



TEST REPORT

EN 60598-2-3

Luminaires

Part 2: Particular requirements Section 3: Luminaires for road and street lighting

EN 62471

Photobiological safety of lamps and lamp systems



Report reference No.:	2018-267
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Accreditation certificate	№ BY/112 02.1.0.0085 from 01.09.1995 Validity: from December 1, 2014 to December 1, 2019
Applicant's name:	EcoCity S.R.L.
Address:	bd. Moscova, 12/3 ap. (of.) 21, MD-2068 Chisinau, Republica Moldova
Manufacturer:	EcoCity S.R.L.
Address:	Mircea cel Batrin str. 11, Chisinau, Republica Moldova
Tested according to standard	EN 60598-2-3:2003/A1:2011, EN 60598-1:2015, EN 62471:2008
Non-standard test methods	Were not applied
Number of samples	1 (one sample) without serial number
Conditions of realization of tests	Normal climatic conditions
The act of sampling	№ 15348 from 2018.06.22
Date of receipt of sample(s)	2018.06.22
Date of realization of tests	2018.07.09 - 2018.07.31
The name of test item	LED Luminaire

The trademark	EcoCity S.R.L.
Model / type of a sample	Eco-Pro Street Quasar S SiO 80 C
Test result	PASSED

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

ANNEX 1: Critical components information – 1 page (page 31)

ANNEX 2: Thermal tests of Section 12 – 1 page (page 32)

ANNEX 3 Screw terminals (part of the luminaire) – 1 page (page 33)

ANNEX 4 Screwless terminals (part of the luminaire) – 2 pages (pages 34 – 35)

ANNEX 5 Testing luminaire in accordance with EN 62471 – 3 pages (pages 36 – 38)

ANNEX 6 Fotos, manual – 10 pages (pages 39–47)

General product information:

LED Luminaire is intended for lighting of roads, streets, parkings, manufacturing facilities and interior lighting of industrial buildings, storages, etc. Luminaire is designed for console mounting on a support with diameter 48–60mm

Possible test case verdicts:

- test case does not apply to the test object	N/A (Not applied)
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
- test were not conducted	—

The general(common) notes:

This report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item(s) tested.

"(see appended table)" refers to a table appended to the report,

"(see remark #)" refers to a remark appended to the report, "(see Annex #)" refers to an annex appended to the report.

Test items (or destructed parts) after the tests are returned to the Applicant, except in cases where the recycling needed.

Test report was issued in 3 copies and sent to:

- 1 Test centre BelGISS
2. EcoCity S.R.L.
3. Technical Testing Institute (TSU Piestyany)

Tests item particulars	
Rated voltage	110–250 V 50–60Hz
Rated power	80 W
Class of protection against electric shock	I
Protection against ingress of water	IP66
Dimensions	102×250×525 mm
Weight	5,4 kg

Test conditions	
Temperature	21°C – 24°C
Relative humidity of air	59% – 68%
Atmospheric pressure	98 кПа – 101 кПа

The test equipment and means of measurement			
№	Name	Factory number	Certificated, calibrated up to
1.	Thermohygrometer UNITESS THB-1	170018	28.11.2018
2.	Test device to verify protection of jet-proof appliances	2	01.02.2019
3.	Dust chamber DI-3000	LP201610DI015	06.06.2019
4.	Climatic chamber Feutron KPK 1700	085/08	04.12.2018
5.	Thermal vacuum chamber ТБК-1000	11122016	03.03.2019
6.	Power meter PPA 510 (ПРИЗМА-50/1)	111-04272	04.04.2019
7.	Oscilloscope Tektronix, TDS2014B	C035910	25.01.2019
8.	Earth continuity tester Kikusui TOS6210	XK002785	05.10.2018
9.	Withstanding voltage tester УПУ–10	0449	20.11.2018
10.	Spring-operated impact test apparatus	2	07.10.2018
11.	Calibration device for spring-operated impact test apparatus	2	07.10.2018
12.	Apparatus for ball pressure test	M23	21.12.2018
13.	Thermometer Sosna 002	818	04.07.2019
14.	Glow-wire test apparatus	2999	26.01.2020
15.	Needle-test apparatus	2	01.02.2019
16.	Tracking-test apparatus	A07	26.01.2020
17.	Stopwatch СДСп 1-2-00	0480142	05.02.2019
18.	Ruler	117160	30.04.2019
19.	Microscope Mitutoyo TM 505	381311	13.09.2018
20.	Calipers SHAN 0-150 мм	D0611/D18842	04.04.2019
21.	Test finger	B	11.12.2019
22.	Dynamometer PCE-FB200	139	20.11.2018
23.	Torque screwdriver TOPTUL ANAM0803 1-25 Nm	PF00503	04.07.2019
24.	Scales BTC 100Д14	2141	30.09.2018
25.	Test machine Time WDW-5E	4792	15.05.2019
26.	IDR300-PSL Photobiological Safety Spectroradiometer	19041	31.12.2018
27.	CL6 Halogen Spectral Irradiance Standard (250-3000nm)	19068/1	31.12.2018

28.	CL7 Deuterium Spectral Irradiance Standard (200-400nm)	18721/2	31.12.2018
29.	SRS12 Halogen Spectral Radiance Standard (250-2500nm)	18732/2	31.12.2018
30.	Power supply APS77100	GEQ221859	—

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
3.2 (0)	GENERAL TEST REQUIREMENTS		
3.2 (0.3)	More sections applicable	Yes ☐ No ☒ 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		—
	Luminaire design in the light source safety standard		N/A

3.4 (2)	CLASSIFICATION OF LUMINAIRES		
3.4 (2.2)	Type of protection	Class I	P
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	See foto 3	P
	Position of the marking		P
	Format of symbols/text		P
3.5 (3.3)	Additional information		P
	Language of instructions	English (See fotos 7–12)	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	-45°C – +50°C	P
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

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.8)	Limitation for semi-luminaires		N/A
3.5 (3.3.9)	Power factor and supply current	PF > 0,95, I < 1,1 A	P
3.5 (3.3.10)	Suitability for use indoors		P
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		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		N/A
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
3.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
3.5 (3.3.24)	If not supplied with terminal block, information on the packaging	Terminal block in the luminaire	N/A
3.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		N/A
3.5 (-)	Additional information in instruction leaflet		P
	a) Design attitude	More than 15 m	N/A
	b) Weight	5,4 kg	P
	c) Overall dimensions	102×250×525 mm	P
	d) Maximum projected area if applicable	0,25×0,525=0,131m ²	P
	e) Cross-sectional area of wires if applicable		N/A
	f) Suitability for indoors use		P
	g) Dimensions of the compartment		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	h) Torque setting to be applied to bolts or screws	17-19Nm	P
	i) Maximum mounting height		N/A
3.6 (4)	CONSTRUCTION		
3.6 (4.2)	Components replaceable without difficulty	No 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 (4.4.1)	Integral lampholder	No lampholders	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	No starter holders	N/A
	Starter holder class II construction		N/A
3.6 (4.6)	Terminal blocks		N/A
	Tails	Terminal block in the luminaire	N/A
	Unsecured blocks		N/A
3.6 (4.7)	Terminals and supply connections		P
3.6 (4.7.1)	Contact to metal parts		P
3.6 (4.7.2)	Test 8 mm live conductor		P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Test 8 mm earth conductor		P
3.6 (4.7.3)	Terminals for supply conductors	Screw terminals	P
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		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		N/A
	- adequate rating	No switches	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		N/A
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	Class I luminaire	N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
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
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
3.6 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
3.6 (4.11)	Electrical connections and current-carrying parts		P
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		P
	- self-tapping screws	Not used	P
	- thread-cutting screws	Not used	P
3.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- 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		P
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part screw terminal.....:	0,5Nm	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		N/A
3.6 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm).....:		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	- lampholder; torque (Nm)		N/A
	- push-button switches; torque 0,8 Nm.....		N/A
3.6 (4.12.5)	Screwed glands; force (Nm)	3,25 Nm	P
3.6 (4.13)	Mechanical strength		P
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) glass cover	0,5 Nm	P
	- other parts; energy (Nm) case.....	0,7 Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
3.6 (4.13.2)	Metal parts have adequate mechanical strength		P
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		P
3.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		N/A
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm).....		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N/A
	Metal rod. diameter (mm)		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
3.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg)		—
	Stress in conductors (N/mm ²)		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
3.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles	Not adjustable	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		N/A
	- glow-wire test 650°C	Only metal and glass	N/A
	- spacing ≥ 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	Install on pipe or console	N/A
	No lamp control gear		N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
3.6 (4.16.1)	Lamp control gear spacing:		P
	- spacing 35 mm		N/A
	- spacing 10 mm		P
3.6 (4.16.2)	Thermal protection:		P
	- in lamp control gear	110°C	P
	- external		N/A
	- fixed position		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.16.3)	Design to satisfy the test of 12.6		N/A
3.6 (4.17)	Drain holes		P
	Clearance at least 5 mm		P
3.6 (4.18)	Resistance to corrosion		P
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	Cast under pressure aluminium case	P
3.6 (4.19)	Ignitors compatible with ballast		N/A
3.6 (4.20)	Rough service vibration		N/A
3.6 (4.21)	Protective shield		N/A
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.....:		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		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	RG2	—
	Luminaires with $E_{thr} = 19400$ lux:		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2....:	0,5m	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

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
3.6 (4.26)	Short-circuit protection		N/A
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts	No such 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 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		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material ($^{\circ}\text{C}$):		—
	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		P
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		P
3.6 (4.30)	Luminaires with non-user replaceable light source		P
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:		N/A
	Minimum two fixing means		P
3.6 (4.31)	Insulation between circuits		P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	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	LED driver providing SELV in accordance with IEC 61347	P
	Voltage $\leq$ ELV	36 V	P
	Insulating of SELV circuits from LV supply	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		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
	Plugs and socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.2)	FELV circuits		N/A
	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		N/A
	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:		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
3.6 (4.32)	Overvoltage protective devices		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
3.6.1 (-)	At least IP X3 or X5 respectively. IP		P
	Column-integrated luminaires:		N/A
	- 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		P
	- drag coefficient	1,2	P
	- loaded area (m ²)	0,131 m ²	P
	- used load (N)	313 N	P
	- measured deformation (cm/m)	No visible deformation	P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		N/A
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		P
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or	IK08 (5 J)	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

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	- number of particles is more than 40		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		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		P
3.6.6 (-)	Connection compartment of column-integrated luminaire		N/A
	- 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:		N/A
	- 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:		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 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	—
	Category III according Annex U		N/A
	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 table 3.7 (11.2)	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		N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
3.7 (11.2.3)	Clearances for frequency up to 30 kHz	See table 3.7 (11.2)	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_p		N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347		N/A

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 : earth wire – metal case.....:	0,005 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		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
	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		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		P
3.8.1 (-)	Attachment prevented from rotation		P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

3.9 (14)	SCREW TERMINALS		
	Separately approved; component list	PA8 (See Annex 1)	P
	Part of the luminaire		N/A

3.9 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		
	Separately approved; component list		N/A
	Part of the luminaire		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	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		N/A
3.10 (5.2.2)	Type of cable		N/A
	Nominal cross-sectional area (mm ²).....		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:		P
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges	Screwed gland	P
3.10 (5.2.8)	Insulating bushings:		N/A
	- 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:		P
	- covering protected from abrasion	Screwed gland	P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	- insulating material or lining		P
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:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) 60 N		P
	- torque test: torque (Nm) 0,25 Nm.....		P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
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)		N/A
	Installation couplers (IEC 61535)		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	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		P
3.10 (5.3.1)	Internal wiring of suitable size and type	Input wiring of LED driver H05RN-F 3×1,0mm ² Output wiring of LED driver H05RN-F 2×1,0mm ²	P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures:		N/A
	Green-yellow for earth only		P
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm ²) 0,5 mm ²:	1,0 mm ²	P
	Insulation thickness (mm) 0,6 mm.....:	0,8 mm	P
	Extra insulation added where necessary	Double insulated cable	P
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Cross-sectional area (mm ²).....:		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	Rubber insulated cable	N/A
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
3.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
3.10 (5.3.4)	Joints and junctions effectively insulated		P
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 (5.4)	Test to determine suitability of conductors having a reduced cross-sectional area		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2		N/A
	No damage to luminaire wiring after test		N/A
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N)..... :	100 N	P
	- torque test: torque (Nm) :	0,35 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		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		N/A
	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

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation lacquer not reliable		P
	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:	Insulated SELV parts	N/A
	Ordinary luminaire:		N/A
	- voltage under load (V)		N/A
	- no-load voltage (V)		N/A
	- touch current if applicable (mA)		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V)		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
3.11 (8.2.4)	Portable luminaire has 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)	Luminaire other than below with capacitor > 0,5 μ F not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 μ F (0.25) not exceed 34 V 1 s after disconnection		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Other luminaires with capacitor > 0,1 μ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		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		—
3.12 (12.2)	Selection of lamps and ballasts		—
	Lamp used according Annex B	Built-in LED module	—
	Controlgear if separate and not supplied	Built-in LED driver	—
3.12 (12.3)	Endurance test		
	a) mounting-position suspended horizontally		—
	b) test temperature (°C) 35°C.....		—
	c) total duration (h) 240 h		—
	d) supply voltage (V) 265 V		—
	d) if not equipped with controlgear, constant voltage/current (V) or (A)		—
	e) luminaire ceases to operate	Luminaire kept working capacity	—
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
3.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
3.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
3.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—
	- case of abnormal conditions.....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un		—
	- measured mounting surface temperature (°C) at 1,1 Un		N/A
	- calculated mounting surface temperature (°C)		N/A

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	- track-mounted luminaires		N/A
3.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions.....:		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C)		N/A
	- 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:		N/A
	- case of abnormal conditions.....:		—
	- Ballast failure at supply voltage (V)		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions.....:		—
	- measured winding temperature (°C): at 1,1 Un.....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		—
	- calculated temperature of fixing point/exposed part (°C)		—
	Ball-pressure test.....:		N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions.....:		—
	- measured winding temperature (°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)		—

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Ball-pressure test.....:		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:.....:		N/A
3.12.1 (-)	Temperature reduction if for outdoor use only	For outdoor and indoor use	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 AND MOISTURE		
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:		P
	- classification according to IP	IP 66	—
	- mounting position during test horizontally		—
	- fixing screws tightened; torque (Nm).....:		—
	- tests according to clauses 9.2.2, 9.2.7		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		N/A
	c.2) For luminaires with drain holes – no hazardous water entry		P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		P
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		—
	Insulation resistance (MΩ) 2 MΩ.....		—
	SELV		N/A
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface		N/A
	- between current-carrying parts and metal parts of the luminaire		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N/A
	- Insulation bushings as described in Section 5		N/A
	Other than SELV		P
	- between live parts of different polarity.....		N/A
	- between live parts and mounting surface.....		N/A
	- between live parts and metal parts 2 MΩ.....	>310 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		N/A
	- Insulation bushings as described in Section 5		N/A
3.14 (10.2.2)	Electric strength test		P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V) 1500 V		P
	SELV		N/A
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface		N/A
	- between current-carrying parts and metal parts of the luminaire		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N/A
	- Insulation bushings as described in Section 5		N/A
	Other than SELV		P
	- between live parts of different polarity		N/A
	- between live parts and mounting surface		N/A
	- 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):	0,28mA	P

3.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		
3.15 (13.2.1)	Ball-pressure test	See table 3.15 (13.2.1)	P
3.15 (13.3.1)	Needle-flame test (10 s)	See table 3.15 (13.3.1)	P
3.15 (13.3.2)	Glow-wire test (650°C)	See table 3.15 (13.3.2)	P
3.15 (13.4)	Proof tracking test (IEC 60112)	See table 3.15 (13.4)	P

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
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	5,2mm	1,5mm	11.1B	5,2mm	2,5mm	11.1A
Working voltage (V) 250V							—
PTI					< 600 ☒ ≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV)							—
Supplementary information: between L in terminal block and metal case							
Distance 2:							
Working voltage (V)							—
PTI					< 600 ☐ ≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV)							—
Supplementary information:							
Distance 3:							
Working voltage (V)							—
PTI					< 600 ☐ ≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV)							—
Supplementary information:							

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

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 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV)							—

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015							
Clause	Requirement + Test				Result - Remark		Verdict
Supplementary information:							
Distance 2:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV)							—
Supplementary information:							
Distance 3:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV)							—
Supplementary information:							

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

3.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics				P
Allowed impression diameter (mm)				2 mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)		
Terminal with screw-type clamping unit PA8	Heavy Power Co., Ltd.	125°C	1,1mm		
Supplementary information:					

3.15 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)					P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Terminal with screw- type clamping unit PA8	Heavy Power Co., Ltd.	10s	No	No	P	
Supplementary information:						

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015				
Clause	Requirement + Test		Result - Remark	
3.15 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)			P
Glow wire temperature		650°C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Terminal with screw-type clamping unit PA8	Heavy Power Co., Ltd.	No	No	P
Supplementary information:				

3.15 (13.4)	TABLE: Proof tracking test (IEC 60112)				P
Test voltage PTI :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Terminal with screw-type clamping unit PA8	Heavy Power Co., Ltd.	Withstand	Withstand	Withstand	P
Supplementary information:					

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1 TABLE: Critical components information						P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
LED (24 pieces)	B	Cree	XP-G3 type 3535	3V, 6W	EN 62471, EN 60598-1	Tested with luminaire
LED driver	B	Mean Well	ELG-100-36A-3Y	In: 100-240V, 50/60Hz, 1,1A, Out: 36V, 100W IP65, t _c =90°C	EN 61347-1 EN 61347-2-13	ENEC05
Circuit board of LED module	C	EcoCity	—	1,5mm ² , 36V, coating Lead Free Hasl	EN 60598-1	Tested with luminaire
Case	C	EcoCity	—	Cast under pressure aluminium with powder coating	EN 60598-1	Tested with luminaire
Glass	C	EcoCity	—	4 mm, strained glass	EN 60598-1	Tested with luminaire
Terminal with screw-type clamping unit	A	Heavy Power Co., Ltd.	PA8	16A, 450V, T110	EN 60998-1 EN 60998-2-1	VDE
Description:						
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						

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015

Clause	Requirement + Test	Result - Remark	Verdict
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ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference.....:	Eco-Pro Street Quasar S SiO 80 C	—
	Lamp used	LED module as part of the luminaire	—
	Lamp control gear used	ELG-100-36A-3Y	—
	Mounting position of luminaire	Suspended horizontally	—
	Supply wattage (W)	77,3 W	—
	Supply current (A)	0,347 A	—
	Temperatures in test 1 - 4 below are corrected for t_a (°C)	22,5°C	—
	- abnormal operating mode	Separately certified LED driver with protection of short circuit, over current, over voltage and over temperature	—
1.12 (12.4)	- test 1: rated voltage	230 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	243,8 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.....	—	—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Case of LED driver at the point t_c	22,5	61	—	—	90	—	—
Calbe inside luminaire	22,5	—	43	—	90	—	—
Case (radiator)	22,5	—	40*	—	—	—	—
Glass	22,5	—	45*	—	—	—	—

Supplementary information: * measurements for information

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
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		
(14.3.2.2)	Special preparation		
(14.3.2.3)	Terminal size		
	Cross-sectional area (mm ²)		—
(14.3.3)	Conductor space (mm)		
(14.4)	Mechanical tests		
(14.4.1)	Minimum distance		
(14.4.2)	Cannot slip out		
(14.4.3)	Special preparation		
(14.4.4)	Nominal diameter of thread (metric ISO thread)	M	
	External wiring		
	No soft metal		
(14.4.5)	Corrosion		
(14.4.6)	Nominal diameter of thread (mm)		
	Torque (Nm)		
(14.4.7)	Between metal surfaces		
	Lug terminal		
	Mantle terminal		
	Pull test; pull (N)		
(14.4.8)	Without undue damage		

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015

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

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal size and rating		
15.6.2	Mechanical tests		
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)		
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N)		
(15.6.3)	Electrical tests		
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		

(15.6.3.1) (15.6.3.2)	TABLE: Contact resistance test / Heating tests										
	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										
	Voltage drop after 10th alt. 25th cycle										
	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										
	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										
	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										
	Max. allowed voltage drop (mV)										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015

Clause	Requirement + Test	Result - Remark	Verdict
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ANNEX 5 Testing luminaire in accordance with EN 62471**1. Source Profile**

The source emission profile (single LED), measured with using the Bentham PSL profiler and calculated from 50% emission points Source: 1,1×1,0 mm. Average angular subtend from a distance of 200 mm – 5,2 mrad (small source) (See Fig. 1)

Overall source size (LED module) is 161×112 mm. Average angular subtend from a distance of 200 mm – >100 mrad (See Fig.2)

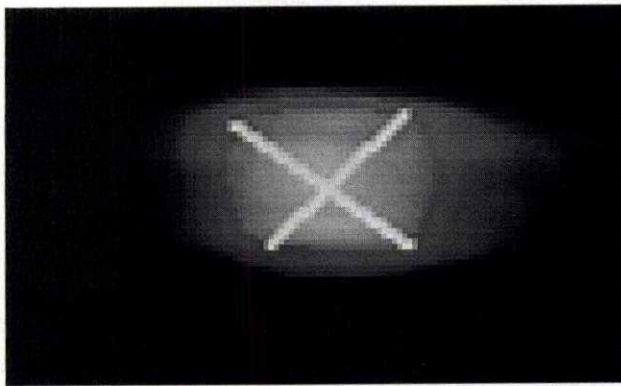


Fig. 1

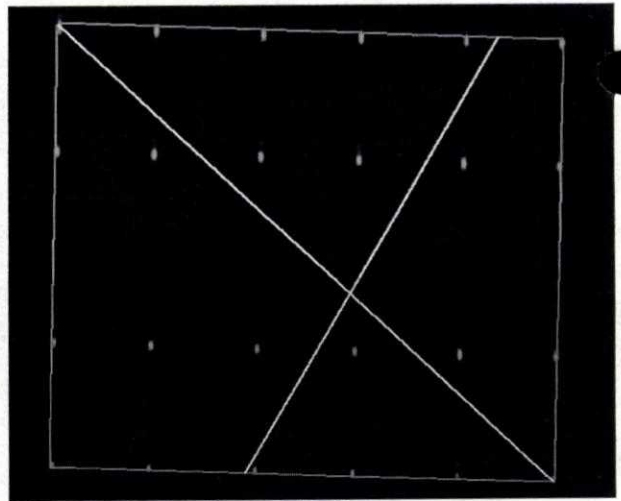


Fig. 2

2. Irradiance Results

Measurement distance: 200 mm
Spectral Range 200 - 1400 nm

Hazard	Measured value	Resulting risk group	Risk group limit value	Time to exposure limit (s)
Actinic UV ($mW m^{-2}$)	5,76E-02	Exempt	1	> 30000
Near UVA ($W m^{-2}$)	4,69E-02	Exempt	10	> 30000
Blue Light Small Source ($W m^{-2}$)	3,47E-00	Group 2	400	28,8
IR Eye ($W m^{-2}$)	n/a	n/a	n/a	n/a
Thermal Skin ($W m^{-2}$)	n/a	n/a	n/a	n/a

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015

Clause	Requirement + Test	Result - Remark	Verdict
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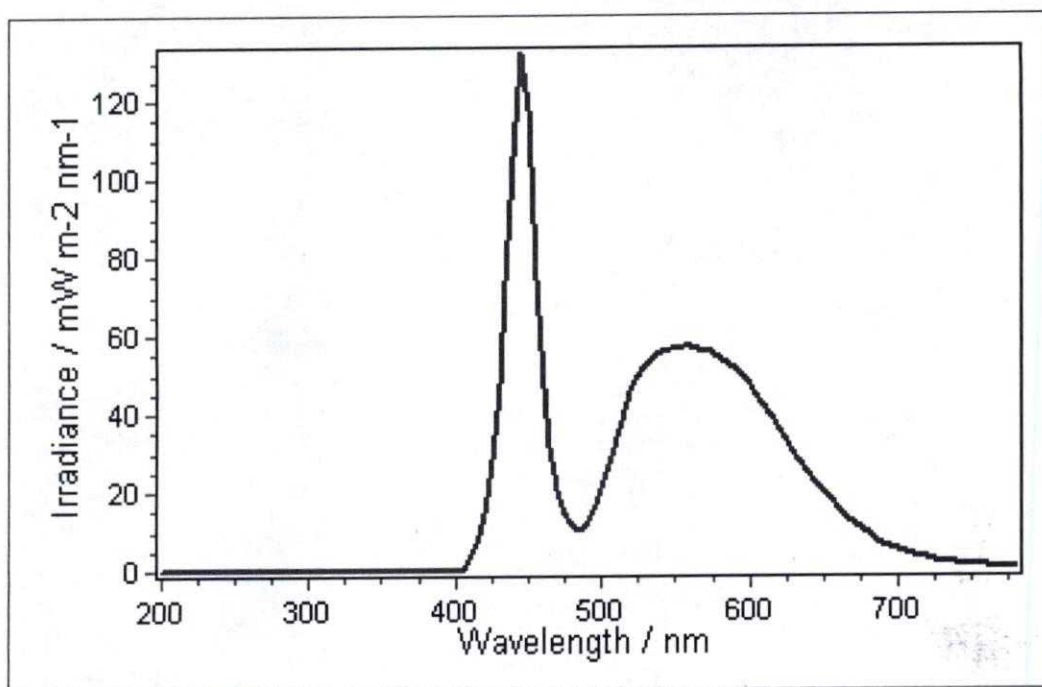


Fig.3

3. Radiance Results

Measurement distance: 200 mm
 Spectral Range 200 - 1400 nm
 Luminance in 11 mrad 8740000 cd m⁻²

Hazard	Measured value (W sr ⁻¹ m ⁻²)	Risk group limit value (W sr ⁻¹ m ⁻²)	Risk group tested	Pass/Fail
Blue light hazard 100mrad FOV	n/a	n/a	Exempt	n/a
Blue light hazard 11mrad FOV	n/a	n/a	Group 1	n/a
Blue light hazard 1.7mrad FOV	n/a	n/a	Group 2	n/a
Retinal Thermal 11mrad FOV	6,98E+04	5,43E+06	Exempt	Pass
Retinal Thermal 1.7mrad FOV	n/a	n/a	Group 2	n/a
Retinal Thermal Weak Visual 35mrad FOV	n/a	n/a	Exempt	n/a
Retinal Thermal Weak Visual 11mrad FOV	n/a	n/a	Group 1	n/a

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015

Clause	Requirement + Test	Result - Remark	Verdict
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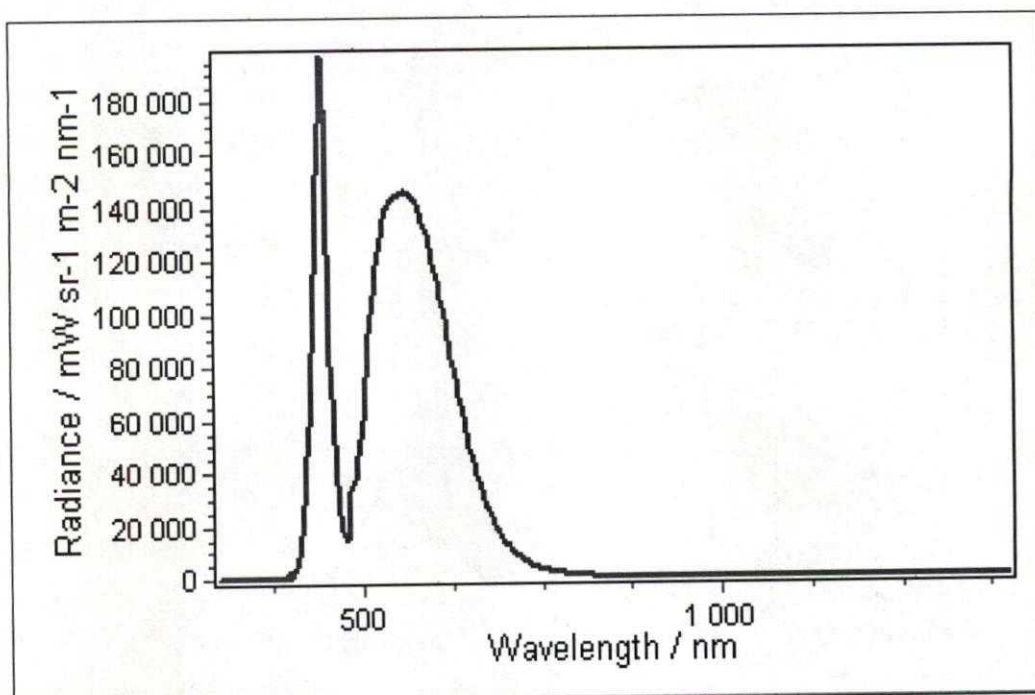


Fig.4

4. Resulting IEC62471 Classification and Labelling

Hazard	Risk Group	Labelling
Actinic UV	Exempt	No Labelling Required
Near UV	Exempt	No Labelling Required
Blue Light Small Source	Group 2	Labelling Required**
Retinal Thermal	Exempt	No Labelling Required

****CAUTION. Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eye**



EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

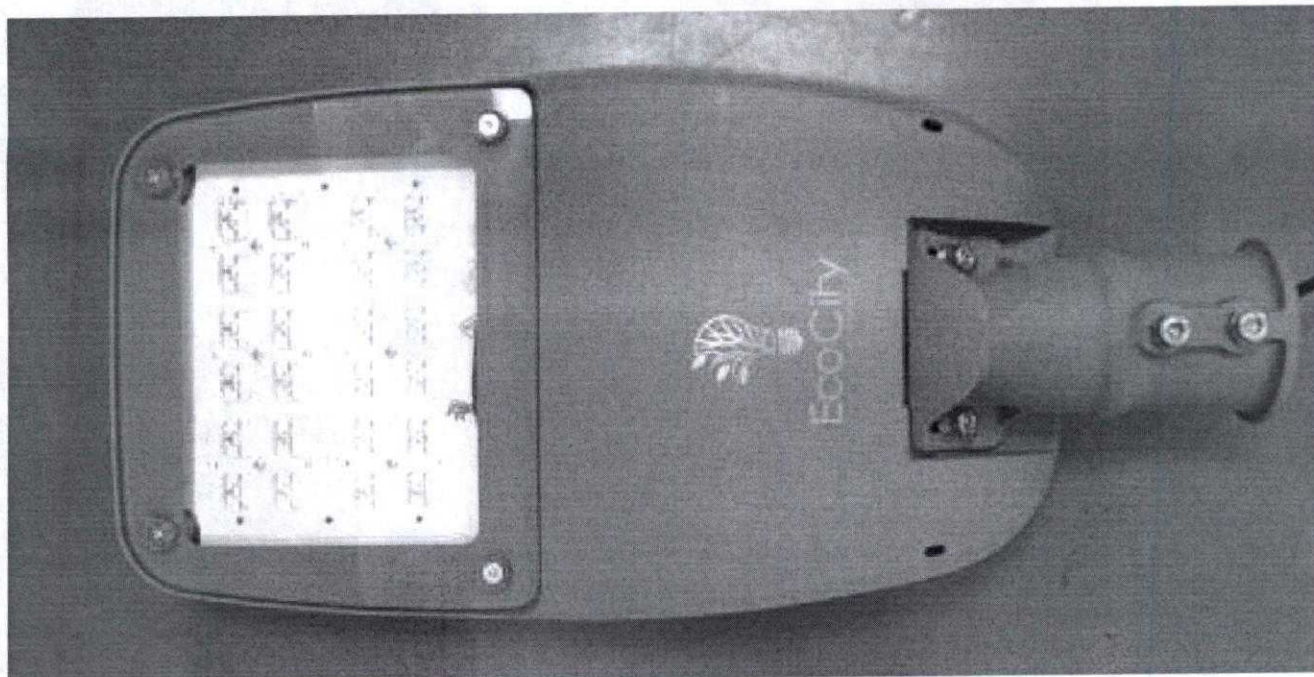
ANNEX 6 Fotos, manual

Foto 1

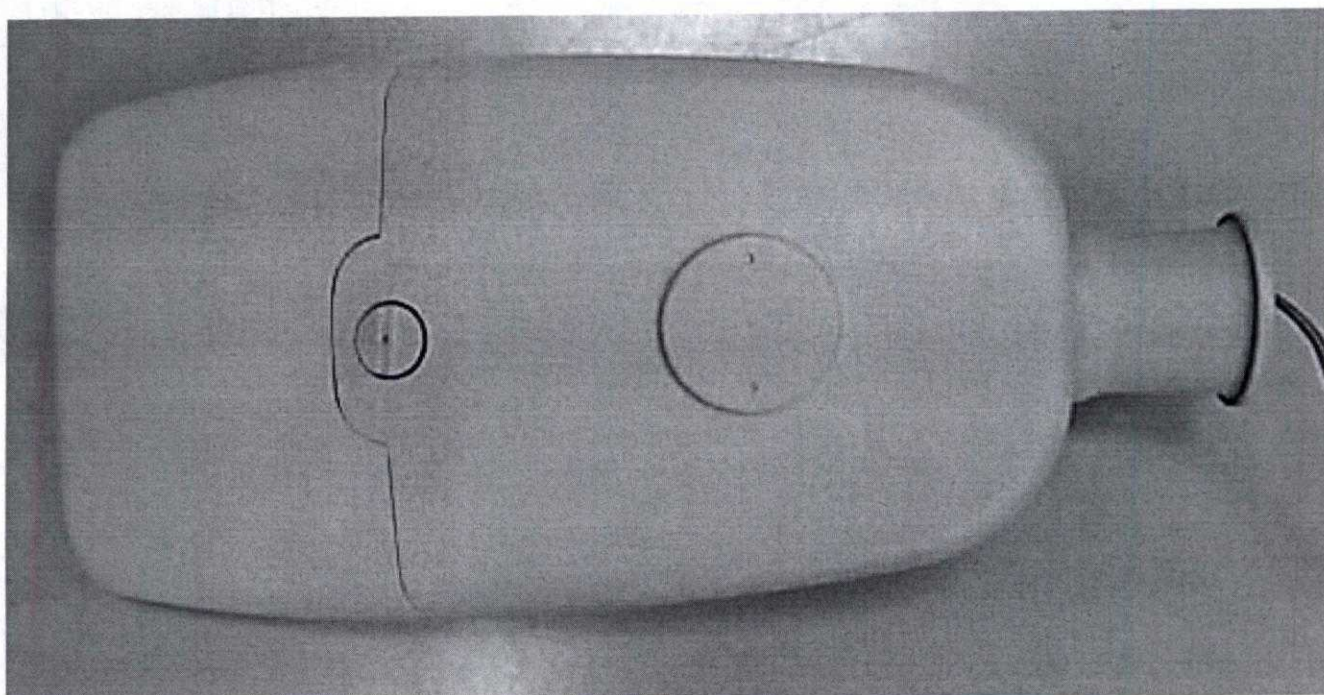


Foto 2

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict



Foto 3

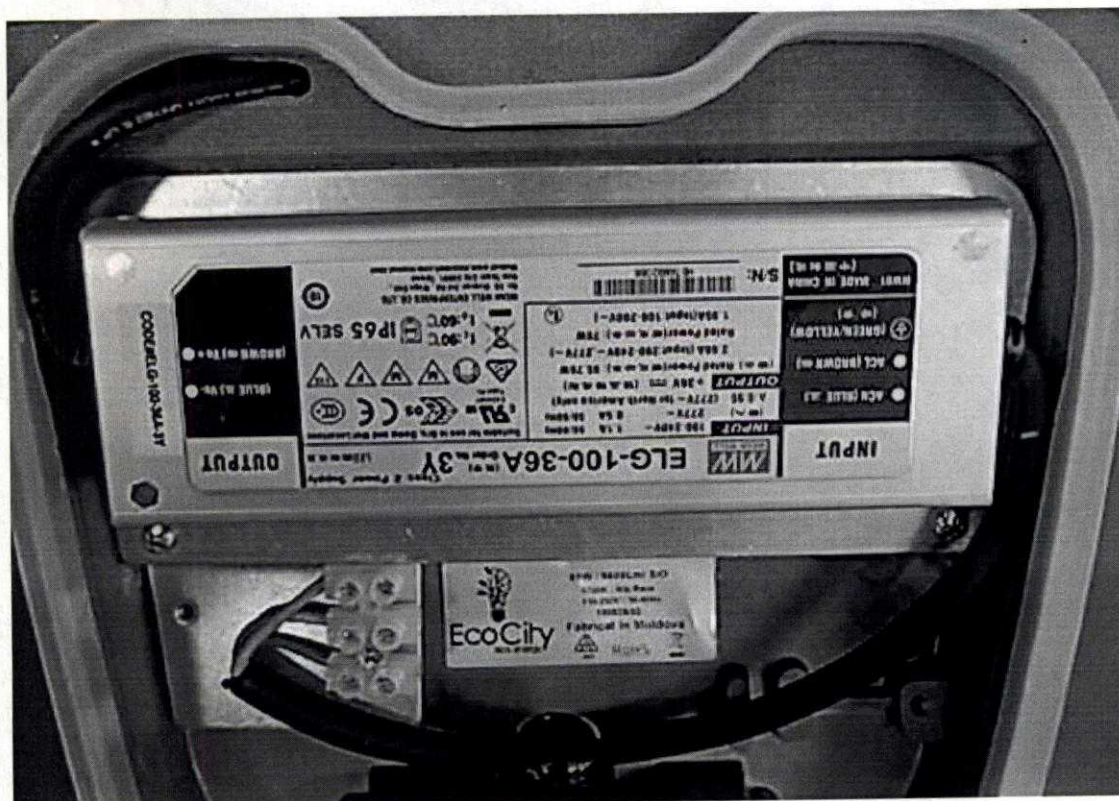


Foto 4

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict



Foto 5



Foto 6

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

Passport and Instruction Manual
Led lamp ECO-PRO
STREET QUASAR S

Foto 7

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

1. General description:

1.1. Eco-pro street Quasar S is designed for mounting on walls or special lighting supports/pillars, because power supply is built-in and hermetically sealed. This type of led light is intended to be used for outdoor lighting including lighting highways, main streets, streets of all categories, territories of micro districts, squares, car parking areas, factory territories, railway platforms, building premises, as well as for indoor lighting of industrial buildings, warehouses, etc.

1.2. This led lamp can work only of 180-295 V mains voltage, 50-60 Hz frequency.

1.3. Eco-pro street Quasar S has first degree protection from an electric shock.

1.4. Eco-pro street Quasar S is designed for console mounting on standard lighting support (spigot) with a diameter of no more than 48-60mm on wall, pillar, etc.

1.5. Nominal climatic factors values are the following:

- Operating temperature range from -45°C to +50°C;

- Temperature limits are settled between -50°C and +60°C;

1.6. Lamp case protection grade – IP66. Eco-pro street Quasar S is hermetically sealed and protected against dust and massive water flows, which can cause a lamp damage by getting inside the lamp case.

1.7. The most important light-forming element is a high efficiency light-emitting diode, produced by CREE/NICHIA companies.

1.8. Eco-pro street Quasar S is equipped with high efficiency power supply, produced by MEANWELL company.

1.9. This led lamp has the following conventional designation (Eco-Pro Street Quasar S XX —X), where the meaning of letters and numbers is the next:

XX- letters, meaning the type of secondary optics (lenses) used in the lamp construction;

--- two-digit or three-digit number, meaning the lamp power indicators.

X- letter, meaning the lamp color temperature.

For the example: Eco-Pro Street Quasar S WD 50N

WD- letters, meaning the type of secondary optics (lenses) used in the lamp construction (detailed information on the luminous intensity distribution curve of each lens is sent on individual request);

50- two-digit or three-digit number, meaning the lamp power indicators. In this case - 100W.

N- letter, meaning the lamp color temperature. C – cool white (5000K - 6500K), N – neutral white (4000K - 5000K), H – warm white (3000K - 4000K).

Foto 8

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015

Clause	Requirement + Test	Result - Remark	Verdict
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2. Technical Characteristics

Characteristics	Eco-Pro Street Quasar S XX 30X	Eco-Pro Street Quasar S XX 40X	Eco-Pro Street Quasar S XX 50X	Eco-Pro Street Quasar S XX 60X	Eco-Pro Street Quasar S XX 80X
Ingress Protection	IP66	IP66	IP66	IP66	IP66
Impact Protection	IK08	IK08	IK08	IK08	IK08
Overall dimensions, HxWxL, mm	102*250*525	102*250*525	102*250*525	102*250*525	102*250*525
Net weight, kg	5,4	5,4	5,4	5,4	5,4
Power consumption, W	30	40	50	60	80
Lumen flux, Lm	3540±15%	4600±15%	5750±15%	6780±15%	8960±15%
Surge protection device	4kV	4kV	4kV	4kV	4kV
Color rendering index, Ra	>70	>70	>70	>70	>70
Color temperature, K	3000-6500	3000-6500	3000-6500	3000-6500	3000-6500
Service time, not less (hours)	50 000	50 000	50 000	50 000	50 000
Wire cross-section, mm ²	3 x 0,75	3 x 0,75	3 x 0,75	3 x 0,75	3 x 0,75

3. Full Set includes

Eco-Pro Street Quasar S – 1 pcs.

Passport and Instruction Manual – 1 pcs each.

Fastening details – 1set.

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

4. Lamp Features

- The fixture is made of corrosion resistant die-cast aluminum. Polyester powder coated painting after chemical washing treatment.
- Glass: IK09 degree of protection against external mechanical impacts.
- Gasket: made up from heat-resistant rubber, through which ip66 grade is achieved.
- Secure connection: If the power supply compartment is opened, the electrical power outage occurs.
- Power supply meets all the requirements of modern safety standards. It also can be equipped with dimming system, surge protection device, etc.
- Universal mounting hole.



5. Exploitation and security guide:

5.1. Exploitation of this led lamp need to be hold on with accordance to "Consumer rules for Installation of Electrical Equipment", in this case - Passport and Instruction Manual. Before the Installation make sure that all mains voltage parameters are observed (220V AC network).

ATTENTION! INSTALLATION AND REMOVAL OF THIS LED LAMP IS STRICTLY PROHIBITED WHILE POWER IS TURNED ON! PLEASE MAKE SURE TO TURN THE POWER OFF BEFORE LED LAMP INSTALLATION OR REMOVAL.

5.2. Proper grounding is crucial for the electrical system, because it helps to prevent any possibility of electrical shock. There is a socket in the terminal block of the led lamp case with special graphical symbol which helps to identify the existence of the earth grounding.

5.3. The exploitation of the led lamp with damaged wire isolation or connection places is strictly prohibited.

5.4. Installation and removal of LED lamp has to be done by professional staff.

5.5. To ensure the connection security of the led lamp with a spigot, mounting stainless steel bolts have to be tightened with a force of not less than 17 Nm and not more than 19 Nm.

5.6. Usage of any toxic materials in lamp composition is strictly prohibited.

Foto 10

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

6. Preparation for led lamp installation and beginning of the working process

ATTENTION! PLEASE MAKE SURE TO TURN THE POWER OFF BEFORE THE LED LAMP INSTALLATION!

Unpack the lamp and read the Instruction Manual.

6.1. Led lamp installation process.

Led lamp mounting is designed for mounting on spigot with pipe diameter 48-60mm. Take out network and earth grounding wires from spigot. Strip the insulation from wires at 7mm length under the clips in the terminal block. Turn the mounting screws on the pipe while getting to the stop point. Put the pipe on the spigot. Connect network and earth grounding wires to the terminal box. Wires, emerging from pipe, do not need to create a force load on the terminal box with their weight. Another clips need to be in set for higher spigots, which keep weight inside pipe and spigot. Then the lamp need to be based into a correct angle and fixed with bolts. Find the required angle of rotation of the lamp by vertical and fix it. The lamp installation is made strictly 0gr. - 90gr. relative to the horizon line.

7. Led lamp additional technical service requirements

7.1. Additional technical service is not required.

8. Warranty

8.1. Led lamp warranty is 60 months, beginning from the sale date. In case if Eco-pro street Quasar led lamp is not working during the warranty period (60 month), seller is obligated to repair the lamp or to change the lamp if buyer was following all Sale Agreements, which are described in this installation Manual and lamp Passport.

Please, contact the manufacturer by the following address: Moldova, Chisinau, str. Mircea cel Batrin, 11. Please write a reclamation, describing all problems, and give it to the manufacturer along with the lamp itself.

8.2. Warranty is not available in next cases:

- Visible mechanical damages on the lamp case;
- Absence or violation of protective labels and seals;
- Exposure of chemically active substances on the lamp case;
- Exposure of abrasive materials on the lamp case;
- Reparation process was made by any person, excluding manufacturer or the manufacturer service center.
- Buyer did not follow the conditions of storage, transportation or usage.

EN 60598-2-3:2003/A1:2011, EN 60598-1:2015			
Clause	Requirement + Test	Result - Remark	Verdict

9. Package, transportation and storage data

9.1. Eco-Pro Street Quasar package CMB is 0,065 m³. Every lamp has its individual package - corrugated cardboard box.

9.2. Transportation is allowed by any type of covered transport, which protect product from mechanical damages and direct impact of oil products, corrosive environments and atmospheric precipitation.

9.3. The lamp storage is allowed only on shelves in closed dry premises in conditions that exclude the impact of oil products and corrosive environments, at a distance of at least one meter from heating and heating appliances. Possible storage temperature is -50 to +60°C at a relative humidity of air no more than 85%.

10. Lamp recycling

10.1. There are no expensive or toxic materials in lamp composition that's why there are no special recycling suggestions. Recycling is carried out in the usual way.

Signature of the Chief of the Production and Technical Department



Signature of the head of the technical control department

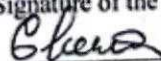


Foto 12

