE04112160-3.0   |
| Supplementary information:<br>1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.<br>The codes above have the following meaning:<br>A - The component is replaceable with another one, also certified, with equivalent characteristics<br>B - The component is replaceable if authorised by the test house<br>C - Integrated component tested together with the appliance<br>D - Alternative component |                    |         |                                  |                                           |          |                             |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

| ANNEX 2                        | TABLE: Temperature measurements, thermal tests of Section 12                              |                                        |        |        |       |                        |       |
|--------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------|--------|--------|-------|------------------------|-------|
|                                | Type reference .....                                                                      | P1546 – Axia Gen 2 size 1              | ¾      |        |       |                        |       |
|                                | Lamp used.....                                                                            | Integrated led module (24 leds – 30 W) | ¾      |        |       |                        |       |
|                                | Lamp control gear used.....                                                               | Osram – OT 60/170-240/1A0 DIML-T2 E    | ¾      |        |       |                        |       |
|                                | Mounting position of luminaire .....                                                      | On post                                | ¾      |        |       |                        |       |
|                                | Supply wattage (W) .....                                                                  | -                                      | ¾      |        |       |                        |       |
|                                | Supply current (A) .....                                                                  | -                                      | ¾      |        |       |                        |       |
|                                | Calculated power factor.....                                                              | -                                      | ¾      |        |       |                        |       |
|                                | Table: measured temperatures corrected for ta = 50 °C:                                    |                                        | P      |        |       |                        |       |
|                                | - abnormal operating mode .....                                                           | N/A                                    | ¾      |        |       |                        |       |
|                                | - test 1: rated voltage.....                                                              | 230 V                                  | ¾      |        |       |                        |       |
|                                | - test 2: 1,06 times rated voltage or 1,05 times rated wattage .....                      | 243,8 V                                | ¾      |        |       |                        |       |
|                                | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... | -                                      | ¾      |        |       |                        |       |
|                                | - test 4: 1,1 times rated voltage or 1,05 times rated wattage .....                       | -                                      | ¾      |        |       |                        |       |
|                                | Through wiring or looping-in wiring loaded by a current of A during the test .....        | -                                      | ¾      |        |       |                        |       |
| Temperature measurements, (°C) |                                                                                           |                                        |        |        |       |                        |       |
| Part                           | Ambient                                                                                   | Clause 12.4 – normal                   |        |        |       | Clause 12.5 – abnormal |       |
|                                |                                                                                           | test 1                                 | test 2 | test 3 | limit | test 4                 | limit |
| Tc led control gear            | 49,8                                                                                      | 70.3                                   | -      | -      | 85/90 | -                      | -     |
| Controller luminaire           |                                                                                           | -                                      | 53,9   | -      | -     | -                      | -     |
| Connetor                       |                                                                                           | -                                      | 53,5   | -      | 110   | -                      | -     |
| Internal wiring                |                                                                                           | -                                      | 55,4   | -      | 90    | -                      | -     |
| Terminal block                 |                                                                                           | -                                      | 54,8   | -      | 70    | -                      | -     |
| Surge protection device        |                                                                                           | -                                      | 55,3   | -      | 70    | -                      | -     |
| TC led module                  |                                                                                           | -                                      | 62,1   | -      | 85    | -                      | -     |
| Supplementary information:     |                                                                                           |                                        |        |        |       |                        |       |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

| ANNEX 2                        | TABLE: Temperature measurements, thermal tests of Section 12                              |                                         |        |                                                                                       |       |                        |       |
|--------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------|--------|---------------------------------------------------------------------------------------|-------|------------------------|-------|
|                                | Type reference .....                                                                      | P1546 – Axia Gen 2 size 2               | ¾      |                                                                                       |       |                        |       |
|                                | Lamp used.....                                                                            | Integrated led module (48 leds – 137 W) | ¾      |                                                                                       |       |                        |       |
|                                | Lamp control gear used.....                                                               | Osram – OT 165/170-240/1A0 4DIMLT2 E    | ¾      |                                                                                       |       |                        |       |
|                                | Mounting position of luminaire .....                                                      | On post                                 | ¾      |                                                                                       |       |                        |       |
|                                | Supply wattage (W) .....                                                                  | -                                       | ¾      |                                                                                       |       |                        |       |
|                                | Supply current (A) .....                                                                  | -                                       | ¾      |                                                                                       |       |                        |       |
|                                | Calculated power factor.....                                                              | -                                       | ¾      |                                                                                       |       |                        |       |
|                                | Table: measured temperatures corrected for ta = 50 °C:                                    |                                         | P      |                                                                                       |       |                        |       |
|                                | - abnormal operating mode .....                                                           | N/A                                     | ¾      |                                                                                       |       |                        |       |
|                                | - test 1: rated voltage.....                                                              | 230 V                                   | ¾      |                                                                                       |       |                        |       |
|                                | - test 2: 1,06 times rated voltage or 1,05 times rated wattage .....                      | 243,8 V                                 | ¾      |                                                                                       |       |                        |       |
|                                | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... | -                                       | ¾      |                                                                                       |       |                        |       |
|                                | - test 4: 1,1 times rated voltage or 1,05 times rated wattage .....                       | -                                       | ¾      |                                                                                       |       |                        |       |
|                                | Through wiring or looping-in wiring loaded by a current of A during the test .....        | -                                       | ¾      |                                                                                       |       |                        |       |
| Temperature measurements, (°C) |                                                                                           |                                         |        |                                                                                       |       |                        |       |
| Part                           | Ambient                                                                                   | Clause 12.4 – normal                    |        |                                                                                       |       | Clause 12.5 – abnormal |       |
|                                |                                                                                           | test 1                                  | test 2 | test 3                                                                                | limit | test 4                 | limit |
| Tc led control gear            | 30,1                                                                                      | 60,1                                    | -      | -                                                                                     | 85/90 | -                      | -     |
| Controller luminaire           |                                                                                           | -                                       | 37,1   | -                                                                                     | -     | -                      | -     |
| Connector                      |                                                                                           | -                                       | 37,0   | -                                                                                     | 110   | -                      | -     |
| Internal wiring                |                                                                                           | -                                       | 40,8   | -                                                                                     | 90    | -                      | -     |
| Terminal block                 |                                                                                           | -                                       | 37,8   | -                                                                                     | 70    | -                      | -     |
| Surge protection device        |                                                                                           | -                                       | 38,1   | -                                                                                     | 70    | -                      | -     |
| TC led module                  |                                                                                           | -                                       | 47,5   | -                                                                                     | 85    | -                      | -     |
| Supplementary information:     |                                                                                           |                                         |        |  |       |                        |       |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

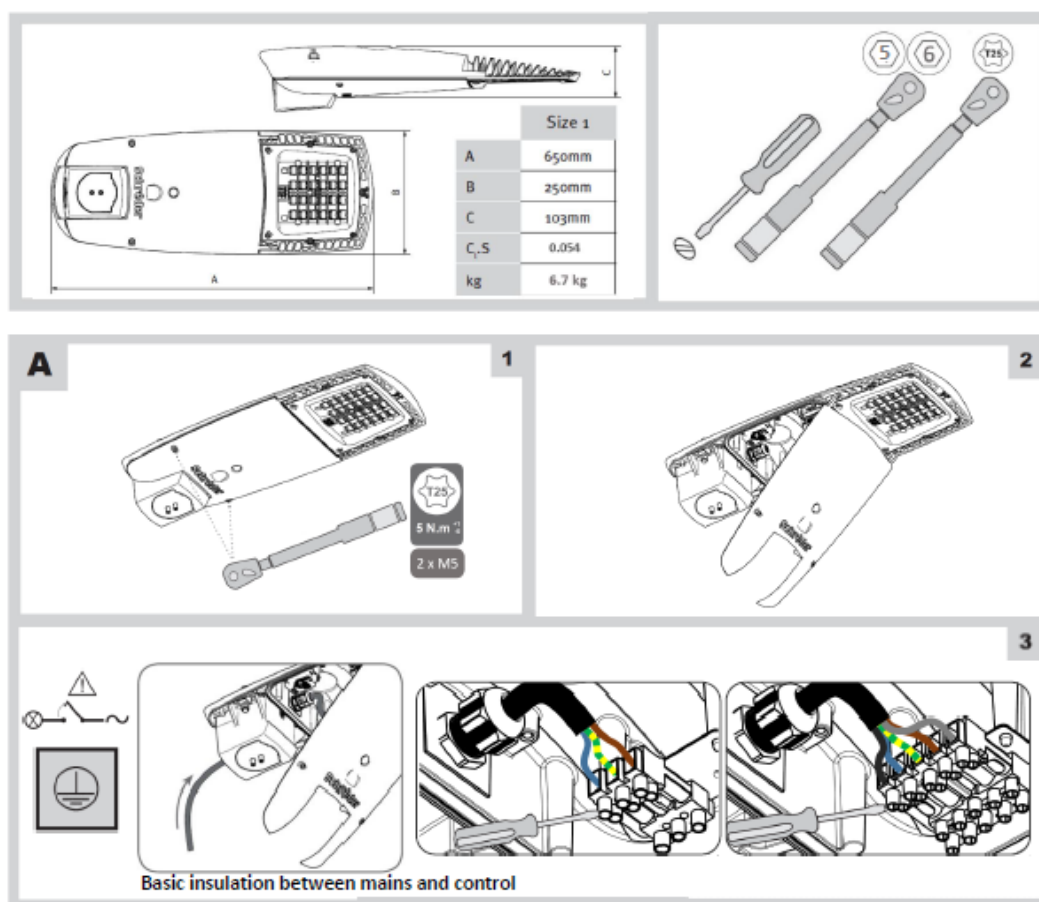
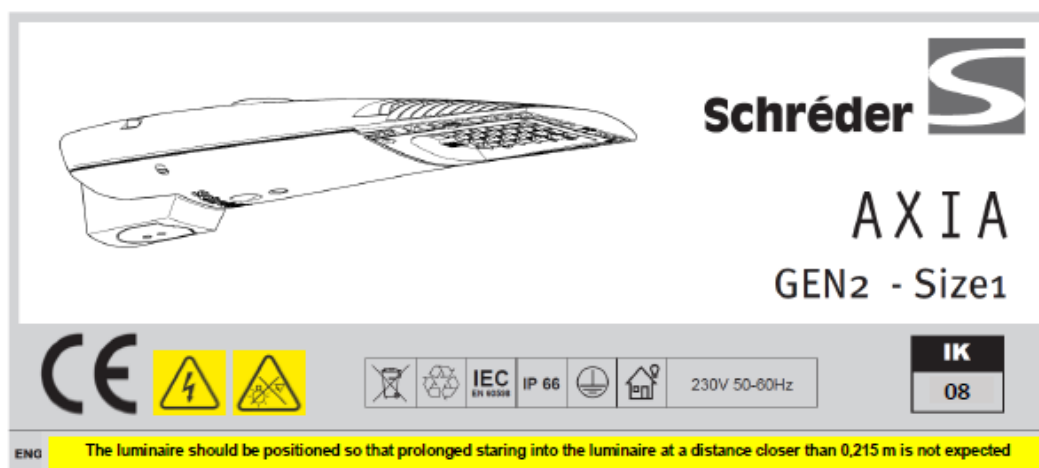
|         |                                         |  |     |
|---------|-----------------------------------------|--|-----|
| ANNEX 3 | Screw terminals (part of the luminaire) |  | N/A |
|---------|-----------------------------------------|--|-----|

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

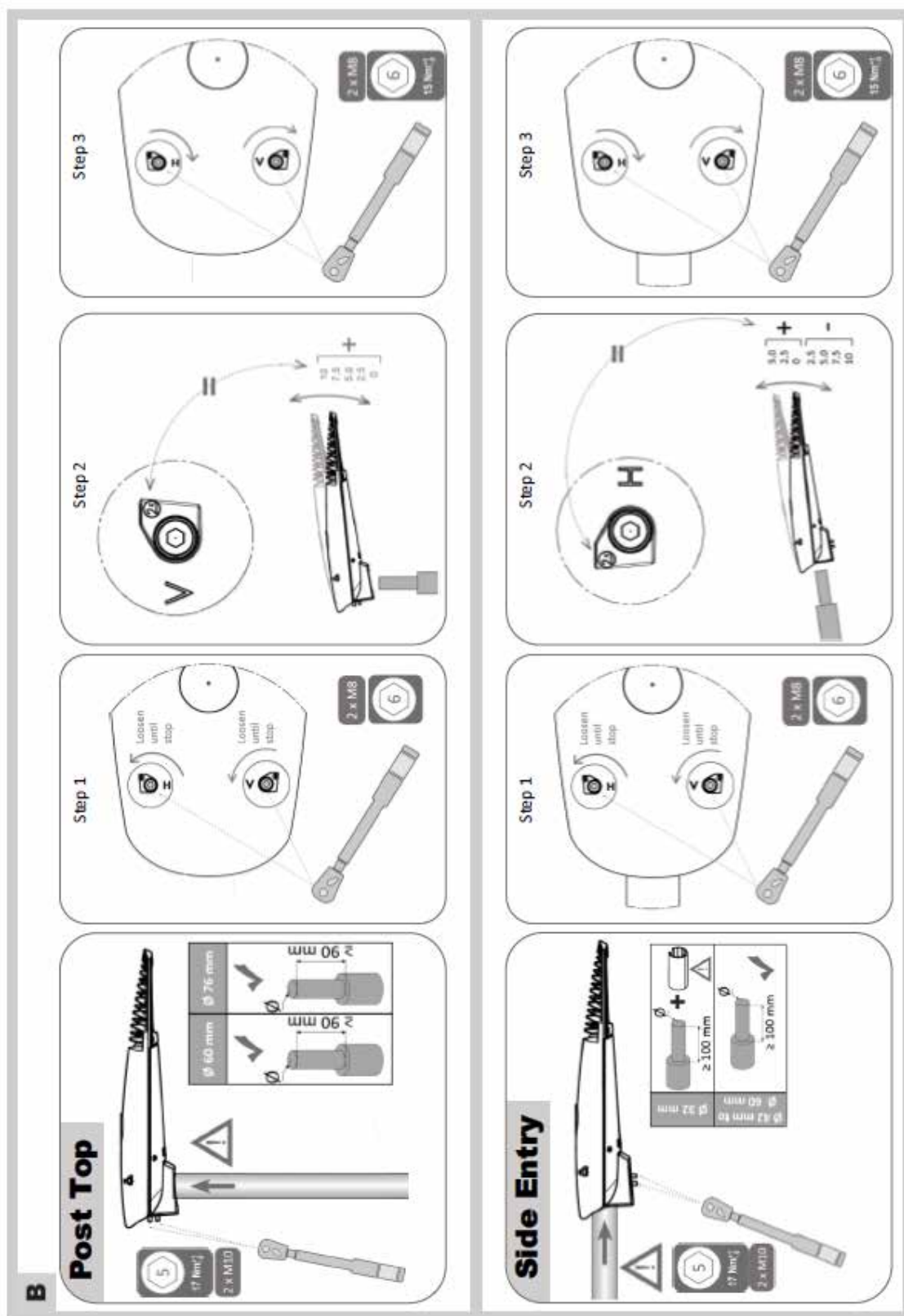


| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

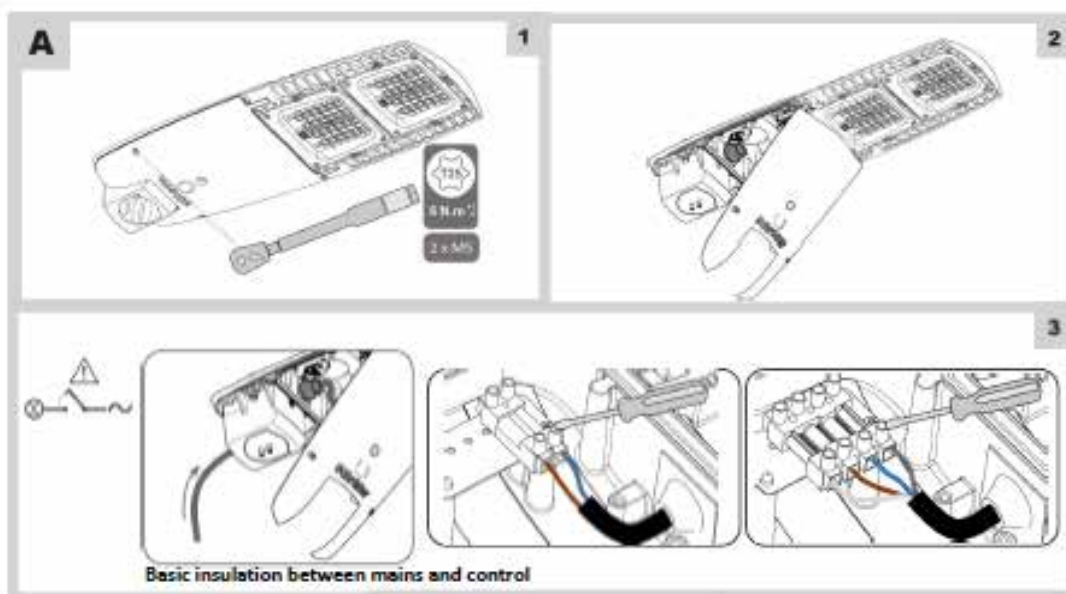
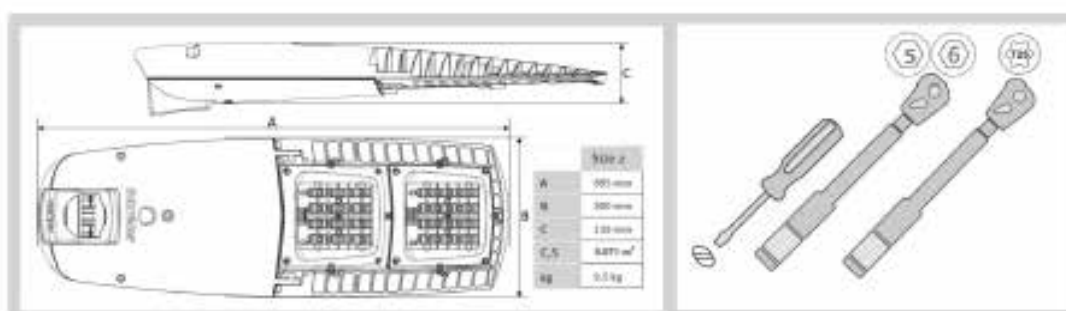
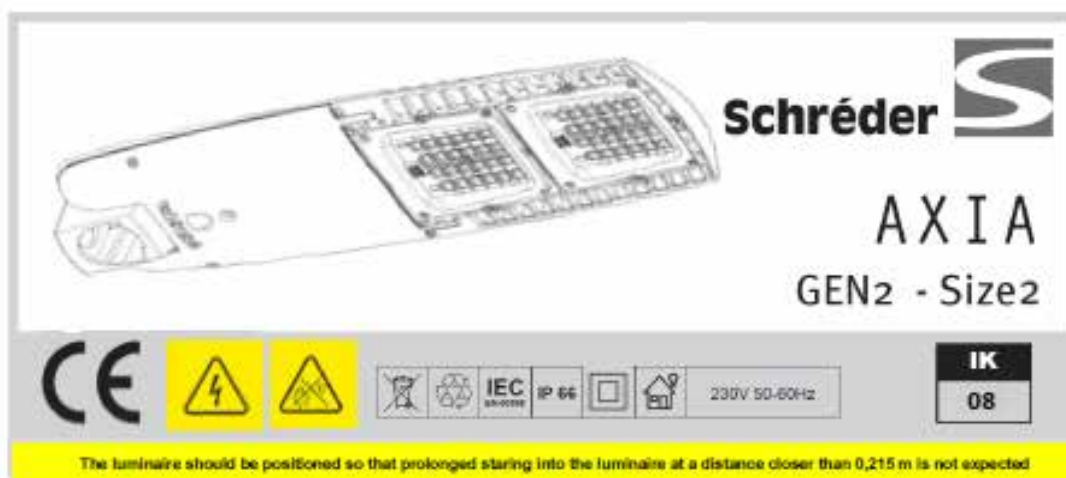
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|-----------------------------------|
| ANNEX 5: additional documentation |
|-----------------------------------|



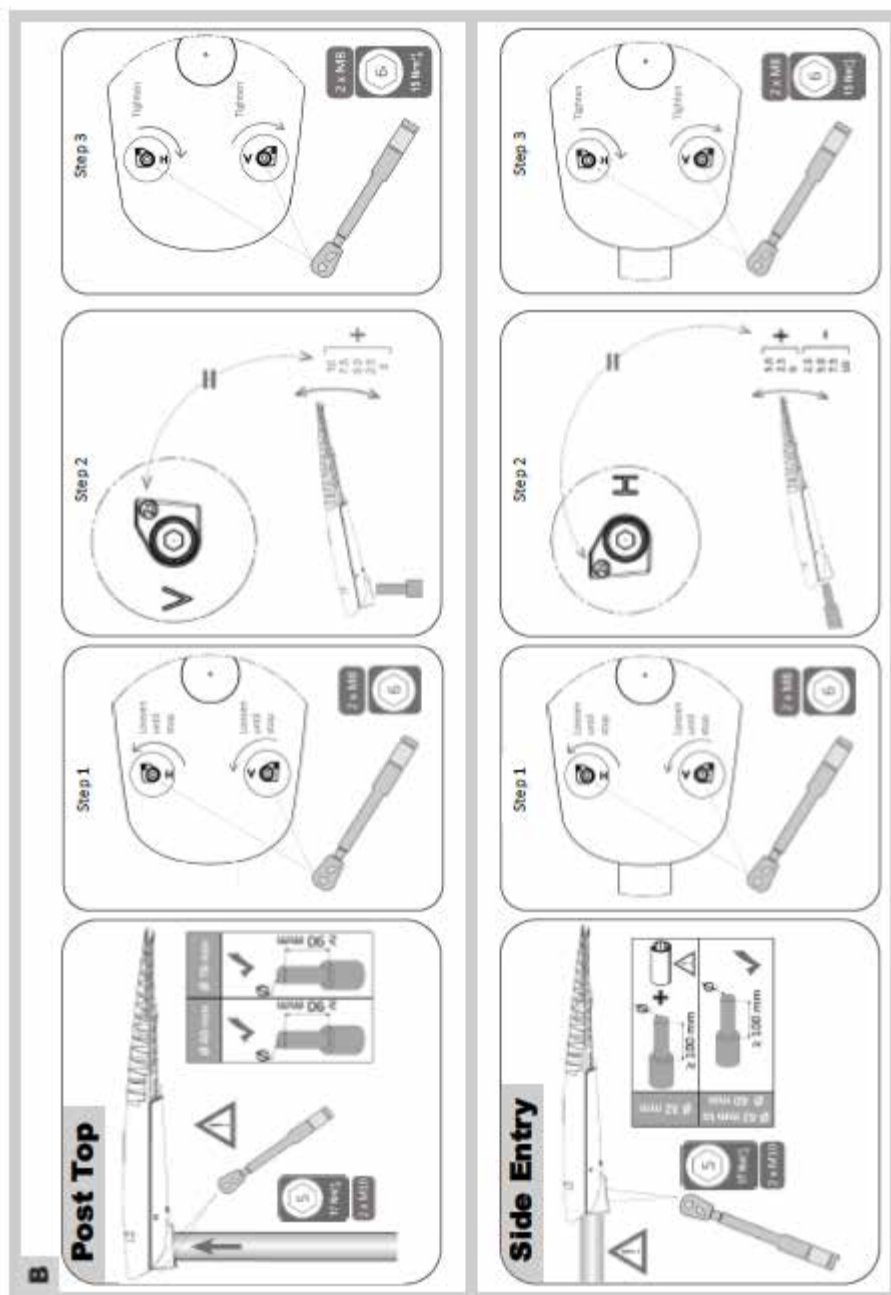
| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

## SYNOPTIC TABLE WITH STRUCTURED DESCRIPTION

## AXIA GEN 2

20145 09 11

[illegible]

## IEC 60598-2-3

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

[illegible]

## IEC 60598-2-3

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

| CONTROLS   |                   |           |                    |        |               | FIXATION |                | OPTIONS |                                    |
|------------|-------------------|-----------|--------------------|--------|---------------|----------|----------------|---------|------------------------------------|
| Controller |                   | Photocell |                    | Sensor |               | Fixation |                | Options |                                    |
| C _        |                   | -         |                    | -      |               | - -      |                | - -     |                                    |
| C0         | No Controller     | 0         | No Photocell       | 0      | No Sensor     | U1       | Universal      | N0      | No Options                         |
| C1         | LuCo-NXP          |           |                    | 1      | PIR Presence  | U2       | Universal 32mm | A0      | Toolless                           |
| C2         | LuCo-ADP          |           |                    |        |               |          |                |         |                                    |
| C3         | LuCo-PD           | C         | Nema Socket 3 pins |        |               |          |                | A6      | Seaside                            |
| C4         | LuCo-P7           | H         | Nema Socket 6 pins |        |               |          |                |         |                                    |
|            |                   | E         | Nema Socket 7 pins |        |               |          |                | AA      | Special labeling                   |
|            |                   |           |                    |        |               |          |                |         |                                    |
|            |                   | G         | Ø20 hole           |        |               |          |                | BP      | supplied pre-cabled post top entry |
|            |                   |           |                    |        |               |          |                | BQ      | supplied pre-cabled lateral entry  |
|            |                   | I         | 20 lux 1:1 IP67    |        |               |          |                |         |                                    |
|            |                   | J         | 35 lux 1:0.5       |        |               |          |                |         |                                    |
|            |                   | K         | 35 lux 1:0.5 IP67  |        |               |          |                |         |                                    |
|            |                   | L         | 55 lux 1:0.5       |        |               |          |                | DXXX    | Dimming profile custom             |
|            |                   | M         | 55 lux 1:0.5 IP67  |        |               |          |                | CXXX    | Cables custom                      |
|            |                   | N         | 70 lux 1:0.5       |        |               |          |                | SXXX    | Control/Sensor position, type, ... |
|            |                   | O         | 70 lux 1:0.5 IP67  |        |               |          |                | TXXX    | Photocell                          |
|            |                   |           |                    |        |               |          |                | UXXX    | Label custom                       |
|            |                   |           |                    |        |               |          |                | FXXX    | Finishing Colour , vernish, ...    |
|            |                   |           |                    |        |               |          |                | OXXX    | Others                             |
| ZZ         | CUSTOM CONTROLLER | Z         | CUSTOM PHOTOCCELL  | Z      | CUSTOM SENSOR |          |                |         |                                    |
|            |                   |           |                    |        |               |          |                |         |                                    |
|            |                   |           |                    |        |               |          |                |         |                                    |

| COLOUR    |                            |
|-----------|----------------------------|
| Colour    |                            |
| -         |                            |
|           |                            |
|           | Standard colours available |
| 0B        | RAL 3004 T                 |
| 0C        | RAL 6005 T                 |
| 0D        | RAL 6009 B                 |
| 0E        | RAL 7016 B                 |
| 0F        | RAL 7035 B                 |
| 0G        | RAL 7040 B                 |
| 0H        | RAL 7040 T                 |
| 0I        | RAL 9005 B                 |
| 0J        | RAL 9006 B                 |
| 0K        | RAL 9011 T                 |
| 0L        | AKZO 150 GS                |
| 0M        | AKZO 200 BS                |
| 0N        | AKZO 900 GS                |
| 0O        | RAL 7038 B                 |
| 0P        | RAL 9003 M                 |
| 0R        | RAL 9022 T                 |
| 0S        | RAL 7001 T                 |
| 0T        | RAL 9006 M                 |
| 0U        | RAL 9005 M                 |
| 0V        | RAL 7040 M                 |
| 0W        | RAL 9006 T                 |
| 0I        | RAL 7037 T                 |
| RALxxxx M | Other Ral color Mat        |
| RALxxxx B | Other Ral color Brilliant  |
| RALxxxx T | Other Ral color Textured   |
| ZZ        | Other specific paint       |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

## Laboratory Service PHYSICAL TEST REPORT



R-Tech  
Rue de Mons 3 - B-4000 Liège - Belgium  
Tel.: +32 4 224 71 40 - Fax: +32 4 224 25 90  
Member of Schröder Group

**Subject:** AXIA-1 Gen 2 / 24 led's @ 890mA

Sample n°: P-E15480

**From:** ESS

**Test purpose:** Photobiological safety tests following IEC-EN 62471 Standard

**Remarks:**

Test request n°: P-D16010

Folder n°: P-F15070

### TEST CONDITIONS:

Operator: Laborelec

**AXIA-1 Gen 2 24 led's @ 890 mA**



### Test program:

Spectral radiance and irradiance measurements of the device under test in the following wavelength ranges:

- 200 to 400 nm : « Actinic UV skin & eye » irradiance
- 315 to 400 nm : « Eye UV-A » irradiance
- 300 to 700 nm : « Blue Light » radiance
- 380 to 1400 nm : « Thermal Retinal » radiance
- 780 to 1400 nm : « Thermal Retinal » radiance (weak visual stimulus)

Determination of the Risk Group classification for each hazard and recommendation about the marking of the product.

**Test and results:** see report LBE04112160 - 1.0 here after

### CONCLUSIONS:



Fitting is risk Group 2 at 200 mm => moderate risk for maintenance users  
1 at 215 mm => no risk for user  
0 at 2,2 m => no risk for user

Duplicate to: MM Ph. Joris, M. Thijs  
LAB 20/01/2016  
L. Maghe

P-16E010

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

**LABORELEC**



LABORATOIRE CENTRAL D'ELECTRICITE (L.C.E.)  
CENTRAAL LABORATORIUM VOOR ELEKTRICITEIT (C.L.E.)  
CENTRAL LABORATORY OF ELECTRICITY (C.L.E.)

Rodestraat, 125 – B-1630 Linkebeek

Photometry and lighting fixtures

#### REPORT OF TEST / MEASUREMENT

|                                   |                                                                                                                            |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Purpose of the test / measurement | Photobiological safety of a Led Luminaire according to IEC 62471<br>Schreder Axia 2.1 24 Leds 890mA 4000K                  |
| Delivered to                      | R-TECH<br>Laurent Maghe<br>rue de Mons 3<br>B-4000 Liège<br><a href="mailto:l.maghe@schreder.com">l.maghe@schreder.com</a> |
| Performed on                      | November 2015                                                                                                              |
| Delivered on                      | 11/04/2016                                                                                                                 |
| CLE task nr.                      | 15_04796_A                                                                                                                 |
| CLE report nr.                    | LBE04112160 - 3.0                                                                                                          |
| Applicant reference nr            | Order N° PO000556                                                                                                          |

\*This document is fully electronically signed

\*Author

Couvreux Guy  
Technical operator  
Tel.: +32 2 382 03 67

E-mail: [guy.couvreux@laborelec.com](mailto:guy.couvreux@laborelec.com)

\*Verifier

Deswert Jean Michel  
Technical expert

\*Approver

Deswert Jean Michel  
Technology Manager

This report concerns type tests on one or a serie of specimens (delivered by the client) or a measurement campaign.  
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| <b>TEST REPORT</b><br><b>IEC 62471</b><br><b>Photobiological safety of lamps and lamp systems</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Report Reference No. ....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LBE04112160 - 3.0                                               |
| Date of issue .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | October 29-30/ 2015                                             |
| Total number of pages .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 18 pages                                                        |
| Testing Laboratory .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Laborelec                                                       |
| Address .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 125 Rue de Rhode – 1630 Linkebeek - BELGIUM                     |
| Applicant's name .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | R-TECH                                                          |
| Address .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Rue de Mons 3<br>B-4000 Liège                                   |
| <b>Test specification:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                 |
| Standard .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | IEC 62471:2006 (First Edition)                                  |
| Test procedure .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Laborelec ISO17025 LCE_LIGHT_511_INS                            |
| Non-standard test method .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A                                                             |
| Test Report Form No. ....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | IEC62471A                                                       |
| TRF Originator .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | VDE Testing and Certification Institute                         |
| Master TRF .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Dated 2009-05                                                   |
| Copyright © 2009 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.<br>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.<br>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.<br><b>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.</b> |                                                                 |
| Test item description .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Schreder Axia 2.1 24 Leds 890mA 4000K                           |
| Trade Mark .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Schreder                                                        |
| Manufacturer .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Schreder                                                        |
| Model/Type reference .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Axia 2.1 24 Leds 890mA 4000K                                    |
| Ratings .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 230 V a.c. ; 50 Hz<br>LED current : 890 mA (manufacturer value) |

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TRF No. IEC60598\_2\_3J



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|                                                         |                                             |
|---------------------------------------------------------|---------------------------------------------|
| Testing procedure and testing location:                 |                                             |
| <input checked="" type="checkbox"/> Testing Laboratory: | Laborelec                                   |
| Testing location/ address .....                         | 125 Rue de Rhode – 1630 Linkebeek - BELGIUM |
| <input type="checkbox"/> Associated CB Laboratory:      |                                             |
| Testing location/ address .....                         |                                             |
| Tested by (name + signature) .....                      | Couvreux Guy                                |
| Approved by (+ signature) .....                         | Deswert Jean Michel                         |
| <input type="checkbox"/> Testing procedure: TMP         |                                             |
| Tested by (name + signature) .....                      |                                             |
| Approved by (+ signature) .....                         |                                             |
| Testing location/ address .....                         |                                             |
| <input type="checkbox"/> Testing procedure: WMT         |                                             |
| Tested by (name + signature) .....                      |                                             |
| Witnessed by (+ signature) .....                        |                                             |
| Approved by (+ signature) .....                         |                                             |
| Testing location/ address .....                         |                                             |
| <input type="checkbox"/> Testing procedure: SMT         |                                             |
| Tested by (name + signature) .....                      |                                             |
| Approved by (+ signature) .....                         |                                             |
| Supervised by (+ signature) .....                       |                                             |
| Testing location/ address .....                         |                                             |
| <input type="checkbox"/> Testing procedure: RMT         |                                             |
| Tested by (name + signature) .....                      |                                             |
| Approved by (+ signature) .....                         |                                             |
| Supervised by (+ signature) .....                       |                                             |
| Testing location/ address .....                         |                                             |



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|                                                                                                                                                                   |                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Summary of testing:</b>                                                                                                                                        |                                                                                  |
| <b>Tests performed (name of test and test clause):</b><br><br>IEC 62471 edition 1 – 2006<br>CIE S 009:2002<br><br>Measurements performed at a distance of 200 mm. | <b>Testing location:</b><br><br>Laborelec<br>Rue de Rhode, 125<br>1630 Linkebeek |
| <b>Summary of compliance with National Differences:</b><br><br>N/A                                                                                                |                                                                                  |
| <b>Copy of marking plate:</b><br><br>                                          |                                                                                  |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test item particulars</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                            |
| Tested lamp .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> continuous wave lamps <input type="checkbox"/> pulsed lamps                                            |
| Tested lamp system .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | LED Luminaire                                                                                                                              |
| Lamp classification group at 200 mm .....                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> exempt <input type="checkbox"/> risk 1 <input checked="" type="checkbox"/> risk 2 <input type="checkbox"/> risk 3 |
| Lamp cap .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A                                                                                                                                        |
| Bulb .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Led                                                                                                                                        |
| Rated of the lamp .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 230,0 V, LED current : 890 mA (measured value)                                                                                             |
| Furthermore marking on the lamp .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                                                                                                                                          |
| Seasoning of lamps according IEC standard .....                                                                                                                                                                                                                                                                                                                                                                                                                                                      | No seasoning before testing                                                                                                                |
| Used measurement instrument .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Bentham DTMc300 Double Monochromator equipped with D7 and TEL309 optics.                                                                   |
| Temperature by measurement .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 25°C ± 1°C                                                                                                                                 |
| Information for safety use .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | N/A                                                                                                                                        |
| <b>Possible test case verdicts:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                            |
| - test case does not apply to the test object .....                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                            |
| - test object does meet the requirement .....                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                            |
| - test object does not meet the requirement .....                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                            |
| <b>Testing:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                            |
| Date of receipt of test item .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 24/09/2015                                                                                                                                 |
| Date (s) of performance of tests .....                                                                                                                                                                                                                                                                                                                                                                                                                                                               | October 2015                                                                                                                               |
| <b>General remarks:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                            |
| The test results presented in this report relate only to the object tested.<br>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.<br>"(See Enclosure #)" refers to additional information appended to the report.<br>"(See appended table)" refers to a table appended to the report.<br>Throughout this report a comma is used as the decimal separator.<br>List of test equipment must be kept on file and available for review. |                                                                                                                                            |
| <b>General product information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                            |
| Led luminaire with LED's                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                            |

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| IEC 62471    |                                                                                                                                                                                                                                                                                                                                    |                 |         |
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| Clause       | Requirement + Test                                                                                                                                                                                                                                                                                                                 | Result - Remark | Verdict |
| <b>4</b>     | <b>EXPOSURE LIMITS</b>                                                                                                                                                                                                                                                                                                             |                 | -       |
| <b>4.1</b>   | <b>General</b>                                                                                                                                                                                                                                                                                                                     |                 | -       |
|              | The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure                                                                                                                                                                          |                 | P       |
|              | Detailed spectral data of a light source are generally required only if the luminance of the source exceeds $10^4 \text{ cd/m}^2$                                                                                                                                                                                                  | see clause 4.3  | P       |
| <b>4.3</b>   | <b>Hazard exposure limits</b>                                                                                                                                                                                                                                                                                                      |                 | -       |
| <b>4.3.1</b> | <b>Actinic UV hazard exposure limit for the skin and eye</b>                                                                                                                                                                                                                                                                       |                 | P       |
|              | The exposure limit for effective radiant exposure is $30 \text{ J/m}^2$ within any 8-hour period                                                                                                                                                                                                                                   |                 | P       |
|              | To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, $E_b$ , of the light source shall not exceed the levels defined by:                                                                                                 |                 | P       |
|              | $E_b \cdot t = \sum_{200}^{400} E_{\lambda}(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta\lambda \cdot \Delta t \leq 30 \quad \text{J} \cdot \text{m}^{-2}$                                                                                                                                                                       |                 | P       |
|              | The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:                                                                                                                                                                                                         |                 | P       |
|              | $t_{\max} = \frac{30}{E_b} \quad \text{s}$                                                                                                                                                                                                                                                                                         |                 | N/A     |
| <b>4.3.2</b> | <b>Near-UV hazard exposure limit for eye</b>                                                                                                                                                                                                                                                                                       |                 | -       |
|              | For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J/m}^2$ for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, $E_{UVA}$ , shall not exceed $10 \text{ W/m}^2$ . |                 | N/A     |
|              | The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:                                                                                                                                                                                      |                 | P       |
|              | $t_{\max} \leq \frac{10\,000}{E_{UVA}} \quad \text{s}$                                                                                                                                                                                                                                                                             |                 | N/A     |
| <b>4.3.3</b> | <b>Retinal blue light hazard exposure limit</b>                                                                                                                                                                                                                                                                                    |                 | -       |
|              | To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$ , i.e., the blue-light weighted radiance, $L_b$ , shall not exceed the levels defined by:                                     |                 | P       |



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

| IEC 62471 |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                          |         |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                                                                                                                             | Result - Remark                                                                                                                                                                          | Verdict |
|           | $L_B \cdot t = \sum_{300}^{700} L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                                | for $t \leq 10^4 \text{ s}$ $t_{\max} = \frac{10^6}{L_B}$<br><br>$L_B = 10345 \text{ Wm}^{-2}\text{sr}^{-1}$ for 11 mrad field of view<br><br>$t_{\max} = 97 \text{ s} (<100 \text{ s})$ | F       |
|           | $L_B = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                                                     | for $t > 10^4 \text{ s}$<br><br>$L_B = 1780 \text{ Wm}^{-2}\text{sr}^{-1}$ for 100 mrad field of view                                                                                    | F       |
| 4.3.4     | Retinal blue light hazard exposure limit - small source                                                                                                                                                                                                                                        |                                                                                                                                                                                          | -       |
|           | Thus the spectral irradiance at the eye $E_{\lambda}$ , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:                                                                                                                                   | see table 4.2                                                                                                                                                                            | N/A     |
|           | $E_B \cdot t = \sum_{300}^{700} E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{J} \cdot \text{m}^{-2}$                                                                                                                                                      | for $t \leq 100 \text{ s}$                                                                                                                                                               | N/A     |
|           | $E_B = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \text{W} \cdot \text{m}^{-2}$                                                                                                                                                                            | for $t > 100 \text{ s}$                                                                                                                                                                  | N/A     |
| 4.3.5     | Retinal thermal hazard exposure limit                                                                                                                                                                                                                                                          |                                                                                                                                                                                          | -       |
|           | To protect against retinal thermal injury, the integrated spectral radiance of the light source, $L_{\lambda}$ , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by: |                                                                                                                                                                                          | P       |
|           | $L_R = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0.25}} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                  | $(10 \mu\text{s} \leq t \leq 10 \text{ s})$<br><br>$L_R = 138482 \text{ Wm}^{-2}\text{sr}^{-1}$                                                                                          | P       |
| 4.3.6     | Retinal thermal hazard exposure limit – weak visual stimulus                                                                                                                                                                                                                                   |                                                                                                                                                                                          | -       |
|           | For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, $L_{IR}$ , as viewed by the eye for exposure times greater than 10 s shall be limited to:                  |                                                                                                                                                                                          | N/A     |
|           | $L_{IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                               | $t > 10 \text{ s}$                                                                                                                                                                       | N/A     |
| 4.3.7     | Infrared radiation hazard exposure limits for the eye                                                                                                                                                                                                                                          |                                                                                                                                                                                          | -       |

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| IEC 62471 |                                                                                                                                                                                                                                                               |                                                                  |         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                                                                                            | Result - Remark                                                  | Verdict |
|           | The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, $E_{IR}$ , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed: |                                                                  | N/A     |
|           | $E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0,75} \quad W \cdot m^{-2} \quad t \leq 1000 \text{ s}$                                                                                                                    |                                                                  | N/A     |
|           | For times greater than 1000 s the limit becomes:                                                                                                                                                                                                              |                                                                  | N/A     |
|           | $E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2} \quad t > 1000 \text{ s}$                                                                                                                                           |                                                                  | N/A     |
| 4.3.8     | Thermal hazard exposure limit for the skin                                                                                                                                                                                                                    |                                                                  | -       |
|           | Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:                                                                                                                                                                    |                                                                  | N/A     |
|           | $E_H = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta\lambda \leq 20\,000 \cdot t^{0,25} \quad J \cdot m^{-2}$                                                                                                                                 |                                                                  | N/A     |
| 5         | MEASUREMENT OF LAMPS AND LAMP SYSTEMS                                                                                                                                                                                                                         |                                                                  | -       |
| 5.1       | Measurement conditions                                                                                                                                                                                                                                        |                                                                  | -       |
|           | Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.                                                                                                                     |                                                                  | P       |
| 5.1.1     | Lamp ageing (seasoning)                                                                                                                                                                                                                                       |                                                                  | -       |
|           | Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.                                                                                                                                                                              | No seasoning is required                                         | N/A     |
| 5.1.2     | Test environment                                                                                                                                                                                                                                              |                                                                  | -       |
|           | For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.                                                                                    | Ambient temperature : $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ | P       |
| 5.1.3     | Extraneous radiation                                                                                                                                                                                                                                          |                                                                  | -       |
|           | Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.                                                                                                             |                                                                  | P       |
| 5.1.4     | Lamp operation                                                                                                                                                                                                                                                |                                                                  | -       |
|           | Operation of the test lamp shall be provided in accordance with:                                                                                                                                                                                              |                                                                  | -       |
|           | – the appropriate IEC lamp standard, or                                                                                                                                                                                                                       | IEC 60598-1                                                      | P       |
|           | – the manufacturer's recommendation                                                                                                                                                                                                                           |                                                                  | N/A     |
| 5.1.5     | Lamp system operation                                                                                                                                                                                                                                         |                                                                  | -       |



| IEC 60598-2-3 |                    |                 |         |
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| Clause        | Requirement + Test | Result - Remark | Verdict |

| IEC 62471 |                                                                                                                                                                                        |                                                                              |         |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                     | Result - Remark                                                              | Verdict |
|           | The power source for operation of the test lamp shall be provided in accordance with:                                                                                                  |                                                                              | -       |
|           | - the appropriate IEC standard, or                                                                                                                                                     |                                                                              | N/A     |
|           | - the manufacturer's recommendation                                                                                                                                                    |                                                                              | P       |
| 5.2       | Measurement procedure                                                                                                                                                                  |                                                                              | -       |
| 5.2.1     | Irradiance measurements                                                                                                                                                                |                                                                              | -       |
|           | Minimum aperture diameter 7mm.                                                                                                                                                         | Aperture diameter : 10 mm                                                    | P       |
|           | Maximum aperture diameter 50 mm.                                                                                                                                                       | Aperture diameter : 10 mm                                                    | P       |
|           | The measurement shall be made in that position of the beam giving the maximum reading.                                                                                                 |                                                                              | P       |
|           | The measurement instrument is adequate calibrated.                                                                                                                                     |                                                                              | P       |
| 5.2.2     | Radiance measurements                                                                                                                                                                  |                                                                              | -       |
| 5.2.2.1   | Standard method                                                                                                                                                                        |                                                                              | -       |
|           | The measurements made with an optical system.                                                                                                                                          |                                                                              | -       |
|           | The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument. | Measurements at 1,7 and 11 mrad are performed with calibrated optical system | P       |
| 5.2.2.2   | Alternative method                                                                                                                                                                     |                                                                              | -       |
|           | Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.            | Measurements at 100 mrad are performed with calibrated optical system        | P       |
| 5.2.3     | Measurement of source size                                                                                                                                                             |                                                                              | -       |
|           | The determination of $\alpha$ , the angle subtended by a source, requires the determination of the 50% emission points of the source.                                                  |                                                                              | P       |
| 5.2.4     | Pulse width measurement for pulsed sources                                                                                                                                             |                                                                              | -       |
|           | The determination of $\Delta t$ , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.                 |                                                                              | N/A     |
| 5.3       | Analysis methods                                                                                                                                                                       |                                                                              | -       |
| 5.3.1     | Weighting curve interpolations                                                                                                                                                         |                                                                              | -       |
|           | To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.                             | see table 4.1                                                                | P       |
| 5.3.2     | Calculations                                                                                                                                                                           |                                                                              | -       |

| IEC 60598-2-3 |                    |                 |         |
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| Clause        | Requirement + Test | Result - Remark | Verdict |

| IEC 62471 |                                                                                                                                                                  |                         |         |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------|
| Clause    | Requirement + Test                                                                                                                                               | Result - Remark         | Verdict |
|           | The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy. |                         | P       |
| 5.3.3     | Measurement uncertainty                                                                                                                                          |                         | -       |
|           | The quality of all measurement results must be quantified by an analysis of the uncertainty.                                                                     | see Annex C in the norm | P       |

|       |                                                                                                                                                                                                                               |                                                                                                                                                       |     |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 6     | LAMP CLASSIFICATION                                                                                                                                                                                                           |                                                                                                                                                       | -   |
|       | For the purposes of this standard it was decided that the values shall be reported as follows:                                                                                                                                | see table 6.1                                                                                                                                         | -   |
|       | – for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm | The IEC 60598-1 ed8 requires the measurement at 200mm and the determination of the distance between luminaire and the borderline between RG2 and RG1. | P   |
|       | – for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm                                                                                                     |                                                                                                                                                       | N/A |
| 6.1   | Continuous wave lamps                                                                                                                                                                                                         |                                                                                                                                                       | -   |
| 6.1.1 | Exempt Group                                                                                                                                                                                                                  |                                                                                                                                                       | -   |
|       | In the exempt group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:                                                                                         |                                                                                                                                                       | -   |
|       | – an actinic ultraviolet hazard ( $E_s$ ) within 8-hours exposure (30000 s), nor                                                                                                                                              |                                                                                                                                                       | N/A |
|       | – a near-UV hazard ( $E_{UVA}$ ) within 1000 s, (about 16 min), nor                                                                                                                                                           |                                                                                                                                                       | N/A |
|       | – a retinal blue-light hazard ( $L_B$ ) within 10000 s (about 2,8 h), nor                                                                                                                                                     | The luminaire is classified in RG2 for blue-light hazard at 200mm                                                                                     | F   |
|       | – a retinal thermal hazard ( $L_R$ ) within 10 s, nor                                                                                                                                                                         | The Luminaire is classified in RG0 for retinal thermal hazard at 200mm                                                                                | P   |
|       | – an infrared radiation hazard for the eye ( $E_{IR}$ ) within 1000 s                                                                                                                                                         |                                                                                                                                                       | N/A |
| 6.1.2 | Risk Group 1 (Low-Risk)                                                                                                                                                                                                       |                                                                                                                                                       | -   |
|       | In this group are lamps, which exceeds the limits for the exempt group but that does not pose:                                                                                                                                |                                                                                                                                                       | -   |
|       | – an actinic ultraviolet hazard ( $E_s$ ) within 10000 s, nor                                                                                                                                                                 |                                                                                                                                                       | N/A |
|       | – a near ultraviolet hazard ( $E_{UVA}$ ) within 300 s, nor                                                                                                                                                                   |                                                                                                                                                       | N/A |

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

| IEC 62471 |                                                                                                                                                                    |                                                                        |         |
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| Clause    | Requirement + Test                                                                                                                                                 | Result - Remark                                                        | Verdict |
|           | – a retinal blue-light hazard ( $L_B$ ) within 100 s, nor                                                                                                          | The luminaire is classified in RG2 for blue-light hazard at 200mm      | F       |
|           | – a retinal thermal hazard ( $L_R$ ) within 10 s, nor                                                                                                              | The Luminaire is classified in RG0 for retinal thermal hazard at 200mm | N/A     |
|           | – an infrared radiation hazard for the eye ( $E_{IR}$ ) within 100 s                                                                                               |                                                                        | N/A     |
|           | Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard ( $L_{IR}$ ), within 100 s are in Risk Group 1. |                                                                        | N/A     |
| 6.1.3     | Risk Group 2 (Moderate-Risk)                                                                                                                                       |                                                                        | -       |
|           | This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:                                                              |                                                                        | -       |
|           | – an actinic ultraviolet hazard ( $E_S$ ) within 1000 s exposure, nor                                                                                              |                                                                        | N/A     |
|           | – a near ultraviolet hazard ( $E_{UVA}$ ) within 100 s, nor                                                                                                        |                                                                        | N/A     |
|           | – a retinal blue-light hazard ( $L_B$ ) within 0,25 s (aversion response), nor                                                                                     |                                                                        | N/A     |
|           | – a retinal thermal hazard ( $L_R$ ) within 0,25 s (aversion response), nor                                                                                        | The luminaire is classified in RG2 for blue-light hazard at 200mm      | P       |
|           | – an infrared radiation hazard for the eye ( $E_{IR}$ ) within 10 s                                                                                                | The Luminaire is classified in RG0 for retinal thermal hazard at 200mm | N/A     |
|           | Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard ( $L_{IR}$ ), within 10 s are in Risk Group 2.  |                                                                        | N/A     |
| 6.1.4     | Risk Group 3 (High-Risk)                                                                                                                                           |                                                                        | -       |
|           | Lamps which exceed the limits for Risk Group 2 are in Group 3.                                                                                                     |                                                                        | N/A     |
| 6.2       | Pulsed lamps                                                                                                                                                       |                                                                        | -       |
|           | Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.                                                                        |                                                                        | N/A     |
|           | A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.                                                           |                                                                        | N/A     |
|           | The risk group determination of the lamp being tested shall be made as follows:                                                                                    |                                                                        | N/A     |
|           | – a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)                                                              |                                                                        | N/A     |

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| IEC 62471 |                                                                                                                                                                                                                                                          |                 |         |
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| Clause    | Requirement + Test                                                                                                                                                                                                                                       | Result – Remark | Verdict |
|           | – for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group                                                                                         |                 | N/A     |
|           | – for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission |                 | N/A     |
|           |                                                                                                                                                                                                                                                          |                 |         |

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

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

| Table 4.1 Spectral weighting function for assessing ultraviolet hazards for skin and eye |                                      |                              |                                      |
|------------------------------------------------------------------------------------------|--------------------------------------|------------------------------|--------------------------------------|
| Wavelength <sup>1</sup><br>$\lambda$ , nm                                                | UV hazard function<br>$S_w(\lambda)$ | Wavelength<br>$\lambda$ , nm | UV hazard function<br>$S_w(\lambda)$ |
| 200                                                                                      | 0,030                                | 313*                         | 0,006                                |
| 205                                                                                      | 0,051                                | 315                          | 0,003                                |
| 210                                                                                      | 0,075                                | 316                          | 0,0024                               |
| 215                                                                                      | 0,095                                | 317                          | 0,0020                               |
| 220                                                                                      | 0,120                                | 318                          | 0,0016                               |
| 225                                                                                      | 0,150                                | 319                          | 0,0012                               |
| 230                                                                                      | 0,190                                | 320                          | 0,0010                               |
| 235                                                                                      | 0,240                                | 322                          | 0,00067                              |
| 240                                                                                      | 0,300                                | 323                          | 0,00054                              |
| 245                                                                                      | 0,360                                | 325                          | 0,00050                              |
| 250                                                                                      | 0,430                                | 328                          | 0,00044                              |
| 254*                                                                                     | 0,500                                | 330                          | 0,00041                              |
| 255                                                                                      | 0,520                                | 333*                         | 0,00037                              |
| 260                                                                                      | 0,650                                | 335                          | 0,00034                              |
| 265                                                                                      | 0,810                                | 340                          | 0,00028                              |
| 270                                                                                      | 1,000                                | 345                          | 0,00024                              |
| 275                                                                                      | 0,960                                | 350                          | 0,00020                              |
| 280*                                                                                     | 0,880                                | 355                          | 0,00016                              |
| 285                                                                                      | 0,770                                | 360                          | 0,00013                              |
| 290                                                                                      | 0,640                                | 365*                         | 0,00011                              |
| 295                                                                                      | 0,540                                | 370                          | 0,000093                             |
| 297*                                                                                     | 0,460                                | 375                          | 0,000077                             |
| 300                                                                                      | 0,300                                | 380                          | 0,000064                             |
| 303*                                                                                     | 0,120                                | 385                          | 0,000053                             |
| 305                                                                                      | 0,060                                | 390                          | 0,000044                             |
| 308                                                                                      | 0,026                                | 395                          | 0,000036                             |
| 310                                                                                      | 0,015                                | 400                          | 0,000030                             |

<sup>1</sup> Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.  
 \* Emission lines of a mercury discharge spectrum.

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

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| Table 4.2 Spectral weighting functions for assessing retinal hazards from broadband optical sources |                                  |                                      |  |
|-----------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------|--|
| Wavelength nm                                                                                       | Blue-light hazard function B (λ) | Burn hazard function R (λ)           |  |
| 300                                                                                                 | 0,01                             |                                      |  |
| 305                                                                                                 | 0,01                             |                                      |  |
| 310                                                                                                 | 0,01                             |                                      |  |
| 315                                                                                                 | 0,01                             |                                      |  |
| 320                                                                                                 | 0,01                             |                                      |  |
| 325                                                                                                 | 0,01                             |                                      |  |
| 330                                                                                                 | 0,01                             |                                      |  |
| 335                                                                                                 | 0,01                             |                                      |  |
| 340                                                                                                 | 0,01                             |                                      |  |
| 345                                                                                                 | 0,01                             |                                      |  |
| 350                                                                                                 | 0,01                             |                                      |  |
| 355                                                                                                 | 0,01                             |                                      |  |
| 360                                                                                                 | 0,01                             |                                      |  |
| 365                                                                                                 | 0,01                             |                                      |  |
| 370                                                                                                 | 0,01                             |                                      |  |
| 375                                                                                                 | 0,01                             |                                      |  |
| 380                                                                                                 | 0,01                             | 0,1                                  |  |
| 385                                                                                                 | 0,013                            | 0,13                                 |  |
| 390                                                                                                 | 0,025                            | 0,25                                 |  |
| 395                                                                                                 | 0,05                             | 0,5                                  |  |
| 400                                                                                                 | 0,10                             | 1,0                                  |  |
| 405                                                                                                 | 0,20                             | 2,0                                  |  |
| 410                                                                                                 | 0,40                             | 4,0                                  |  |
| 415                                                                                                 | 0,80                             | 8,0                                  |  |
| 420                                                                                                 | 0,90                             | 9,0                                  |  |
| 425                                                                                                 | 0,95                             | 9,5                                  |  |
| 430                                                                                                 | 0,98                             | 9,8                                  |  |
| 435                                                                                                 | 1,00                             | 10,0                                 |  |
| 440                                                                                                 | 1,00                             | 10,0                                 |  |
| 445                                                                                                 | 0,97                             | 9,7                                  |  |
| 450                                                                                                 | 0,94                             | 9,4                                  |  |
| 455                                                                                                 | 0,90                             | 9,0                                  |  |
| 460                                                                                                 | 0,80                             | 8,0                                  |  |
| 465                                                                                                 | 0,70                             | 7,0                                  |  |
| 470                                                                                                 | 0,62                             | 6,2                                  |  |
| 475                                                                                                 | 0,55                             | 5,5                                  |  |
| 480                                                                                                 | 0,45                             | 4,5                                  |  |
| 485                                                                                                 | 0,40                             | 4,0                                  |  |
| 490                                                                                                 | 0,22                             | 2,2                                  |  |
| 495                                                                                                 | 0,16                             | 1,6                                  |  |
| 500-600                                                                                             | $10^{[(450-\lambda)/50]}$        | 1,0                                  |  |
| 600-700                                                                                             | 0,001                            | 1,0                                  |  |
| 700-1050                                                                                            |                                  | $10^{[(700-\lambda)/50]}$            |  |
| 1050-1150                                                                                           |                                  | 0,2                                  |  |
| 1150-1200                                                                                           |                                  | $0,2 \cdot 10^{[(1150-\lambda)/50]}$ |  |
| 1200-1400                                                                                           |                                  | 0,02                                 |  |

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| Table 5.4 Summary of the ELs for the surface of the skin or cornea (irradiance based values) |                                                             |                     |                       |                             |                                                     |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------|-----------------------|-----------------------------|-----------------------------------------------------|
| Hazard Name                                                                                  | Relevant equation                                           | Wavelength range nm | Exposure duration sec | Limiting aperture rad (deg) | EL in terms of constant irradiance $W \cdot m^{-2}$ |
| Actinic UV skin & eye                                                                        | $E_S = \sum E_\lambda \cdot S(\lambda) \cdot \Delta\lambda$ | 200 – 400           | < 30000               | 1,4 (80)                    | 30/t                                                |
| Eye UV-A                                                                                     | $E_{UV-A} = \sum E_\lambda \cdot \Delta\lambda$             | 315 – 400           | $\leq 1000$<br>> 1000 | 1,4 (80)                    | 10000/t<br>10                                       |
| Blue-light small source                                                                      | $E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$ | 300 – 700           | $\leq 100$<br>> 100   | < 0,011                     | 100/t<br>1,0                                        |
| Eye IR                                                                                       | $E_{IR} = \sum E_\lambda \cdot \Delta\lambda$               | 780 – 3000          | $\leq 1000$<br>> 1000 | 1,4 (80)                    | 18000/t <sup>0,75</sup><br>100                      |
| Skin thermal                                                                                 | $E_H = \sum E_\lambda \cdot \Delta\lambda$                  | 380 – 3000          | < 10                  | 2π sr                       | 20000/t <sup>0,75</sup>                             |

| Table 5.5 Summary of the ELs for the retina (radiance based values) |                                                                |                     |                                                  |                                                                        |                                                                    |
|---------------------------------------------------------------------|----------------------------------------------------------------|---------------------|--------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------|
| Hazard Name                                                         | Relevant equation                                              | Wavelength range nm | Exposure duration sec                            | Field of view radians                                                  | EL in terms of constant radiance $W \cdot m^{-2} \cdot sr^{-1}$    |
| Blue light                                                          | $L_B = \sum L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$    | 300 – 700           | 0,25 – 10<br>10-100<br>100-10000<br>$\geq 10000$ | $0,011 \cdot \sqrt{(t/10)}$<br>0,011<br>$0,0011 \cdot \sqrt{t}$<br>0,1 | $10^5/t$<br>$10^5/t$<br>$10^5/t$<br>100                            |
| Retinal thermal                                                     | $L_R = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$    | 380 – 1400          | < 0,25<br>0,25 – 10                              | 0,0017<br>$0,011 \cdot \sqrt{(t/10)}$                                  | $50000/(\alpha \cdot t^{0,25})$<br>$50000/(\alpha \cdot t^{0,25})$ |
| Retinal thermal (weak visual stimulus)                              | $L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$ | 780 – 1400          | > 10                                             | 0,011                                                                  | 6000/α                                                             |



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| Table 6.1 Emission limits for risk groups of continuous wave lamps                                            |                   |           |                                |                          |        |                 |        |                 | P      |
|---------------------------------------------------------------------------------------------------------------|-------------------|-----------|--------------------------------|--------------------------|--------|-----------------|--------|-----------------|--------|
| Risk                                                                                                          | Action spectrum   | Symbol    | Units                          | Emission Measurement     |        |                 |        |                 |        |
|                                                                                                               |                   |           |                                | Exempt                   |        | Low risk        |        | Mod risk        |        |
|                                                                                                               |                   |           |                                | Limit                    | Result | Limit           | Result | Limit           | Result |
| Actinic UV                                                                                                    | $S_{UV}(\lambda)$ | $E_s$     | $W \cdot m^{-2}$               | 0,001                    | -      | 0,003           | -      | 0,03            | -      |
| Near UV                                                                                                       |                   | $E_{UVA}$ | $W \cdot m^{-2}$               | 10                       | -      | 33              | -      | 100             | -      |
| Blue light                                                                                                    | $B(\lambda)$      | $L_B$     | $W \cdot m^{-2} \cdot sr^{-1}$ | 100                      | 1780   | 10000           | 10345  | 4000000         | 10306  |
| Blue light, small source                                                                                      | $B(\lambda)$      | $E_0$     | $W \cdot m^{-2}$               | 1,0*                     | -      | 1,0             | -      | 400             | -      |
| Retinal thermal                                                                                               | $R(\lambda)$      | $L_R$     | $W \cdot m^{-2} \cdot sr^{-1}$ | 28000/ $\alpha$ = 281171 | 138482 | 28000/ $\alpha$ | -      | 71000/ $\alpha$ | -      |
| Retinal thermal, weak visual stimulus**                                                                       | $R(\lambda)$      | $L_{IR}$  | $W \cdot m^{-2} \cdot sr^{-1}$ | 6000/ $\alpha$           | -      | 6000/ $\alpha$  | -      | 6000/ $\alpha$  | -      |
| IR radiation, eye                                                                                             |                   | $E_R$     | $W \cdot m^{-2}$               | 100                      | -      | 570             | -      | 3200            | -      |
| * Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian. |                   |           |                                |                          |        |                 |        |                 |        |
| ** Involves evaluation of non-GLS source                                                                      |                   |           |                                |                          |        |                 |        |                 |        |

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LABORATOIRE CENTRAL D'ELECTRICITE (L.C.E.)  
CENTRAAL LABORATORIUM VOOR ELEKTRICITEIT (C.L.E.)  
CENTRAL LABORATORY OF ELECTRICITY (C.L.E.)

Measurement report

CLE Report nr LBE04112160 - 3.0

#### Furthermore remarks:

According to IEC 60598-1 Ed.8, for fixed luminaires having a Blue Light Risk Group higher than RG1 at 200 mm, an additional assessment shall be made to find the distance  $x$  between the luminaire and the borderline between RG2 and RG1. According to the measurements, this distance  $x$  (distance at which the Blue Light Risk Group goes from RG2 to RG1) is 215 mm.

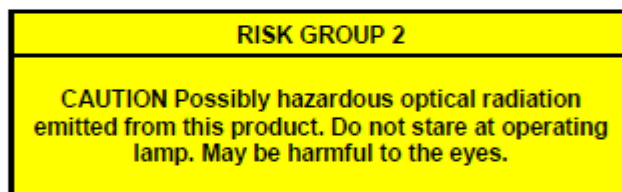
#### Conclusion:

At a distance of 200mm, the tested luminaire (Schröder Axia 24 Leds 890mA 4000K) is classified as follow:

| Hazard Name              | Risk Group              |
|--------------------------|-------------------------|
| Radiance Blue Light      | Risk Group 2 (Moderate) |
| Radiance Retinal Thermal | Risk Group 0 (Exempt)   |

According to IEC 62471-2 and IEC 60598-1 Ed.8, the following marking is required:

- The following label should be permanently fixed on the housing, legible, and clearly visible during maintenance and service. They should be positioned so that they can be read without the necessity for human exposure to optical radiation in excess of the applicable ELVs. Text and borders should be black on a yellow background. The label size should be adapted to the size of the product. Reproductions of all required labels should be included in the user manual



- The following marking has to be visible when replacing lamps or other replaceable components on the outside of the luminaire (except the mounting side) or behind a cover which is removed during lamp or other component replacement and with the lamp removed. The marking shall be visible after installation with the luminaire assembled and installed as for normal use and with the lamp in place.



- the manufacturer's instructions provided with the luminaire shall give the following text: "The luminaire should be positioned so that prolonged staring into the luminaire at a distance closer than 0,215 m is not expected".
- According to the measurements, the distance  $x$  (distance at which the Blue Light Risk Group goes from RG1 to RG0) is 2200 mm (2,2 m).

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

Measurement report

LABORATOIRE CENTRAL D'ELECTRICITE (L.C.E.)  
CENTRAAL LABORATORIUM VOOR ELEKTRICITEIT (C.L.E.)  
CENTRAL LABORATORY OF ELECTRICITY (C.L.E.)

CLE Report nr LBE04112160 - 3.0

#### Pictures of the device under test:

Overview of luminaire



Overview of lenses



Overview of auxiliary



End of the report

Restricted

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|                                    |  |  |  |
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| ANNEX 6: Photographs of the sample |  |  |  |
|------------------------------------|--|--|--|

Axia Gen 2 – size 1



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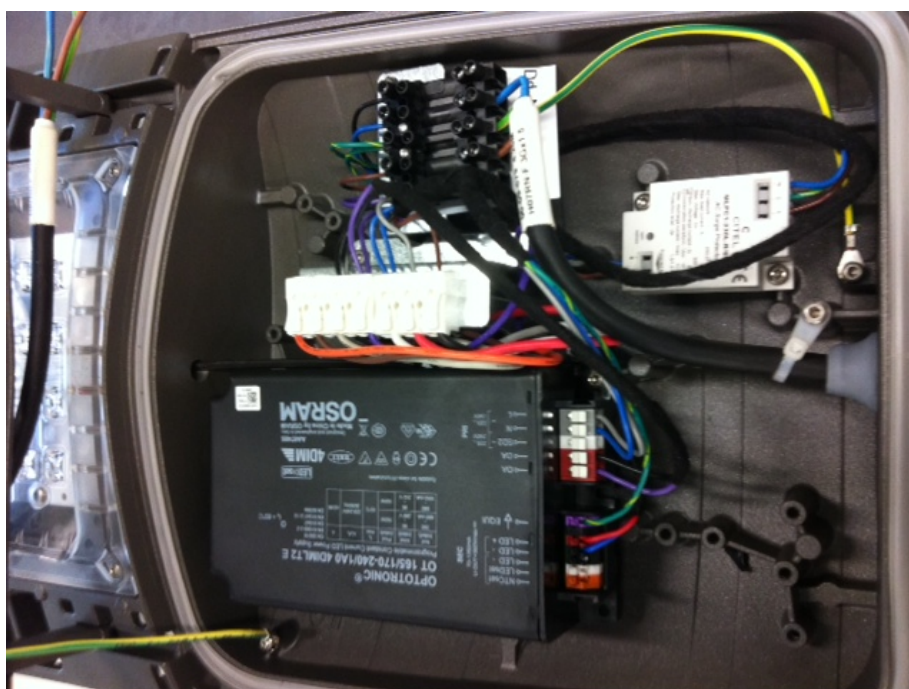
| Clause | Requirement + Test | Result - Remark | Verdict |
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| Clause | Requirement + Test | Result - Remark | Verdict |
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Axia Gen 2 – size 2



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|                                                                                                                                                                                                                                                   |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| <p align="center"><b>ATTACHMENT TO TEST REPORT IEC 60598-2-3</b><br/> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b><br/> LUMINAIRES<br/> PART 2: PARTICULAR REQUIREMENTS<br/> SECTION 3: LUMINAIRES FOR ROAD AND STREET LIGHTING</p> |  |  |  |
| <b>Differences according to</b> .....: EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2014                                                                                                                                       |  |  |  |
| <b>Annex Form No.</b> .....: EU_GD_IEC60598_2_3J                                                                                                                                                                                                  |  |  |  |
| <b>Annex Form Originator</b> .....: OVE                                                                                                                                                                                                           |  |  |  |
| <b>Master Annex Form</b> .....: 2014-12                                                                                                                                                                                                           |  |  |  |
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|  |                                          |   |
|--|------------------------------------------|---|
|  | <b>CENELEC COMMON MODIFICATIONS (EN)</b> | - |
|--|------------------------------------------|---|

|                |                                                                                     |     |
|----------------|-------------------------------------------------------------------------------------|-----|
| <b>3.5 (3)</b> | <b>MARKING</b>                                                                      | -   |
| 3.5 (3.3.101)  | For luminaires not supplied with terminal block:<br>Adequate warning on the package | N/A |

|                |                                    |     |
|----------------|------------------------------------|-----|
| <b>3.6 (4)</b> | <b>CONSTRUCTION</b>                | -   |
| 3.6 (4.11.6)   | Electro-mechanical contact systems | N/A |

|                 |                                                                          |     |
|-----------------|--------------------------------------------------------------------------|-----|
| <b>3.10 (5)</b> | <b>EXTERNAL AND INTERNAL WIRING</b>                                      | -   |
| 3.10 (5.2.1)    | Connecting leads                                                         | P   |
|                 | - without a means for connection to the supply                           | N/A |
|                 | - terminal block specified                                               | P   |
|                 | - relevant information provided                                          | P   |
|                 | - compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1 | P   |
| 3.10 (5.2.2)    | Cables equal to EN 50525                                                 | P   |
|                 | Replace table 5.1 – Supply cord                                          | P   |

|                  |                                                                                                    |   |
|------------------|----------------------------------------------------------------------------------------------------|---|
| <b>3.12 (12)</b> | <b>ENDURANCE TESTS AND THERMAL TESTS</b>                                                           | - |
| 3.12 (12.4.2c)   | Thermal test (normal operation)<br>see footnote c to table 12.2 relating to unsleeved fixed wiring | P |



| IEC 60598-2-3 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

|           |                                                         |  |     |
|-----------|---------------------------------------------------------|--|-----|
| <b>ZB</b> | <b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>       |  | -   |
| (3.3)     | DK: power supply cords of class I luminaires with label |  | N/A |
| (4.5.1)   | DK: socket-outlets                                      |  | N/A |
| (5.2.1)   | CY, DK, FI, SE, GB: type of plug                        |  | N/A |

|           |                                                                  |  |     |
|-----------|------------------------------------------------------------------|--|-----|
| <b>ZC</b> | <b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>                        |  | -   |
| (4 & 5)   | FR: Shuttered socket-outlets 10/16A                              |  | N/A |
|           | GB: Requirements according to United Kingdom Building Regulation |  | N/A |

