



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: 4788981241-4
Date of issue: 2019-06-21; **Amendment 2** 2021-08-31
Total number of pages: 22 including attachments

**Name of Testing Laboratory
preparing the Report**.....: UL International Italia S.r.l.

Applicant's name: NERI S.p.A.
Address: SS Emilia, 1622 – Longiano (FC) 47020 - Italy

Test specification:
Standard.....: IEC 60598-2-3:2002, AMD1:2011 used in conjunction with
IEC 60598-1:2014, AMD1:2017
Test procedure: CB Scheme
Non-standard test method: N/A

Test Report Form No.: IEC60598_2_3L
Test Report Form(s) Originator: Intertek Semko AB
Master TRF.....: Dated 2018-03-09

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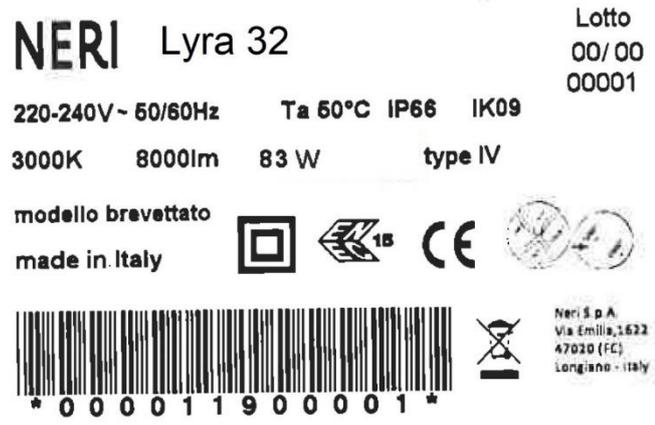
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Test item description	Luminaire for road and street lighting	
Trade Mark	NERI	
Manufacturer	NERI S.p.A. SS Emilia, 1622 – Longiano (FC) 47020 - Italy	
Model/Type reference	Lyra 32 (see Variants for additional models)	
Ratings	220-240 V ~ 50/60 Hz 83 W Class II IP66 IK09 t_a 50°C (see Variants for additional models)	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	UL International Italia S.r.l.
Testing location/ address	Via delle Industrie, 5 & 6 – 20061 Carugate (MI) – Italy	
Tested by (name, function, signature)	Marco Caroli Project Handler	<i>M. Caroli</i>
Approved by (name, function, signature) ...:	Fausto Pedroni Reviewer	<i>Fausto Pedroni</i>
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ...:		
<input checked="" type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address	NERI S.p.A. SS Emilia, 1622 – Longiano (FC) 47020 - Italy	
Tested by (name + signature)	Simone Zoffoli Tester	<i>Simone Zoffoli</i>
Witnessed by (name, function, signature) .:	Marco Caroli Project Handler	<i>M. Caroli</i>
Approved by (name, function, signature) ...:	Fausto Pedroni Reviewer	<i>Fausto Pedroni</i>
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
Testing location/ address		
Tested by (name, function, signature)		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature) ...:		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):				
Equipment list: (Enclosure 6): 1 page				
Summary of testing:				
Tests performed (name of test and test clause):				Testing location:
3.5	Marking	Applicable	Pass	NERI S.p.A. SS Emilia, 1622 Longiano (FC) 47020 Italy
3.6	Construction	Applicable	Pass	
3.7	Creepage distances and clearances	Applicable	Pass	
3.8	Provision for earthing	Not Applicable	N/A	
3.9	Terminals	Not Applicable	N/A	
3.10	External and internal wiring	Not Applicable	N/A	
3.11	Protection against electric shock	Not Applicable	N/A	
3.12	Endurance test and thermal tests	Applicable	Pass	
3.13	Resistance to dust and moisture	Not Applicable	N/A	
3.14	Insulation resistance and electric strength	Applicable	Pass	
3.15	Resistance to heat, fire and tracking	Not Applicable	N/A	
TEST RESULTS WERE FAVOURABLE				
<p>The measurement uncertainties stated in this Test Report are estimated according to the Quality Procedure MP02-A1.</p> <p>If requested, NERI S.p.A. will be able to estimate the uncertainty contribution for all the quantities stated in this Test Report</p>				
Summary of compliance with National Differences:				
List of countries addressed				
<ul style="list-style-type: none"> • All countries member of CENELEC (see Enclosure 1 of the original report) 				
<input checked="" type="checkbox"/> The product fulfils the requirements of EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015 +A1:2018.				

Copy of marking plate:

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



Main model



Extended model



**Some models
(See GPI)**



**Some models
(See GPI)**

Test item particulars	
Classification of installation and use: Road LED luminaire for installation on a post top	
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: N/A (CTF stage 2)	
Date (s) of performance of tests: 2021-06-07 to 2021-06-25	
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.	
Clause numbers between brackets refer to clauses in IEC 60598-1	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies): NERI S.p.A. Via delle Querce 4 – Longiano (FC) 47020 - Italy	

General product information:

Luminaire for road and street lighting provided with LED modules as light source and with an electronic control gear for LED module; intended for installation on a post top.

Rated 220-240 V~, 50/60 Hz, degrees of protection IP66 and IK09, construction in insulation Class II.

It is composed by an upper enclosure made of cast aluminum and a lower fork with a protective screen made of flat tempered glass. The lower fork serves also for top pole fixing.

The main model is provided with a LED driver declared double insulated between primary and secondary circuit and with a Uopen of max 240 Vd.c., some extended models are provided with LED drivers SELV.

The tests of clause 10 and clause 11 have been performed according to Annex X of IEC 60598-1:2014 considering the requirement of a basic insulation complying with Uout as the worst condition.

Photobiological information:

The Luminaire that has been evaluated to check the photobiological effects in accordance with the standard IEC TR 62778:2014.

The results are laid down in the test reports No.:

- 4788981241.10 issued by UL International Italia S.r.l. on 2019-06-07.

For models Lyra the radiation hazard complies with the limit level for the group Risk 1 at a Dthr 2,7 m.

- **4789889617.2 issued by UL International Italia S.r.l. on 2021-08-11.**

For models LULYR00 the radiation hazard complies with the limit level for the group Risk 1.

Amendment 1:

The original test report **4788981241-4** issued on **2019-06-21** with his certificate DK-84997-UL issued on 2019-06-27, have been modified on 2019-11-07 to insert the following changes that have been considered technical modifications:

- The models Type reference has been modified from **Light 112 32** to **Lyra 32**; from **Light 112 24** to **Lyra 24** and from **Light 112 16** to **Lyra 16** "Model/Type reference" on page 2, Marking plate on page 4 and "Variants" in this page have been updated consequently, previous models and actual models are the same.
- Addition of Engineering evaluation according to Australia/New Zealand's National Differences; Enclosure 7 added.

After the review of the previous report and engineering evaluation, no additional test were considered necessary.

This Amendment report shall be read in conjunction with the original report.

Amendment 2:

The original test report 4788981241-4 issued on 2019-06-21 with his Amendment 1 issued on 2019-11-07, have been modified on 2021-08-31 to insert the following changes that have been considered technical modifications:

- Addition of the new models Type references LULYR00 32, LULYR00 24 and LULYR00 16; Marking plates on page 4 and "Variants" have been updated consequently, same constructions and same components of the previous models except for the LED modules used.
- Addition of new LED modules as critical components in new models (Photobiological Information and Annex 1 updated in **bold**).

After the review of the previous reports and engineering evaluation, only the following tests were considered necessary:

- Electrical tests of clauses 10.2.1 and 10.2.2;
- Creepage and clearance of clause 11;

- Therma test of clause 12.4.

Only the following pages have been affected by this amendment.

This Amendment report shall be read in conjunction with the original report and his Amendment 1.

Variants:

The main model:

Type ref.	Ratings	Photobiological classification
Lyra 32	220-240 V~ 50/60 Hz 83W Class II IP66 t_a 50 °C (IK09)	Risk 1 at a Dthr 2,7 m

extends the following models:

Type ref.	Ratings	Photobiological classification
Lyra 24	220-240 V~ 50/60 Hz 66W Class II IP66 t_a 50 °C (IK09)	Risk 1 at a Dthr 2,7 m
Lyra 16	220-240 V~ 50/60 Hz 36W Class II IP66 t_a 50 °C (IK09)	Risk 1 at a Dthr 2,7 m
LULYR00 32	220-240 V~ 50/60 Hz 83W Class II IP66 t_a 50 °C (IK09)	Risk 1
LULYR00 24	220-240 V~ 50/60 Hz 66W Class II IP66 t_a 50 °C (IK09)	Risk 1
LULYR00 16	220-240 V~ 50/60 Hz 36W Class II IP66 t_a 50 °C (IK09)	Risk 1

All the models may have variants related to customers features; differences are not relevant for the safety of the luminaire. The correlated temperature color of the light source may be up to 4000K.

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

3.2 (0)	GENERAL TEST REQUIREMENTS		—
3.2 (0.3)	More sections applicable..... :	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Section/s:	—
3.2 (0.5)	Components	(see Annex 1)	—
3.2 (0.7)	Information for luminaire design in light sources standards		—
3.2 (0.7.2)	Light source safety standard	IEC/EN 62031	—
	Luminaire design in the light source safety standard	Built in LED module	N/A

3.4 (2)	CLASSIFICATION OF LUMINAIRES		P
3.4 (2.2)	Type of protection	Class II	P
3.4 (2.3)	Degree of protection..... :	IP 66	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
3.4 (2.5)	Luminaire for normal use	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	b) on a mast arm	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	c) on a post top	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	d) on span or suspension wires	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	e) on a wall	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

3.6 (4)	CONSTRUCTION		P
3.6 (4.2)	Components replaceable without difficulty	No user replaceable components	N/A
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	Lampholders		N/A
3.6 (4.5)	Starter holders		N/A
3.6 (4.6)	Terminal blocks		N/A
3.6 (4.7)	Terminals and supply connections		P
3.6 (4.7.1)	Contact to metal parts	Terminal block	P
3.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		N/A
3.6 (4.7.3)	Terminals for supply conductors		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
3.6 (4.7.4)	Terminals other than supply connection	See Annex 1	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
3.6 (4.9)	Insulating lining and sleeves		N/A
3.6 (4.10)	Double or reinforced insulation		N/A
3.6 (4.11)	Electrical connections and current-carrying parts		N/A
3.6 (4.12)	Screws and connections (mechanical) and glands		N/A
3.6 (4.13)	Mechanical strength		N/A
3.6 (4.14)	Suspensions, fixings and means of adjusting		N/A
3.6 (4.15)	Flammable materials		N/A
3.6 (4.16)	Luminaires for mounting on normally flammable surfaces		N/A
3.6 (4.17)	Drain holes		N/A
3.6 (4.18)	Resistance to corrosion		N/A
3.6 (4.21)	Protective shield		N/A
3.6 (4.24)	Photobiological hazards		P
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		P
	Class of risk group assessed according to IEC/TR 62778	See "Photobiological information" in GPI	—
	Luminaires with E_{thr} :		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 .. :	See "Photobiological information" in GPI	P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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		N/A
3.6 (4.26)	Short-circuit protection		N/A
3.6 (4.27)	Terminal blocks with integrated screwless earthing contacts		N/A
3.6 (4.28)	Fixing of thermal sensing control		N/A
3.6 (4.29)	Luminaires with non-replaceable light source		N/A
3.6 (4.30)	Luminaires with non-user replaceable light source		N/A
3.6 (4.31)	Insulation between circuits		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
3.6 (4.31.1)	SELV circuits		P
	Used SELV source	Separately approved SELV LED controlgear (some models)	P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		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		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Used FELV source		N/A
	Voltage \leq ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		P
	- conductive parts are connected together		P
	- test according 7.2.3		P
	- conductive part not cause an electric shock in case of an insulation fault		P
	- 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		N/A

3.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
3.7 (11.2.1)	Impulse withstand category (Normal category II)	Category II <input type="checkbox"/> Category III <input checked="" type="checkbox"/>	—
	Category III according Annex U		P
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
3.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with \hat{U}_{OUT} and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.8 (7)	PROVISION FOR EARTHING		N/A
3.9 (14)	SCREW TERMINALS		N/A
3.9 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		N/A
3.10 (5)	EXTERNAL AND INTERNAL WIRING		N/A
3.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		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 (12.2)	Selection of lamps and ballasts		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Controlgear if separate and not supplied	(Controlgear used see Annex 2)	—
3.12 (12.3)	Endurance test		N/A
3.12 (12.4)	Thermal test (normal operation)		P
3.12 (12.5)	Thermal test (abnormal operation)		P
3.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
3.13 (9)	RESISTANCE TO DUST AND MOISTURE		N/A
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 \varnothing		—

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation resistance (MΩ)		—
	SELV		P
	- between current-carrying parts of different polarity :	For models with SELV controlgears (see GPI): >100 MΩ (1 MΩ)	P
	- between current-carrying parts and mounting surface..... :	>100 MΩ (1 MΩ)	P
	- between current-carrying parts and metal parts of the luminaire..... :	>100 MΩ (1 MΩ)	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5		N/A
	Other than SELV		P
	- between live parts of different polarity	> 100 MΩ (2 MΩ)	P
	- between live parts and mounting surface	> 100 MΩ (4 MΩ)	P
	- between live parts and metal parts	> 100 MΩ (4 MΩ)	P
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	> 100 MΩ (2 MΩ)	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)		N/A
	SELV		P
	- between current-carrying parts of different polarity :	For models with SELV controlgears (see GPI): 500 V	P
	- between current-carrying parts and mounting surface..... :	500 V	P
	- between current-carrying parts and metal parts of the luminaire..... :	500 V	P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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 :	1480 V	P
	- between live parts and mounting surface :	2960 V; secondary circuits: 1480 V (according to "Table X" for Uout 240 Vd.c., see GPI)	P
	- between live parts and metal parts :	2960 V; secondary circuits: 1480 V (according to "Table X" for Uout 240 Vd.c., see GPI)	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):	touch current: 0,68 mA (0,7mA)	P
3.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		N/A

IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
3.7 (11.2)	TABLE I: Creepage distances and clearances						P
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages						P
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	> 3,9	3,0	U1	> 3,9	3,0 (#)	11.1.A
Working voltage (V)					240	—	
PTI					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—	
Pulse voltage or U_P if applicable (kV)					—	—	
Supplementary information: (#) 2,5 elevated to 3,0 as required by clause U.2							
Distance 2:	S	> 3,9	3,0	U1	> 3,9	3,0 (#)	11.1.A
Working voltage (V)					240	—	
PTI					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—	
Pulse voltage or U_P if applicable (kV)					—	—	
Supplementary information: (#) 2,5 elevated to 3,0 as required by clause U.2							
Distance 3:	R	>7,2	5,5	U.1	>7,2	5,5 (#)	11.1.A
Working voltage (V)					240	—	
PTI					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—	
Pulse voltage or U_P if applicable (kV)					—	—	
Supplementary information: (#) 5,0 elevated to 5,5 as required by clause U.2							
Distance 4:	R	2,5	1.5	11.1.B	2,5	2,4	11.1.A
Working voltage (V)					240	—	
PTI					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—	
Pulse voltage or U_P if applicable (kV)					—	—	
Supplementary information: parts supplied by secondary circuit of LED driver (Uout max 240 Vd.c.);							

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

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

3.7 (11.2)	TABLE II: Creepage distances and clearances						N/A
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages							
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2							
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI					< 600 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	—
Peak value of the working voltage \hat{U}_{out} if applicable (kV)							—
Supplementary information:							
Distance 2:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI					< 600 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	—
Peak value of the working voltage \hat{U}_{out} if applicable (kV)							—
Supplementary information:							
Distance 3:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI					< 600 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	—
Peak value of the working voltage \hat{U}_{out} if applicable (kV)							—
Supplementary information:							

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

IEC 60598-2-3			
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⁾	
Internal wiring for primary circuit	A	SILTEK	UG4G4 / FG4G4	450/700 V T 180 °C 0,75 mm ²	Properties equivalent to EN 60228	CSv-IMQ Cert. n° CA01.00289	
Internal wiring for primary circuit	C/D	COLOSIO	RD17	300/500 V T 90 °C 0,75 mm ² PVC covered with an additional PVC sleeve	IEC/EN 60598; EN 50525:2011	Tested in luminaire; IMQ <HAR> for the core Cert. n° DAT95005315	
Internal wiring for primary circuit	C/D	SALCAVI	UR7R7	300/500V T 90°C 1 mm ²	TI3 type PVC conforming to EN 50363-3	Tested in Luminaire	
Internal wiring for Secondary circuit	C	TE CO TECNOLOGIA COMMERCIALE SPA	Style 1569	T105°C 22 AWG 300 V STYLE 1569	IEC/EN 60598-1 ANSI/UL 224	Tested in Luminaire Also UL certified (E244280)	
Internal wiring for Secondary circuit	C/D	VER CAVI	Style 1569	T105°C 22 AWG 300 V STYLE 1569	IEC/EN 60598-1 ANSI/UL 224	Tested in Luminaire Also UL certified (E140367)	
Internal wiring for Secondary circuit	A	SALCAVI	H05V-U	300/500 V T 90 °C 0,5 mm ² PVC	EN 50525-2-31:2011	IMQ <HAR> Cert. n° DAT95000710	
Main Terminal block	A	ADELS CONTACT	LK 980 RZ	16A, 600V AWG 14-20 T105°C	EN 60998-1:2004 EN60998-2-2:2004	VDE Cert. n° 40021343	
Surge protective device (optional)	A	Philips	Surge Protector Class II	255V – 50/60Hz Tc 80°C	EN 61643-11:2012	KEMA-KEUR Cert.n° 31-102677	
Surge protective device (optional)	A/D	PHOENIX CONTACT	BLT-T2-320-UT 29 06 10 0	Un:100-277Vac Uc:320Vac Up:1,3Kv Uoc:10Kv In:5 KA ; IL: 16A Class II	EN 61643-11:2012	KEMA-KEUR Cert. n° 2179938.01	

IEC 60598-2-3						
Clause	Requirement + Test			Result - Remark		Verdict
Dimming control (optional)	A	ALGORAB	P5-SLC	230V - 50Hz 20mA – Ta 70°C	IEC/EN 61347-1:2015 IEC/EN 61347-2-11:2001	ENEC 17 Cert. n° NO4301
LED controlgear	B	PHILIPS	Xi SR 150W 0.3-1.0A SNEMP 230V S240 sXt	220-240 Vac 50/60 Hz 300-1050 mA 70-214 Vdc (240 Vdc max) 150 W Tc 90°C T _{marked} „130“ (*)	IEC/EN 61347-1:2008+A1+A1 IEC/EN 61347-2-13:2014	ENEC 05 Cert. n° 2198842.01
LED controlgear	B	PHILIPS	Xi FP 110W 0.3-1.0A SNLDAE 230V C133 sXt	220-240 Vac 50/60 Hz 300-1050 mA 50-160 Vdc (230 Vdc max) 110W Tc 85°C T _{marked} „130“	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014+A1	ENEC 05 Cert. n° 31-102940
LED controlgear	B	PHILIPS	Xi LP 110W 0.3-1.0A S1 230V C133 sXt	220-240 Vac 50/60 Hz 300-1050 mA 50-160 Vdc (230 Vdc max) 110W Tc 90°C T _{marked} „130“	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014+A1	ENEC 05 Cert. n° 31-105242
LED controlgear	B	PHILIPS	Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt	220-240 Vac 50/60 Hz 300-1050 mA 35-108 Vdc (150 Vdc max) 75 W Tc 80°C T _{marked} „130“	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014	ENEC 05 Cert.n° 31-101322
LED controlgear	B	PHILIPS	Xi LP 75W 0.3-1.0A S1 230V C133 sXt	220-240 Vac 50/60 Hz 300-1050 mA 35-108 Vdc (150 Vdc max) 75 W Tc 80°C T _{marked} „130“	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014+A1	ENEC 05 Cert. n° 31-105242
LED controlgear	B	PHILIPS	Xi SR 75W 0.3-1.0A SNEMP 230V S240 sXt	220-240 Vac 50/60 Hz 300-1050 mA 35-108 Vdc (150 Vdc max) 75 W Tc 80°C T _{marked} „130“	IEC/EN 61347-1:2008+A1+A1 IEC/EN 61347-2-13:2014	ENEC 05 Cert. n° 2198842.02

IEC 60598-2-3						
Clause	Requirement + Test			Result - Remark	Verdict	
LED controlgear	B	PHILIPS	Xi LP 40W 0.2-0.7A S1 230V C123 sXt	220-240 V 50/60 Hz I _{out} :200-700 mA U _{out} 25-77 Vdc (U _{open} 100 Vdc)* 40 W tc 85 °C T _{marked} „120“ SELV	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014+A1	ENEC 05 cert. n° 31-103018
LED controlgear	B	PHILIPS	Xi FP 40W 0.2-0.7A SNLDAE 230V C123 sXt	220-240 V 50/60 Hz I _{out} :200-700 mA U _{out} 25-77 Vdc (U _{open} 100 Vdc)* 40 W tc 85 °C T _{marked} „120“ SELV	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014+A1	ENEC 05 Cert. n° 31-102115
LED controlgear	B	PHILIPS	Xi FP 40W 0.2-0.7A SNEMP 230V C133 sXt	220-240 V 50/60 Hz I _{out} :200-700 mA U _{out} 25-77 Vdc (U _{open} 100 Vdc)* 40 W tc 85 °C T _{marked} „120“ SELV	IEC/EN 61347-1:2015 IEC/EN 61347-2-13:2014+A1	ENEC 05 Cert. n° 71-101395
(*) = declared double insulated between primary and secondary circuits and between primary circuit and accessible parts.						
LED MODULE	C	NERI	H0450	32 LEDs	IEC/EN 62031	Tested in luminaire
	C	NERI	H0449	24 LEDs	IEC/EN 62031	Tested in luminaire
	C	NERI	H0448	16 LEDs	IEC/EN 62031	Tested in luminaire
LED Chip	C	NICHIA	NVSW219xx	900mA up to 4000K T _j 150°C	IEC/EN 62031	Tested in Luminaire
LED Chip	C	CREE	XP-G2 HE	900mA up to 4000K T _j 150°C	IEC/EN 62031	Tested in Luminaire
LED module PWB	C	ITEQ	IT-859GTA	T110 – V0	IEC/EN 62031	Tested in luminaire also UL certified E178114
LED module PWB	C/D	Ventec	VT-4B3	T130 – V0	IEC/EN 62031	Tested in luminaire also UL certified E214381

IEC 60598-2-3							
Clause	Requirement + Test			Result - Remark			Verdict
	LED modules terminal	A	WAGO	2061	250 V – 19 A T105°C	EN 60838-2-2:2006+A1 EN 60838-1:2017+A1	KEMA-KEUR Cert. n° 71-106232
	LED Module	B	NERI	C0894	32 LEDs Max 1000 mA 96 W (Max 300 V)	IEC/EN 62031:2020	ENEC 15 Cert. n° ENEC-03662
	LED Module	B	NERI	C0895	24 LEDs Max 1000 mA 72 W (Max 300 V)	IEC/EN 62031:2020	ENEC 15 Cert. n° ENEC-03662
	LED Module	B	NERI	C0896	16 LEDs Max 1000 mA 48 W (Max 300 V)	IEC/EN 62031:2020	ENEC 15 Cert. n° ENEC-03662
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: Thermal tests of Section 12	P	
	Type reference	LULYR00 32	—
	Lamp used.....	LED module C0894 (850mA)	—
	Lamp control gear used.....	Philips Xi FP 110W 0,3-1,0A SNLDAE C133 sXt (@850mA)	—
	Mounting position of luminaire	On pole	—
	Supply wattage (W)	81,8 W (240 V) 82,0 W (254 V)	—
	Supply current (A)	0,346 A (240 V) 0,328 A (254 V)	—
	Temperatures in test 1 - 4 below are corrected for ta (°C)	50	—
	- abnormal operating mode	Short circuit of secondary (*)	—
1.12 (12.4)	- test 1: rated voltage	240 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	254,4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage	—	—
	Through wiring or looping-in wiring loaded by a current of A during the test	—	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	264 V	—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
LED chip solder point (Tsp)	50,2		88		121 (**)		
LED chip solder point (Tsp2)	50,2		89		121 (**)		
Lens	50,2		90		90		
Tc point of LED Controlgear	50,2	86 (#)	-		85		
Internal air	50,2		64		(***)		

Supplementary information:

(#) According to clause to 12.4.2 a) *The temperature shall not exceed the limits by more than 5 °C.*

(*) LED control-gear short circuit protected immediately operated

(**) limit calculated according to LED datasheet (Tj-max: 125 °C; Thermal res.: 1,4 °C/W; PLED: ~ 2,4 W);
Tsp = 125 – (1,4x2,4).

(***) For reference only

Enclosure 6	Equipment List
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Clause	Measurement	Testing / measuring equipment / materials used	Range used	Calibration Date [Year-Month-Day]	
				Last	Due
3.14	Insulation resistance and electric strength	LAB017 – Electrical safety tester GLP-2e (2051)	0-5 kV 0-100 mA 0-10 MΩ	2020-12-14	2021-12-14
3.6	Construction	LAB026 - Caliper	0-200 mm	2020/07/15 2021/07/13	2021/07/15 2022/07/13
3.12	Endurance test and thermal tests	LAB018 – Thermal test room and acquisition system	0-300 °C	2020-12-09	2021-12-09