SIGURANȚĂ

STARE DE BINE

DEZVOLTARE DURABILĂ

ECONOMII

SOLUȚII

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Schréder

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MINISTERIO
DE INDUSTRIA, ENERGIA
Y TURISMO

L.C.O.E.

LABORATORIO CENTRAL OFICIAL
DE ELECTROTECNIA

FUNDACIÓN PARA EL FOMENTO
DE LA INNOVACIÓN INDUSTRIAL

ENAC
ENSAYOS
Nº 3/LE/130

INFORME DE ENSAYOS
TEST REPORT

Ensayo Nº/*Test Report Nº*: 2016050306B1-M1

Solicitante/ *Applicant's name*:	SCHREDER Group		
Domicilio/ *Address*:	Rue de Lusambo 71 - 1190 Brussels (Belgium)		
Aparato/ *Test item description*:	Luminaires for road and street lighting	Fecha recepción *Date of receipt of test item*:	17/02/2016 **(M1 – 19/07/2016)**
Marca/ *Trade mark*:	Schréder	Fecha de ensayo *Date(s) of performance of test*:	23/02/2016 to 30/05/2016 **(M1-20/07/2016 to 13/09/2016)**
Modelo/ *Model*:	Axia GEN2 Size 1 and Size 2 series – Class I	Nº total de págs./ *Total pags. Number*:	1 + 1 + 68
Tipo, Nº de Ref./ *Type reference*:	---		
Normas aplicadas/ 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		

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 Javier Carrasco Santos
Nombre de reconocimiento (DN): c=ES, cn=Alberto Javier Carrasco Santos, email=acarrasco@lcoe.etsii.upm.es, serialNumber=02239228V, sn=Carrasco Santos, givenName=Alberto Javier, 1.3.6.1.4.1.17326.30.3=GB0455231, ou=FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL, ou=LCOE BAJA TENSION, title=ANALISTA, 2.5.4.13=Qualified Certificate: CAM-PF-SW-KPSC
Motivo: Ensayado
Fecha: 2016.09.26 12:32:48 +02'00'

ALBERTO J. CARRASCO SANTOS

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, S.L.U.

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.etsii.upm.es, serialNumber=08029499S, sn=Sánchez Pando, givenName=Jesús, 1.3.6.1.4.1.17326.30.3=GB0455231, ou=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
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.

TEST REPORT SUMMARY

Report Reference No.....:	**2016050306B1-M1**
Date of issue.....:	26/09/2016
Tested by (name + signature) .....:	ALBERTO J. CARRASCO SANTOS
Witnessed by (name + signature) ....:	
Approved by (name + signature).....:	JESUS SANCHEZ PANDO
Supervised by (name + signature) ...:	
Testing Laboratory.....:	LABORATORIO CENTRAL OFICIAL DE ELECTROTÉCNIA
Address .....:	C/ Eric Kandel, 1 · TECNOGETAFE · 28906 Getafe-Madrid (SPAIN)
Testing procedure .....:	☒ ENEC/CCA-TL ☐ IECEE/CBTL ☐ TMP ☐ WMT ☐ SMT
Testing location.....:	--
Address .....:	--
Applicant .....:	SCHREDER Group
Address .....:	Rue de Lusambo 71 - 1190 Brussels (Belgium)
Manufacturer.....:	SCHREDER Group
Address .....:	Rue de Lusambo 71 - 1190 Brussels (Belgium)
Product.....:	LUMINAIRES FOR ROAD AND STREET LIGHTING
Model/Type reference.....:	Axia GEN2 Size 1 and Size 2 series – Class I
Trademark.....:	Schréder
Ratings .....:	230 V; 50 Hz; max 24 led – 66 W(size 1) – max 48 led – 137 W (size 2); IP66; IK08; Ta 50 ºC (size 1) and 30 ºC (size 2); Class I
Certification Scheme .....:	☒ ENEC ☐ CCA ☐ Other: _____
Standard(s).....:	EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015

☐ 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.

☒ The text of the a.m. European Standard was approved by CENELEC with agreed common modifications and is not identical with the corresponding IEC Publication.

This EN test report consists of the following parts:

☒ **IEC TRF No. IEC60598_2_3J.....:**	Report Reference No ..... :	**2016050306B1-M1**
☒ **EN Common modifications SNCs and A-deviations** .....:	Report Reference No……:	**2016050306B1-M1**

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

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

General disclaimer:

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

Test item description ..... :	**Luminaires for road and street lighting**
Trade Mark ..... :	**Schréder**
Manufacturer ..... :	**SCHRÉDER SOCELEC S.A.**
Model/Type reference ..... :	Axia GEN2 Size 1 and Size 2 series – Class I
Ratings ..... :	230 V; 50 Hz; max 24 led – 66 W(size 1) – max 48 led – 137 W (size 2); IP66; IK08; Ta 50 ºC (size 1) and 30 ºC (size 2); Class I

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**	**LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA (LCOE)**
Testing location/ address.....:		C/ Eric Kandel, 1 – 28906 Getafe (Madrid)
☐	~~**Associated CB Testing Laboratory:**~~	
~~**Testing location/ address.....:**~~		
Tested by (name, function, signature).....:		ALBERTO J. CARRASCO SANTOS Firmado digitalmente por Alberto Javier Carrasco Santos Nombre de reconocimiento (DN): c=ES, cn=Alberto Javier Carrasco Santos, email=acarrasco@lcoe.etsii.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 Motivo: Ensayado Fecha: 2016.09.26 12:33:58 +02'00'
Approved by (name, function, signature)...:		JESÚS SÁNCHEZ PANDO (Technical responsible) Firmado digitalmente por Jesús Sánchez Pando Nombre de reconocimiento (DN): c=ES, cn=Jesús Sánchez Pando, email=jsp@lcoe.etsii.upm.es, serialNumber=08029499S, 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 Fecha: 2016.09.27 09:28:54 +02'00'

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, E.T.S.I.I.

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):	**Testing location:**
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.	**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:

Test item particulars.....:	
Classification of installation and use.....:	According to the instructions of the manufacturer
Supply Connection.....:	Terminal block
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	17/02/2016 **(M1 – 19/07/2016)**
Date (s) of performance of tests.....:	23/02/2016 to 30/05/2016 **(M1- 20/07/2016 to 13/09/2016)**

General remarks:

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

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

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☒ **Yes** ☐ **Not applicable**

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

Name and address of factory (ies).....:	SCHRÉDER SOCELEC S.A. AV Roanne 66 - P.I. El Henares 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

3.2 (0)	**GENERAL TEST REQUIREMENTS**		-
3.2 (0.1)	Information for luminaire design considered ..... :	Standard Yes ☐ No ☒	¾
3.2 (0.3)	More sections applicable..... :	Yes ☐ No ☒	¾

3.4 (2)	**CLASSIFICATION**		-
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 ☒ No ☐	¾
3.4 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	¾
	Luminaire for rough service ..... :	Yes ☐ No ☒	¾
3.4 (-)	Modes of installation of road or street lighting		¾
	a) on a pipe	Yes ☐ No ☒	¾
	b) on a mast arm	Yes ☒ No ☐	¾
	c) on a post top	Yes ☒ No ☐	¾
	d) on span or suspension wires	Yes ☐ No ☒	¾
	e) on a wall	Yes ☐ No ☒	¾

3.5 (3)	**MARKING**		-
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 ºC; 30 ºC	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
3.6 (4)	**CONSTRUCTION**		-
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
3.6 (4.4)	**Lampholders**		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
3.6 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
3.6 (4.6)	**Terminal blocks**		**-**
	Tails		N/A
	Unsecured blocks		N/A
3.6 (4.7)	**Terminals and supply connections**		**-**
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
3.6 (4.8)	**Switches**		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
3.6 (4.9)	**Insulating lining and sleeves**		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
3.6 (4.10)	**Double or reinforced insulation**		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
3.6 (4.11)	**Electrical connections and current-carrying parts**		**-**
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
3.6 (4.12)	**Screws and connections (mechanical) and glands**		**-**
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
3.6 (4.13)	**Mechanical strength (IK08 according to EN 62262)**		**P**
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
3.6 (4.14)	**Suspensions, fixings and means of adjusting**		**-**
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/mm²) ..... :		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
3.6 (4.15)	**Flammable materials**		**-**
	- 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 ³ 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
3.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		-
	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
3.6 (4.17)	**Drain holes**		-
	Clearance at least 5 mm		N/A
3.6 (4.18)	**Resistance to corrosion**		**-**
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
3.6 (4.21)	**Protective shield**		**-**
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

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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
3.6 (4.24)	**Photobiological hazards**		-
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 See TRF Nº 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
3.6 (4.25)	**Mechanical hazard**		**-**
	No sharp point or edges		P
3.6 (4.26)	**Short-circuit protection**		**-**
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
3.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		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		

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Clause	Requirement + Test	Result - Remark	Verdict
	Voltage drop test, resistance < 0,05 W		N/A
3.6 (4.28)	**Fixing of thermal sensing control**		**-**
	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
3.6 (4.29)	**Luminaires with non-replaceable light source**		**-**
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
3.6 (4.30)	**Luminaires with non-user replaceable light source**		**-**
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		-
	Minimum two fixing means		P
3.6 (4.31)	**Insulation between circuits**		**-**
	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
3.6 (4.31.1)	SELV circuits		-
	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

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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 ≤ 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

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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 (m^2).....:	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

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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
3.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		-
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 ☒ Non-sinusoidal ☐	¾
	PTI..... :	< 600 ☒ ≥ 600 ☐	¾
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	¾
3.8 (7)	**PROVISION FOR EARTHING**		
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

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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
3.9 (14)	**SCREW TERMINALS**		-
	Separately approved; component list..... :	(see Annex 1)	P
	Part of the luminaire ..... :	(see Annex 3)	-
3.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		-
	Separately approved; component list..... :	(see Annex 1)	P
	Part of the luminaire ..... :	(see Annex 4)	-
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		-
3.10 (5.2)	**Supply connection and external wiring**		**-**
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 ≤ 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 (mm²) ..... :		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

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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 £ 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 (5.2.11)	External wiring passing into luminaire		P
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (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 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
3.10 (5.3)	**Internal wiring**		**-**
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 (5.3.1.1)	Internal wiring connected directly to fixed wiring		-
	Cross-sectional area (mm²)..... :	1	P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
3.10 (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

3.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		-
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 ³ 0,5 mF		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
3.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		-
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 ºC	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 ≤ 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 ≤ 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 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link ..... :	Yes ☐ No ☐	¾
	- manual reset cut-out ..... :	Yes ☐ No ☐	¾
	- auto reset cut-out ..... :	Yes ☐ No ☐	¾
	- case of abnormal conditions ..... :		¾
	- highest measured temperature of fixing point/ 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 by the glass manufacturer		N/A

3.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		P
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
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		P
	a) no deposit in dust-proof luminaire		P
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		P
	f) no contact with live parts (IP 2X)		P
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A

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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
3.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		-
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :		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

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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

3.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		-
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

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

3.7 (11.2)	**TABLES: Creepage distances and clearances**						
Table 11.1	**Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages**						
RMS working voltage (V) not exceeding		50	150	250	500	750	1000
Creepage distances							
Required basic insulation, PTI ³ 600		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 ³ 600		-	0,8	1,5	3	4	5,5
Measured							
Required supplementary insulation PTI < 600		-	1,6	2,5	5	8	10
Measured							
Required reinforced insulation		-	3,2	5	6	8	11
Measured							
Clearances							
Required basic insulation		0,2	0,8	1,5	3	4	5,5
Measured				>> 2,5			
Required supplementary insulation		-	0,8	1,5	3	4	5,5
Measured							
Required reinforced insulation		-	1,6	3	6	8	11
Measured							
Table 11.2	**Minimum distances (mm) for non-sinusoidal pulse voltages**						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured							
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

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

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

3.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**					N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Terminal block	Adels	10	No	0	P	
Terminal block	Wieland	10	N0	0	P	
Supplementary information:						

3.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**					N/A
Glow wire temperature ..... :		650°C				¾
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Terminal block	Adels	0	No	0	P	
Terminal block	Wieland	0	N0	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)	**TABLE: Proof tracking test (IEC 60112)**				N/A
Test voltage PTI ..... :		175 V			¾
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

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

ANNEX 1	TABLE: Critical components information					
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
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

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Clause	Requirement + Test	Result - Remark	Verdict

Led control gear	A	LG	PISE-A027M	27W 0,2-1A 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	TUV Rheiland JPTUV-069219
Led control gear	A	LG	PISE-A150 D	150W; 0,35-0,7 A 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	TUV Rheiland ENEC18 HN 69246191
Surge protection Device	A	CITEL	MLPC1-230L-R	277/Uo10kV, T85	IEC 61643-11	TUV Rheiland R 50307743
Supply connector	A	WIELAND	GST18i3 SB1 Serie	250-400 V; 5 poles; 1-2,5mm2; T70	EN 61984 EN 61535	VDE 3927 40018414
Terminal block	A	ADELS	LK980-01	2.5mm², 450V 24A	EN 60998-1&2-2	VDE 40021343
Terminal block	A	ADELS	900-07/Q	0.5-4mm² 450V	EN 60998-1&2-2	VDE 40027360
Terminal block	A	ADELS	AC-166 ST(D)/3	0.5-2,5mm² 250-400V	EN 61535	VDE 40036416
Control Device	A	Owlet	LuCo ADP	110-277V 50/60 Hz Tmax = 80°C	IEC/EN 61347	EUROFINS DE-6-G5150184 DE-6-G5130046 DE-6-G5130047
Control Device	A	Owlet	LuCo NXP	110-277V 50/60 Hz Tmax = 80°C	IEC/EN 61347	
Control Device	A	Owlet	LuCo P7	110-277V 50/60 Hz Tmax = 75°C	IEC/EN 61347	
Internal connector led	A	TE Connectivity	TE NEMA Socket 7-pin	Power contacts: 15A 480V Dimming contacts: 0.10A 10V	-	UL 28476
Cable	A	Auxicom	H07RN-F 3G	Rubber 1,5-2,5mm² OD 10-12mm	EN 50525-2-21	HAR
Cable	A	Auxicom	H07RN-F 5G	Rubber 1,5-2,5mm² OD 12-14mm	EN 50525-2-21	HAR
Led Modules (Axia)	A	Zöllner	4 Leds 219C NW 4000K@680mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0
Led Modules (Axia)	A	Zöllner	8 Leds 219C NW 4000K@ 820mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0
Led Modules (Axia)	A	Zöllner	16 Leds 219C NW 4000K@ 760mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0

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

Led Modules (Axia)	A	Zöllner	24 Leds 219C NW 4000K@ 890mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0
Led Modules (Axia)	A	Zöllner	32 Leds 219C NW 4000K@ 960mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0
Led Modules (Axia)	A	Zöllner	40 Leds 219C NW 4000K@ 1000mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0
Led Modules (Axia)	A	Zöllner	48 Leds 219C NW 4000K@ 1000mA	RG02@ 200mm RG01@ 215mm RG0@ 2200mm	EN 62031	Checked in the appliance
					EN 62471	R-Tech LBE04112160-3.0

Supplementary information:

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

The codes above have the following meaning:

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

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

C - Integrated component tested together with the appliance

D - Alternative component

IEC 60598-2-3			
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 gerar	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)

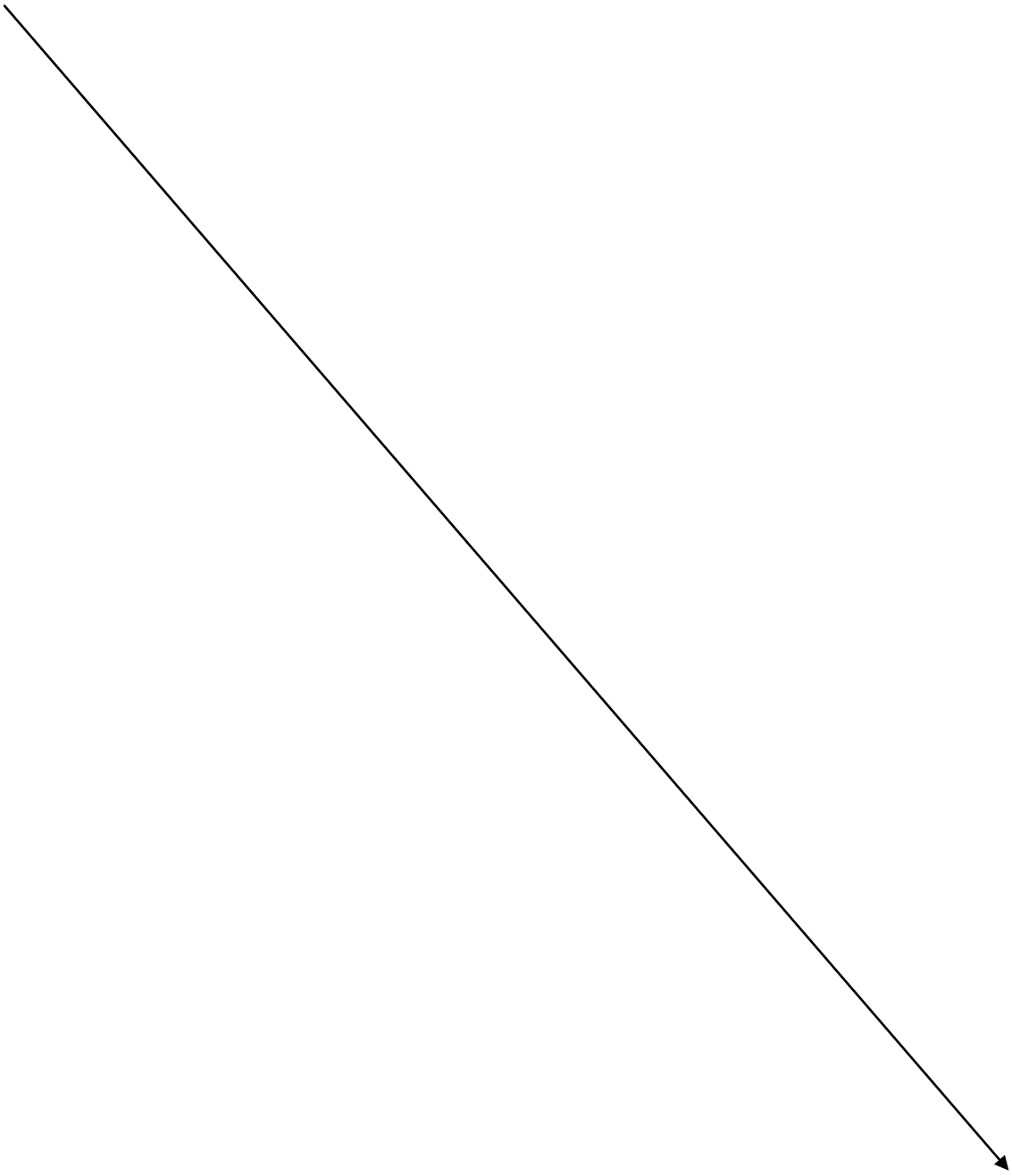
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Tc led control gear	30,1	60,1	-	-	85/90	-	-
Controller luminaire		-	37,1	-	-	-	-
Connector		-	37,0	-	110	-	-
Internal wiring		-	40,8	-	90	-	-
Terminal block		-	37,8	-	70	-	-
Surge protection device		-	38,1	-	70	-	-
TC led module		-	47,5	-	85	-	-

Supplementary information:

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

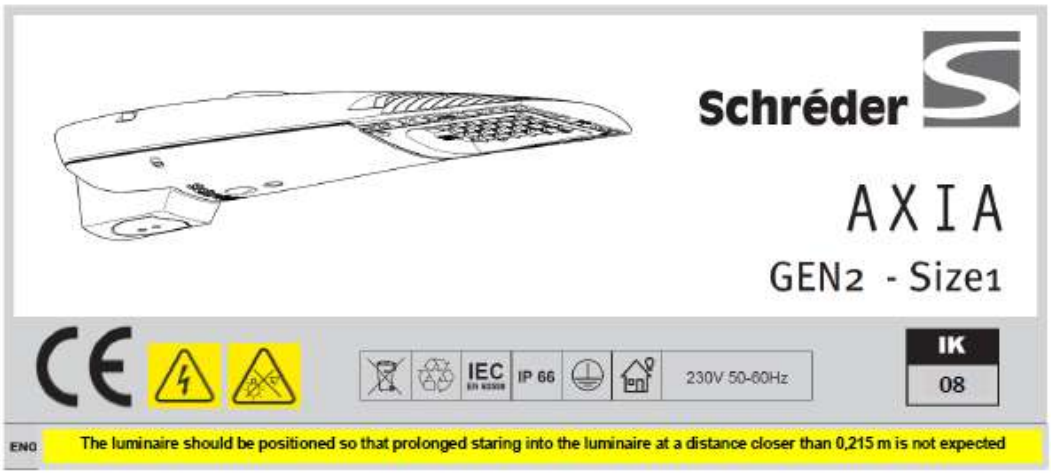
ANNEX 3	**Screw terminals (part of the luminaire)**	N/A

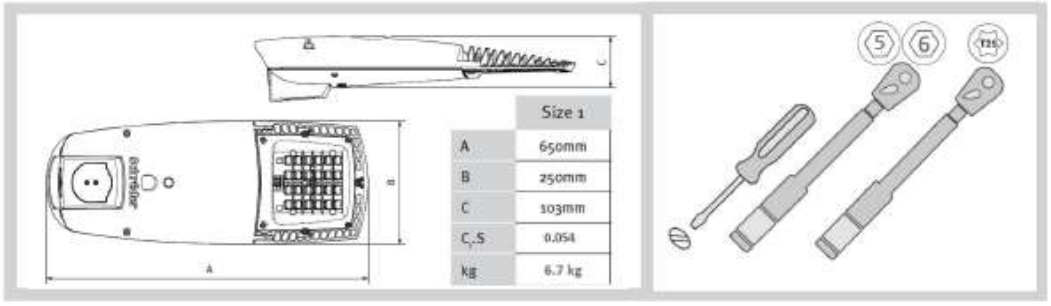
ANNEX 4	**Screwless terminals (part of the luminaire)**	N/A

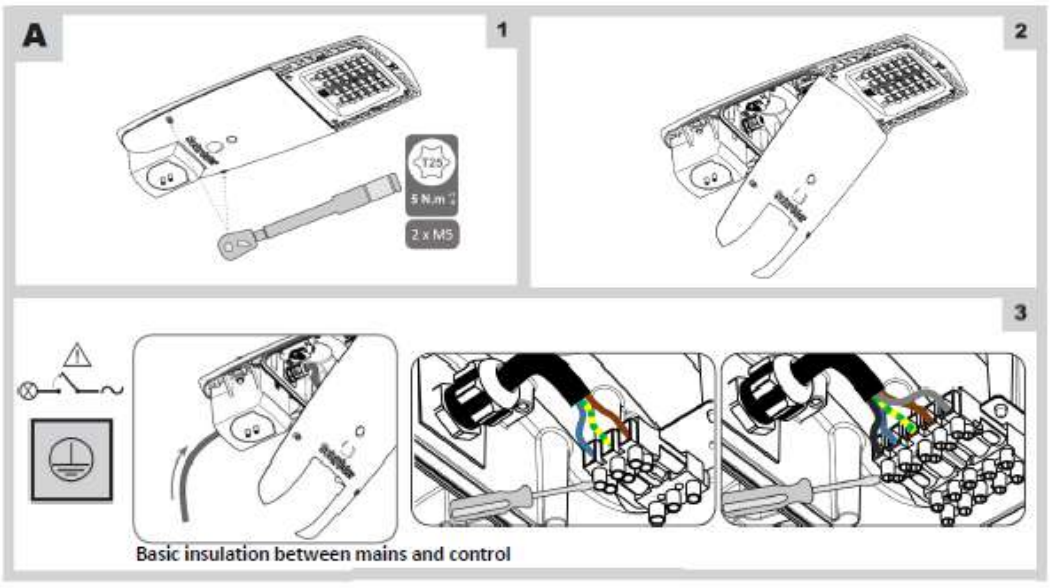


IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

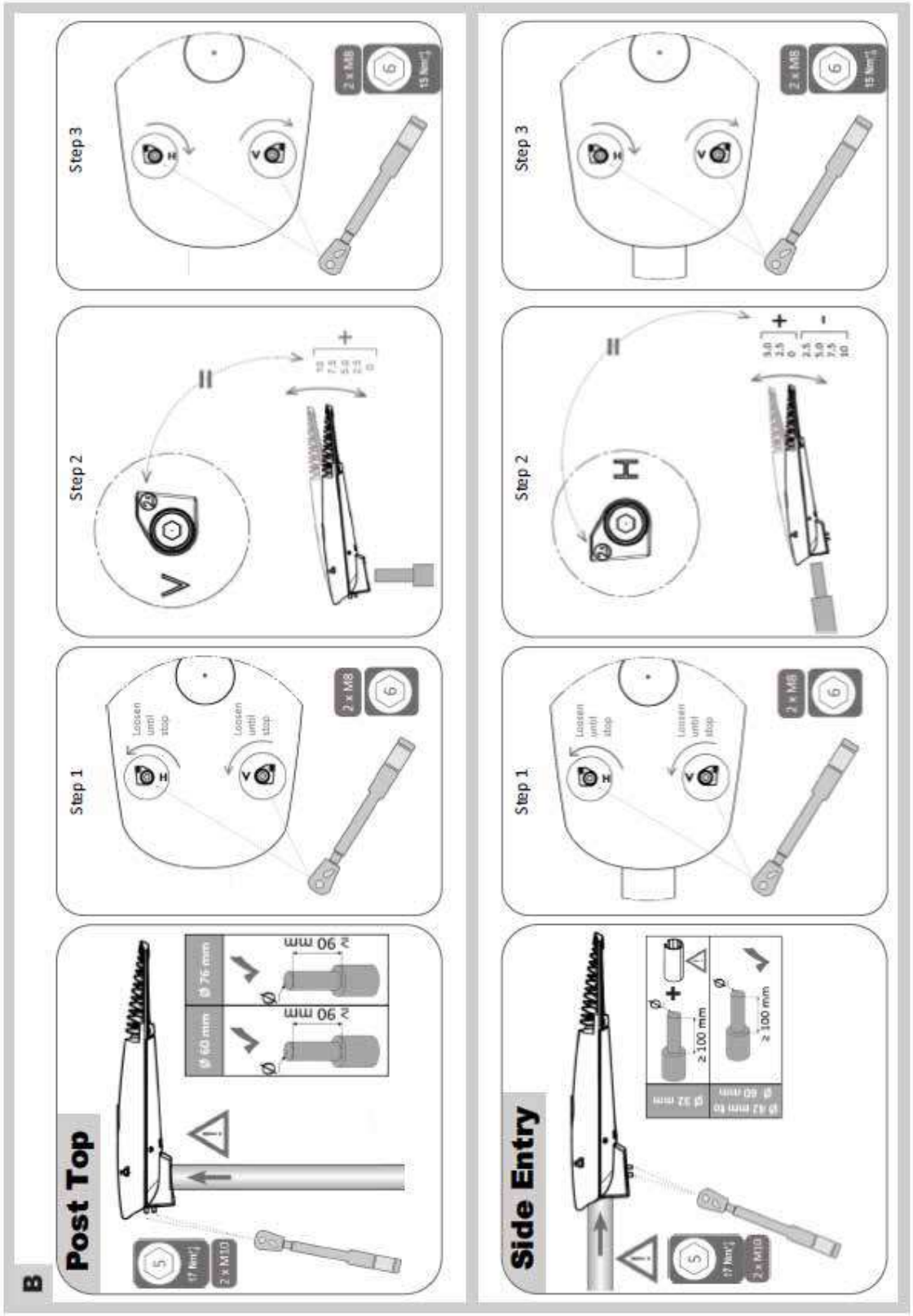
	ANNEX 5: **additional documentation**



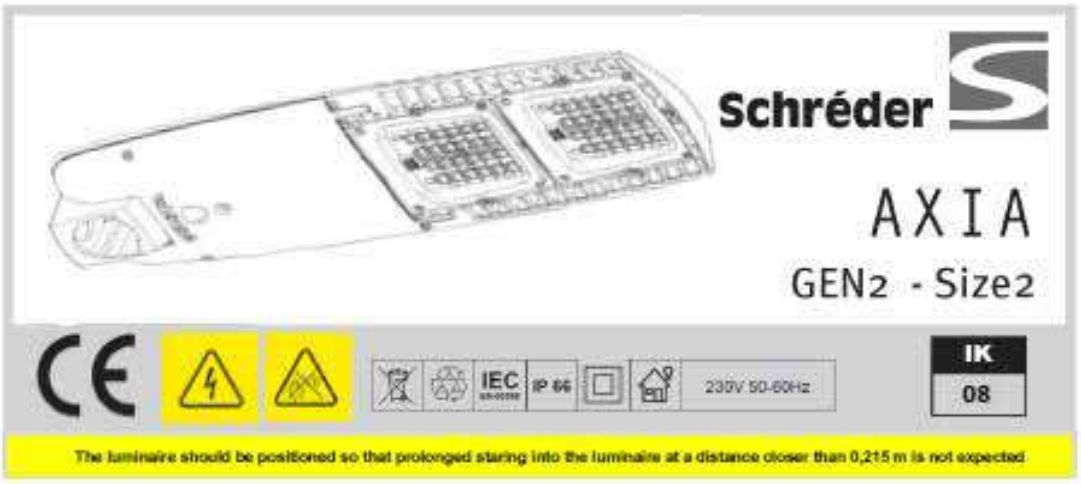


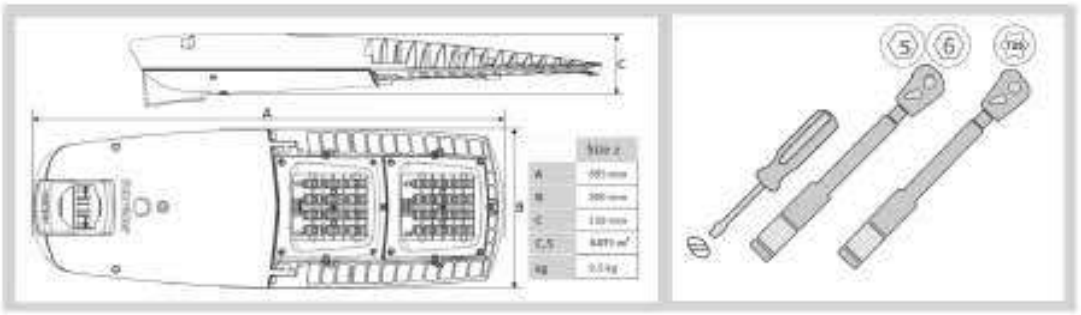


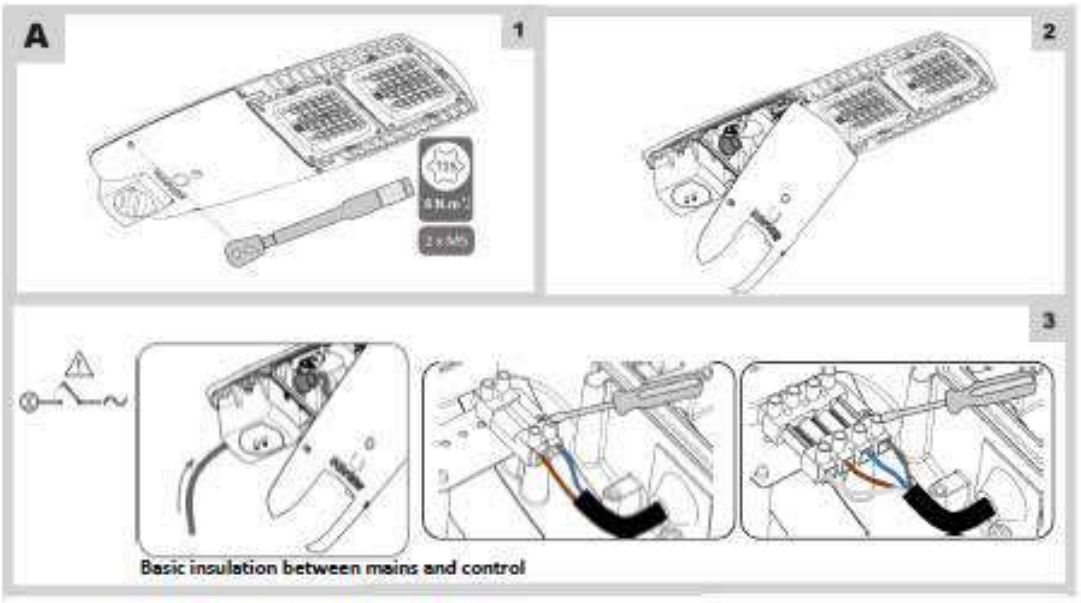
IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict



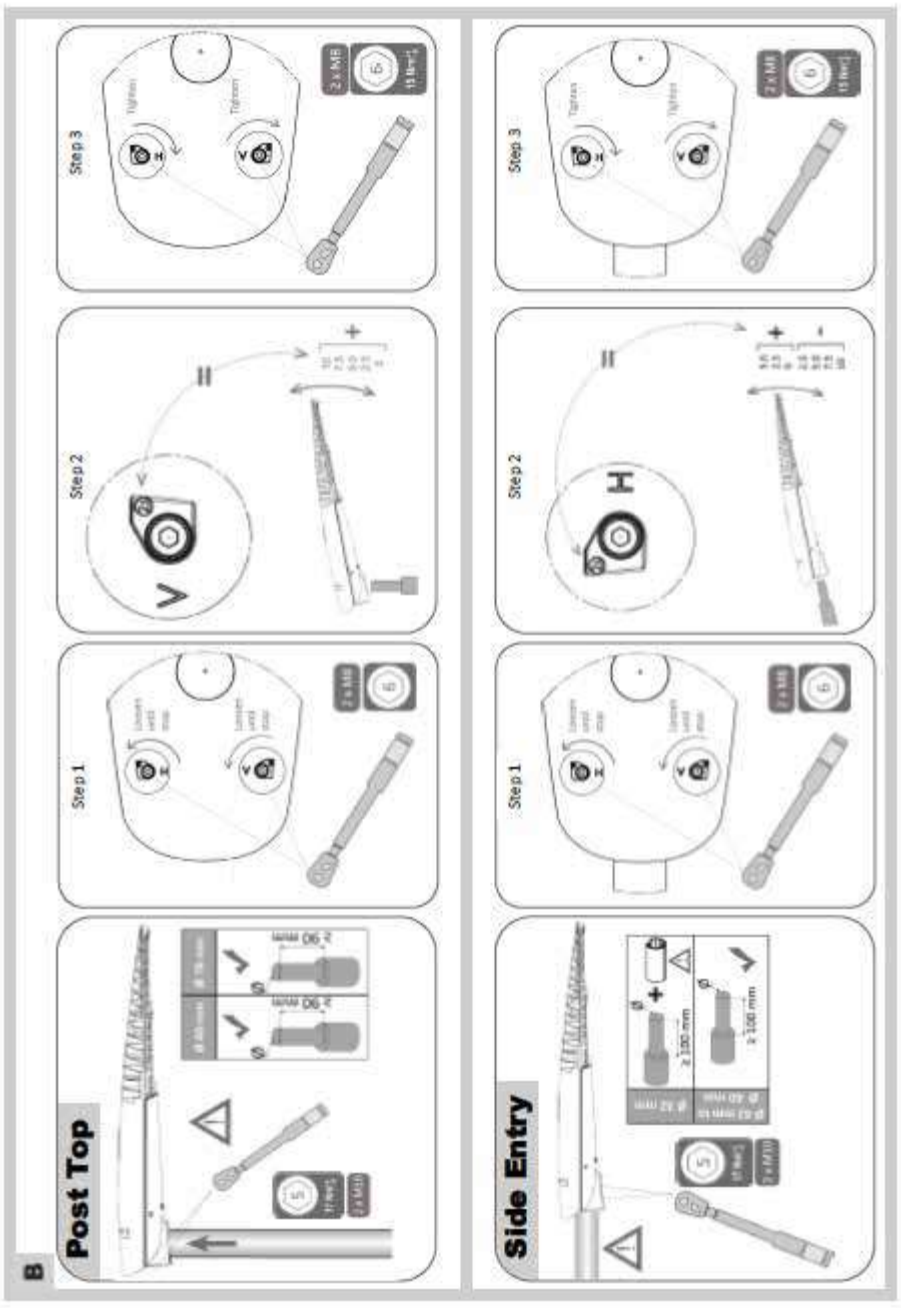
IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict







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

ID	COUNTRY		OPTICAL BLOCK					
Product ID	Country of final installation		Color Temperature		Typical Initial Lumens	Photometry Type	Protector	
	--		--		-----	------	PR00	
		Country of installation*			see charts for level Lumen table			
AXG2S1	GB	United Kingdom of Great Britain and Northern Ireland	NW	Neutral White		5165AS	PR00	No Protector
	AO	Angola				5166AS		
	AR	Argentina				5167AS		
	AU	Australia				5176AS		
	AT	Austria				5177AS		
	BE	Belgium				5178AS		
	00	Universal Standard				5179AS		

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

GEARS									
Voltage + Electrical Class		Dimming		Electrical protection Surge + Fuse		Power cable		Cable type	
V_ _		D _ _		S _		C _		_ _	
V02	230V CLI	D00	No Dimming	S3	10kV - no Fuse	C0	No Cable	00	No Cable
		D01	0 - 10V			CH	Cable length 4m		
		D02	DALI			CI	Cable length 5m	3C	3G1.5²
						CJ	Cable length 6m	3E	3G2.5²
		D04	Custom Dimming Profile			CK	Cable length 7m		
						CL	Cable length 8m	5A	5G1.5²
		D15	Telemanagement by 0-10V			CM	Cable length 9,5m	5B	5G2.5²
		D19	Telemanagement by Dali			CN	Cable length 10m		
						CO	Cable length 12m		
						CP	Cable length 15m		
								ZZ	CUSTOM CABLE

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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
								LXXX	Label custom
								FXXX	Finishing Colour , vernish, ...
								OXXX	Others
ZZ	CUSTOM CONTROLLER	Z	CUSTOM PHOTOCELL	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
01	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

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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 Schréder 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

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BELAC Accr. 002-Test EN-ISO 17025

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 Schreder Axia 2.1 24 Leds 890mA 4000K
Delivered to	R-TECH Laurent Maghe rue de Mons 3 B-4000 Liège l.maghe@schreder.com
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	*Verifier	*Approver
Couvreur Guy Technical operator Tel.: +32 2 382 03 67 E-mail: guy.couvreur@laborelec.com	Deswert Jean Michel Technical expert	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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If the version of the current document is greater than 1.0, it automatically replaces and cancels all previous versions.

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TEST REPORT
IEC 62471
Photobiological safety of lamps and lamp systems

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 B-4000 Liège
Test specification:	
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

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.

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 LED current : 890 mA (manufacturer value)

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

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Testing procedure and testing location:	
☒ **Testing Laboratory:**	Laborelec
Testing location/ address.....:	125 Rue de Rhode – 1630 Linkebeek - BELGIUM
☐ **Associated CB Laboratory:**	
Testing location/ address.....:	
Tested by (name + signature) .....:	Couvreur Guy
Approved by (+ signature).....:	Deswert Jean Michel
☐ Testing procedure: TMP	
Tested by (name + signature) .....:	
Approved by (+ signature).....:	
Testing location/ address.....:	
☐ Testing procedure: WMT	
Tested by (name + signature) .....:	
Witnessed by (+ signature).....:	
Approved by (+ signature).....:	
Testing location/ address.....:	
☐ Testing procedure: SMT	
Tested by (name + signature) .....:	
Approved by (+ signature).....:	
Supervised by (+ signature) .....:	
Testing location/ address..... :	
☐ Testing procedure: RMT	
Tested by (name + signature) .....:	
Approved by (+ signature).....:	
Supervised by (+ signature) .....:	
Testing location/ address.....:	

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

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
IEC 62471 edition 1 – 2006 CIE S 009:2002 Measurements performed at a distance of 200 mm.	Laborelec Rue de Rhode, 125 1630 Linkebeek

Summary of compliance with National Differences:

N/A

Copy of marking plate:

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Test item particulars	
Tested lamp	☒ continuous wave lamps ☐ pulsed lamps
Tested lamp system	LED Luminaire
Lamp classification group at 200 mm	☐ exempt ☐ risk 1 ☒ risk 2 ☐ 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
Possible test case verdicts:	
– test case does not apply to the test object	N/A
– test object does meet the requirement	P (Pass)
– test object does not meet the requirement	F (Fail)
Testing:	
Date of receipt of test item	24/09/2015
Date (s) of performance of tests	October 2015

General remarks:

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 testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a comma is used as the decimal separator.
List of test equipment must be kept on file and available for review.

General product information:

Led luminaire with LED's

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

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
4	**EXPOSURE LIMITS**		-
4.1	General		-
	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 cd·m^{-2}	see clause 4.3	P
4.3	Hazard exposure limits		-
4.3.1	Actinic UV hazard exposure limit for the skin and eye		P
	The exposure limit for effective radiant exposure is 30 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_s, of the light source shall not exceed the levels defined by:		P
	$E_s \cdot t = \sum_{200}^{400} \sum_{t} E_\lambda(\lambda,t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 30$ J·m^{-2}		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		P
	$t_{max} = \frac{30}{E_S}$ s		N/A
4.3.2	Near-UV hazard exposure limit for eye		-
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed 10000 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 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
	$t_{max} \le \frac{10\,000}{E_{UVA}}$ s		N/A
4.3.3	Retinal blue light hazard exposure limit		-
	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(λ), i.e., the blue-light weighted radiance , L_B, shall not exceed the levels defined by:		P

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TRF No. IEC60598_2_3J

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	$L_B \cdot t = \sum_{300}^{700} \sum_{t} L_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 10^6$ J · m^{-2} · sr^{-1}	for t ≤ 10^4 s $t_{max} = \frac{10^6}{L_B}$ L_B = 10345 Wm^{-2}sr^{-1} for 11 mrad field of view t_{max} = 97 s (<100 s)	F
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \le 100$ W · m^{-2} · sr^{-1}	for t > 10^4 s L_B = 1780 Wm^{-2}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_λ, weighted against the blue-light hazard function B(λ) shall not exceed the levels defined by:	see table 4.2	N/A
	$E_B \cdot t = \sum_{300}^{700} \sum_{t} E_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 100$ J · m^{-2}	for t ≤ 100 s	N/A
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \le 1$ W · m^{-2}	for t > 100 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_λ, weighted by the burn hazard weighting function R(λ) (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \le \frac{50\,000}{\alpha \cdot t^{0,25}}$ W · m^{-2} · sr^{-1}	(10 µs ≤ t ≤ 10 s) L_R = 138482 Wm^{-2}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
	$L_{IR} = \sum_{700}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \le \frac{6\,000}{\alpha}$ W · m^{-2} · sr^{-1}	t > 10 s	N/A
4.3.7	Infrared radiation hazard exposure limits for the eye		-

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	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
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \le 18\,000 \cdot t^{-0,75}$ $W \cdot m^{-2}$	t ≤ 1000 s	N/A
	For times greater than 1000 s the limit becomes:		N/A
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \le 100$ $W \cdot m^{-2}$	t > 1000 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
	$E_H \cdot t = \sum_{380}^{3000} \sum_{t} E_\lambda(\lambda,t) \cdot \Delta t \cdot \Delta\lambda \le 20\,000 \cdot t^{0,25}$ $J \cdot m^{-2}$		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°C ± 1°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		-

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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 α, 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 Δt, 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		-

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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 except 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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	– 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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Clause	Requirement + Test	Result - Remark	Verdict

IEC 62471			
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[1] λ, nm	UV hazard function $S_{uv}(\lambda)$	Wavelength λ, nm	UV hazard function $S_{uv}(\lambda)$
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

[1] 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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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		$10^{[(700-\lambda)/500]}$
1050-1150		0,2
1150-1200		$0{,}2 \cdot 10^{[0{,}02(1150-\lambda)]}$
1200-1400		0,02

TRF No. IEC62471A

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

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

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	$E_{UVA} = \sum E_\lambda \cdot \Delta\lambda$	315 – 400	≤1000 >1000	1,4 (80)	10000/t 10
Blue-light small source	$E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	≤100 >100	< 0,011	100/t 1,0
Eye IR	$E_{IR} = \sum E_\lambda \cdot \Delta\lambda$	780 –3000	≤1000 >1000	1,4 (80)	$18000/t^{0,75}$ 100
Skin thermal	$E_H = \sum E_\lambda \cdot \Delta\lambda$	380 – 3000	< 10	2π sr	$20000/t^{0,75}$

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 10-100 100-10000 ≥ 10000	$0,011 \cdot \sqrt{(t/10)}$ 0,011 $0,0011 \cdot \sqrt{t}$ 0,1	$10^6/t$ $10^6/t$ $10^6/t$ 100
Retinal thermal	$L_R = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	380 – 1400	< 0,25 0,25 – 10	0,0017 $0,011 \cdot \sqrt{(t/10)}$	$50000/(\alpha \cdot t^{0,25})$ $50000/(\alpha \cdot t^{0,25})$
Retinal thermal (weak visual stimulus)	$L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	780 – 1400	> 10	0,011	6000/α

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

LABORELEC

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

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_B	$W \cdot m^{-2}$	1,0*	-	1,0	-	400	-
Retinal thermal	$R(\lambda)$	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/α = 281171	138482	28000/α	-	71000/α	-
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	6000/α	-	6000/α	-	6000/α	-
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	-	570	-	3200	-

* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source

TRF No. IEC62471A

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

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.**

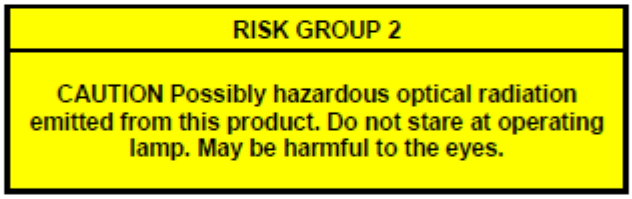
Conclusion:

At a distance of 200mm, the tested luminaire (Schréder 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).**

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

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

Pictures of the device under test:

Overview of luminaire

Overview of lenses

Overview of auxiliary

End of the report

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

	ANNEX 6: **Photographs of the sample**

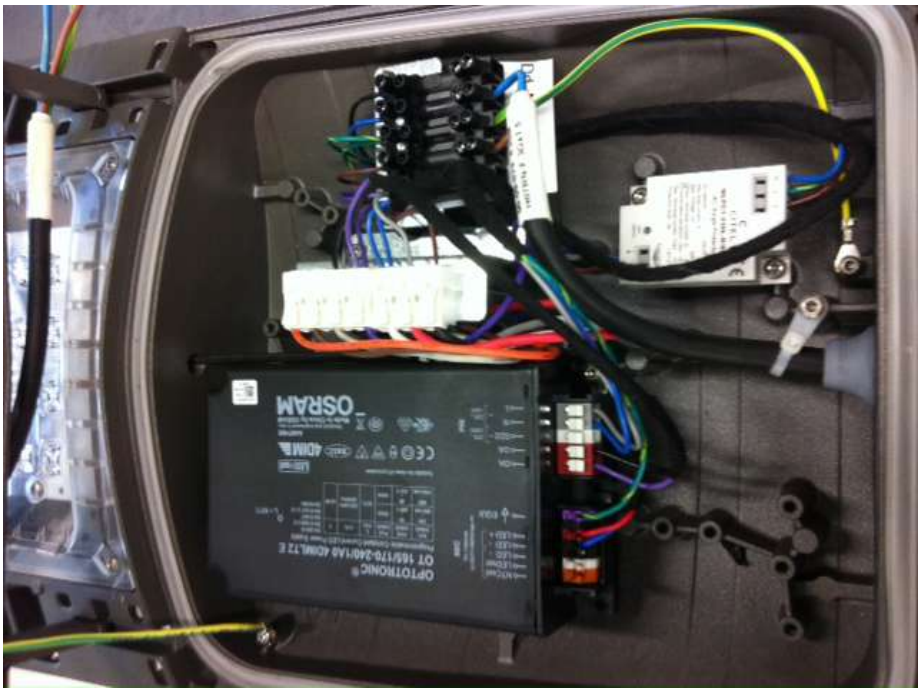
Axia Gen 2 – size 1

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

Axia Gen 2 – size 2



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

ATTACHMENT TO TEST REPORT IEC 60598-2-3
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
LUMINAIRES
PART 2: PARTICULAR REQUIREMENTS
SECTION 3: LUMINAIRES FOR ROAD AND STREET LIGHTING

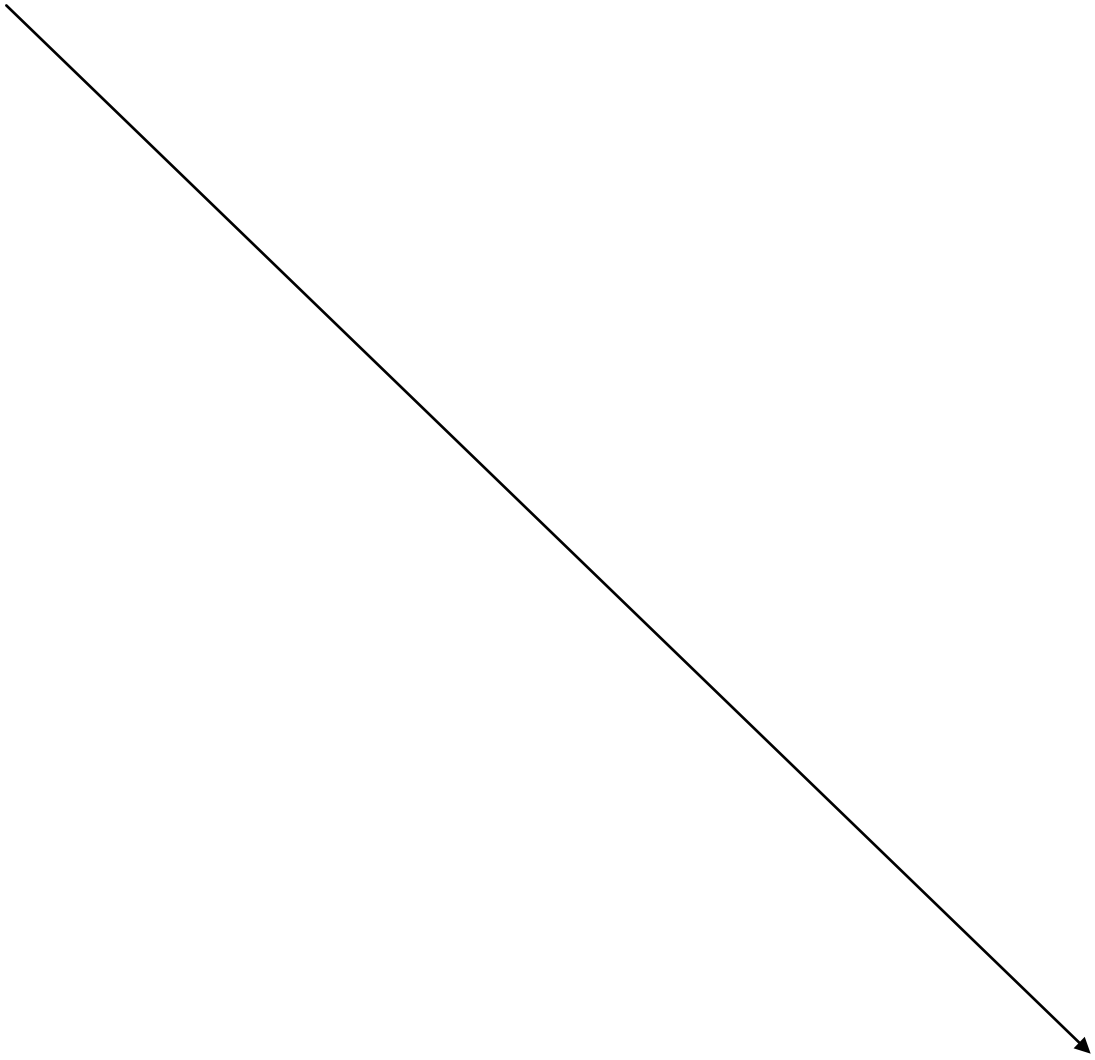
Differences according to.....:	EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2014
Annex Form No.....:	EU_GD_IEC60598_2_3J
Annex Form Originator.....:	OVE
Master Annex Form.....:	2014-12

	CENELEC COMMON MODIFICATIONS (EN)		**-**
3.5 (3)	***MARKING***		**-**
3.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A
3.6 (4)	***CONSTRUCTION***		**-**
3.6 (4.11.6)	Electro-mechanical contact systems		N/A
3.10 (5)	***EXTERNAL AND INTERNAL WIRING***		**-**
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
3.12 (12)	***ENDURANCE TESTS AND THERMAL TESTS***		**-**
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P

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

ZB	***ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)***		**-**
(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

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



Ref. Certif. No.
BE-7584

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	Street lighting
Name and address of the applicant	R-Tech Rue de Mons, 3 4000 LIEGE Belgium
Name and address of the manufacturer	Schreder S.A. Rue de Lusambo, 67 1190 BRUXELLES Belgium
Name and address of the factory Note: *When more than one factory, please report on page 2*	☒ Additional information on page 2 Schréder do Brasil Iluminação Ltda. Rua Iracema Lucas, 415 Distrito Industrial Vinhedo 13280-000 SAO PAULO Brazil
Ratings and principal characteristics	See Appendix 1
Trademark (if any)	SCHREDER
Customer's Testing Facility (CTF) Stage used	CTF Stage 3
Model / Type Ref.	VOLTANA0 6 LED xx, VOLTANA0 8 LED xx
Additional information (if necessary may also be reported on page 2)	☐ Additional information on page 2 /
A sample of the product was tested and found to be in conformity with	IEC 60598-1:2014, IEC 60598-2-3:2002, IEC 60598-2-3:2002/AMD1:2011 National differences: EU Group Differences
As shown in the Test Report Ref. No. which forms part of this Certificate	P1560-Ia

This CB Test Certificate is issued by the National Certification Body

Business Riverside Park, Avenue Internationalelaan 55 Build. D, BE-1070
BRUSSEL, Belgium
SGS Belgium N.V. - Division SGS-CEBEC

Date: 2017-03-15

Signature: Calogero Lana

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

Additional factory

Schreder TOV
Vul. Mykulynetska 46B
46000 TERNOPIL
Ukraine

Schreder (China) Lighting Industrial Co., Ltd
No.40 Xinye 2 Street
Tianjin Economic Technological Development Zone West Zone
300462 Tianjin City
China

Socelec S.A.
Av. de Roanne, 66, Poligono Industrial "EL HENARES"
19180 MARCHAMALO (GUADALAJARA)
Spain

Schréder Iluminação S.A.
Rua da Fraternidade Operária, n° 3
2795-491 CARNAXIDE, OEIRAS
Portugal

Comatelec S.A.
Z.I., 18400 SAINT FLORENT S/CHER
France

Tungsram-Schréder Világitási Berendezések Zrt
Tópart 2
2084 PILISSZENTIVAN
Hungary

This CB Test Certificate is issued by the National Certification Body

Business Riverside Park, Avenue Internationalelaan 55 Build. D, BE-1070
BRUSSEL, Belgium
SGS Belgium N.V. - Division SGS-CEBEC

Date: 2017-03-15

Signature: Calogero Lana

Ratings:

description	:	Street lighting
rated voltage (Un)	:	200-240 V
rated frequency	:	50-60 Hz
class	:	class I
degree of protection	:	IP66
additional information	:	IK08
rated output current (In out)	:	max. 1050 mA

Product data - type VOLTANA0_6 LED xx:

rated power	:	8-10-15-23 W
lamp(s)	:	6 LED
temperature class	:	Ta max.50°C

Product data - type VOLTANA0_8 LED xx:

rated power	:	11-14-20-31 W
lamp(s)	:	8 LED
temperature class	:	Ta max. 40°C

Further Data:

xx = Color Temperature can be :
NW neutral white
CW cool white
WW warm white

LICENCE

No. 20254 replaces No.20142

Issued to:
Applicant:
R-Tech
Rue de Mons, 3
4000 LIEGE
Belgium

Licensee:
Schreder S.A.
Rue de Lusambo, 67
1190 BRUXELLES
Belgium

Product	:	road, square, street, flood lighting
Trade name(s)	:	SCHREDER
Type(s)/model(s)	:	VOLTANA0 6 LED xx, VOLTANA0 8 LED xx

The product and any acceptable variation thereto is specified in the annex to this licence and the documents therein referred to.

SGS CEBEC hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard specified in annex
- an inspection of the production location
- a certification agreement with the number 1173

SGS CEBEC hereby grants the right to use the CEBEC certification mark

The ENEC/CEBEC certification mark may be applied to the product as specified in this licence for the duration of the ENEC/CEBEC certification agreement and under the conditions of the ENEC/CEBEC certification agreement.

This licence is issued on: 15/03/2017

ir. C. Lana,
Certification Manager

SGS Belgium NV-Division SGS CEBEC
Business Riverside Park
Bld Internationalelaan 55 Build. D
B-1070 Brussels
Tel.+32(0)2 556 00 20 Fax.+32(0)2 556 00 36

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

Product	:	road, square, street, flood lighting
Trade name(s)	:	SCHREDER
Type(s)/Model(s)	:	VOLTANA0 6 LED xx, VOLTANA0 8 LED xx
description	:	Street lighting
rated voltage (Un)	:	200-240 V
rated frequency	:	50-60 Hz
class	:	class I
degree of protection	:	IP66
additional information	:	IK08
rated output current (In out)	:	max. 1050 mA

Additional information

xx = Color Temperature can be :
NW neutral white
CW cool white
WW warm white

Product data - type VOLTANA0 6 LED xx

rated power	:	8-10-15-23 W
lamp(s)	:	6 LED
temperature class	:	Ta max.50°C

Product data - type VOLTANA0 8 LED xx

rated power	:	11-14-20-31 W
lamp(s)	:	8 LED
temperature class	:	Ta max. 40°C

TESTS

Test requirements

EN 60598-1:2015
EN 60598-2-3:2003 + A1:2011

Test results

The test results are laid down in test report(s) ref. P-1560-Ia

Remarks

This certificate is based on test reports Nos. P1560-Ia

Conclusion

The examination proved that all test requirements were met.

Checked by, project leader : Christian Maes - 15/03/2017

Department Manager, Product Certification :

Certification Manager : 2017-03-15

SGS Belgium NV-Division SGS CEBEC
Business Riverside Park
Bld Internationalelaan 55 Build. D
B-1070 Brussels
Tel.+32(0)2 556 00 20 Fax.+32(0)2 556 00 36

FACTORY LOCATION(S)

Schréder do Brasil Iluminação Ltda.
Rua Iracema Lucas, 415
Distrito Industrial Vinhedo
13280-000 SAO PAULO
Brazil

Schreder TOV
Vul. Mykulynetska 46B
46000 TERNOPIL
Ukraine

Schreder (China) Lighting Industrial Co., Ltd
No.40 Xinye 2 Street, Tianjin Economic Technological Development Zone West Zone,
300462 Tianjin City, P.R.China
China

Socelec S.A.
Av. de Roanne, 66
Poligono Industrial "EL HENARES"
19180 MARCHAMALO (GUADALAJARA)
Spain

Schréder Iluminação S.A.
Rua da Fraternidade Operária, n° 3
2795-491 CARNAXIDE, OEIRAS
Portugal

Comatelec S.A.
Z.I.
18400 SAINT FLORENT S/CHER
France

Tungsram-Schréder Világitási Berendezések Zrt
Tópart 2
2084 PILISSZENTIVAN
Hungary

Test Report issued under the responsibility of:

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

Report Number. .....:	**P1560-Ia**
Date of issue .....:	**2017-03-03**
Total number of pages	**45+2**
Name of Testing Laboratory preparing the Report .....:	**R-TECH**
Applicant's name.....:	**R-TECH**
Address.....:	Rue de Mons, 3,B-4000 LIEGE
Test specification:	
Standard.....:	IEC 60598-2-3:2002 (Third Edition) + A1:2011 used in conjunction with IEC 60598-1:2014 (Eighth Edition)
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

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

General disclaimer:

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

Test item description.....	Street lighting
Trade Mark.....	SCHREDER
Manufacturer.....	SCHREDER
Model/Type reference.....	VOLTANA 0
Ratings.....	120-240 V, 50-60 Hz, Cl. I , IP66, LED, IK08 (glass), IK08 (lenses). Version with 6 & 8 led's ; Max. 23 & max.31 W. Led: Max 1050 mA

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☐	**CB Testing Laboratory:**		
Testing location/ address .....:			
☐	**Associated CB Testing Laboratory:**		
Testing location/ address .....:			
Tested by (name, function, signature) .....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address .....:			
Tested by (name, function, signature) .....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address .....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☒	**Testing procedure: SMT/CTF Stage 3 or 4:**	R-Tech	
Testing location/ address .....:		Rue de Mons, 3,B-4000 LIEGE	
Tested by (name, function, signature) .....:		Laurent Maghe	
Witnessed by (name, function, signature) .:		Christian Maes	
Approved by (name, function, signature)...:		Cheuvart Geoffrey	
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment): **EU deviations** **Pictures** **Instructions**
Summary of testing: full test

Tests performed (name of test and test clause): IEC 60598-2-3:2002 (Third Edition) + A1:2011 used in conjunction with IEC 60598-1:2014 (Eighth Edition)	**Testing location:** R-tech sa Rue de Mons, 3 B-4000 LIEGE Belgium.

Summary of compliance with National Differences: Europe

List of countries addressed

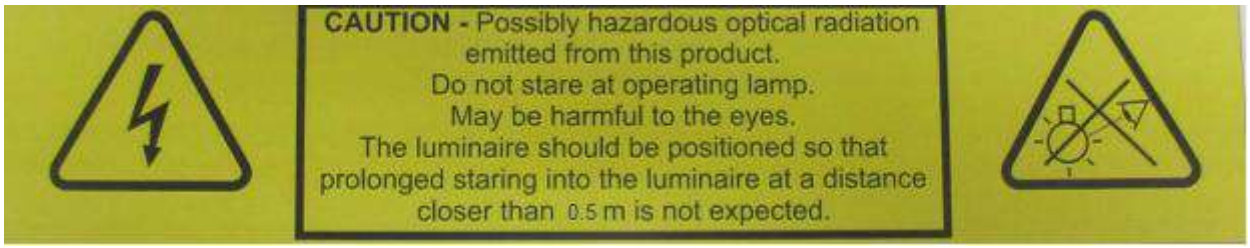
☒ **The product fulfils the requirements of**

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 60598-1:2014.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars..... :	
Classification of installation and use ..... :	Class I
Supply Connection..... :	Connector
..... :	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing .....:	
Date of receipt of test item.....:	October 2016
Date (s) of performance of tests .....:	February 2017
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☐ comma / ☐ point is used as the decimal separator.**	
Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☒ **Yes** ☐ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) ..... :	
Comatelec S.A. Z.I. F-18400 SAINT FLORENT S/CHER France	Socelec S.A. Av. de Roanne, 66 Poligono Industrial "EL HENARES" 19180 MARCHAMALO (GUADALAJARA),Spain
Schréder Iluminação S.A. Apartado, 132 2790-076 CARNAXIDE,Portugal	Schréder do Brasil Iluminação Ltda. Rua Iracema Lucas, 415 Distrito Industrial Vinhedo 13280-000 SAO PAULO,Brazil
Schreder TOV Vul. Mykulynetska 46B 46000 TERNOPIL,Ukraine	Schreder (China) Lighting Industrial Co., Ltd No.40 Xinye 2 Street, Tianjin Economic Technological Development Zone West Zone, 300462 Tianjin City, P.R.China,China
Tungsram-Schréder Világitási Berendezések Zrt Tópart 2 2084 PILISSZENTIVAN,Hungary	

General product information:

Ta following Leds current :

LED Count	Current (mA)	Power (W)	Ta (°C)	Ta with EMI filter(°C)
6	350	8	50	35
	500	10	50	30
	700	15	50	30
	1050	23	35	20
8	350	11	40	/
	500	14	40	/
	700	20	40	/
	1050	31	30	/

Color Temperature can be :
NW neutral white
CW cool white
WW warm white

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

3.2 (0)	**GENERAL TEST REQUIREMENTS**		P
3.2 (0.1)	Information for luminaire design considered .....:	Standard Yes ☒ No ☐	—
3.2 (0.3)	More sections applicable.....:	Yes ☐ No ☒	—

3.4 (2)	**CLASSIFICATION**		P
3.4 (2.2)	Type of protection .....:	Class I	—
3.4 (2.3)	Degree of protection .....:	IP 66	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....:	Yes ☒ No ☐	—
3.4 (2.5)	Luminaire for normal use .....:	Yes ☒ No ☐	—
	Luminaire for rough service .....:	Yes ☐ No ☒	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes ☒ No ☐	—
	b) on a mast arm	Yes ☒ No ☐	—
	c) on a post top	Yes ☒ No ☐	—
	d) on span or suspension wires	Yes ☐ No ☒	—
	e) on a wall	Yes ☐ No ☒	—

3.5 (3)	**MARKING**		
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	50-60 Hz	P
3.5 (3.3.3)	Operating temperature		N/A
3.5 (3.3.4)	Symbol or warning notice		N/A
3.5 (3.3.5)	Wiring diagram		N/A
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	0.91	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		N/A
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		P
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		P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
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		
	a) Design attitude	See attached Installation Notice	P
	b) Weight	See attached Installation Notice	P
	c) Overall dimensions	See attached Installation Notice	P
	d) Maximum projected area if applicable	See attached Installation Notice	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	See attached Installation Notice	P
	i) Maximum mounting height	>6 m	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4)	**CONSTRUCTION**		
3.6 (4.2)	Components replaceable without difficulty		N/A
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	**Lampholders**		
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
3.6 (4.5)	**Starter holders**		
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
3.6 (4.6)	**Terminal blocks**		
	Tails	Provided with internal connector	N/A
	Unsecured blocks	Fixed	N/A
3.6 (4.7)	**Terminals and supply connections**		
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

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.7.3.1)	Welded method and material		
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.8.2		N/A
	- 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		N/A
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
3.6 (4.8)	**Switches**		
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
3.6 (4.9)	**Insulating lining and sleeves**		
3.6 (4.9.1)	Retainment		N/A
	Method of fixing.....:		—
3.6 (4.9.2)	Insulated linings and sleeves:		
	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
3.6 (4.10)	**Double or reinforced insulation**		
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:		
	- not coincidental		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no straight access with test probe		N/A
3.6 (4.10.3)	Retainment of insulation:		
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
3.6 (4.11)	**Electrical connections and current-carrying parts**		
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		
	- spring washer		P
	- rivets		N/A
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
3.6 (4.12)	**Screws and connections (mechanical) and glands**		
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part .....:	2Nm (case)	P
	Torque test: torque (Nm); part .....:	1.2Nm (drivers)	N/A
	Torque test: torque (Nm); part .....:	1.2Nm (glass)	N/A
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
3.6 (4.12.4)	Locked connections:		
	- fixed arms; torque (Nm) .....:		P
	- lampholder; torque (Nm) .....:		N/A
	- push-button switches; torque 0,8 Nm .....:		N/A
3.6 (4.12.5)	Screwed glands; force (Nm) .....:		P
3.6 (4.13)	**Mechanical strength**		
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:	IK08 (glass) IK08 (lenses)	P
	- other parts; energy (Nm) .....:		P
	1) live parts		P

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Clause	Requirement + Test	Result - Remark	Verdict
	2) linings		P
	3) protection		P
	4) covers		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		
	- 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
3.6 (4.14)	**Suspensions, fixings and means of adjusting**		
3.6 (4.14.1)	Mechanical load:		
	A) four times the weight		N/A
	B) torque 2,5 Nm		P
	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/mm²) .....:		N/A
	Mass (kg) of semi-luminaire .....:		—
	Bending moment (Nm) of semi-luminaire .....:		N/A
3.6 (4.14.3)	Adjusting devices:		
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.15)	**Flammable materials**		
	- glow-wire test 650°C.....:	See Test Table 3.15 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
3.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		
	a) construction		P
	b) temperature sensing control	110	P
	c) surface temperature		N/A
3.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		
	No lamp control gear .....:	(compliance with Section 12)	N/A
3.6 (4.16.1)	Lamp control gear spacing:		
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (4.16.2)	Thermal protection:		
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		P
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	P
3.6 (4.17)	**Drain holes**		
	Clearance at least 5 mm		N/A
3.6 (4.18)	**Resistance to corrosion**		
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
3.6 (4.21)	**Protective shield**		
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Shield of glass if tungsten halogen lamps		N/A
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
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
3.6 (4.24)	**Photobiological hazards**		
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		P
3.6 (4.24.2)	Retinal blue light hazard		
	Luminaires with E_{thr}:		
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 ..:	RG2@20cm RG1@50cm RG0@500cm	P
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		
	- 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
3.6 (4.25)	**Mechanical hazard**		
	No sharp point or edges		P
3.6 (4.26)	**Short-circuit protection**		
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
3.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
3.6 (4.28)	**Fixing of thermal sensing control**		
	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
3.6 (4.29)	**Luminaires with non-replaceable light source**		
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
3.6 (4.30)	**Luminaires with non-user replaceable light source**		
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
3.6 (4.31)	**Insulation between circuits**		
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3	SELV/IEC 61347-2-13	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
3.6 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply	Double/reinforced	P
	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		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.2)	FELV circuits		
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to 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		N/A
	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		N/A
3.6 (4.32)	**Overvoltage protective devices**		
	Comply with IEC 61643-11	CB	P
	External to controlgear and connected to earth:		
	- only in fixed luminaires		P
	- only connected to protective earth		P
3.6.1 (-)	At least IP X3 or X5 respectively. IP .....:	IP66	P
	Column-integrated luminaires:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts below 2,5 m. IP .....:		N/A
	- parts above 2,5 m. IP .....:		N/A
3.6.2 (-)	Suspension on span wires		N/A
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.....:	0.2563	P
	- loaded area (m^2).....:	0.014m^2	P
	- used load (N) .....:	0.2N	P
	- measured deformation (cm/m) .....:	0cm/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	Safety Glass	P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		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		P
	- number of particles is more than 40 .....:	48	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		P
3.6.5.2.1 (-)	Glass covers have high mechanical strength		P
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample	Glass : IK08 Lenses : IK08	P
3.6.5.2.2 (-)	Glass covers not break into large pieces		P
	- test according 3.6.5.1, number of particles is more than 20 .....:	50	P
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:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- corrosion-resistant		N/A
	- opening only possible for an authorized person		N/A
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		
	- 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
3.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
3.7 (11.2)	Creepage distances and clearances .....:	See Table 3.7 (11.2)	P
	Working voltage (V) .....:	120-240 V	—
	Rated pulse voltage (kV) .....:	/	—
	Voltage form .....:	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI .....:	< 600 ☐ ≥ 600 ☒	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☐ Category III ☐	—
3.8 (7)	**PROVISION FOR EARTHING**		
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω .....:		P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		P
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
3.8 (7.2.4)	Locking of clamping means		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Compliance with 4.7.3		P
	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		P
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
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		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		N/A
3.8.1 (-)	Attachment prevented from rotation		N/A
3.9 (14)	**SCREW TERMINALS**		P
	Separately approved; component list .....:	(see Annex 1)	P
	Part of the luminaire.....:	(see Annex 3)	N/A
3.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		P
	Separately approved; component list .....:	(see Annex 1)	P
	Part of the luminaire.....:	(see Annex 4)	N/A
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		
3.10 (5.2)	**Supply connection and external wiring**		**P**
3.10 (5.2.1)	Means of connection.....:	Internal connector	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N/A
3.10 (5.2.2)	Type of cable .....:	H07RN-F (if provided)	P
	Nominal cross-sectional area (mm²).....:	1,5 mm²	P
	Cables equal to IEC 60227 or IEC 60245		P
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:		
	- suitable for introduction		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
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:		
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		
	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:		
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60	P
	- torque test: torque (Nm) ..... :	0.25Nm	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- no damage of cable or cord		P
	- function independent of electrical connection		N/A
3.10 (5.2.11)	External wiring passing into luminaire		N/A
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		P
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		
	- IEC 60083		N/A
	- other standard		N/A
3.10 (5.3)	**Internal wiring**		
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) .....:		N/A
	- temperatures.....:	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		
	Cross-sectional area (mm²).....:		P
	Insulation thickness		P
	Extra insulation added where necessary		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		
	Adequate cross-sectional area and insulation thickness		N/A
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		P
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		P
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		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		P
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		N/A
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N).....:	60 N	P
	- torque test: torque (Nm).....:	0.25 Nm	P
3.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		
3.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		P
	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		N/A
	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:		
	- 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:		
	Ordinary luminaire:		
	- touch current .....:		N/A
	- no-load voltage.....:		N/A
	Other than ordinary luminaire:		
	- 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		P
3.11 (8.2.6)	Covers reliably secured		P

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Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8.2.7)	Discharging of capacitors ≥ 0,5 μF		N/A
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A
3.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
3.12.2 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13		—
3.12 (12.3)	Endurance test:		P
	- mounting-position .....:	Acc. To mounting instruction	—
	- test temperature (°C) .....:	35°C	—
	- total duration (h) .....:	240 H	—
	- supply voltage: Un factor; calculated voltage (V)...:		—
	- lamp used.....:		—
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)	P
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) .....:		—
	- case of abnormal conditions.....:		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un ....:		—
	- measured mounting surface temperature (°C) at 1,1 Un.....:		N/A
	- calculated mounting surface temperature (°C) .....:		N/A
	- track-mounted luminaires		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.12 (12.6.2)	Temperature sensing control		
	- case of abnormal conditions.....:		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) .....:		N/A
	- track-mounted luminaires		N/A
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 ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....:		—
	Test according to 12.7.1.1:		
	- case of abnormal conditions.....:		—
	- Ballast failure at supply voltage (V) .....:		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		
	- case of abnormal conditions.....:		—
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		—
	- calculated temperature of fixing point/exposed part (°C) .....:		—
	Ball-pressure test .....:	See Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		
	- case of abnormal conditions.....:		—
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		—
	- calculated temperature of fixing point/exposed part (°C) .....:		—
	Ball-pressure test .....:	See Table 3.15 (13.2.1)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions.....:		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link .....:	Yes ☐ No ☐	—
	- manual reset cut-out.....:	Yes ☐ No ☐	—
	- auto reset cut-out .....:	Yes ☐ No ☐	—
	- case of abnormal conditions.....:		—
	- highest measured temperature of fixing point/ exposed part (°C): .....:		—
	Ball-pressure test: .....:	See 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)		—
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
	f) no contact with live parts (IP 2X)		P
	f) no entry into enclosure (IP 3X and IP 4X)		P
	f) no contact with live parts (IP3X and IP4X)		P
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		N/A
3.13 (9.3)	Humidity test 48 h		P
3.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:		—
	Insulation resistance (MΩ) .....:		—
	SELV		
	- between current-carrying parts of different polarity :	>1,3 Mohm	P
	- between current-carrying parts and mounting surface .....:	>1,3 Mohm	P
	- between current-carrying parts and metal parts of the luminaire .....:	>1,3 Mohm	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
	Other than SELV		
	- between live parts of different polarity .....:	>2,6 Mohm	P
	- between live parts and mounting surface .....:	>2,6 Mohm	P
	- between live parts and metal parts.....:	>2,6 Mohm	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 .....:	>2,6 Mohm	P
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with manual ignitors		N/A
	Test voltage (V) ..... :		P
	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 ..... :	1480 V	P
	- between live parts and mounting surface ..... :	1480 V	P
	- between live parts and metal parts..... :	1480 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 ..... :	1480 V	P
	- Insulation bushings as described in Section 5 ..... :		N/A
3.14 (10.3)	Touch current or protective conductor current (mA) :	<<0,5	P

3.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
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

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

3.7 (11.2)	**TABLES: Creepage distances and clearances**	p
Table 11.1	**Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages**	

RMS working voltage (V) not exceeding	50	150	250	500	750	1000
Creepage distances						
Required basic insulation, PTI ≥ 600	0,6	0,8	1,5	3	4	5,5
Measured			>2			
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10
Measured						
Required supplementary insulation PTI ≥ 600	-	0,8	1,5	3	4	5,5
Measured						
Required supplementary insulation PTI < 600	-	1,6	2,5	5	8	10
Measured						
Required reinforced insulation	-	3,2	5	6	8	11
Measured						
Clearances						
Required basic insulation	0,2	0,8	1,5	3	4	5,5
Measured			>2			
Required supplementary insulation	-	0,8	1,5	3	4	5,5
Measured						
Required reinforced insulation	-	1,6	3	6	8	11
Measured						

Table 11.2	**Minimum distances (mm) for non-sinusoidal pulse voltages**						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured							
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

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

3.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**N/A**
Allowed impression diameter (mm) .....:				—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Supplementary information:				

3.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Supplementary information:					

3.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**				**N/A**
Glow wire temperature .....:	650°C				—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
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)	**TABLE: Proof tracking test (IEC 60112)**				**N/A**
Test voltage PTI .....:	175 V				—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

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

ANNEX 1	TABLE: Critical components information					
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Drivers	A	Meanwell	APC-8E Series	8W 50-60Hz 0,25-0,7A 200-240V Tc=75°C	IEC 61347-2-13	CB
Drivers	A	Meanwell	PLM-12 Series	12W 50-60Hz 0,35-1,05A 110-240V Tc=75°C	IEC 61347-2-13 IEC 62384	TUV
Drivers	A	Meanwell	PLM-25 Series	25W 50-60Hz 0,35-1,05A 110-240V Tc=80°C	IEC 61347-2-13 IEC 62384	TUV
Drivers	A	Meanwell	PLD-16 Series	17W 50-60Hz 0,35-1,4A 200-240V Tc=70°C	IEC 61347-2-13	CB
Drivers	A	Meanwell	PLD-25 Series	25W 50-60Hz 0.35/0.7/1.05/1.4A 100-240Vac Tc=70°C	IEC 61347-2-13	CB
Drivers	A	Meanwell	PLD-40 Series	40W 50-60Hz 0.35-1.75A 200-240Vac Tc=90°C	IEC 61347-2-13	CB
Driver	A	LG	PISE-A027M	27W 0,2-1A 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	CB / UL
Driver	A	LG	PISE-A027A	27W 1A 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	CB / UL
Drivers	A	Moons	PU025H Series	25W 50-60Hz 0,35-2,1A 100-240V Tc=90°C	IEC 61347-2-13	TUV
Drivers	A	PHILIPS	Xi LP/FP 22W 0,3-1,0A 230V S175 sXt	22W 50-60Hz 0,3-1,05A 198-264V Tc=85°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi FP/LP 40W 0,3-1,0A 230V S175 sXt	40W 50-60Hz 0,3-1,05A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	TRIDONIC	LCI 27W	27W 50-60Hz 1A 220-240V Tc=70°C	IEC 61347-2-13	OVE
EMI filter	A	TE connectivity	Corcom 2FB3	Imax 2A Vmax = 250Vac/d Tc 50°C	IEC 60939-2	VDE
Surge protection Device	A	CITEL	MLPC1-230L-R	277 V, T85 10kA 20KV (DM) 120KV (CM)	IEC 61643-11	ENEC
VDR	A	Littelfuse	TM0V	275 Vac Tc=85°C 10kA	IEC 61051-2-2	VDE
FUSE HOLDER	A	Mersen	10x38mm CCR8-10 Series	20-32A 400V	IEC 60269-1 & -2	ENEC
FUSE HOLDER	A	ADELS	403/503 SI	400V 10A 5x20mm	IEC 60127-1 & -6	VDE
FUSE	A	Mersen	FR10 10x38mm	0.5-32A 400-500V	IEC 60269-1 & -2	ENEC
FUSE	A	Littelfuse	5x20mm 213 Series	0.2-6.3A 250V	IEC 60269-1 & -2	VDE
Terminal	A	ADELS	500 Series	0.5-4mm² 450V	EN 60998-1&2-2	VDE
Terminal	A	ADELS	900-07 & 08	0.5-4mm² 450V	EN 60998-1&2-2	VDE / UL
Terminal	A	WIELAND	ST18, GST18I	12-16A 250V 0,75-2,5mm²	EN 60998-1&2-2	VDE / UL

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Clause	Requirement + Test	Result - Remark	Verdict

Led Modules	A	LG	6 Leds LG3535 G4TOP@1050 mA 8 Leds LG3535 G4TOP @1000 mA	RG2@20cm RG1@40cm RG0@325cm	IEC/EN 62031-62471	Tested in appliance
Led Modules	A	LG	6 Leds LG3535 G4L@1050 mA	RG2@20cm RG1@50cm RG0@500cm	IEC/EN 62031-62471	Tested in appliance

Supplementary information:

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

The codes above have the following meaning:

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

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

C - Integrated component tested together with the appliance

D - Alternative component

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

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		
	Type reference ..... :	VOLTANA-0	—
	Lamp used ..... :	6 Led's LG3535	—
	Lamp control gear used..... :	MeanWell PLM-25 @ 1050mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W)..... :		—
	Supply current (A)..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 35 °C:		
	- abnormal operating mode..... :		—
	- test 1: rated voltage ..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	35	78			80		
VDR x 3 Tc	35	52			85		
Supply wiring	35	52			90		
Led Module	35	76			85		
Terminal	35	52			110		
Internal wiring	35	52			90		

Supplementary information:
Corrected for Ta 35 °C

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

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		
	Type reference ..... :	VOLTANA-0	—
	Lamp used ..... :	6 Led's LG3535	—
	Lamp control gear used..... :	PLD-16 @ 700 mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W)..... :		—
	Supply current (A)..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 50 °C:		
	- abnormal operating mode..... :		—
	- test 1: rated voltage ..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	50	70			70		
VDR x 3 Tc	50	60			85		
Supply wiring	50	60			90		
Led Module	50	75			85		
Terminal	50	60			110		
Internal wiring	50	60			90		

Supplementary information:
Corrected for Ta 50 °C

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

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		
	Type reference ..... :	VOLTANA-0	—
	Lamp used ..... :	8 Led's LG3535	—
	Lamp control gear used..... :	LCI 27W @ 1000mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W)..... :		—
	Supply current (A)..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 30 °C:		
	- abnormal operating mode..... :		—
	- test 1: rated voltage ..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	30	64			70		
SPD Tc	30	53			85		
Supply wiring	30	53			90		
Led Module	30	80			85		
Terminal	30	53			110		
Internal wiring	30	53			90		

Supplementary information:
Corrected for Ta 30°C

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

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		
	Type reference ..... :	VOLTANA-0	—
	Lamp used ..... :	8 Led's LG3535	—
	Lamp control gear used..... :	Philips 40W @ 1050mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W)..... :		—
	Supply current (A)..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 35 °C:		
	- abnormal operating mode..... :		—
	- test 1: rated voltage ..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	30	84			90		
SPD Tc	30	53			85		
Supply wiring	30	53			90		
Led Module	30	74			85		
Terminal	30	53			110		
Internal wiring	30	53			90		

Supplementary information:
Corrected for Ta 35°C

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

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		
	Type reference ..... :	VOLTANA-0	—
	Lamp used ..... :	6 Led's LG3535	—
	Lamp control gear used..... :	Moons @ 1050mA (MeanWell @ 350mA)	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W)..... :		—
	Supply current (A)..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 20 °C (35°C):		
	- abnormal operating mode..... :		—
	- test 1: rated voltage ..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	20 (35°C)	42 (57)			90 (75)		
SPD Tc	20 (35°C)	33 (38)			85		
Supply wiring	20 (35°C)	33 (38)			90		
Led Module	20 (35°C)	74 (45)			85		
Terminal	20 (35°C)	33 (38)			110		
Internal wiring	20 (35°C)	33 (38)			90		
EMI filter	(35°C)	(45)			50		

Supplementary information:
Corrected for Ta 20°C (35°C)

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

ANNEX 3	**Screw terminals (part of the luminaire)**		N/A
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal .....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²).....:		—
(14.3.3)	Conductor space (mm) .....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread).....:		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) .....:		N/A
	Torque (Nm) .....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

ANNEX 4	**Screwless terminals (part of the luminaire)**		N/A
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal .....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A

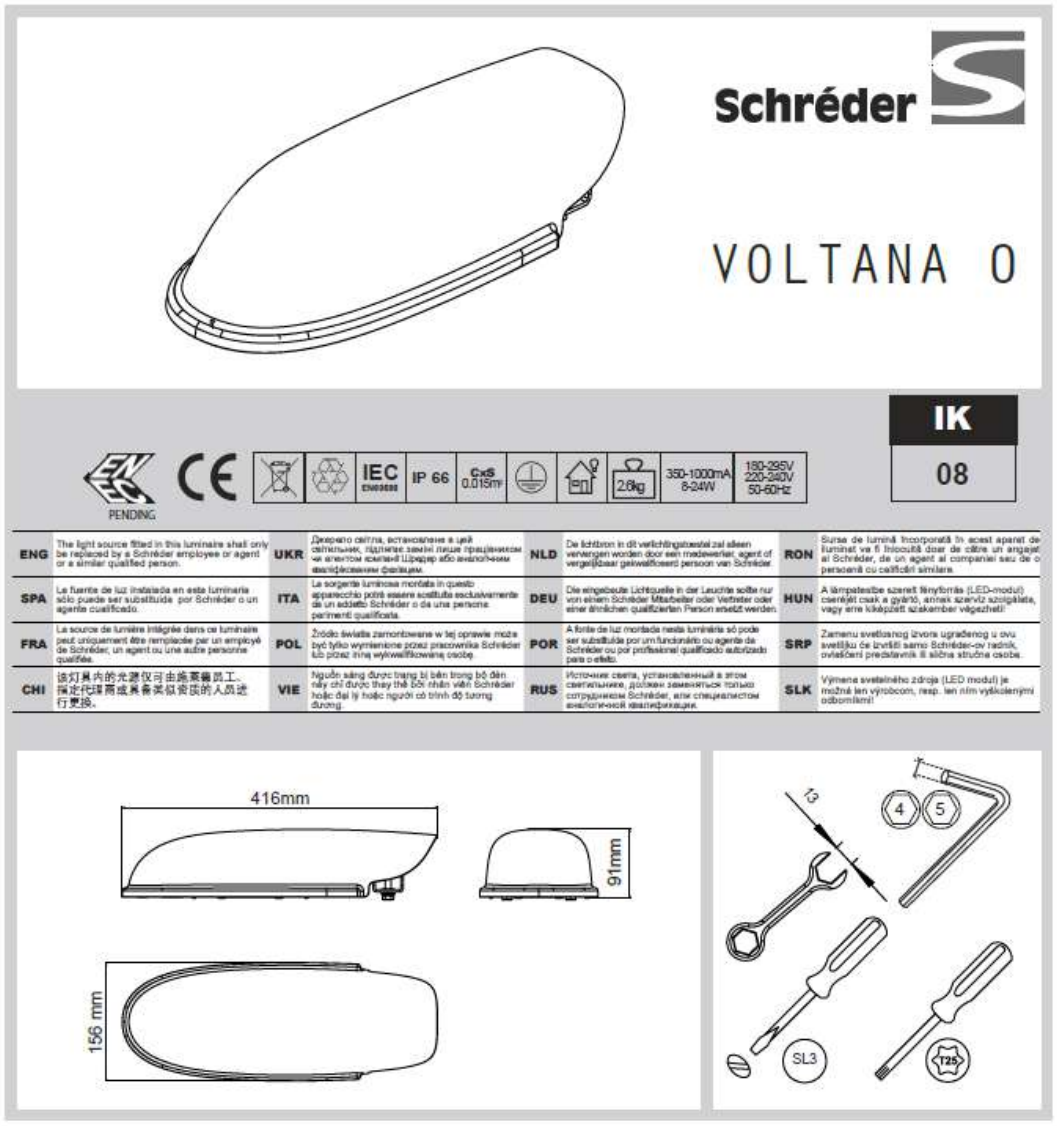
IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples) .....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
(15.6)	Terminals external wiring		N/A
	Terminal size and rating		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A

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

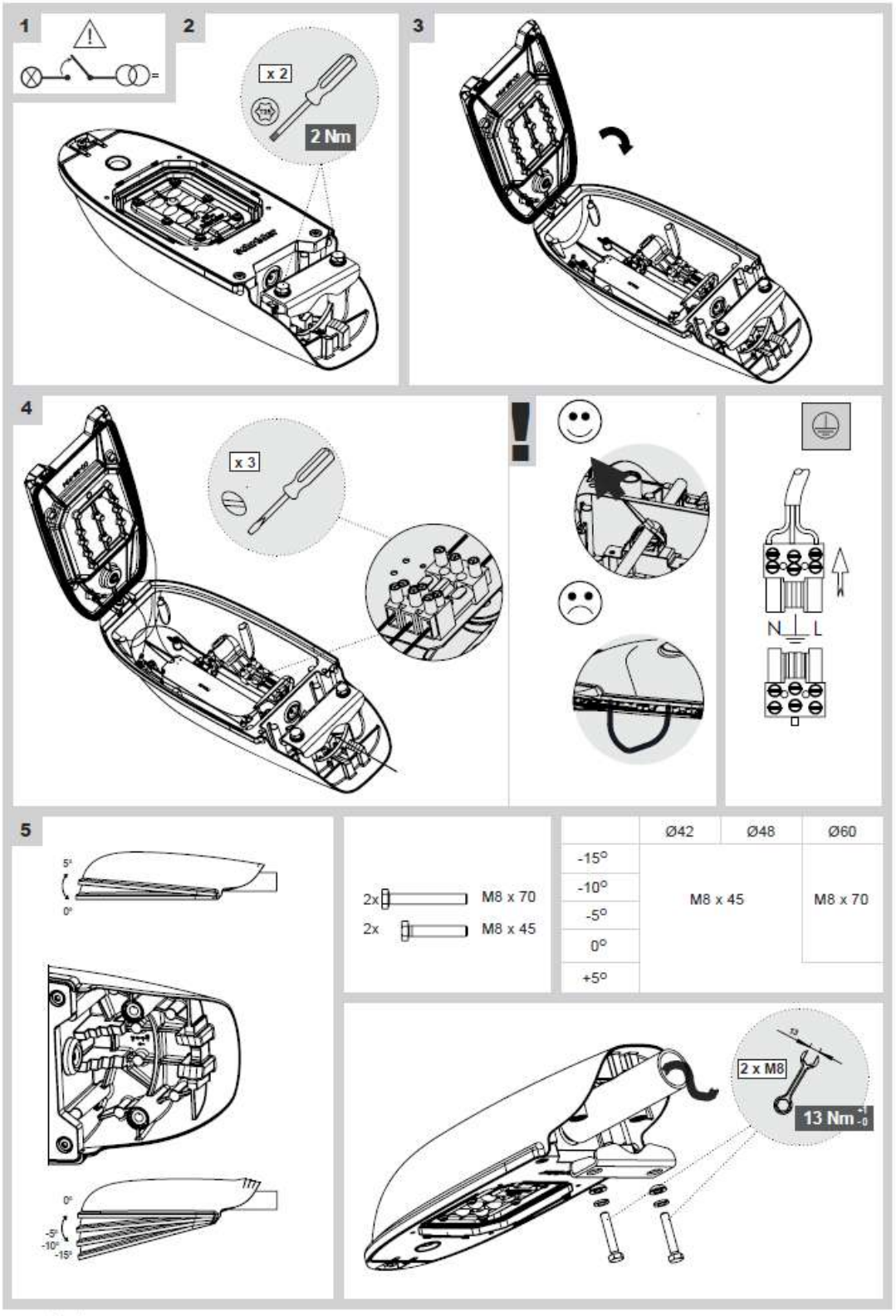
(15.6.3.1)	**TABLE: Contact resistance test**										N/A
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV).....: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

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

Installation notice and Pictures

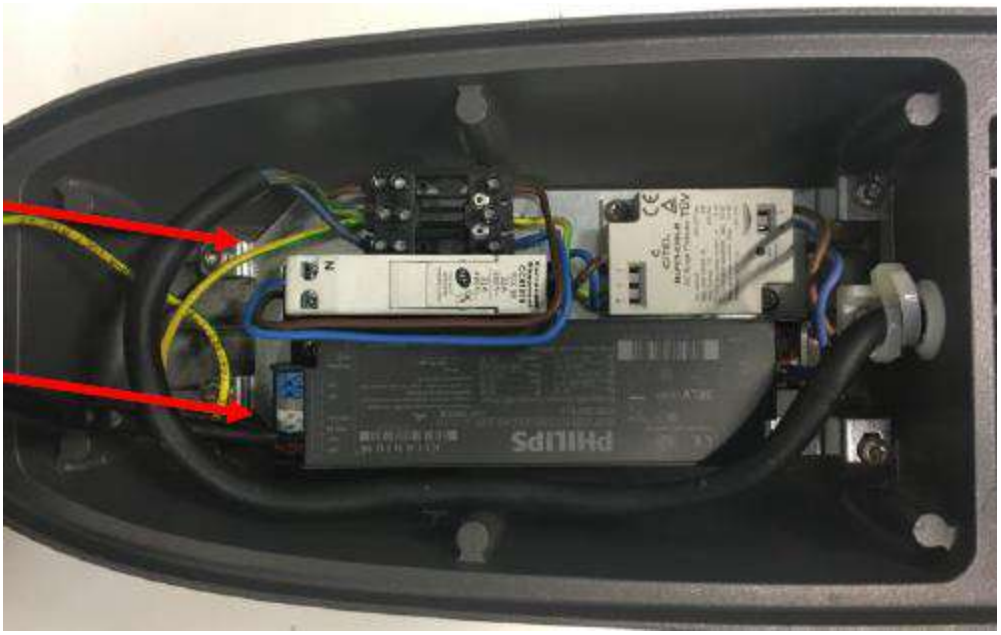


IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict



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

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



IEC60598_2_3K - ATTACHMENT			
Clause	Requirement – Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-3
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
LUMINAIRES
PART 2: PARTICULAR REQUIREMENTS
SECTION 3: LUMINAIRES FOR ROAD AND STREET LIGHTING

Differences according to ..... : EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015

Annex Form No. ..... : EU_GD_IEC60598_2_3K

Annex Form Originator ..... : IMQ S.p.A.

Master Annex Form..... : 2016-12

	CENELEC COMMON MODIFICATIONS (EN)		**P**

3.5 (3)	**MARKING**		**P**
3.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A

3.6 (4)	**CONSTRUCTION**		
3.6 (4.11.6)	Electro-mechanical contact systems		N/A

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

3.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N/A

ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A

IEC60598_2_3K - ATTACHMENT			
Clause	Requirement – Test	Result - Remark	Verdict
(5.2.1)	CY, DK, FI, GB: type of plug		
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

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 Schréder Group

Subject: **VOLTANA-0 / 6 led's / Moons PU025H105AQ 0-10V driver**
Sample n°: P-E16371, P-E16375

Test purpose: **Electrical measurements @ 1.05A**

Remarks:
Test request n°: P-D16542
Folder n°: P-F16041

TEST CONDITIONS:

Operator: CLOSSET Frédérick

Load: 6 Led's
Typical Vf: 3,1 V

Driver: Moon's PU025H105AQ_0-10V Series

Power supply: Elgar ET3500 230V 50Hz

Measurement device: Fluke Norma 4000 HF power meter

CONCLUSIONS:

PF: 0.97

Efficiency: 82.1 %

THD: 9.1 %

Harmonics we are under the 25W => no measurements

Duplicate to: Mr M. Thijs
LAB 05/10/2016
L. Maghe

//P-16CR542

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 Schréder Group

Subject: **VOLTANA-0 8 led's class II PHILIPS driver 40 W**
Sample n°: P-E17149

Test purpose: **EMC tests according to EN 55015 & EN 61547 Standards**

Remarks:
Test request n°: P-D17187
Folder n°: P-F16041

TEST CONDITIONS: Operator: EMC - ULg

Test Summary
EN 55015 & EN 61547 Standards

Emission

Standard	Limit / Level	Result	
		PASS	FAIL
EN 55015 Conducted Emission	9kHz- 30 MHz	X	
EN 55015 Annex B	30 MHz – 300 MHz	X	
EN 61000-3-2	Class C a)	X	

Immunity

Standard	Limit / Level	Result	
		PASS	FAIL
EN 61000-4-2	4 kV at contact 2, 4 & 8 kV in the air Criteria B required	X	
EN 61000-4-3	3 V/m 80 MHz – 1 GHz AM 80 % 1 kHz Criteria A required	X	
EN 61000-4-4	1 kV 5 kHz Criteria B required	X	
EN 61000-4-5	0.5 & 1 kV MD Criteria C required	X	
EN 61000-4-5	Complementary levels 2, 4, 8 & 10 in MD Criteria C required	X	
EN 61000-4-6	3 V 150 kHz – 80 MHz AM 80 % 1 kHz Criteria A required	X	
EN 61000-4-11	0% U 0.5 period 70% U 10 periods Criteria B/C required	X	

VOLTANA-0 8 led's class II PHILIPS driver 40 W

Driver: Philips FP 40W 0.3-1A

EMC Auxiliaries: Varistors

CONCLUSIONS:

VOLTANA 0 8 led's driven by PHILIPS FP 40 W driver complies with the CISPR/EN 55015 and EN 61547 Standards.

Remark: Surge protection tested OK up to 10 KV for Differential mode for the equipment with eventual Fuse replacement.

Duplicate to: Mr Ph. Verbeeck
LAB 24/04/2014 //P-17CR187
G. Cheuvart

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 Schréder Group

Subject: **VOLTANA-0 with Glass protector**
Sample n°: P-E16420

Test purpose: **Mechanical impact resistance test following IEC/EN 62262 Standard**

Remarks:
Test request n°: P-D16604
Folder n°: P-F16041

TEST CONDITIONS:

Operator: BOMBIL Patrick

Glass thickness: 5 mm

At pendulum hammer
5 impact points distributed on protector surface
1 impact on clamp
One impact on each point

Test on 5 samples

Test	Result
IK08 : Impact energy: 5 joules Hammer weight: 1,7 kg Height of fall: 29,4 cm	OK for the 5 samples for all tested points

CONCLUSIONS:

VOLTANA 0 equipped with glass protector complies with IK08 test following IEC/EN 62262 Standard.

Duplicate to: Mr M. Thijs
LAB 07/11/2016
L. Maghe

//P-16CR604

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 Schréder Group

Subject: **VOLTANA-0 equipped with 5205 & 5206 lenses**
Sample n°: P-E16393, P-E16460

Test purpose: **Mechanical impact resistance test following IEC/EN 62262 Standard**

Remarks:
Test request n°: P-D16655
Folder n°: P-F16041

TEST CONDITIONS:

Operator: BOMBIL Patrick

VOLTANA-0 equipped with 6 led's

At pendulum hammer
5+2 impact points distributed on lens protector surface
One impact on each point

Test on 5 samples

Test	**Result**
IK08 : Impact energy: 5 joules Hammer weight: 1,7 kg Height of fall: 29,4 cm	OK for all tested samples

CONCLUSIONS:

VOLTANA 0 equipped with 5205 & 5206 lenses complies with IK08 test following IEC/EN 62262 Standard.

Duplicate to: Mr M. Thijs
LAB 23/11/2016
L. Maghe

//P-16CR655

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 Schréder Group

Subject: **VOLTANA 0 – 8 led's – Flat glass protector**
Sample n°: P-E16377, P-E16394

Test purpose: **Tightness test IP66 following IEC/EN 60598-1 Standard**

Remarks:
Test request n°: P-D16575
Folder n°: P-F16041

TEST CONDITIONS: Operator: BOMBIL Patrick

VOLTANA-0 8 led's with flat glass protector

Pre-conditioning: endurance test

Test	Result
IP6X : -Luminaire switched ON until stable T° -Talcum in suspension (blowing ON) -After 1', luminaire OFF -Talcum for 3 hours	OK
IPX6 : - Luminaire switched ON until stable T° - Luminaire switched OFF and immediately sprayed with water jet - Hose Φ 12,5 mm - Water pressure: 1 kg/cm2 - Spraying distance: 3 m - Duration of test: 3 minutes	OK

CONCLUSIONS:

VOLTANA-0 8 led's with flat glass protector complies with IP66 test following IEC/EN 60598-1 Standard.

Duplicate to: Mr M. Thijs
LAB 21/11/2016
L. Maghe

//P-16CR575

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 Schréder Group

Subject: **VOLTANA 0 – 6 led's NW @ 1050 mA**
Sample n°: P-E16418

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

Remarks:
Test request n°: P-D17045
Folder n°: P-F16041

TEST CONDITIONS: Operator: Laborelec

VOLTANA 0 – 6 led's NW @ 1050 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.

CONCLUSIONS:

RG2 @ 20 cm

RG1 @ 30 cm

Duplicate to: Mr Ph. Verbeeck
LAB 08/06/2017
G. Cheuvart

//P-17CR045

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 Schréder Group

Subject: **VOLTANA-0 / 6 led's / Moons PU025H105AQ 0-10V driver**
Sample n°: P-E16371, P-E16375

Test purpose: **Thermal test @ 1050 mA following IEC/EN 60598-1 Standard**

Remarks:
Test request n°: P-D16541
Folder n°: P-F16041

TEST CONDITIONS:

Operator: CLOSSET Frédérick

Load: 6 Led's

Driver: Moon's PU025H105AQ_0-10V Series
Tc: 90°C
Working temperature: -40 ~ +60°C according
To datasheet.

Measurement device:
Yokogawa TX10: thermal measurement
Yokogawa WT 210: primary EM
Fluke 87: Led's EM

Junction Temperature measurement method
Junction temperature measurement by base temperature measurement and electrical measurement.
$T°_j = T°_b + R_{jb} \times P_{led}$

CONCLUSIONS:

Ta (IEC): 55 °C limited by Driver
Tq (IEC): 35 °C limited by Driver

Tq given for 100 khrs of lifetime
T° given without wind effect to comply with IEC 62722-2-1

Duplicate to: Mr M. Thijs
LAB 06/10/2016
L. Maghe

//P-16CR541

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 Schréder Group

Subject: **VOLTANA 0 Side-entry configuration for pole ∅ 42 mm**
Sample n°:

Test purpose: **Vibration test following "Street Lighting Luminaires" testing protocol**
Test request n°: P-D17428
Folder n°: P-F16041

TEST CONDITIONS:

Operator: V2i

Testing protocol	
	"Street Lighting Luminaires" testing protocol
Test Item	Post-top and Side-entry Luminaire
Excitation Direction	3 directions
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 55 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g
Test	Q < 2 (no natural frequency)
	Excitation: **RANDOM (*)** Frequency band: 5 - 55 Hz Acceleration: 0.84g_{RMS} Duration: 1h
	Q > 2
	Excitation : sine dwell Frequency : f0 (Qmax) Acceleration : 0.5g Duration : 30 minutes
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 55 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g

(*) The RANDOM equivalent test consist in an accelerated ageing process of one hour which presents, on a reference one-degree-of-freedom system, an equivalent fatigue damage spectrum than 20 years of mean wind and 90 hours of storms.

CONCLUSIONS:

VOLTANA 0 in Side-entry configuration for pole ∅ 42 mm complies with vibrations test following Street Lighting Luminaires testing protocol.

Duplicate to: Mr Ph. Verbeeck
LAB 14/06/2017
G. Cheuvart

//P-17CR428

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 Schréder Group

Subject: **VOLTANA-0**
Sample n°: P-E16383

Test purpose: **Aerodynamic wind test**

Remarks:
Test request n°: P-D16561
Folder n°: P-F16041

TEST CONDITIONS: Operator: ULg – CAT Soufflerie

2 tests realized:

1) Aerodynamic Coefficient determination
2) Endurance test

1) Aerodynamic coefficient determination

	Value (m²)		
Wind Direction	**Cd.S (drag)**	**Cs.S (Side)**	**Cl.S (Lift)**
Front 5°	0,004	0,002	0,012

2) Endurance test: wind qualification test

Wind direction: Front 5°

Wind resistance: 2' at 188 km/h

Result: OK

CONCLUSIONS:

VOLTANA 0 satisfies the wind speed test 188 Km/h for 2 minutes.

See Aerodynamic coefficients here above.

Duplicate to: Mr M. Thijs
LAB 03/11/2016
G. Cheuvart

//P-16CR561

VOLTANA O

ILUMINAÇÃO LED PARA TODOS

LED

owlet

Lenso Flex 2

Schréder

PERFORMANCE

USANDO A MAIS AVANÇADA **TECNOLOGIA LED**, A VOLTANA 0 **OFERECE O MAIS ELEVADO DESENPENHO NA SUA CLASSE**

- **Elevada eficácia** (sistema): até 130lm/W
- Índice de restituição cromática (CRI) › 70
- **Fotometria avançada** que permite o aumento da distância entre pontos de luz com elevados níveis de uniformidade

VERSÁTIL

PARA OFERECER A **SOLUÇÃO IDEAL** DE ACORDO COM AS SUAS NECESSIDADES DE ILUMINAÇÃO A VOLTANA 0 É **FLEXÍVEL**

- Desenhada para **montagem lateral e post-top** (opção)
- Regulação precisa no local: **sitema de inclinação incorporado**
- **Resistente a temperaturas extremas** (Ta até 55°C)

CONSTRUÍDA PARA DURAR

A VOLTANA 0 FOI DESENHADA PARA OFERECER **PERFORMANCES DE LONGA DURAÇÃO**

- **Dissipação térmica otimizada** para maximizar a vida útil efetiva dos componentes
- **Proteção térmica integrada** com capacidade de dimming em caso de sobre aquecimento
- **Proteção contra sobre tensão** para proteger a luminária de picos de tensão (4kV standard, 10kV opcional)
- **Elevado nível de estanquicidade** (IP 66) para prevenir danos internos ou perda de performance
- **Materiais robustos** - alumínio, aço galvanizado e vidro temperado - para elevado nível de proteção contra os impactos (IK 08)
- **Certificada para vibração 3G** (com peça de montagem)
- **Resistência ao vento** até 180 km/h

CERTIFICAÇÃO

A VOLTANA 0 FOI **CERTIFICADA PELOS MAIS EXIGENTES ORGANISMOS EU E US**

- ENEC
- ETL / UL
- LED Lighting facts

SUSTENTÁVEL

DESDE O INICIO, A VOLTANA 0 FOI DESENVOLVIDA COM UMA **FILOSOFIA ECO-FRIENDLY**

- **Materiais recicláveis** (alumínio, aço e vidro)
- **Perfil ambiental do produto** (PEP) para minimizar a pegada ecológica
- Grande redução nas emissões de **CO_2** (energia e manutenção)
- Sem poluição luminosa (**ULOR 0%**) graças a fotometria precisa

SOCIAL

A VOLTANA 0 OFERECE **MUITOS BENEFÍCIOS COLETIVOS**

- A luz branca melhora a visibilidade oferecendo **elevado contraste**
- Aumenta a **segurança para peões e condutores**
- **Menos perturbação no trânsito** devido à ausência de manutenção e às opções de monitorização (opcional)
- Contribuição efetiva para boa gestão das finanças e uma **utilização responsável da energia**

PRECISÃO

A VOLTANA 0 RESPONDE COM PRECISÃO A CADA NECESSIDADE ESPECÍFICA

- **Investimento otimizado** com o minímo de materiais
- **Regulação precisa** de acordo com as necessidades reais
- **Design consistente** para todo o seu projeto
- **Instalação user-friendly** fornecida pré-cablada (opcional)

INTELIGENTE

A VOLTANA 0 OFERECE OPORTUNIDADE DE CRIAR CENÁRIOS DE ILUMINAÇÃO DE ACORDO COM AS CARATERÍSTICAS DOS LOCAIS

- Disponível com perfis de dimming 1 - 10V, DALI ou personalizado
- **Fluxo luminoso constante** (CLO) compensação automática da depreciação do fluxo

PRINCIPAIS CARATERÍSTICAS

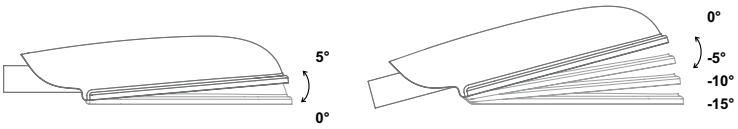
	Voltana o
Fluxo tipo emitido pela luminária (gama)(*)	700 a 2,500lm
Potência consumida (W) (*)	8 a 30W
Fluxo residual @ tq 25°C	@100,000h Corrente até 700mA: até 95% | Corrente de 701mA até 1A: até 90%
Temperatura de cor	Branco Neutro ou Quente
Estanquicidade bloco ótico	IP 66 (**)
Estanquicidade acessórios	IP 66 (**)
Resistência ao choque (vidro)	IK 08 (***)
Tensão nominal	120 - 277V - 50 - 60Hz
Classe elétrica	I(**)
Altura de instalação	4 a 6m
Materiais	
Corpo	Alumínio
Difusor	Vidro (policarbonato em algumas variantes Voltana 0)
Cor	RAL 7038 Qualquer cor RAL mediante pedido

(*) O fluxo inicial e a potência consumida da luminárias são valores indicativos válidos para uma temperatura ambiente de 25°C. O fluxo real emitido pela luminária depende das condições ambientais (ex. temperatura e poluição) e pode variar segundo configurações específicas. Os valores comunicados estão sujeitos às tolerâncias em tecnologia. Para verificar se este documento refere a informação mais atualizada, por favor visite o nosso sítio na Web.
(**) segundo IEC - EN 60598 – (***) segundo IEC - EN 62262

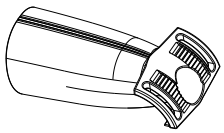
MONTAGEM

MONTAGEM STANDARD LATERAL DIÂMETRO 42MM.

REGULAÇÕES



ADAPTADOR MONTAGEM UNIVERSAL

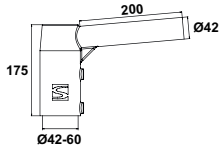


Ø 32 - 48mm

Ø 42 - 60mm

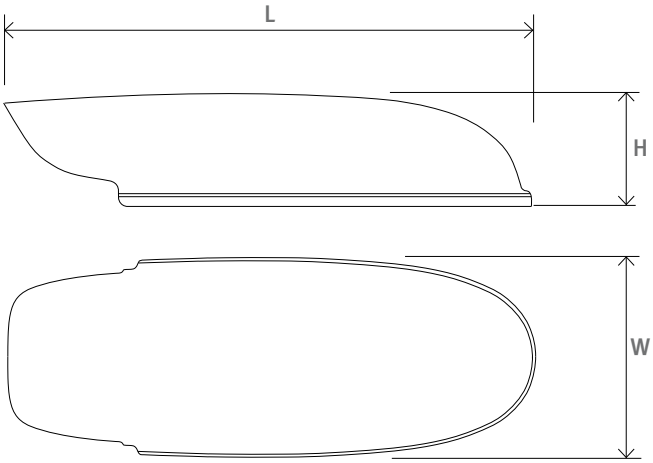
Ø 76mm

ADAPTADOR POST-TOP



DIMENSÕES | PESO

	Voltana o
L	416mm
W	156mm
H	91mm
KG	2.6kg



SEGURANÇA

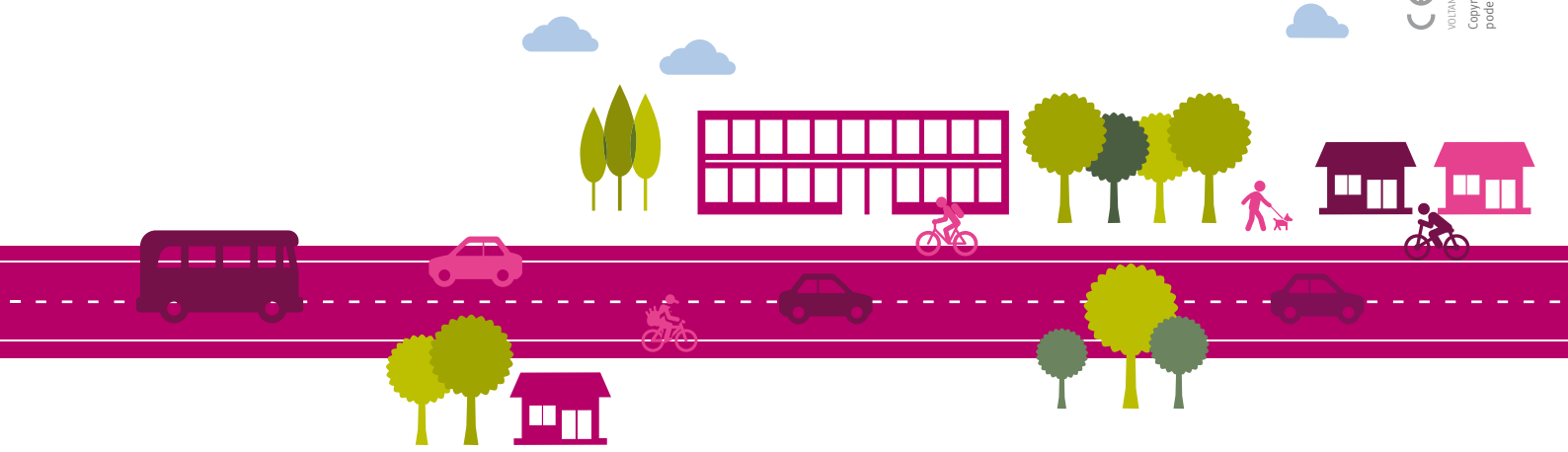
CONFORTO

SUSTENTABILIDADE

ECONOMIA

SOLUÇÕES

VOLTAMA o-GRP0053-PO-PTS-2017-02



Schréder

www.schreder.com

LICENCE

No. 20113 replaces No.19525

Issued to:
Applicant:
R-Tech
Rue de Mons, 3
4000 LIEGE
Belgium

Licensee:
Schreder S.A.
Rue de Lusambo, 67
1190 BRUXELLES
Belgium

Product	:	road, square, street, flood lighting
Trade name(s)	:	SCHREDER
Type(s)/model(s)	:	VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4, VOLTANA 5

The product and any acceptable variation thereto is specified in the annex to this licence and the documents therein referred to.

SGS CEBEC hereby declares that the above-mentioned product has been certified on the basis of:
- a type test according to the standard specified in annex
- an inspection of the production location
- a certification agreement with the number 1173

SGS CEBEC hereby grants the right to use the CEBEC certification mark
The ENEC/CEBEC certification mark may be applied to the product as specified in this licence for the duration of the ENEC/CEBEC certification agreement and under the conditions of the ENEC/CEBEC certification agreement.

This licence is issued on: 14/10/2016

ir. C. Lana,
Certification Manager

SGS Belgium NV-Division SGS CEBEC
Business Riverside Park
Bld Internationalelaan 55 Build. D
B-1070 Brussels
Tel.+32(0)2 556 00 20 Fax.+32(0)2 556 00 36

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

Product	:	road, square, street, flood lighting
Trade name(s)	:	SCHREDER
Type(s)/Model(s)	:	VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4, VOLTANA 5
description	:	Street lighting
rated voltage (Un)	:	100-240 V
rated frequency	:	50-60 Hz
rated secondary current (In SEC)	:	350, 500, 700, 1000 mA (LED)
class	:	class I
degree of protection	:	IP66
additional information	:	IK08

Product data - type VOLTANA 1

rated power	:	10-15-20-31 W
lamp(s)	:	8 LED
temperature class	:	Ta 45-55°C

Product data - type VOLTANA 2

rated power	:	20-28-39-56 W
lamp(s)	:	16 LED
temperature class	:	Ta 50-55°C

Product data - type VOLTANA 3

rated power	:	28-41-55-80 W
lamp(s)	:	24 LED
temperature class	:	Ta 45-55°C

Product data - type VOLTANA 4

rated power	:	37-52-75-110 W
lamp(s)	:	32 LED
temperature class	:	Ta 35-55°C

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Product data - type VOLTANA 5

rated power	:	70-102-145-212 W
lamp(s)	:	64 LED
temperature class	:	Ta 35-45-55°C

TESTS

Test requirements

EN 60598-1:2015
EN 60598-2-3:2003 + A1:2011

Test results

The test results are laid down in certification file 618719/03.

Remarks

This certificate is based on test report No. P1540-44-I.

Conclusion

The examination proved that all test requirements were met.

Checked by, project leader : Christian Maes - 14/10/2016

Department Manager, Product Certification :

Certification Manager : 2016-10-14

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List of components

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Drivers	LG Innotek	LLP 110 W, 1A, (LG PISE A110A) 68-110 V	V in 120-277 VAC, max. 110 W, Vout : 68-110 Vdc, tc : 80°C	IEC/EN 61347-2-13	CB
Drivers	LG Innotek	LLP 55 W, 1A, (LG PISE A55A) 44-55 V	V in 120-277 VAC, max. 55 W, Vout : 44-55 Vdc, tc : 80°C	IEC/EN 61347-2-13	CB
Drivers	LG Innotek	LG PISE A027A	V in 120-277 VAC, max. 27 W, Vout : 22-27 Vdc, tc : 80°C	IEC/EN 61347-2-13	CB
Drivers	Tridonic	LCI 27W 1-10V	220-240 V, 50/60 Hz, Tc 70°C	IEC/EN 61347-2-13	CB
Drivers	Philips	Xi FP 40W 0.3-1.0 A SNLDAE 230 V S175 sXt	40 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 40W 0.2-0.7 A SNLDAE 230 V S175 sXt	40 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB

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Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Drivers	Philips	Xi LP 40W 0.3-1.0 A S1 230V S175 sXt	40 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 40W 0.2-0.7 A S1 230V S175 sXt	40 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 70W 0.2-0.7A SL 230V C150 sXt	70 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 75W 0.2-0.7A SNLDAE 230V S240 sXt	75 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 75W 0.3-1.0A SNLDAE 230V S240 sXt	75 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 75W 0.3-1.0A S1 230V S240 sXt	75 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB

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Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Drivers	Philips	Xi LP 75W 0.2-0.7A S1 230V S240 sXt	75 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 150W 0.3-1.0A SL 230V S240 sXt	150 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt	150 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 150W 0.2-0.7A SL 230V S240 sXt	150 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 150W 0.2-0.7A SNLDAE 230V S240 sXt	150W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Control device	Owlet	LuCo ADP	110-277 V, 50/60 Hz, Tmax = 80°C	IEC/EN 61347	CB / UL

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Control device	Owlet	LuCo NXP	110-277 V, 50/60 Hz, Tmax = 80°C	IEC/EN 61347	CB / UL
Control device	Owlet	LuCo P7	110-277 V, 50/60 Hz, Tmax = 75°C	IEC/EN 61347	CB / UL
Control device	Owlet	Shorting Cap	Luco P7 Empty Body	IEC/EN 61347	Test report P-E16059
Connection device	TE	TE NEMA socket 7-pin	Power contacts : 15 A, 480 V, dimming contacts : 0.10 A, 10 V	IEC 61347-1, IEC 61347-2-11	CB
Surge protection device	Vossloh	SPC3/ 230/ 10K/i	100-277 V, 50/60 Hz, 10 kV, Tc = 80°C	IEC 61643-11	DEKRA
Fuse holder	Mersen	10x38 mm, CCR8-10 series	20-32 A, 400 V	IEC 60269-1 & -2	ENEC
Fuse holder	Camdenboss	CFTBN 5x20 mm	13 A, 250 V	IEC 60269-1 & -2	VDE / UL
Fuse	Mersen	FR10 10x38 mm	0.5-32 A, 400-500 V	IEC 60269-1 & -2	ENEC
Fuse	Littlefuse	5x20 mm, 213 series	0.2-6.3 A, 250 V	IEC 60269-1 & -2	VDE
Surge protection device	Vossloh	SPC3/ 230/ 10K/i	100-277 V, 50/60 Hz, 10 kV, Tc = 80°C	IEC 61643-11	DEKRA
Terminal	Wieland	GST18i S B	16 A/250 V, 2.5 mm²	EN 60998-1 & 2-2	VDE / UL

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Terminal	Adels	LK980-01	2.5 mm², 450 V, 24 A	EN 60998-1 & 2-2	VDE / UL
Terminal	Adels	900-07/Q	0.5-4 mm², 450 V	EN 60998-1 & 2-2	VDE / UL
Terminal	Adels	AC-166 ST (D)/3	0.5-2.5 mm², 250-400 V	EN 60998-1 & 2-2	VDE / UL
Terminal	Wago	222 Series	0.08-2.5 mm², 20 A/400 V	EN 60998-1 & 2-2	ENEC / UL
Terminal	Wago	221 Series	0.2-4 mm², 32 A/450 V	EN 60998-1 & 2-2	ENEC / UL
Terminal	Wago	Connector 2 pole 294 model	24 A/500 V, 0.5-2.5 mm²	EN 60998-1 & 2-2	ENEC
Cable gland	Hummel	HSK-K	IP68-10 bar M20x1.5	DIN EN 62444	VDE / UL
Led modules	LG	8-16-24-32 Leds LG3535	RG0, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	LG	8-16-24-32 Leds G4TOP	RG, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	LG	8-16-24-32 Leds G4	RG, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	LG	8-16-24-32 Leds G4L	RG, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	Schreder	2x12, 2x16, 24, 32 Leds XP-G2	RG0, 700 mA	IEC/EN 62031 - 62471	Tested in appliance
1) indicates a component tested as part of the appliance					

FACTORY LOCATION(S)

Schréder do Brasil Iluminação Ltda.
Rua Iracema Lucas, 415
Distrito Industrial Vinhedo
13280-000 SAO PAULO
Brazil

Schreder TOV
Vul. Mykulynetska 46B
46000 TERNOPIL
Ukraine

Schreder (China) Lighting Industrial Co., Ltd
No.40 Xinye 2 Street, Tianjin Economic Technological Development Zone West Zone,
300462 Tianjin City, P.R.China
China

Socelec S.A.
Av. de Roanne, 66
Poligono Industrial "EL HENARES"
19180 MARCHAMALO (GUADALAJARA)
Spain

Schréder Iluminação S.A.
Rua da Fraternidade Operária, n°3
2795-491 CARNAXIDE, OEIRAS
Portugal

Uitrusting Schreder
Puursesteenweg, 327
2880 BORNEM
Belgium

Comatelec S.A.
Z.I.
18400 SAINT FLORENT S/CHER
France

Tungsram-Schréder Világitási Berendezések Zrt
Tópart 2
2084 PILISSZENTIVAN
Hungary

Test Report issued under the responsibility of:

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

Report Number. .....:	**P1540-44-IIb**
Date of issue .....:	**2017-10-09**
Total number of pages.....	**49+2**
Name of Testing Laboratory preparing the Report.....:	**SGS BELGIUM division SGS CEBEC**
Applicant's name.....:	**R-TECH**
Address .....:	Rue de Mons, 3,B-4000 LIEGE
Test specification:	
Standard .....:	IEC 60598-2-3:2002 (Third Edition) + A1:2011 used in conjunction with IEC 60598-1:2014 (Eighth Edition)
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

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

General disclaimer:

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

Test item description	Street lighting
Trade Mark	SCHREDER
Manufacturer.....	SCHREDER
Model/Type reference.....	VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4 & VOLTANA 5.
Ratings	120-240 V, 50-60 Hz, Cl. II , IP66, LED, IK08 Version with 64, 32, 24, 16, 8 led's Led: 350-500-700-1000 mA

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☐	**CB Testing Laboratory:**		
Testing location/ address.....:			
☐	**Associated CB Testing Laboratory:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address.....:		R-TECH, Rue de Mons, 3,B-4000 LIEGE	
Tested by (name + signature).....:		Marc Abry	
Witnessed by (name, function, signature) .:		Christian Maes	
Approved by (name, function, signature)...:		Laurent Maghe	
☒	**Testing procedure: SMT/CTF Stage 3 or 4:**	R-Tech	
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):
Report integrated ledmodule
EU deviations
Pictures
Instructions

Summary of testing: full test

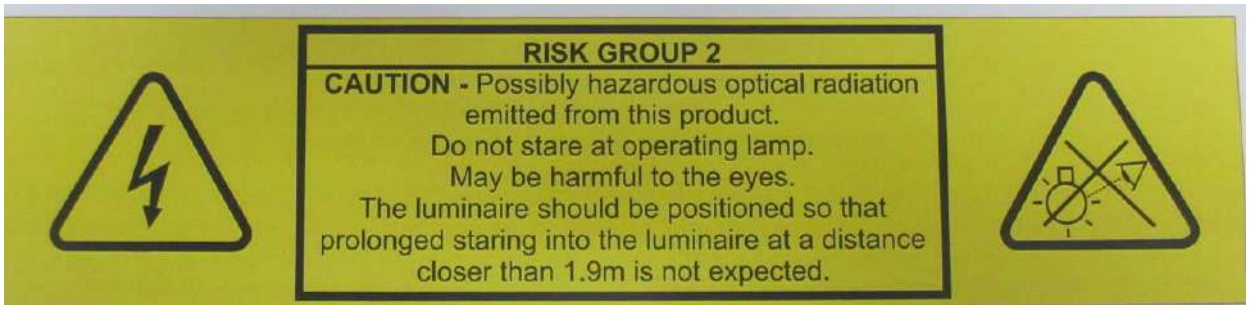
Tests performed (name of test and test clause):	**Testing location:**
IEC 60598-2-3:2002 (Third Edition) + A1:2011 used in conjunction with IEC 60598-1:2014 (Eighth Edition)	R-tech sa Rue de Mons, 3 B-4000 LIEGE Belgium.

Summary of compliance with National Differences: Europe
List of countries addressed

☒ **The product fulfils the requirements of**
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

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars.....:	
Classification of installation and use.....:	
Supply Connection.....:	
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	September 2017
Date (s) of performance of tests.....:	September 2017

General remarks:

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

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

Drivers Meanwell PLM-12(E)-350 has been added based on report P1540-44-II.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☒ **Yes** ☐ **Not applicable**

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

Name and address of factory (ies) ..... :

Comatelec S.A. Z.I. F-18400 SAINT FLORENT S/CHER France	Socelec S.A. Av. de Roanne, 66 Poligono Industrial "EL HENARES" 19180 MARCHAMALO (GUADALAJARA),Spain
Schréder Iluminação S.A. Apartado, 132 2790-076 CARNAXIDE,Portugal	Schréder do Brasil Iluminação Ltda. Rua Iracema Lucas, 415 Distrito Industrial Vinhedo 13280-000 SAO PAULO,Brazil
Schreder TOV Vul. Mykulynetska 46B 46000 TERNOPIL,Ukraine	Schreder (China) Lighting Industrial Co., Ltd No.40 Xinye 2 Street, Tianjin Economic Technological Development Zone West Zone, 300462 Tianjin City, P.R.China,China
Tungsram-Schréder Világitási Berendezések Zrt Tópart 2 2084 PILISSZENTIVAN,Hungary	

General product information:

Ta following drivers in use :

	Current (mA)	Ta Philips (°C)	Ta LG (°C)
Vol1	350	/*	55
	500	/*	55
	700	/*	55
	1000	/*	45
Vol2	350	40	55
	500	40	55
	700	40	55
	1000	/*	50
Vol3	350	55	55
	500	55	55
	700	55	55
	1000	35	45
Vol4	350	55	55
	500	50	55
	700	50	55
	1000	40	35
Vol5	350	50	55
	500	50	55
	700	50	45
	1000	40	35

* no Philips drivers available

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

3.2 (0)	**GENERAL TEST REQUIREMENTS**		P
3.2 (0.1)	Information for luminaire design considered ..... :	Standard Yes ☒ No ☐	—
3.2 (0.3)	More sections applicable..... :	Yes ☐ No ☒	—

3.4 (2)	**CLASSIFICATION**		P
3.4 (2.2)	Type of protection ..... :	Class II	—
3.4 (2.3)	Degree of protection..... :	IP 66 (without external cable)	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces ..... :	Yes ☒ No ☐	—
3.4 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes ☒ No ☐	—
	b) on a mast arm	Yes ☒ No ☐	—
	c) on a post top	Yes ☒ No ☐	—
	d) on span or suspension wires	Yes ☐ No ☒	—
	e) on a wall	Yes ☐ No ☒	—

3.5 (3)	**MARKING**		
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	50-60 Hz	P
3.5 (3.3.3)	Operating temperature		N/A
3.5 (3.3.4)	Symbol or warning notice		N/A
3.5 (3.3.5)	Wiring diagram		N/A
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	0.91	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		N/A
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		P
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		P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
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		
	a) Design attitude	See attached Installation Notice	P
	b) Weight	See attached Installation Notice	P
	c) Overall dimensions	See attached Installation Notice	P
	d) Maximum projected area if applicable	See attached Installation Notice	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	See attached Installation Notice	P
	i) Maximum mounting height	>6 m	P

3.6 (4)	**CONSTRUCTION**		
3.6 (4.2)	Components replaceable without difficulty		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	**Lampholders**		
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
3.6 (4.5)	**Starter holders**		
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
3.6 (4.6)	**Terminal blocks**		
	Tails	Provided with internal connector	N/A
	Unsecured blocks	Fixed	N/A
3.6 (4.7)	**Terminals and supply connections**		
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

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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		N/A
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
3.6 (4.8)	**Switches**		
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
3.6 (4.9)	**Insulating lining and sleeves**		
3.6 (4.9.1)	Retainment		N/A
	Method of fixing ..... :		—
3.6 (4.9.2)	Insulated linings and sleeves:		
	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
3.6 (4.10)	**Double or reinforced insulation**		
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:		
	- not coincidental		N/A
	- no straight access with test probe		N/A
3.6 (4.10.3)	Retainment of insulation:		
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
3.6 (4.11)	**Electrical connections and current-carrying parts**		
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		
	- spring washer		P
	- rivets		N/A
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
3.6 (4.12)	**Screws and connections (mechanical) and glands**		
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	2Nm (case)	P
	Torque test: torque (Nm); part..... :	1.2Nm (drivers)	N/A
	Torque test: torque (Nm); part..... :	1.2Nm (glass)	N/A
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
3.6 (4.12.4)	Locked connections:		
	- fixed arms; torque (Nm) ..... :		P
	- lampholder; torque (Nm) ..... :		N/A
	- push-button switches; torque 0,8 Nm ..... :		N/A
3.6 (4.12.5)	Screwed glands; force (Nm)..... :		P
3.6 (4.13)	**Mechanical strength**		
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :	0,5 Nm	P
	- other parts; energy (Nm)..... :	0,7 Nm	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
3.6 (4.14)	**Suspensions, fixings and means of adjusting**		
3.6 (4.14.1)	Mechanical load:		
	A) four times the weight		N/A
	B) torque 2,5 Nm		P
	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/mm²) ..... :		N/A
	Mass (kg) of semi-luminaire ..... :		—
	Bending moment (Nm) of semi-luminaire ..... :		N/A
3.6 (4.14.3)	Adjusting devices:		
	- 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
3.6 (4.15)	**Flammable materials**		
	- glow-wire test 650°C ..... :	See Test Table 3.15 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
3.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		
	a) construction		P
	b) temperature sensing control	110	P
	c) surface temperature		N/A
3.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		
	No lamp control gear ..... :	(compliance with Section 12)	N/A
3.6 (4.16.1)	Lamp control gear spacing:		
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (4.16.2)	Thermal protection:		
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		P
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	P
3.6 (4.17)	**Drain holes**		
	Clearance at least 5 mm		N/A
3.6 (4.18)	**Resistance to corrosion**		
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
3.6 (4.21)	**Protective shield**		
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
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

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Clause	Requirement + Test	Result - Remark	Verdict
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
3.6 (4.24)	**Photobiological hazards**		
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		P
3.6 (4.24.2)	Retinal blue light hazard		
	Luminaires with E_{thr} :		
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 .. :	RG1@400mm	P
	- marking and instruction according 3.2.23		P
	b) Portable and handheld luminaires		
	- 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
3.6 (4.25)	**Mechanical hazard**		
	No sharp point or edges		P
3.6 (4.26)	**Short-circuit protection**		
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
3.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
3.6 (4.28)	**Fixing of thermal sensing control**		
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
3.6 (4.29)	**Luminaires with non-replaceable light source**		
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
3.6 (4.30)	**Luminaires with non-user replaceable light source**		
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
3.6 (4.31)	**Insulation between circuits**		
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3	SELV/IEC 61347-2-13	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
3.6 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply	Double/reinforced	P
	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		P
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.2)	FELV circuits		

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Clause	Requirement + Test	Result - Remark	Verdict
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to 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		N/A
	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		N/A
3.6 (4.32)	**Overvoltage protective devices**		
	Comply with IEC 61643-11	CB	P
	External to controlgear and connected to earth:		
	- only in fixed luminaires		P
	- only connected to protective earth		P
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
3.6.2 (-)	Suspension on span wires		N/A
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.....:	1.225Kg/m³	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- loaded area (m²).....:	0.34m²	P
	- used load (N).....:	675.7N	P
	- measured deformation (cm/m) .....:	1.2cm/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	Safety Glass	P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		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		P
	- number of particles is more than 40.....:	52	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		P
3.6.5.2.1 (-)	Glass covers have high mechanical strength		P
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample	IK08	P
3.6.5.2.2 (-)	Glass covers not break into large pieces		P
	- test according 3.6.5.1, number of particles is more than 20 .....:	48	P
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
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		
	- dimension of the cable entry slot (mm).....:		N/A
	- cable path from the slot to the connection compartment (mm) .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable path free from obstruction that might cause abrasion of the cable		N/A
3.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
3.7 (11.2)	Creepage distances and clearances ..... :	See Table 3.7 (11.2)	P
	Working voltage (V) ..... :	250 V	—
	Rated pulse voltage (kV) ..... :	/	—
	Voltage form ..... :	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI ..... :	< 600 ☐ ≥ 600 ☒	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☐ Category III ☐	—
3.8 (7)	**PROVISION FOR EARTHING**		
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω ..... :		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
3.8 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
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		N/A
	Contact surface bare metal		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A
3.8.1 (-)	Attachment prevented from rotation		N/A
3.9 (14)	**SCREW TERMINALS**		P
	Separately approved; component list..... :	(see Annex 1)	P
	Part of the luminaire ..... :	(see Annex 3)	N/A
3.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		P
	Separately approved; component list..... :	(see Annex 1)	P
	Part of the luminaire ..... :	(see Annex 4)	N/A
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		
3.10 (5.2)	**Supply connection and external wiring**		**P**
3.10 (5.2.1)	Means of connection ..... :	Internal connector	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N/A
3.10 (5.2.2)	Type of cable..... :	H07RN-F (if provided)	P
	Nominal cross-sectional area (mm²) ..... :	1,5 mm²	P
	Cables equal to IEC 60227 or IEC 60245		P
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:		
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.10)	Cord anchorage:		
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		
	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:		
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60	P
	- torque test: torque (Nm) ..... :	0.25Nm	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		N/A
3.10 (5.2.11)	External wiring passing into luminaire		N/A
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		P
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		
	- IEC 60083		N/A
	- other standard		N/A
3.10 (5.3)	**Internal wiring**		
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) ..... :		N/A
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		
	Cross-sectional area (mm²)..... :		P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		
	Adequate cross-sectional area and insulation thickness		N/A
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		P
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		P
3.10 (5.3.2)	Sharp edges etc.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No moving parts of switches etc.		N/A
	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		P
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		N/A
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N) .....:	60 N	P
	- torque test: torque (Nm) .....:	0.25 Nm	P

3.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		
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
	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		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		
	- 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:		
	Ordinary luminaire:		
	- touch current ..... :		N/A
	- no-load voltage..... :		N/A
	Other than ordinary luminaire:		
	- 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		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Discharging of capacitors $\geq$ 0,5 μF		N/A
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

3.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
3.12.2 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13		—
3.12 (12.3)	Endurance test:		P
	- mounting-position..... :	Acc. To mounting instruction	—
	- test temperature (°C) ..... :	35°C	—
	- total duration (h) ..... :	240 H	—
	- supply voltage: Un factor; calculated voltage (V)... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- lamp used..... :		—
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)	P
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) ..... :		—
	- case of abnormal conditions ..... :		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .... :		—
	- measured mounting surface temperature (°C) at 1,1 Un..... :		N/A
	- calculated mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
3.12 (12.6.2)	Temperature sensing control		
	- case of abnormal conditions ..... :		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
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 ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W ..... :		—
	Test according to 12.7.1.1:		
	- case of abnormal conditions ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- Ballast failure at supply voltage (V) ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test .....:	See Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test ..... :	See Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link..... :	Yes ☐ No ☐	—
	- manual reset cut-out ..... :	Yes ☐ No ☐	—
	- auto reset cut-out ..... :	Yes ☐ No ☐	—
	- case of abnormal conditions ..... :		—
	- highest measured temperature of fixing point/ exposed part (°C): ..... :		—
	Ball-pressure test: ..... :	See 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)		—

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Clause	Requirement + Test	Result - Remark	Verdict
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		N/A
3.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		P
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP..... :	IP66	—
	- mounting position during test ..... :	Acc. to mounting instruction	—
	- fixing screws tightened; torque (Nm) ..... :	Acc. to mounting instruction	—
	- tests according to clauses..... :		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		P
	f) no contact with live parts (IP 2X)		P
	f) no entry into enclosure (IP 3X and IP 4X)		P
	f) no contact with live parts (IP3X and IP4X)		P
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		N/A
3.13 (9.3)	Humidity test 48 h		P
3.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :		—
	Insulation resistance (MΩ) ..... :		—
	SELV		
	- between current-carrying parts of different polarity :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and mounting surface..... :		N/A
	- between current-carrying parts and metal parts of the luminaire..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		
	- between live parts of different polarity ..... :	>4 Mohm	P
	- between live parts and mounting surface ..... :	>4 Mohm	P
	- between live parts and metal parts ..... :	>4 Mohm	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..... :	>4 Mohm	P
	- 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) ..... :		P
	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 ..... :	1500V	P
	- between live parts and mounting surface ..... :	1500V	N/A
	- between live parts and metal parts ..... :	1500V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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) :	<<0,5	P

3.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
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

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

3.7 (11.2)	**TABLES: Creepage distances and clearances**	p
Table 11.1	**Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages**	

RMS working voltage (V) not exceeding	50	150	250	500	750	1000
Creepage distances						
Required basic insulation, PTI ≥ 600	0,6	0,8	1,5	3	4	5,5
Measured			>2			
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10
Measured						
Required supplementary insulation PTI ≥ 600	-	0,8	1,5	3	4	5,5
Measured			>2			
Required supplementary insulation PTI < 600	-	1,6	2,5	5	8	10
Measured						
Required reinforced insulation	-	3,2	5	6	8	11
Measured			>7			
Clearances						
Required basic insulation	0,2	0,8	1,5	3	4	5,5
Measured			>2			
Required supplementary insulation	-	0,8	1,5	3	4	5,5
Measured						
Required reinforced insulation	-	1,6	3	6	8	11
Measured			>4			

Table 11.2	**Minimum distances (mm) for non-sinusoidal pulse voltages**						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured							
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

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

3.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**				**N/A**
Allowed impression diameter (mm) ..... :					—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)		
Supplementary information:					

3.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**					N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Supplementary information:						

3.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**					**N/A**
Glow wire temperature ..... :	650°C					—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
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)	**TABLE: Proof tracking test (IEC 60112)**					**N/A**
Test voltage PTI ..... :	175 V					—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict	
Supplementary information:						

ANNEX 1	**TABLE: Critical components information**	

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

Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)]
Drivers	B	LG Innotek	LLP 110W 1A (LG PISE A110A) 68-110V	V in 120-277V AC Max 110W Vout:68-110Vdc tc:80°C	IEC/ EN 613472-13	CB
Drivers	B	LG Innotek	LLP 55W 1A (LG PISE A55A) 44-55V	V in 120-277V AC Max 55W Vout:44-55-Vdc tc:80°C	IEC/ EN 613472-13	CB
Drivers	B	LG Innotek	LG PISE A027A	V in 120-277V AC Max 27W Vout:22-27-Vdc tc:80°C	IEC/ EN 613472-13	CB
Drivers	B	Tridonic	LCI 27W 1-10V	220-240V 50/60Hz tc 70°C	IEC/ EN 613472-13	CB
Driver	A	LG	PISE-A040D	40W 0.35-0.7A 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	CB / UL
Driver	A	LG	PISE-A040A	40W 0.35/0.5/0.7 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	CB / UL
Driver	A	LG	PISE-A075A	75W 0.35/0.5/0.7 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	CB / UL
Driver	A	LG	PISE-A075D	75W 0.35-0.7A 120-277V 50-60Hz Tc=80°C	IEC 61347-2-13	CB / UL
Drivers	A	LG	PISE-A150D	150W 50/60Hz 0.35-07A 120-277V Tc=80°C	IEC 61347-2-13	CB / UL
Drivers	A	LG	PISE-A150A	150W 50/60Hz 0.35/0.5/0.7 120-277V Tc=80°C	IEC 61347-2-13	CB / UL
Drivers	A	PHILIPS	Xi FP 40W 0,3-1,0A SNLDAE 230V S175 sXt	40W 50-60Hz 0,3-1,05A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi FP 40W 0,2-0,7A SNLDAE 230V S175 sXt	40W 50-60Hz 0,2-0,7A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 40W 0,3-1,0A S1 230V S175 sXt	40W 50-60Hz 0,3-1,05A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 40W 0,2-0,7A S1 230V S175 sXt	40W 50-60Hz 0,2-0,7A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 70W 0,2-0,7A SL 230V C150 sXt	70W 50-60Hz 0,2-0,7A 198-264V Tc=85°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi FP 75W 0,2-0,7A SNLDAE 230V S240 sXt	75W 50-60Hz 0,2-0,7A 198-264V Tc=85°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi FP 75W 0,3-1,0A SNLDAE 230V S240 sXt	75W 50-60Hz 0,3-1,05A 198-264V Tc=85°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 75W 0,3-1,0A S1 230V S240 sXt	75W 50-60Hz 0,3-1,05A 198-264V Tc=85°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 75W 0,2-0,7A S1 230V S240 sXt	75W 50-60Hz 0,2-0,7A 198-264V Tc=85°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 150W 0,3-1,0A SL 230V S240 sXt	150W 50-60Hz 0,3-1,05A 198-264V Tc=90°C	IEC 61347-2-13	CB

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

Drivers	A	PHILIPS	Xi LP 150W 0,3-1,0A SL 230V S240 sXt	150W 50-60Hz 0,3-1,05A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi FP 150W 0,3-1,0A SNLDAE 230V S240 sXt	150W 50-60Hz 0,3-1,05A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi LP 150W 0,2-0,7AA SL 230V S240 sXt	150W 50-60Hz 0,2-0,7A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	PHILIPS	Xi FP 150W 0,2-0,7A SNLDAE 230V S240 sXt	150W 50-60Hz 0,2-0,7A 198-264V Tc=90°C	IEC 61347-2-13	CB
Drivers	A	Meanwell	PLM-12-350 PLM-12E-350	12W 50-60Hz 0.35A 110-240Vac Tc=75°C Ta=50°C	IEC 61347-2-13	CB
Control Device	A	Owlet	LuCo ADP	110-277V 50/60 Hz Tmax = 80°C	IEC/EN 61347	CB / UL
Control Device	A	Owlet	LuCo NXP	110-277V 50/60 Hz Tmax = 80°C	IEC/EN 61347	CB / UL
Control Device	A	Owlet	LuCo P7	110-277V 50/60 Hz Tmax = 75°C	IEC/EN 61347	CB / UL
Control Device	A	Owlet	Shorting Cap	Luco P7 Empty Body	IEC/EN 61347	Test report P-E16059
Connection Device	A	TE	TE NEMA Socket 7-pin	Power contacts: 15A 480V Dimming contacts: 0.10A 10V	IEC 61347-1 IEC 61347-2-11	CB
FUSE HOLDER	A	Mersen	10x38mm CCR8-10 Series	20-32A 400V	IEC 60269-1 & -2	ENEC
FUSE HOLDER	A	CAMDENBOSS	CFTBN 5x20mm	13A 250V	IEC 60269-1 & -2	VDE / UL
FUSE	A	Mersen	FR10 10x38mm	0.5-32A 400-500V	IEC 60269-1 & -2	ENEC
FUSE	A	Littlefuse	5x20mm 213 Series	0.2-6.3A 250V	IEC 60269-1 & -2	VDE
VDR	A	Littlefuse	TM0V	275 Vac 10kA 20KV (DM)	IECQ-CECC E 1274/F	VDE
ESD	A	Vishay	VR 37	0,5W 2MΩ	DIN EN 60085	VDE
Surge protection Device	A	Vossloh	SPC3/230/10K/i	100-277V 50/60Hz 10kA 20KV (DM) 120KV (CM) Tc=80°C	IEC 61643-11	DEKRA
Surge protection Device(alt)	A	Cirprotec	NSS-10-C12-P NSS-10/230-D-LCF-P	max 320V 50-60 Hz 10kA 20KV (DM) 120KV (CM) Tc=80°C	IEC 61643-11	DEKRA
Terminal	A	WIELAND	GST18i S B	16A/250V 2.5mm²	EN 60998-1&2-2	VDE / UL
Terminal	A	ADELS	LK980-01	2.5mm², 450V 24A	EN 60998-1&2-2	VDE / UL
Terminal	A	ADELS	900-07/Q	0.5-4mm² 450V	EN 60998-1&2-2	VDE / UL
Terminal	A	ADELS	AC-166 ST(D)/3	0.5-2,5mm² 250-400V	EN 60998-1&2-2	VDE / UL
Terminal	A	WAGO	222 Series	0.08-2.5mm² 20A/400V	EN 60998-1&2-2	ENEC / UL
Terminal	A	WAGO	221 Series	0.2-4mm² 32A/450V	EN 60998-1&2-2	ENEC / UL
Terminal	A	WAGO	Connector 2 pole 294 model	24A/500V 0.5-2.5mm²	EN 60998-1&2-2	ENEC
Cable Gland	A	Hummel	HSK-K	IP68-10bar M20x1,5	DIN EN 62444	VDE / UL

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

Led Modules	A	LG	8 Leds G4TOP @1000 mA 16 Leds G4TOP @1000 mA 24 Leds G4TOP @1000 mA 32 Leds G4TOP @1000 mA	RG	IEC/EN 62031-62471	Tested in appliance
Led Modules	A	LG	8 Leds G4 @1000 mA 16 Leds G4 @1000 mA 24 Leds G4 @1000 mA 32 Leds G4 @1000 mA	RG	IEC/EN 62031-62471	Tested in appliance
Led Modules (Voltana)	A	LG	8 Leds G4L @1000 mA 16 Leds G4L @1000 mA 24 Leds G4L @1000 mA 32 Leds G4L @1000 mA	RG	IEC/EN 62031-62471	Tested in appliance
Led Modules	A	Schréder	2x12 Leds XP-G2 @700 mA 2x16 Leds XP-G2 @700 mA 24 Leds XP-G2 @700 mA 32 Leds XP-G2 @700 mA	RG0	IEC/EN 62031-62471	Tested in appliance

Supplementary information:

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

The codes above have the following meaning:

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

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

C - Integrated component tested together with the appliance

D - Alternative component

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-1	—
	Lamp used..... :	8 Led's LG3535	—
	Lamp control gear used..... :	Tridonic 27W @ 1000 mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 45 °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	45	68			70		
Supply wiring	45	57			90		
Led Module	45	73			85		
Terminal	45	57			110		
Internal wiring	45	57			90		

Supplementary information:
Corrected for Ta 45 °C

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-1	—
	Lamp used..... :	8 Led's XPL	—
	Lamp control gear used..... :	MeanWell PLD-40 @ 1400 mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 55 °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	55	87			90		
Supply wiring	55	64			90		
Led Module	55	106			130		
Terminal	55	64			110		
Internal wiring	55	64			90		

Supplementary information:
Corrected for Ta 55 °C

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-1	—
	Lamp used..... :	8 Led's LG3535	—
	Lamp control gear used..... :	Philips 40W @ 700 mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 55 °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	55	78			90		
Supply wiring	55	64			90		
Led Module	55	74			85		
Terminal	55	64			110		
Internal wiring	55	64			90		

Supplementary information:
Corrected for Ta 55 °C

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-2	—
	Lamp used..... :	16 Led's LG3535	—
	Lamp control gear used..... :	Xitanium 40W @ 700 mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 40 °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	40	86			90		
Supply wiring	40	50			90		
Led Module	40	65			85		
Terminal	40	50			110		
Internal wiring	40	50			90		

Supplementary information:
Corrected for Ta 40°C

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-3	—
	Lamp used..... :	24 Led's LG3535	—
	Lamp control gear used..... :	Xitanium 150W@1000 (700) mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 35 (55) °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	35 (55)	61 (84)			90		
Supply wiring	35 (55)	46 (64)			90		
Led Module	35 (55)	80 (85)			85		
Terminal	35 (55)	46 (64)			110		
Internal wiring	35 (55)	46 (64)			90		

Supplementary information:
Corrected for Ta 35 (55) °C

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-4	—
	Lamp used..... :	32 Led's LG3535	—
	Lamp control gear used..... :	Xitanium 150W @1000 (700) mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 40 (50) °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	40 (50)	88 (86)			90		
Supply wiring	40 (50)	55 (61)			90		
Led Module	40 (50)	81 (79)			85		
Terminal	40 (50)	55 (61)			110		
Internal wiring	40 (50)	55 (61)			90		

Supplementary information:
Corrected for Ta 40 (50) °C

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference ..... :	VOLTANA-5	—
	Lamp used..... :	64 Led's LG3535	—
	Lamp control gear used..... :	Xitanium 150W @1000 (700) mA	—
	Mounting position of luminaire ..... :	Horizontal	—
	Supply wattage (W) ..... :		—
	Supply current (A) ..... :		—
	Calculated power factor..... :		—
	Table: measured temperatures corrected for ta = 35 (50) °C:		
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Convertor Tc	35 (50)	81 (85)			90		
Supply wiring	35 (50)	52 (61)			90		
Led Module	35 (50)	82 (80)			85		
Terminal	35 (50)	52 (61)			110		
Internal wiring	35 (50)	52 (61)			90		

Supplementary information:
Corrected for Ta 35 (50)°C

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

ANNEX 3	**Screw terminals (part of the luminaire)**		N/A
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²).....:		—
(14.3.3)	Conductor space (mm).....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....:		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) .....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

ANNEX 4	**Screwless terminals (part of the luminaire)**		N/A
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A

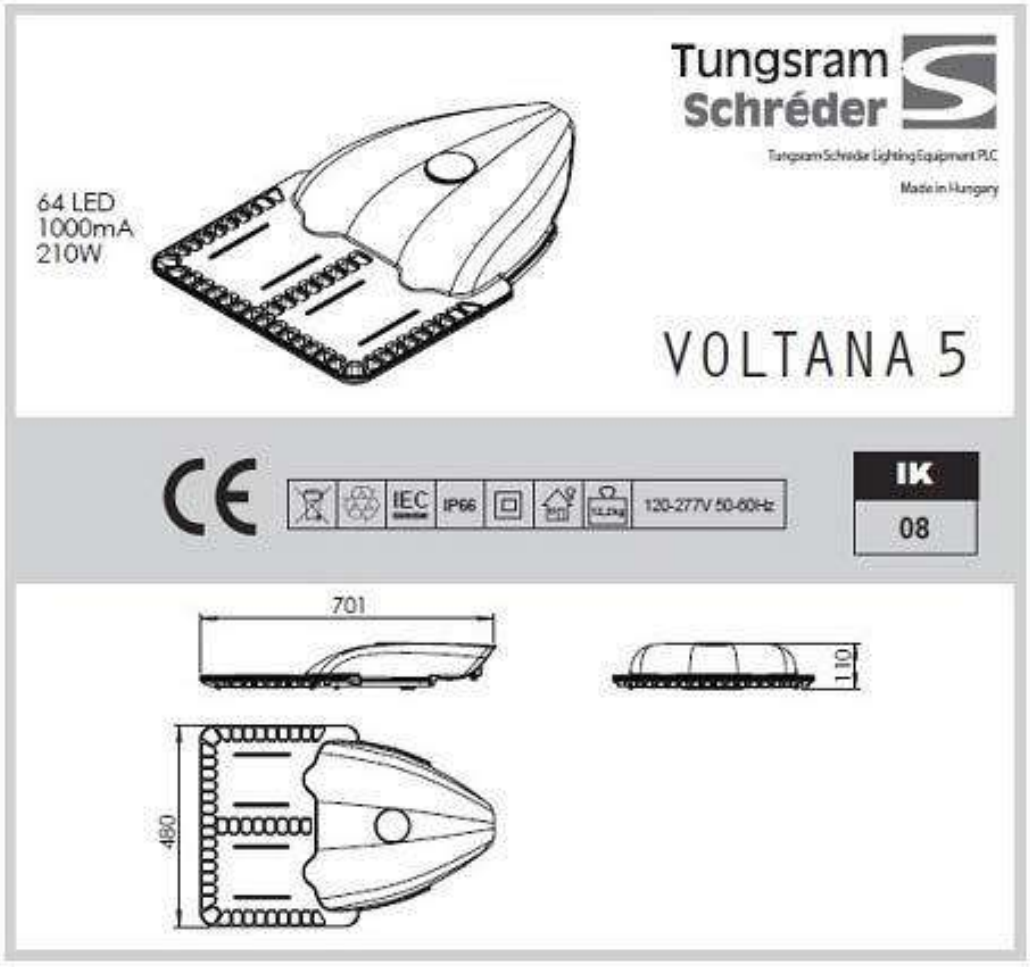
IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
(15.6)	Terminals external wiring		N/A
	Terminal size and rating		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A

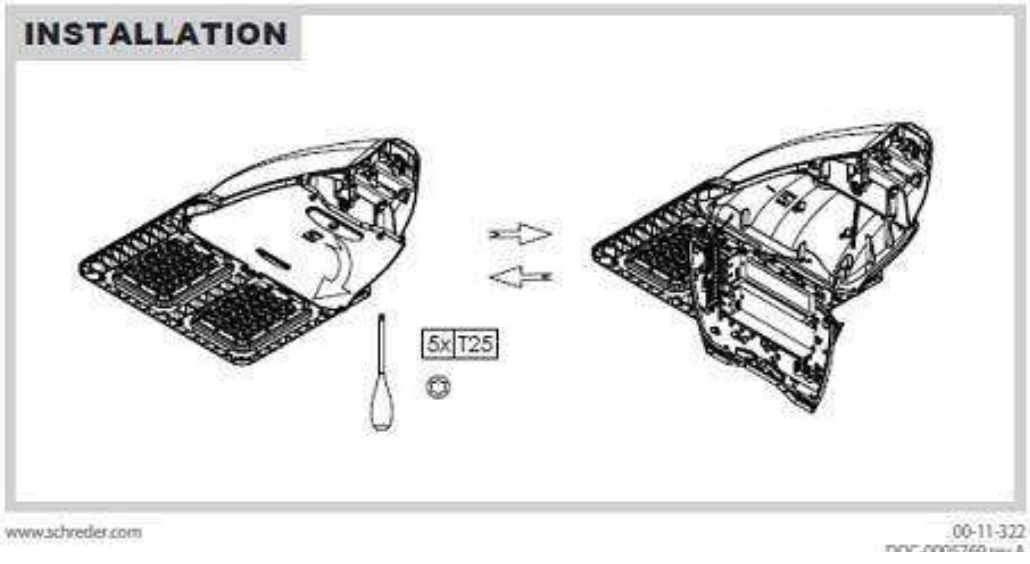
IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

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

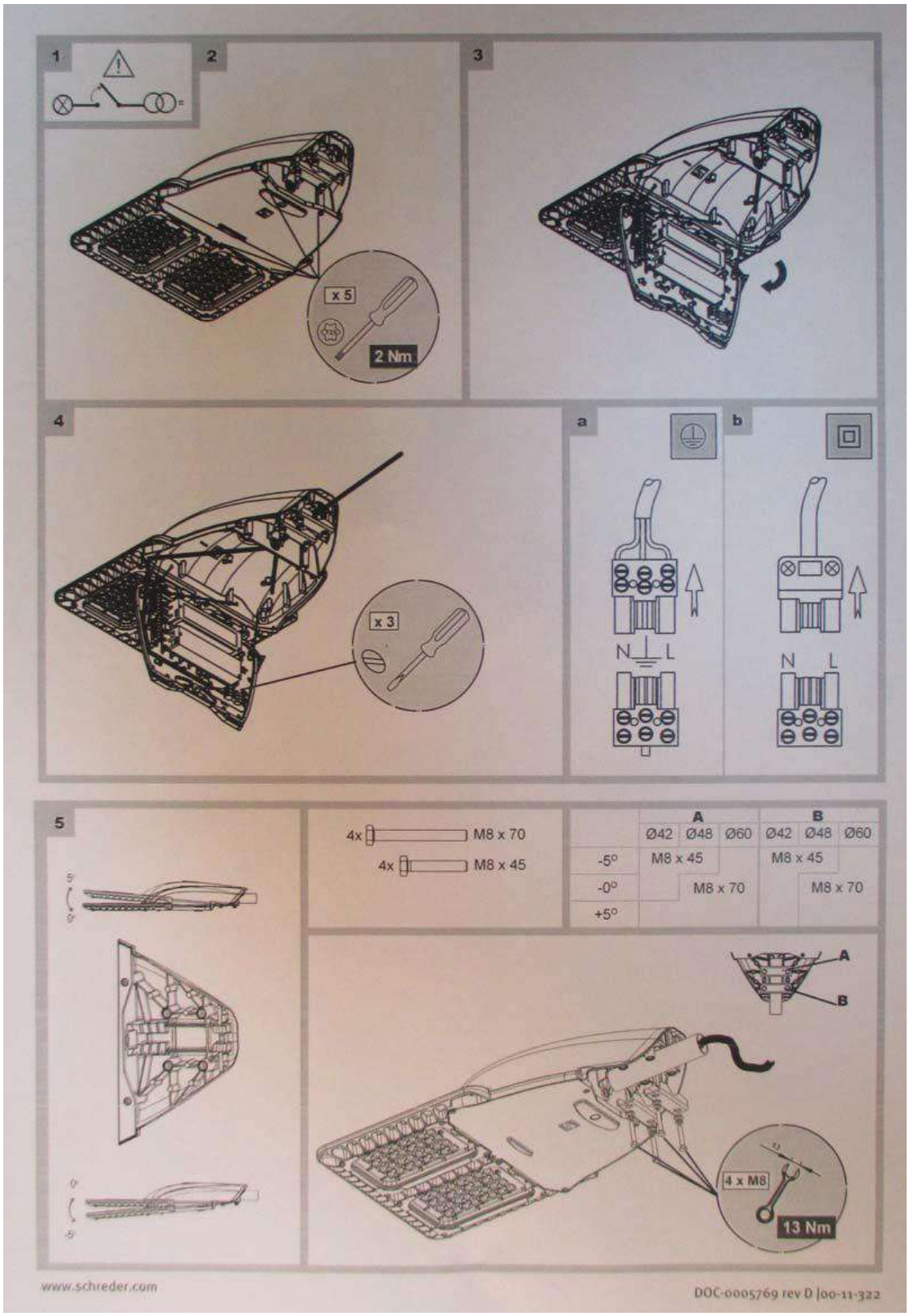
IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Installation Notice and pictures





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

IEC60598_2_3K - ATTACHMENT			
Clause	Requirement – Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-3
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
LUMINAIRES
PART 2: PARTICULAR REQUIREMENTS
SECTION 3: LUMINAIRES FOR ROAD AND STREET LIGHTING

Differences according to ..... :	EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015
Annex Form No. ..... :	EU_GD_IEC60598_2_3K
Annex Form Originator ..... :	IMQ S.p.A.
Master Annex Form..... :	2016-12

	CENELEC COMMON MODIFICATIONS (EN)		**P**

3.5 (3)	**MARKING**		
3.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A

3.6 (4)	**CONSTRUCTION**		
3.6 (4.11.6)	Electro-mechanical contact systems		N/A

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

3.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N/A

ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A

IEC60598_2_3K - ATTACHMENT			
Clause	Requirement – Test	Result - Remark	Verdict
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

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 Schréder Group

Subject: **VOLTANA-2 16 Led's**
Sample n°: P-E14361

Test purpose: **Electrical measurements @ 1A**

Remarks:
Test request n°: P-D14674
Folder n°: P-F14058

TEST CONDITIONS:

Operator: CLOSSET Frédérick

Driver: LG Innotek PISE-A055A, 1A driver

Load: 16 led's (Typical Vf: 3,18 V)

Power Supply:
Elgar Tw 3500-4
Supply voltage: 230 V 50 Hz

Measurement device:
Fluke Norma 4000 (HF Powermeter, User 10, filter OFF)

CONCLUSIONS:

- Efficiency: 87,0 %
- PF: 0,97
- THD: 8,6 %
- Harmonics distribution complies with the IEC/EN 61000-3-2 Standard.

Duplicate to: Mr M. Thijs
LAB 16/09/2014
J.P. Harchies

//P-14E674

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 Schréder Group

Subject: **VOLTANA-2 16 led's @ 1A class I**
Sample n°:

Test purpose: **EMC tests according to EN 55015 & EN 61547 Standards**

Remarks:
Test request n°: P-D14700
Folder n°: P-F14058

TEST CONDITIONS:

Operator: ULg - EMC

Test Summary
EN 55015 & EN 61547 Standards

Emission

Standard	Limit / Level	Result	
		PASS	FAIL
EN 55015 Conducted Emission 9kHz- 30 MHz		X	
EN 55015 Annex B 30 MHz – 300 MHz		X	

Immunity

Standard	Limit / Level	Result	
		PASS	FAIL
EN 61000-4-5	0.5 , 1 , 2 & 4 kV M.D. Impulse + @ 90° Impulse - @ 270° 20' between impulse Criteria B required	X	

Driver: LG Innotek PISE-A 055A – 55W 1A (Rev-04)

EMC Auxiliaries: Ferrite W-E 742 700 55

CONCLUSIONS:

VOLTANA-2 16 led's driven @ 1A by LG Innotek 55 W driver complies with the CISPR/EN 55015 and EN 61547 Standards.

Remark: Surge protection tested OK up to 4 KV for both Differential & Common modes (Max ULg facilities).

Duplicate to: Mr M. Thijs
LAB 23/09/2014
J.P. Harchies

//P-14E700

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 Schréder Group

Subject: **VOLTANA-2 Extra Clear glass protectors**
Sample n°: P-E15378

Test purpose: **Fragmentation test following IEC/EN 60598-2-3 Standard**

Remarks:
Test request n°: P-D15559
Folder n°: P-F14058

TEST CONDITIONS:

Operator: BOMBIL Patrick

3 samples under test
Glass thickness: 5 mm

Fragmentation test

- An adhesive sheet is scotched on the protector internal side to hold the particles after breakage.
- Impact with spring punch hammer
- Impact on the external side of protector
- Impact at 3 cm from the mid-point of the longest edge.
- Counting of the particles in the coarsest area in a 5 cm side square within 5 minutes after breakage.

Results:
Sample 1: 117 pieces
Sample 2: 116 pieces
Sample 3: 118 pieces

CONCLUSIONS:

VOLTANA-2 Extra Clear Glass protector complies with fragmentation test following IEC/EN 60598-2-3 Standard.

Duplicate to: Mr M. Thijs
LAB 21/08/2015
L. Maghe

//P-15CR559

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 Schréder Group

Subject: **VOLTANA-2**
Sample n°: P-E14362

Test purpose: **Mechanical impact resistance test following IEC/EN 62262 Standard**

Remarks:
Test request n°: P-D14698
Folder n°: P-F14058

TEST CONDITIONS:

Operator: BOMBIL Patrick

Smooth extra clear glass
Glass thickness: 5 mm

At pendulum hammer
5 impact points distributed on protector surface
One impact on each point

Test on 5 samples

Test	**Result**
IK08 : Impact energy: 5 joules Hammer weight: 1,7 kg Height of fall: 29,4 cm	OK for the 5 samples for all tested points

CONCLUSIONS:

VOLTANA-2 satisfies the IK08 test following IEC/EN 62262 Standard.

Duplicate to: Mr M. Thijs
LAB 23/09/2014
J.P. Harchies

//P-14E698

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 Schréder Group

Subject: **VOLTANA-2 16 led's @ 1A**
Sample n°:

Test purpose: **Tightness test IP66 following IEC/EN 60598-1 Standard**

Remarks:
Test request n°: P-D14696
Folder n°: P-F14058

TEST CONDITIONS:

Operator: BOMBIL Patrick

Preconditioning: endurance test

Test	Result
IP6X : -Luminaire switched ON until stable T° -Talcum in suspension (blowing ON) -After 1', luminaire OFF -Talcum for 3 hours	OK.
IPX6 : - Luminaire switched ON until stable T° - Luminaire switched OFF and immediately sprayed with water jet - Hose Φ 12,5 mm - Water pressure: 1 kg/cm2 - Spraying distance: 3 m - Duration of test: 3 minutes	OK.

CONCLUSIONS:

VOLTANA-2 16 led's @ 1A satisfies the IP66 test following IEC/EN 60598-1 Standard.

Duplicate to: Mr M. Thijs
LAB 23/09/2014
J.P. Harchies

//P-14E696

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 Schréder Group

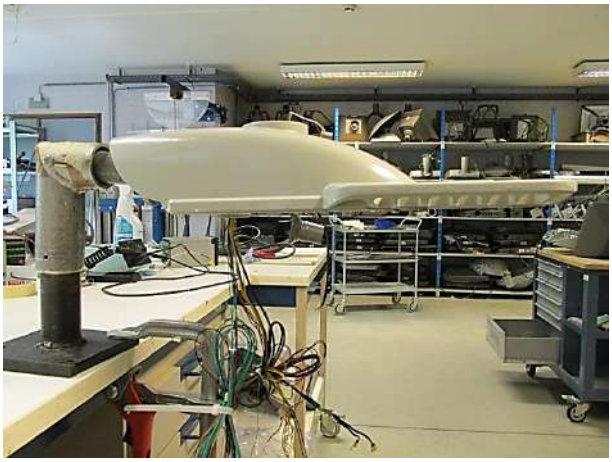
Subject: **VOLTANA-2 16 Led's**
Sample n°: P-E14361

Test purpose: **Thermal test evaluation @ 1A**

Remarks:
Test request n°: P-D14697
Folder n°: P-F14058

TEST CONDITIONS:

Operator: CLOSSET Frédérick



Load: 16 led's

Driver: LG Innotek LLP 55 W 1,0 A
PISE-A055A
Tc 80 °C

Measurement device:
Yokogawa TX10: thermal measurement
Yokogawa WT 210: primary EM
Fluke 87: secondary and led's EM

Junction Temperature measurement method
Junction temperature measurement by base temperature measurement and electrical measurement.
$T°_j = T°_b + R_{jb} \times P_{led}$

CONCLUSIONS:
According to "Led's Lumen Maintenance Criterion" LM80 extrapolation 6.000 hrs, we can state VOLTANA-2 16 led's driven @ 1A by LG Innotek driver LLP 55 W PISE-A055A driver satisfies:
Tq (CEI): 35 °C for led's with L80 – 100 Khrs target
Tq (CEI): 35 °C for lenses in Diakon material
Tq (CEI): 35 °C for driver PISE-A055A
Ta (CEI): 55 °C

Duplicate to: Mr M. Thijs
LAB 23/09/2014
J.P. Harchies

//P-14E697

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 Schréder Group

Subject: **VOLTANA-2 – Side entry Configuration**
Sample n°: P-E14365

Test purpose: **Vibrations test: "Street Lighting Luminaires" testing protocol**

Remarks:
Test request n°: P-D14801
Folder n°: P-F14058

TEST CONDITIONS:

Operator: V2i

Testing protocol

	"Street Lighting Luminaires" testing protocol
Test Item	Post-top and Side-entry Luminaire
Excitation Direction	3 directions
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 55 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g
Test	Q < 2 (no natural frequency)
	Excitation: **RANDOM (*)** Frequency band: 5 - 55 Hz Acceleration: 0.84g_{RMS} Duration: 1h
	Q > 2
	Excitation : sine dwell Frequency : f0 (Qmax) Acceleration : 0.5g Duration : 30 minutes
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 55 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g

(*) The RANDOM equivalent test consist in an accelerated ageing process of one hour which presents, on a reference one-degree-of-freedom system, an equivalent fatigue damage spectrum than 20 years of mean wind and 90 hours of storms.

CONCLUSIONS:

VOLTANA-2 side entry configuration satisfies the Vibration tests following "Street Lighting Luminaires" testing protocol.

Duplicate to: Mr M. Thijs
LAB 21/10/2014
J.P. Harchies

//P-14E801

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 Schréder Group

Subject: **VOLTANA-2**
Sample n°: P-E14363

Test purpose: **Aerodynamic wind test**

Remarks:
Test request n°: P-D14699
Folder n°: P-F14058

TEST CONDITIONS: Operator: ULg – CAT Soufflerie

2 tests realized:

1) Aerodynamic Coefficient determination
2) Endurance test

1) Aerodynamic coefficient determination

	Value (m²)		
Wind Direction	**Cd.S (drag)**	**Cs.S (Side)**	**Cl.S (Lift)**
Front	0,004	-0,004	0,002
Side	0,019	0,019	0,019

2) Endurance test: wind qualification test

Wind direction: Side

Wind resistance: 10' at 180 km/h

Result: OK

CONCLUSIONS:

VOLTANA-2 satisfies the wind speed test 180 Km/h for 10 minutes.
See Aerodynamic coefficients here above.

Duplicate to: Mr M. Thijs
LAB 23/09/2014
J.P. Harchies

//P-14E699

VOLTANA

ILUMINAT CU LEDURI, POTRIVIT ORICUI

EFICIENTIZAREA COSTURILOR

PERFORMANȚĂ RIDICATĂ

BENEFICII REMARCABILE

NU NECESITĂ ÎNTREȚINERE

Schréder

VOLTANA

CEA MAI NOUĂ, RENTABILĂ ŞI PERFORMANTĂ GAMĂ DE APARATE DE ILUMINAT, CARE ÎŞI ACOPERĂ INVESTIȚIA ÎN TIMP

POSIBILITATEA DE A RECUPERA INVESTIȚIA RAPID, PENTRU ILUMINAREA ORICĂRUI TIP DE PEISAJ URBAN SAU RURAL, A STAT LA BAZA DEZVOLTĂRII GAMEI VOLTANA. **DEVIZA NOASTRĂ ESTE: „ILUMINATUL CU LED ESTE PENTRU ORICINE".**

CALITATE FĂRĂ COMPROMISURI

Bazate pe modulul LED LensoFlex®2, aparatele de iluminat Voltana furnizează soluții de iluminat durabile, care scad semnificativ consumul de energie şi îmbunătățesc nivelul de iluminat.

INVESTIȚII MINIME

Disponibil în 5 dimensiuni, cu flux luminos cuprins între 900 de lumeni şi 23.900 lumeni, având numeroase distribuții luminoase de înaltă eficiență şi diverse opțiuni pentru control, gama Voltana întâmpină toate nevoile de iluminat urban şi rutier, cu investiții minime.

RECUPERARE RAPIDĂ, ECONOMII DE DURATĂ

Cu o durată de viață de 100.000 de ore, Voltana permite evitarea a 4, până la 6 schimbări ale lămpilor, comparativ cu sursele de iluminat convenționale. În perioada în care, pentru aparatele cu lămpi, ar fi necesară înlocuirea aparatului de iluminat, Voltana câştigă deja bătălia pentru scăderea costurilor totale, față de soluțiile HID. În primul rând, Voltana recuperează investiția, apoi continuă să ofere beneficii substanțiale, pentru o lungă perioadă de timp.

VOLTANA **0** VOLTANA **1** VOLTANA **2** VOLTANA **3** VOLTANA **4** VOLTANA **5**

ZONE PIETONALE

Străzi, alei şi piste \de biciclete

STRADAL

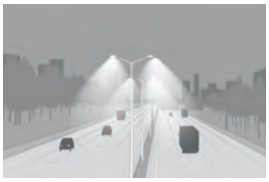
Străzi rezidențiale

Spații comune, zone comerciale din mediul urban

CĂI DE CIRCULAȚIE

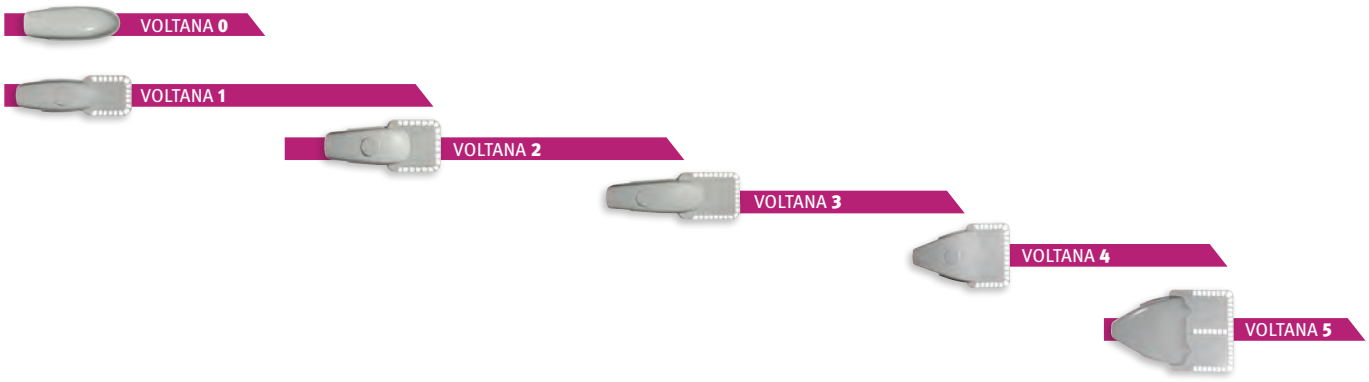
Căi de circulație din mediul rural

Căi de circulație din mediul urban



substitut HID

20/50W	70W	100W	150W	250W



ALTE MEDII ÎN CARE VOLTANA OFERĂ BENEFICII-CHEIE PENTRU CLIENT


FACILITĂȚI DE TRANSPORT


ZONE INDUSTRIALE


ZONE COMERCIALE


FACILITĂȚI SPORTIVE

PERFORMANT

UTILIZÂND **TEHNOLOGIE DE ULTIMĂ ORĂ,** VOLTANA SURCLASEAZĂ ORICE TIP DE APARAT DE ILUMINAT HID:

› Sistem cu **eficienţă ridicată**: până la 130 lm/ W
› **Index ridicat de redare a culorilor** (CRI) › 70
› Distribuție luminoasă avansată, care permite ca spațiul dintre stâlpi să crească, oferind un iluminat uniform

VERSATIL

GAMA VOLTANA ESTE **ULTRA-FLEXIBILĂ**, ASTFEL CĂ OFERĂ SOLUȚIA IDEALĂ PENTRU NEVOILE SPECIFICE DE ILUMINAT:

› **Distribuţii luminoase adaptate** atât pentru zonele şi căile de circulație foarte înguste, cât şi pentru cele foarte largi
› Numeroase **variante de intensitate luminoasă,** mulțumită celor 6 dimensiuni disponibile şi numeroşilor curenți conductori
› Numeroase **opțiuni de control**
› Proiectat atât pentru montaj lateral, cât şi pentru fixarea în vârf de stâlp (opțional)
› Rezistență la temperaturi ambiante extreme, de până la 55°C

CONSTRUIT SĂ REZISTE

VOLTANA A FOST PROIECTAT SĂ OFERE **PERFORMANȚĂ PE TERMEN LUNG**

› **Optimizează disiparea căldurii,** pentru a creşte durata de viață a componentelor
› **Protecție termică integrată,** cu facilități de reducere a fluxului, în caz de supraîncălzire
› **Protecţie la supratensiuni** (4kV standard, 10 kV opțional) pentru a proteja aparatul de iluminat de vârfurile de tensiune
› **Nivelul ridicat de etanşeitate** (IP 66) previne distrugerea componentelor & pierderea performanței
› **Materiale robuste** - aluminiu, oțel galvanizat şi sticlă securizată, pentru un nivel ridicat de rezistență la impact (IK 08)
› **Certificat pentru vibraţii 3G** (cu montaj)
› **Rezistență la vânt** de până la 180 km/h
› **Nu necesită întreținere**

CONFORM

GAMA VOLTANA A FOST **CERTIFICATĂ** DE CELE MAI PRETENȚIOASE ORGANISME EUROPENE ŞI AMERICANE:

› ENEC
› ETL / UL
› date despre iluminatul cu LEDuri

DEZVOLTARE DURABILĂ

DE LA ÎNCEPUT, APARATUL VOLTANA A FOST DEZVOLTAT PENTRU **A PROTEJA MEDIUL**

› **Materiale reciclabile** (aluminiu, oțel şi sticlă)
› **Profil destinat protejării mediului** (PEP) pentru scăderea amprentei ecologice
› **Emisii de CO_2 reduse** (economie şi întreținere)
› Fără poluare luminoasă (**ULOR 0%**), mulțumită distribuției luminoase precise

SOCIAL

VOLTANA ADUCE NUMEROASE **BENEFICII COLECTIVE**

› Vizibilitate îmbunătățită, cu lumină albă, care oferă **contrast ridicat**
› **Siguranță ridicată,** pentru pietoni şi pentru conducătorii auto
› Opțional, iluminat la cerere, pentru a oferi lumină atunci când şi acolo unde este cu adevărat necesară
› **Mai puține interferențe în trafic**, datorită faptului că nu este necesară întreținerea şi datorită posibilității de monitorizare
› Contribuie la **administrarea eficientă a finanțelor** şi la consumul responsabil de energie

PRECIS

CU 6 DIMENSIUNI DISPONIBILE, VOLTANA RĂSPUNDE EXACT **NEVOILOR SPECIFICE**

› **Investiție optimizată,** cu minimum de resurse
› **Adaptare precisă** la nevoile reale
› **Design uniform** pentru întregul proiect
› **Uşor de utilizat** pentru instalator (opțional, poate fi furnizat pre-cablat)

INTELIGENT

CU NUMEROASE **OPȚIUNI DE CONTROL**, VOLTANA OFERĂ OPORTUNITĂȚI PENTRU CREAREA DE SCENARII DE ILUMINAT NELIMITATE ŞI PENTRU **ÎMBUNĂTĂȚIREA MANAGEMENTULUI OPERAȚIONAL**

› Disponibil cu profil **DALI** 1-10 V sau **profil de reducere** personalizat
› **Flux Luminos Constant** (CLO), pentru compensarea automată a deprecierii fluxului
› Poate funcționa într-o **rețea independentă** limitată sau în **rețeaua unui oraş**, prin comunicație fără fir. Scenariile pot fi îmbunătățite prin **senzori externi.***

› Disponibil cu **fotocelulă** sau **priză NEMA P7**, pentru a opera în noua platformă Owlet IoT

* indisponibil pentru Voltana 0

CARACTERISTICI - CHEIE

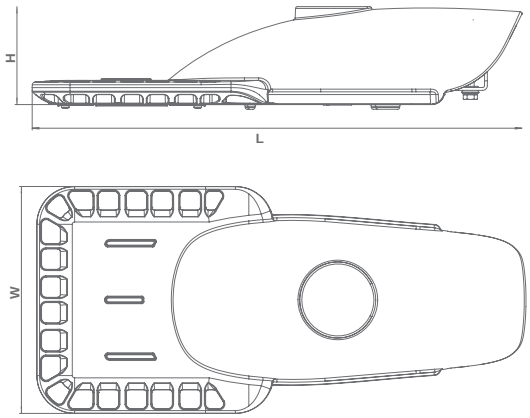
	Voltana 0	Voltana 1	Voltana 2	Voltana 3	Voltana 4	Voltana 5
Flux luminos standard (gamă) (*)	700 - 2,500lm	800 - 3,000lm	1,800 - 6,100lm	2,700 - 9,200lm	3,700 - 12,700lm	7,500 - 25,200lm
Consum de energie (W) (*)	8 - 30W	10 - 31W	20 - 56W	28 - 82W	36 - 110W	70 - 215W
Flux rezidual pe durata de viață @ tq 25°C	@100,000h Curent până la 700mA: up to 95% | Curent de la 701mA până la 1A: până la 90%					
Temperatură de culoare	alb cald sau neutru					
Etanș. compartiment optic	IP 66 (**)					
Etanș. placă echip. control	IP 66 (**)					
Rezistență la impact (sticlă)	IK 08 (***)					
Putere nominală	120 - 277V - 50 - 60Hz					
Clasă electrică	EU I sau II (**)					
Înălțimea de instalare	4 - 12m					
Materiale						
Corp	Aluminiu turnat sub presiune					
Difuzor	Sticlă (policarbonat pentru unele variante ale Voltana o)					
Culoare	RAL 7038 Orice altă culoare din paletarul RAL, la cerere					

(*) Fluxul inițial și consumul de curent al aparatului sunt valori orientative, pentru temperatură ambientală de 25°C. Fluxul real depinde de condițiile de mediu (de exemplu, temperatură) și poate varia, în anumite configurații. Valorile comunicate sunt supuse modificărilor, conform evoluției tehnologice. Pentru a verifica dacă acest document cuprinde ultimele informații disponibile, vă rugăm să vizitați www.schreder.com

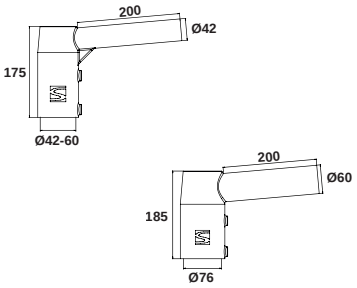
(**) conform standardului IEC - EN 60598 (doar Voltana o este disponibil cu Clasa I) – (***) conform standardului IEC - EN 62262

DIMENSIUNI | GREUTATE

	Voltana 0	Voltana 1	Voltana 2	Voltana 3	Voltana 4	Voltana 5
L	416mm	501mm	518mm	641mm	555mm	705mm
W	156mm	181mm	240mm	240mm	380mm	480mm
H	91mm	87mm	108mm	111mm	112mm	109mm
KG	2.6kg	4kg	5kg	6kg	8kg	12kg

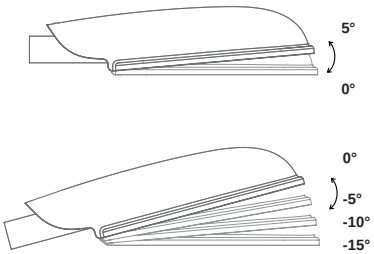


ADAPTOR VÂRF DE STÂLP

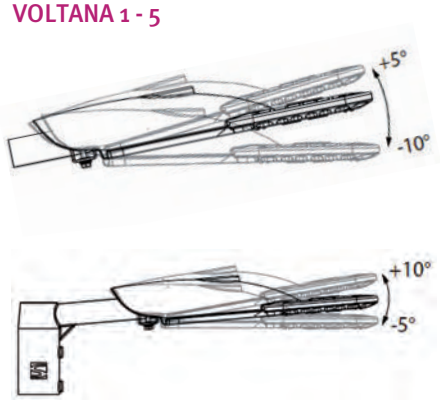


REGLAJE UNGHI ÎNCLINARE

VOLTANA o

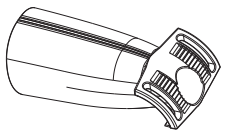


VOLTANA 1 - 5



MONTAJ UNIVERSAL

(OPȚIONAL PENTRU VOLTANA 0-1-2-3-4)



Ø 32 - 48mm

Ø 42 - 60mm

Ø 76mm

ÎNLOCUIȚI-VĂ ACTUALUL SISTEM DE ILUMINAT ŞI FACEȚI ECONOMII IMEDIAT, CU VOLTANA!

Prin simpla înlocuire a aparatelor de iluminat cu lămpi pe bază de sodiu cu aparatele Voltana, economiile de energie devin impresionante. În varianta plug-and-play, opțiunile de control - care nu sunt disponibile sau sunt foarte limitate în cazul aparatelor HPS - nu sunt incluse. În funcție de diferite scenarii, aceste opțiuni pot creşte semnificativ economiile de energie, oferind, în acelaşi timp, siguranță şi confort pentru toți utilizatorii şi îmbunătățind managementul operațional al întregului sistem.

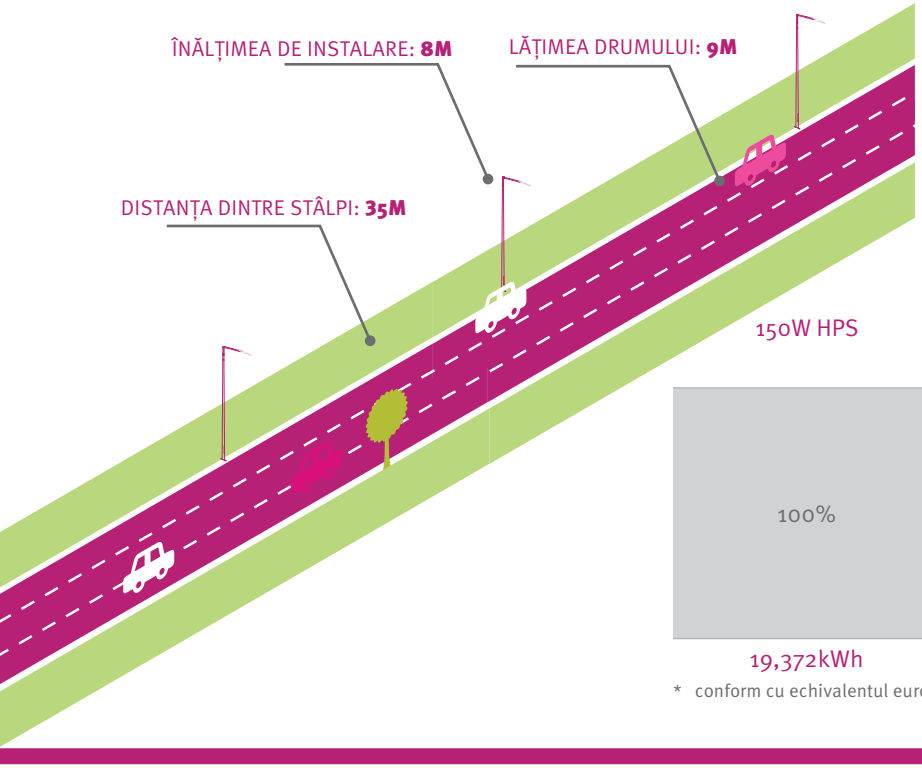
zone pietonale P5-P2		zone pietonale P1		căi de circulație clasificate M6-M5		căi de circulație clasificate M4		căi de circulație clasificate M3		căi de circulație clasificate M2	
aparat HPS 70W	Voltana 1	aparat HPS 100W	Voltana 2	aparat HPS 100W	Voltana 2	aparat HPS 150W	Voltana 3	aparat HPS 150W	Voltana 4	aparat HPS 250W	Voltana 5
78W(*)	economii de 67% / 26W(*)	110W(*)	economii de 56% / 48W(*)	110W(*)	economii de 56% / 48W(*)	167W(*)	economii de 58% / 70W(*)	167W(*)	economii de 45% / 92W(*)	280W(*)	economii de 35% / 180W(*)

(*) Consum de energie total al sistemului

STUDIU DE CAZ

FLEXIBILITATEA DE CARE AVEȚI NEVOIE, PENTRU SCĂDEREA CHELTUIELILOR DE 5 ORI

Cu o investiție minimă (24 de LEDuri, versiunea 1A), Voltana 3 oferă o soluție extrem de competitivă - comparativ cu aparatele de iluminat de 150W, cu lămpi pe bază de sodiu- pentru a ilumina o cale de circulație clasificată M3 (conform standardului CIE 115), cu o recuperare a investiției în mai puțin de 4 ani şi economii de energie de pană la 79%.



ONSUM ANUAL DE CURENT PENTRU UN KILOMETRU (4.000 ORE/AN)

150W HPS	Voltana 3 24 LEDuri 1A	Voltana 3 24 LEDS 1A + dimming
100%	economii la energie de 58% (sau poluare cu 5.17t eq CO2 mai puțin pe an*) / 42%	economii la energie de 79% (sau poluare cu 7.02t eq CO2 mai puțin pe an*) / 21%
19,372kWh	8,120kWh	4,100kWh

* conform cu echivalentul european de 0.46kg eq Co2/kWh

SIGURANȚĂ

STARE DE BINE

DEZVOLTARE DURABILĂ

ECONOMII

SOLUȚII

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