

**LUG**[®]LUG Light Factory Ltd.
Producer of Professional Lighting Fittings

PHOTOMETRIC TEST REPORT

Test Report according to LM-79 / EN13032

1. Device Under Test specification:

TEST REPORT NO. :	098/2018
TEST PROTOCOL NO. :	4674
PLACE/DATE:	ZIELONA GÓRA, 29.03.2018
TESTED AND COMPILED BY:	KRZYSZTOF OLEK
APPROVED BY:	MARCIN BIAŁAS
DEVICE UNDER TEST:	LIGHT FITTING
LUMINAIRE NAME:	URBINO LED ED 6200lm/740 O8 szary
ARTICLE NO:	130222.5L041.081
MANUFACTURER:	LUG LIGHT FACTORY
VERSION INFO:	STANDARD
LED MODULE:	ML1500301.W740.04A
LAMP IDENTIFICATION :	LED 4000K
LED DRIVER:	OSRAM OT 100/120...277/700 P5
INPUT VOLTAGE/FREQUENCY:	230V/50Hz
LUMINAIRE DIMENSIONS :	L : 0.550 m / W : 0.250 m / H : 0.100 m
LIGHT OUTPUT DIMENSIONS :	L : 0.200 m / W : 0.285 m

2. Goniophotometry Test Results:

LUMINOUS FLUX :	6100lm
ACTIVE POWER :	56W
EFFICIENCY :	108,9lm/W
RMS SUPPLY CURRENT	0,26A
POWER FACTOR:	0,942
RMS SUPPLY VOLTAGE :	230,0V
FREQUENCY :	50,0Hz
LIGHT DISTRIBUTION ANGLE:	N/A
ACCURACY :	± 5 %
AMBIENT TEMPERATURE :	25 °C ± 1 °C

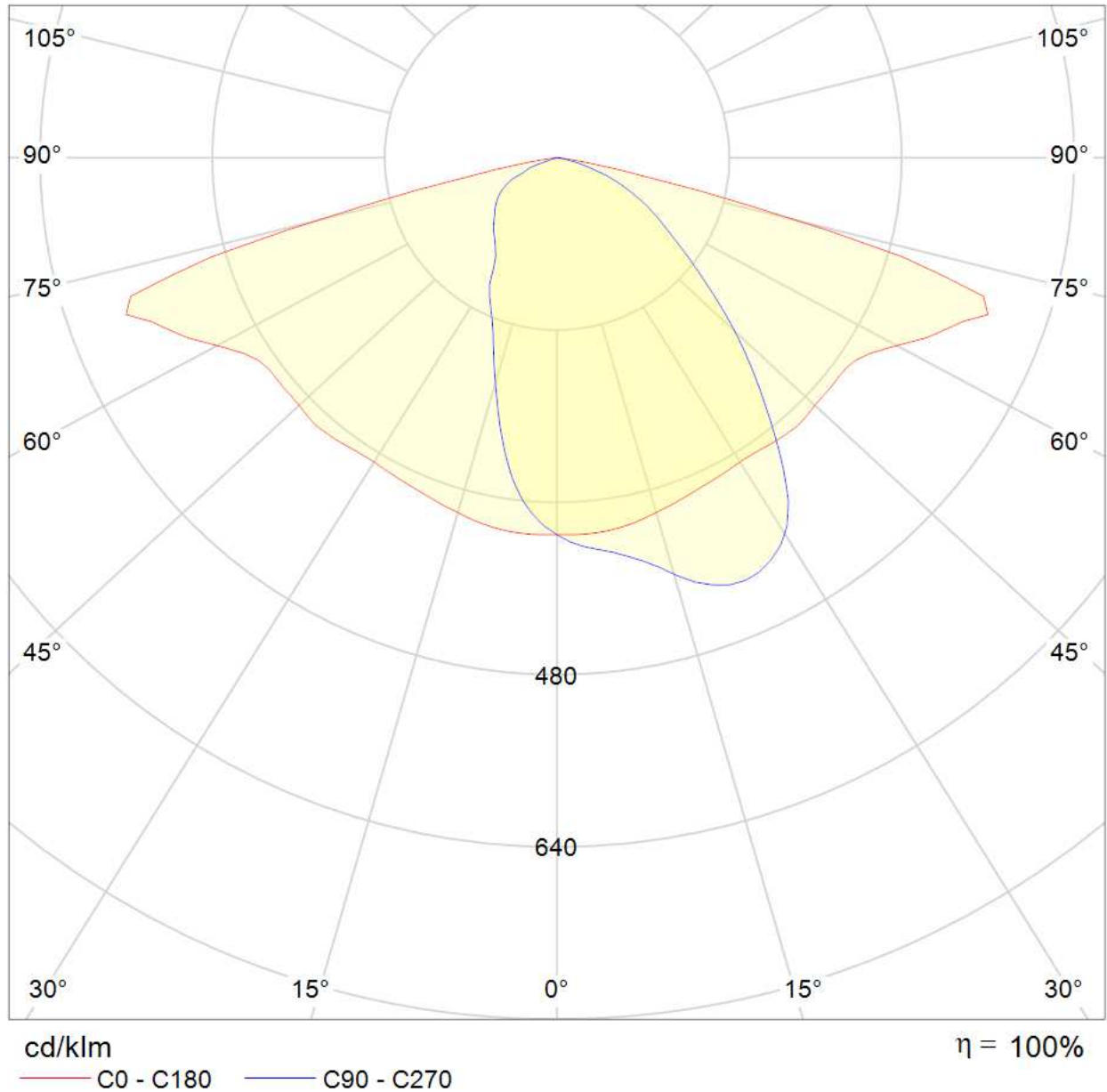


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3. LIGHT DISTRIBUTION (POLAR) CURVE:





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4. LUMINOUS INTENSITY DISTRIBUTION in cd/1000lm:

C/γ	90	105	120	135	150	165	180	195	210	225	240	255	270
0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0
2	342,2	342,0	343,1	344,7	346,4	348,4	350,3	352,3	353,6	355,3	355,9	356,5	357,1
4	331,3	332,4	334,6	338,3	342,2	346,7	350,5	354,1	357,1	359,9	360,9	361,5	362,0
6	317,6	319,6	324,0	330,4	337,2	344,2	350,2	355,9	360,0	363,1	364,5	365,1	365,7
8	299,9	302,7	309,7	320,4	331,1	341,3	349,5	356,9	362,2	366,1	368,2	369,2	369,8
10	278,0	282,2	292,2	307,7	323,7	337,6	348,1	357,4	363,6	368,7	373,0	374,9	375,7
12	254,5	259,3	272,3	292,7	314,5	333,3	346,5	357,5	364,7	371,6	379,0	381,6	382,6
14	230,7	236,2	251,0	275,7	303,9	328,2	344,1	357,1	365,6	375,1	385,1	390,7	391,8
16	209,5	214,9	229,7	257,5	291,6	322,8	341,6	355,3	366,2	379,1	393,4	402,0	403,4
18	190,3	195,6	209,6	238,2	278,4	316,9	339,7	354,1	365,7	384,1	402,9	412,9	414,3
20	173,2	178,1	191,2	219,0	263,7	310,4	337,4	353,2	365,8	390,1	411,2	420,3	422,0
22	160,9	164,6	174,7	201,1	248,7	303,1	335,4	352,0	366,5	396,3	417,5	425,6	427,7
24	151,3	154,5	161,1	184,5	232,7	295,3	333,7	351,1	368,4	403,4	421,5	428,6	429,7
26	142,8	145,8	149,6	169,3	216,6	287,0	332,4	350,9	372,3	408,5	423,8	428,1	428,1
28	133,3	137,0	139,9	156,1	201,2	278,5	331,3	350,6	377,6	411,9	422,8	424,3	423,0
30	117,0	124,0	131,5	145,0	186,7	269,5	330,1	350,3	383,8	413,8	419,9	417,9	415,4
32	107,2	110,1	121,7	135,5	172,7	259,9	329,5	350,8	389,1	412,8	414,0	407,7	403,0
34	102,3	104,2	107,1	126,9	159,3	249,3	329,9	352,9	393,1	409,8	405,7	392,3	384,1
36	97,8	99,6	99,4	119,9	146,7	238,6	331,1	356,6	395,3	404,5	393,5	369,6	357,6
38	94,2	95,5	94,8	109,2	136,1	227,6	332,6	362,9	397,7	397,8	374,8	341,9	329,4
40	91,2	91,7	90,4	96,7	127,3	215,6	333,5	369,9	398,3	389,1	348,5	313,1	301,4
42	88,2	88,3	86,3	90,0	119,7	202,7	334,5	378,3	396,8	376,3	319,1	285,7	275,8
44	84,7	84,5	82,7	85,6	112,7	187,7	333,5	388,9	394,4	356,3	289,5	260,2	251,4
46	81,0	80,5	79,4	81,5	105,1	171,5	332,0	402,7	391,9	329,7	261,9	235,7	226,8
48	77,8	76,7	75,6	77,6	93,2	155,3	331,5	419,5	388,8	297,8	235,9	210,8	202,5
50	75,4	73,6	71,9	73,7	82,6	140,4	331,8	437,2	383,9	266,7	210,4	187,4	179,9
52	72,3	70,1	68,4	69,4	76,8	127,1	331,4	457,3	374,8	237,0	186,0	166,3	160,1
54	69,1	66,3	64,7	65,4	72,3	115,3	332,0	479,7	359,8	209,5	163,2	147,6	142,9
56	66,0	62,9	60,6	61,5	67,4	104,9	335,4	507,7	335,7	183,8	143,6	131,3	127,4
58	62,5	59,3	56,9	57,3	62,6	95,7	342,9	541,9	302,5	159,1	126,7	117,9	115,3
60	58,3	54,8	53,0	53,1	57,9	88,1	353,8	582,7	264,5	136,8	112,1	105,8	104,4
62	53,2	50,6	48,7	49,6	53,2	80,0	366,8	624,3	227,8	117,4	98,7	94,9	93,8
64	48,0	46,5	44,0	45,2	48,7	69,0	381,4	667,1	193,9	100,5	86,4	84,2	81,5
66	34,6	34,8	39,5	40,6	44,4	56,9	393,5	707,4	159,0	85,4	74,7	72,8	70,8
68	30,4	29,5	30,6	36,0	38,7	48,9	406,1	716,8	121,0	69,7	64,1	61,9	60,3
70	25,3	25,0	24,5	31,0	33,4	44,3	425,7	717,0	88,7	56,0	52,9	51,3	49,5
72	10,8	16,7	19,8	21,6	29,2	39,4	416,1	699,4	68,2	42,9	41,4	40,1	36,8

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74	0,3	5,9	13,9	16,3	25,0	34,3	333,6	634,1	51,7	31,1	30,1	28,1	26,9
76	0,0	0,4	6,6	12,4	19,5	27,4	185,8	478,6	37,8	22,5	20,5	20,7	20,0
78	0,0	0,0	1,0	7,9	11,4	20,3	82,2	247,4	25,3	15,3	13,9	14,7	9,9
80	0,0	0,0	0,0	2,1	6,9	13,7	37,7	106,8	16,8	9,9	9,0	8,3	5,8
82	0,0	0,0	0,0	0,1	2,7	6,9	14,1	39,9	10,8	4,4	4,8	3,7	3,3
84	0,0	0,0	0,0	0,0	0,4	2,0	3,6	11,5	4,5	1,5	1,6	1,3	1,0
86	0,0	0,0	0,0	0,0	0,0	0,1	0,3	1,0	0,4	0,0	0,0	0,0	0,0
88	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
90	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

5. LIGHT SPECTRAL DISTRIBUTION :

CIE Colorimetric Parameters

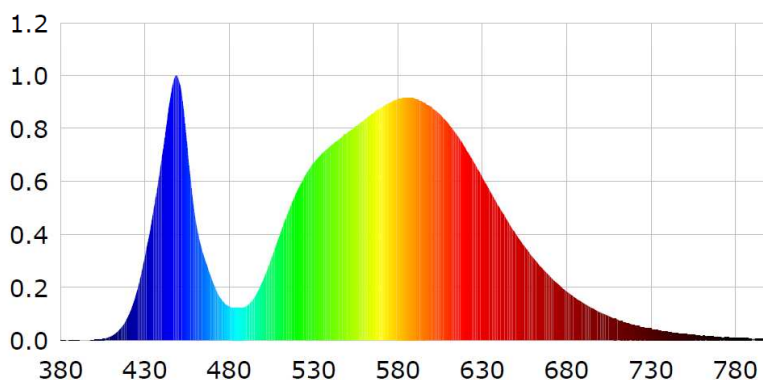
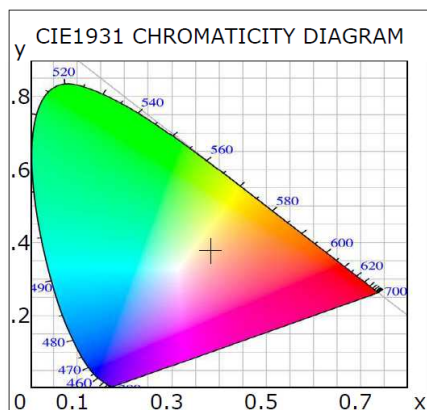
Chromaticity coordinates: $x=0.3815$ $y=0.3762$ $u(u')=0.2260$ $v=0.3343$ $v'=0.5015$ CCT: $T_c=3968K$ ($duv=-0.00055$)Color Ratio: $R=0.172$ $G=0.805$ $B=0.023$

Peak Wavelength: 449nm

Half Bandwidth: 23.7nm

Dominant Wavelength: 579.5nm

Color Purity: 0.274

CRI: R_i : $R_a=73.1$ $R_1=71$ $R_2=79$ $R_3=84$ $R_4=73$ $R_5=70$ $R_6=70$ $R_7=81$ $R_8=56$ $R_9=0$ $R_{10}=49$ $R_{11}=68$ $R_{12}=43$ $R_{13}=72$ $R_{14}=91$ $R_{15}=66$ 

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6. TEST INFORMATION

INTEGRATION TIME: AUTO
INTEGRATOR STABILIZATION TIME: 60 MIN
PHOTOMETRIC DISTANCE: 10,478M
TEST PERFORMED AFTER 2H OF AGING

7. LIST OF EQUIPMENT

SPECIFICATION OF MEASURING APPARATUS USED IN TESTS			
NO.	EQUIPMENT/PRODUCER/TYPER	MARK	USED
1.	SPHERE-SPECTRORADIOMETER LISUN LMS-9000A(PLUS),SCAN RANGE: 380NM~800NM:1NM, SPHERE DIAMETER: 1.50M, 4PI, INTEGRATION TIME: AUTO	SPE/51/LAB	☒
2.	SPECTROMETER: UPRTEK ADVANCED MK350S, SCAN RANGE: 380NM~780NM:1NM	45/LAB/LM	☐
3.	GONIOPHOTOMETER TYPE C-GAMA GONIOMETR GLG-20-1500, G1500-019 4/2017	LAB/UP/26	☒
4.	POWERMETER WITH HARMONIC ANALISER: PF9811 EVERFINE, ACCURACY: CLASS 0,5	53/LAB/DPM	☒
5.	AC TESTING POWER SOURCE DPS1005 EVERFINE	54/LAB/TPS	☒
6.	DIGITAL MULTIMETER, TEKTRONIX	42/LAB/DM	☒
7.	SPEKTROMETER GL SPECTIS 1.0 FLICKER VIS XT010065/16J00129	LAB/PP/34	☒
8.	SPEKTROMETER GL SPECTIS 1.0 VIS GLX10 X0010261/B14W0060	LAB/PP/35	☐
9.	SPEKTROMETER GL SPECTIS 5.0 UV-VIS-NIR XT050149/1104N069	LAB/PP/36	☐
10.	DIGITAL LUXMETER L-100 379/2009	LAB/PP/01	☐
11.	DIGITAL TEMPERATURE&HUMIDITY LOGGER TR-72WF 4214 085A	LAB/PP/15	☐



ELECTROTECHNICAL TESTING INSTITUTE
Pod Lisem 129
171 02 Praha 8 - Troja

No. of pages: 1
No. of annexes/No. of an. pages: 1/37

No. of the Test Report: 601205-01/01

Issued: 13. 6. 2016



TEST REPORT

Name of product: Luminaires for road and street lighting
Type of product: URBINO LED IP66
Ratings: 220-240 V, 50/60 Hz, 28, 37, 55, 84, 110 W, IP 66, class I
Serial number: ---
Manufacturer: LUG Light Factory Sp. z o.o.,
ul. Gorzowska 11, 65-127 Zielona Góra, Poland
Production site: LUG Light Factory Sp. z o.o.,
ul. Gorzowska 11, 65-127 Zielona Góra, Poland
Ordering firm: LUG Light Factory Sp. z o.o.,
ul. Gorzowska 11, 65-127 Zielona Góra, Poland
Number of tested samples: 1
Samples submitted on: ---
Location of testing: EZÚ
Tested from through
Other data: ---
The product was tested according to: IEC 60598-1:2014,
IEC 60598-2-3:2002,
EN 60598-1:2015,
EN 60598-2-3:2003+A1:2011,

Compiled by: Pavel Vodrážka



Approved by: Lukáš Burda
Testing laboratory
technical manager

Test results stated in the test report apply only to the tested subject and unless specified otherwise in the test report, the tests were performed using the method and under the conditions determined in the test regulations, technical norm, instructions for use and information provided by the manufacturer on the tested subject and using accessories required by the manufacturer.
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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..... : 601205-01/01

Date of issue : 13.06.02016

Total number of pages 37

Name of Testing Laboratory preparing the Report : Elektrotechnický zkušební ústav s.p.
Pod Lisem 129, 171 02 Praha 71 - Troja, Czech Republic

Applicant's name : LUG LIGHT FACTORY SP. Z O. O

Address : 65-127 Zielona Góra ul. Gorzowska 11; Polska

Test specification:

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

Test procedure : CB Scheme + ENEC

Non-standard test method : N/A

Test Report Form No. : IEC60598_2_3J

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

Master TRF : 2014-09

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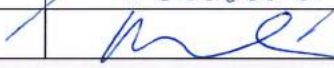
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General disclaimer:

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

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Test item description	Luminaires for road and street lighting	
Trade Mark		
Manufacturer	LUG LIGHT FACTORY SP. Z O. O 65-127 Zielona Góra ul. Gorzowska 11; Polska	
Model/Type reference	URBINO LED IP66	
Ratings	220-240 V, 50/60 Hz, LED module 28, 37, 55, 84, 110 W, IP66,	
☐ CB Testing Laboratory:	Elektrotechnický zkušební ústav s.p	
Testing location/ address	Pod Lisem 129, 171 02 Praha 71-Troja, Czech Republic	
☐ Associated CB Testing Laboratory:		
Testing location/ address	---	
Tested by (name, function, signature)	Pavel Vodrážka	
Approved by (name, function, signature) ...:	Lukáš Burda	
☐ Testing procedure: TMP/CTF Stage 1:		
Testing location/ address	---	
Tested by (name, function, signature)		
Approved by (name, function, signature) ...:		
☐ Testing procedure: WMT/CTF Stage 2:		
Testing location/ address	---	
Tested by (name + signature)		
Witnessed by (name, function, signature) ..:		
Approved by (name, function, signature) ...:		
☐ Testing procedure: SMT/CTF Stage 3 or 4:		
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):

Annex 1: components (one page)

Annex 2: temperature measurements, thermal tests of Section 12 (two pages)

Annex 5: photo (for pages)

Annex 6: instruction (one page)

Summary of testing:**Tests performed (name of test and test clause):**

All required tests.

Testing location:

same address as on page 2.

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

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

Copy of marking plate:

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

**Variants:**

Annex 4, Page 34

Test item particulars	
Classification of installation and use : Luminaires for road and street lighting	
Supply Connection : Terminal block	
..... :	
Possible test case verdicts:	
- test case does not apply to the test object : -- (Not applicable)	
- test object does meet the requirement : P (Pass)	
- test object does not meet the requirement : F (Fail)	
Testing	
Date of receipt of test item : 25.04.2016	
Date (s) of performance of tests : 16.5.2016÷13.6.2016	
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
Throughout this report a ☒ comma / ☐ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-2-13:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : --	
General product information: Protection class: class I. Degree of protection: IP 66 Mounting position: column Supply connection: terminal block Used light source: LED module Tested luminaire: URBINO LED 130222.5L111.031	



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

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

3.4 (2)	CLASSIFICATION		
3.4 (2.2)	Type of protection	Class I	—
3.4 (2.3)	Degree of protection	IP66	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes ☒ No ☐	—
3.4 (2.5)	Luminaire for normal use	Yes ☒ No ☐	—
	Luminaire for rough service	Yes ☐ No ☒	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes ☒ No ☐	—
	b) on a mast arm	Yes ☒ No ☐	—
	c) on a post top	Yes ☐ No ☐	—
	d) on span or suspension wires	Yes ☒ No ☒	—
	e) on a wall	Yes ☒ No ☐	—

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

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

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

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- spot welding		---
	- welding between wires		---
	- Type Z attachment		---
	- mechanical test according to 15.8.2		---
	- electrical test according to 15.9		---
	- heat test according to 15.9.2.3 and 15.9.2.4		---
3.6 (4.7.4)	Terminals other than supply connection		---
3.6 (4.7.5)	Heat-resistant wiring/sleeves		---
3.6 (4.7.6)	Multi-pole plug		---
	- test at 30 N		---
3.6 (4.8)	Switches		
	- adequate rating		---
	- adequate fixing		---
	- polarized supply		---
	- compliance with IEC 61058-1 for electronic switches		---
3.6 (4.9)	Insulating lining and sleeves		
3.6 (4.9.1)	Retainment		---
	Method of fixing		---
3.6 (4.9.2)	Insulated linings and sleeves:		
	Resistant to a temperature > 20 °C to the wire temperature or		---
	a) & c) Insulation resistance and electric strength		---
	b) Ageing test. Temperature (°C)		---
3.6 (4.10)	Double or reinforced insulation		
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		---
	Safe installation fixed luminaires		---
	Capacitors and switches		---
	Interference suppression capacitors according to IEC 60384-14		---
3.6 (4.10.2)	Assembly gaps:		
	- not coincidental		---
	- no straight access with test probe		---
3.6 (4.10.3)	Retainment of insulation:		

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- fixed		---
	- unable to be replaced; luminaire inoperative		---
	- sleeves retained in position		---
	- lining in lampholder		---
3.6 (4.11)	Electrical connections and current-carrying parts		
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		
	- self-tapping screws		---
	- thread-cutting screws		---
3.6 (4.11.3)	Screw locking:		
	- spring washer		P
	- rivets		---
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		---
3.6 (4.12)	Screws and connections (mechanical) and glands		
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		---
	Torque test: torque (Nm); part.....:	cover M4: 1,2 Nm	P
	Torque test: torque (Nm); part.....:		---
	Torque test: torque (Nm); part.....:		---
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		---
3.6 (4.12.4)	Locked connections:		
	- fixed arms; torque (Nm).....:		---
	- lampholder; torque (Nm)		---
	- push-button switches; torque 0,8 Nm.....:		---
3.6 (4.12.5)	Screwed glands; force (Nm)	3,25	P
3.6 (4.13)	Mechanical strength		
3.6 (4.13.1)	Impact tests:		
	- fragile parts; energy (Nm).....:	Optical part: 0,5	P
	- other parts; energy (Nm)	Body: 0,7	P
	1) live parts		P
	2) linings		---
	3) protection		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	4) covers		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		
	- IP54 or higher		---
	a) fixed		---
	b) hand-held		---
	c) delivered with a stand		---
	d) for temporary installations and suitable for mounting on a stand		---
3.6 (4.13.6)	Tumbling barrel		---
3.6 (4.14)	Suspensions, fixings and means of adjusting		
3.6 (4.14.1)	Mechanical load:		
	A) four times the weight		---
	B) torque 2,5 Nm		---
	C) bracket arm; bending moment (Nm).....:		---
	D) load track-mounted luminaires		---
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		---
	Metal rod. diameter (mm)		---
	Fixed luminaire or independent control gear without fixing devices		---
3.6 (4.14.2)	Load to flexible cables		
	Mass (kg)		---
	Stress in conductors (N/mm ²)		---
	Mass (kg) of semi-luminaire		---
	Bending moment (Nm) of semi-luminaire		---
3.6 (4.14.3)	Adjusting devices:		
	- flexing test; number of cycles.....:		---
	- strands broken.....:		---
	- electric strength test afterwards		---
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		---
3.6 (4.14.5)	Guide pulleys		---
3.6 (4.14.6)	Strain on socket-outlets		---
3.6 (4.15)	Flammable materials		

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- glow-wire test 650°C	See Test Table 3.15 (13.3.2)	---
	- spacing ≥ 30 mm		---
	- screen withstanding test of 13.3.1		---
	- screen dimensions		---
	- no fiercely burning material		---
	- thermal protection		---
	- electronic circuits exempted		---
3.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		
	a) construction		---
	b) temperature sensing control		---
	c) surface temperature		---
3.6 (4.16)	Luminaires for mounting on normally flammable surfaces		
	No lamp control gear	(compliance with Section 12)	---
3.6 (4.16.1)	Lamp control gear spacing:		
	- spacing 35 mm		P
	- spacing 10 mm		---
3.6 (4.16.2)	Thermal protection:		
	- in lamp control gear		P
	- external		---
	- fixed position		---
	- temperature marked lamp control gear	T120	P
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	---
3.6 (4.17)	Drain holes		
	Clearance at least 5 mm		---
3.6 (4.18)	Resistance to corrosion		
3.6 (4.18.1)	- rust-resistance		---
3.6 (4.18.2)	- season cracking in copper		---
3.6 (4.18.3)	- corrosion of aluminium		---
3.6 (4.19)	Igniters compatible with ballast		---
3.6 (4.20)	Rough service vibration		---
3.6 (4.21)	Protective shield		
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		---
	Shield of glass if tungsten halogen lamps		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		---
3.6 (4.21.3)	No direct path		---
3.6 (4.21.4)	Impact test on shield		---
	Glow-wire test on lamp compartment.....:	See Test Table 3.15 (13.3.2)	---
3.6 (4.22)	Attachments to lamps not cause overheating or damage		---
3.6 (4.23)	Semi-luminaires comply Class II		---
3.6 (4.24)	Photobiological hazards		
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		---
3.6 (4.24.2)	Retinal blue light hazard		
	Luminaires with E_{thr} :		---
	a) Fixed luminaires		---
	- distance x m, borderline between RG1 and RG2...:		---
	- marking and instruction according 3.2.23		---
	b) Portable and handheld luminaires		---
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		---
	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		---
3.6 (4.25)	Mechanical hazard		
	No sharp point or edges		P
3.6 (4.26)	Short-circuit protection		
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		---
3.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		
	Test chain not melt through		---
	Test sample not exceed values of Table 12.1 and 12.2		---
3.6 (4.27)	Terminal blocks with integrated screwless earthing contacts		
	Test according Annex V		---
	Pull test of terminal fixing (20 N)		---
	After test, resistance < 0,05 Ω		---
	Pull test of mechanical connection (50 N)		---
	After test, resistance < 0,05 Ω		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage drop test, resistance < 0,05 Ω		---
3.6 (4.28)	Fixing of thermal sensing control		
	Not plug-in or easily replaceable type		---
	Reliably kept in position		---
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		---
	Not outside the luminaire enclosure		---
	Test of adhesive fixing:		
	Max. temperature on adhesive material (°C).....:		---
	100 cycles between t min and t max		---
	Temperature sensing control still in position		---
3.6 (4.29)	Luminaires with non-replaceable light source		
	Not possible to replace light source		---
	Live part not accessible after parts have been opened by hand or tools		---
3.6 (4.30)	Luminaires with non-user replaceable light source		
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:		
	Minimum two fixing means		---
3.6 (4.31)	Insulation between circuits		
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		---
	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		---
3.6 (4.31.1)	SELV circuits		
	Used SELV source		---
	Voltage $\leq$ ELV		---
	Insulating of SELV circuits from LV supply		---
	Insulating of SELV circuits from other non SELV circuits		---
	Insulating of SELV circuits from FELV		---
	Insulating of SELV circuits from other SELV circuits		---
	SELV circuits insulated from accessible parts according Table X.1		---
	Plugs not able to enter socket-outlets of other voltage systems		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Socket outlets does not admit plugs of other voltage systems		---
	Plugs and socket-outlets does not have protective conductor contact		---
3.6 (4.31.2)	FELV circuits		
	Used FELV source		---
	Voltage $\leq$ ELV		---
	Insulating of FELV circuits from LV supply		---
	FELV circuits insulated from accessible parts according Table X.1		---
	Plugs not able to enter socket-outlets of other voltage systems		---
	Socket outlets does not admit plugs of other voltage systems		---
	Socket-outlets does not have protective conductor contact		---
3.6 (4.31.3)	Other circuits		
	Other circuits insulated from accessible parts according Table X.1		---
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		---
	- conductive parts are connected together		---
	- test according 7.2.3 of above		---
	- conductive part not cause an electric shock in case of an insulation fault		---
	- equipotential bonding in master/slave applications		---
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		---
	- slave luminaire constructed as class I		---
3.6 (4.32)	Overvoltage protective devices		
	Comply with IEC 61643-11		---
	External to controlgear and connected to earth:		
	- only in fixed luminaires		---
	- only connected to protective earth		---
3.6.1 (-)	At least IP X3 or X5 respectively. IP	IP66	P
	Column-integrated luminaires:		
	- parts below 2,5 m. IP		---
	- parts above 2,5 m. IP	min. 6 m, max. 10 m $\downarrow$: IP66	P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6.2 (-)	Suspension on span wires		---
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		---
3.6.3.1 (-)	Static load test		
	- drag coefficient	1,2	P
	- loaded area (m ²)	0,039	P
	- used load (N)	77,5	P
	- measured deformation (cm/m)		P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		---
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		---
	c) protected by any means to retain glass fragments		---
	For tunnel luminaires 3.6.5.1 apply		---
	Method of protection declared by the manufacturer		P
3.6.5.1 (-)	Protection by the use of glass that fractures into small pieces		
	- number of particles is more than 40	51	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		
3.6.5.2.1 (-)	Glass covers have high mechanical strength		---
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample		---
3.6.5.2.2 (-)	Glass covers not break into large pieces		---
	- test according 3.6.5.1, number of particles is more than 20		P
3.6.6 (-)	Connection compartment of column-integrated luminaire		
	- provides adequate space		---
	- means for attachment		---
	- means for attachment of metal corrosion-resistant		---
3.6.7 (-)	Compliance with ISO standard or other		---
3.6.8 (-)	Doors of column-integrated luminaires:		
	- corrosion-resistant		---
	- opening only possible for an authorized person		---

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

3.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		
3.7 (11.2)	Creepage distances and clearances	See Table 3.7 (11.2)	
	Working voltage (V)	230	---
	Rated pulse voltage (kV)		---
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	---
	PTI	< 600 ☒ ≥ 600 ☐	---
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	---

3.8 (7)	PROVISION FOR EARTHING		
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω	0,011	P
	Self-tapping screws used		---
	Thread-forming screws		---
	Thread-forming screw used in a grove		---
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		---
	Protective earthing of the luminaire not via built-in control gear		---
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		---
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P

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

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		---
3.10 (5.2.8)	Insulating bushings:		
	- suitably fixed		---
	- material in bushings		---
	- material not likely to deteriorate		---
	- tubes or guards made of insulating material		P
3.10 (5.2.9)	Locking of screwed bushings		---
3.10 (5.2.10)	Cord anchorage:		
	- covering protected from abrasion		---
	- clear how to be effective		---
	- no mechanical or thermal stress		---
	- no tying of cables into knots etc.		---
	- insulating material or lining		---
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		
	a) at least one part fixed		---
	b) types of cable		---
	c) no damaging of the cable		---
	d) whole cable can be mounted		---
	e) no touching of clamping screws		---
	f) metal screw not directly on cable		---
	g) replacement without special tool		---
	Glands not used as anchorage		---
	Labyrinth type anchorages		---
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		---
3.10 (5.2.10.3)	Tests:		
	- impossible to push cable; unsafe		---
	- pull test: 25 times; pull (N).....:		---
	- torque test: torque (Nm)		---
	- displacement ≤ 2 mm		---
	- no movement of conductors		---
	- no damage of cable or cord		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- function independent of electrical connection		---
3.10 (5.2.11)	External wiring passing into luminaire		P
3.10 (5.2.12)	Looping-in terminals		---
3.10 (5.2.13)	Wire ends not tinned		---
	Wire ends tinned: no cold flow		---
3.10 (5.2.14)	Mains plug same protection		---
	Class III luminaire plug		---
	No unsafe compatibility		---
3.10 (5.2.16)	Appliance inlets (IEC 60320)		---
	Installation couplers (IEC 61535)		---
	Other appliance inlet or connector according relevant IEC standard		---
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		---
3.10 (5.2.18)	Used plug in accordance with		
	- IEC 60083		---
	- other standard		---
3.10 (5.3)	Internal wiring		
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		
	- not delivered/ mounting instruction		---
	- factory assembled		P
	- socket outlet loaded (A).....:		---
	- temperatures: (see Annex 2)		---
	Green-yellow for earth only		---
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		
	Cross-sectional area (mm ²).....:	0,5	P
	Insulation thickness		P
	Extra insulation added where necessary		---
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Adequate cross-sectional area and insulation thickness		---
3.10 (5.3.1.3)	Double or reinforced insulation for class II		P
3.10 (5.3.1.4)	Conductors without insulation		---
3.10 (5.3.1.5)	SELV current-carrying parts		---
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		P
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		---
	Joints, raising/lowering devices		---
	Telescopic tubes etc.		---
	No twisting over 360°		---
3.10 (5.3.3)	Insulating bushings:		
	- suitable fixed		---
	- material in bushings		---
	- material not likely to deteriorate		---
	- cables with protective sheath		---
3.10 (5.3.4)	Joints and junctions effectively insulated		---
3.10 (5.3.5)	Strain on internal wiring		---
3.10 (5.3.6)	Wire carriers		---
3.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		---
3.10.1 (-)	Cord anchorage if applicable		---
	- pull test: 25 times; pull (N)..... :		---
	- torque test: torque (Nm)..... :		---

3.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		
3.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		---
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		---
	Basic insulation only accessible under lamp or starter replacement		---
	Protection in any position		P
	Double-ended tungsten filament lamp		---
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		---
	Relevant warning according to 3.2.18 fitted to the luminaire		---
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		---
3.11 (8.2.3.a)	Class II luminaire:		
	- basic insulated metal parts not accessible during starter or lamp replacement		---
	- basic insulation not accessible other than during starter or lamp replacement		---
	- glass protective shields not used as supplementary insulation		---
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		---
3.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		
	Ordinary luminaire:		
	- touch current		---
	- no-load voltage		---
	Other than ordinary luminaire:		
	- nominal voltage		---
3.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		---
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		---
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		---
	Portable plug connected luminaire with capacitor		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Other plug connected luminaire with capacitor		---
	Discharge device on or within capacitor		---
	Discharge device mounted separately		---

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 (12.3)	Endurance test:		
	- mounting-position	On pipe	---
	- test temperature (°C)	35	---
	- total duration (h)	168	---
	- supply voltage: Un factor; calculated voltage (V)	230	---
	- lamp used	LED module ML1500302	---
3.12 (12.3.2)	After endurance test:		
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		---
	- 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)	---
3.12 (12.6)	Thermal test (failed lamp control gear condition):		
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		---
	- case of abnormal conditions.....		---
	- electronic lamp control gear		---
	- measured winding temperature (°C): at 1,1 Un		---
	- measured mounting surface temperature (°C) at 1,1 Un		---
	- calculated mounting surface temperature (°C)		---
	- track-mounted luminaires		---
3.12 (12.6.2)	Temperature sensing control		
	- case of abnormal conditions.....		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- thermal link		---
	- manual reset cut-out		---
	- auto reset cut-out		---
	- measured mounting surface temperature (°C).....:		---
	- track-mounted luminaires		---
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		
3.12 (12.7.1)	Luminaire without temperature sensing control		---
3.12 (12.7.1.1)	Luminaire with fluorescent lamp $\leq 70W$		---
	Test method 12.7.1.1 or Annex W		---
	Test according to 12.7.1.1:		
	- case of abnormal conditions.....:		---
	- Ballast failure at supply voltage (V)		---
	- Components retained in place after the test		---
	- Test with standard test finger after the test		---
	Test according to Annex W:		
	- case of abnormal conditions.....:		---
	- measured winding temperature (°C): at 1,1 Un		---
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		---
	- calculated temperature of fixing point/exposed part (°C)		---
	Ball-pressure test.....:	See Table 3.15 (13.2.1)	---
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp $> 70W$, transformer $> 10 VA$		
	- case of abnormal conditions.....:		---
	- measured winding temperature (°C): at 1,1 Un		---
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		---
	- calculated temperature of fixing point/exposed part (°C)		---
	Ball-pressure test.....:	See Table 3.15 (13.2.1)	---
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers $\leq 10 VA$		---
	- case of abnormal conditions.....:		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- Components retained in place after the test		---
	- Test with standard test finger after the test		---
3.12 (12.7.2)	Luminaire with temperature sensing control		
	- thermal link	Yes ☐ No ☐	---
	- manual reset cut-out.....	Yes ☐ No ☐	---
	- auto reset cut-out	Yes ☐ No ☐	---
	- case of abnormal conditions.....		---
	- highest measured temperature of fixing point/ exposed part (°C):		---
	Ball-pressure test:.....	See Table 3.15 (13.2.1)	---
3.12.1 (-)	Temperature reduction if for outdoor use only		---
3.12.2 (-)	(See above)		---
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		---

3.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		---
	- classification according to IP	IP66	---
	- mounting position during test	On pipe	---
	- fixing screws tightened; torque (Nm).....	M8: 20 Nm	---
	- tests according to clauses	9.2.2, 9.2.7	---
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		---
	b) no talcum in dust-tight luminaire	IP6X	P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		---
	d) i) For luminaires without drain holes – no water entry		---
	d) ii) For luminaires with drain holes – no hazardous water entry		---
	e) no water in watertight luminaire	IPX6	P
	f) no contact with live parts (IP 2X)		---
	f) no entry into enclosure (IP 3X and IP 4X)		---
	f) no contact with live parts (IP3X and IP4X)		---

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	g) no trace of water on part of lamp requiring protection from splashing water		---
	h) no damage of protective shield or glass envelope		P
3.13 (9.3)	Humidity test 48 h		P

3.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
3.14 (10.2.1)	Insulation resistance test		---
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø		---
	Insulation resistance (MΩ).....		---
	SELV		
	- between current-carrying parts of different polarity :		---
	- between current-carrying parts and mounting surface	>110	P
	- between current-carrying parts and metal parts of the luminaire	>110	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		---
	- Insulation bushings as described in Section 5		---
	Other than SELV		
	- between live parts of different polarity		---
	- between live parts and mounting surface.....	>550	P
	- between live parts and metal parts	>550	P
	- between live parts of different polarity through action of a switch		---
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		---
	- Insulation bushings as described in Section 5		
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		---
	Luminaires with ignitors after 24 h test		---
	Luminaires with manual ignitors		---
	Test voltage (V)		---
	SELV		

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity :		---
	- between current-carrying parts and mounting surface	500	P
	- between current-carrying parts and metal parts of the luminaire	500	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		---
	- Insulation bushings as described in Section 5		---
	Other than SELV		
	- between live parts of different polarity		---
	- between live parts and mounting surface	1460	P
	- between live parts and metal parts	1460	P
	- between live parts of different polarity through action of a switch		---
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		---
	- Insulation bushings as described in Section 5		---
3.14 (10.3)	Touch current (mA)	< 0,004 mA	P
	Protective conductor current (mA)	0,005 mA	P

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

IEC 60598-2-3							
Clause	Requirement + Test			Result - Remark			Verdict
3.7 (11.2)	TABLES: Creepage distances and clearances						
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						
RMS working voltage (V) not exceeding		50	150	250	500	750	1000
Creepage distances							
Required basic insulation, PTI ≥ 600		0,6	0,8	1,5	3	4	5,5
Measured		---	---	---	---	---	---
Required basic insulation, PTI < 600		1,2	1,6	2,5	5	8	10
Measured		---	>1,6	>2,5	---	---	---
Required supplementary insulation PTI ≥ 600		---	0,8	1,5	3	4	5,5
Measured			---	---	---	---	---
Required supplementary insulation PTI < 600		---	1,6	2,5	5	8	10
Measured			---	---	---	---	---
Required reinforced insulation		---	3,2	5	6	8	11
Measured			---	---	---	---	---
Clearances							
Required basic insulation		0,2	0,8	1,5	3	4	5,5
Measured		---	>0,8	>1,5	---	---	---
Required supplementary insulation		---	0,8	1,5	3	4	5,5
Measured			---	---	---	---	---
Required reinforced insulation		---	1,6	3	6	8	11
Measured			---	---	---	---	---
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages						
Rated pulse voltage (peak kV)		2,0	2,5	3,0	4,0	5,0	6,0
Required clearances		1,0	1,5	2	3	4	5,5
Measured		---	---	---	---	---	---
Rated pulse voltage (peak kV)		10	12	15	20	25	30
Required clearances		11	14	18	25	33	40
Measured		---	---	---	---	---	---
Rated pulse voltage (peak kV)		50	60	80	100	---	---
Required clearances		75	90	130	170	---	---
Measured		---	---	---	---		

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics		
	not applicable		---
3.15 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)		
	not applicable		---
3.15 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)		
	not applicable		---
3.15 (13.4)	TABLE: Proof tracking test (IEC 60112)		
	not applicable		---

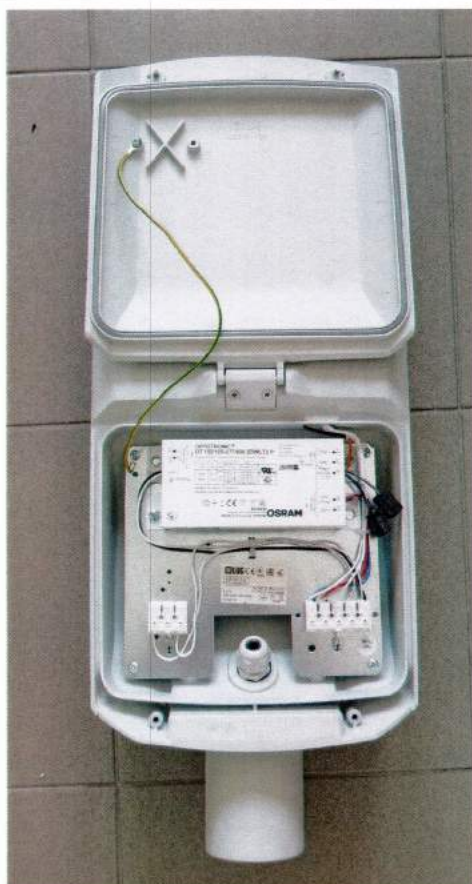
List of used test equipment:

Device	Type	Inv. No.
Greisinger - thermometer	GHT 1200 A	20211
High voltage transformer	HT5053	00005866
Earth continuity test equipment	MPO-01A	550724
Voltmeter	EL20	14672
Power supply KIKUSUI	PCR500M	00110185
Multimeter FLUKE	1587	551734
Load gauge 10N	BRNO	21369
Caliper	MITUTOYO	551392
Test finger	BRNO	21364
Impact test apparatus	F 22.50	4994
Touch and leakage current measurement		N 700054

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12						
	Type reference.....:	URBINO LED 130222.5L111.031		—			
	Lamp used.....:	LED module LUG ML1500302		—			
	Lamp control gear used.....:	OSRAM OPTOTRONIC OT 110/120-277/800 2DIMLT2 P 220-240 V, 50/60 Hz, T120, tc85		—			
	Mounting position of luminaire.....:	On pipe		—			
	Supply wattage (W).....:	110		—			
	Supply current (A).....:	---		—			
	Calculated power factor.....:	---		—			
	Table: measured temperatures corrected for ta = 25 °C						
	- abnormal operating mode.....:	Not used; see supplementary information		—			
	- test 1: rated voltage.....:	230 V		—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	243,8 V		—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:	---		—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....:	---		—			
	Through wiring or looping-in wiring loaded by a current of A during the test.....:	---		—			
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Driver tc	25,5	70	---	---	85	—	
LED module tc	25,5	67	---	---	85	---	
LED wires	25,5	---	51	---	90	---	
Terminal block	25,5	---	48	---	85	---	
External wires	25,5	---	48	---	90	---	
Supplementary information: Temperature marked control gear T120.							

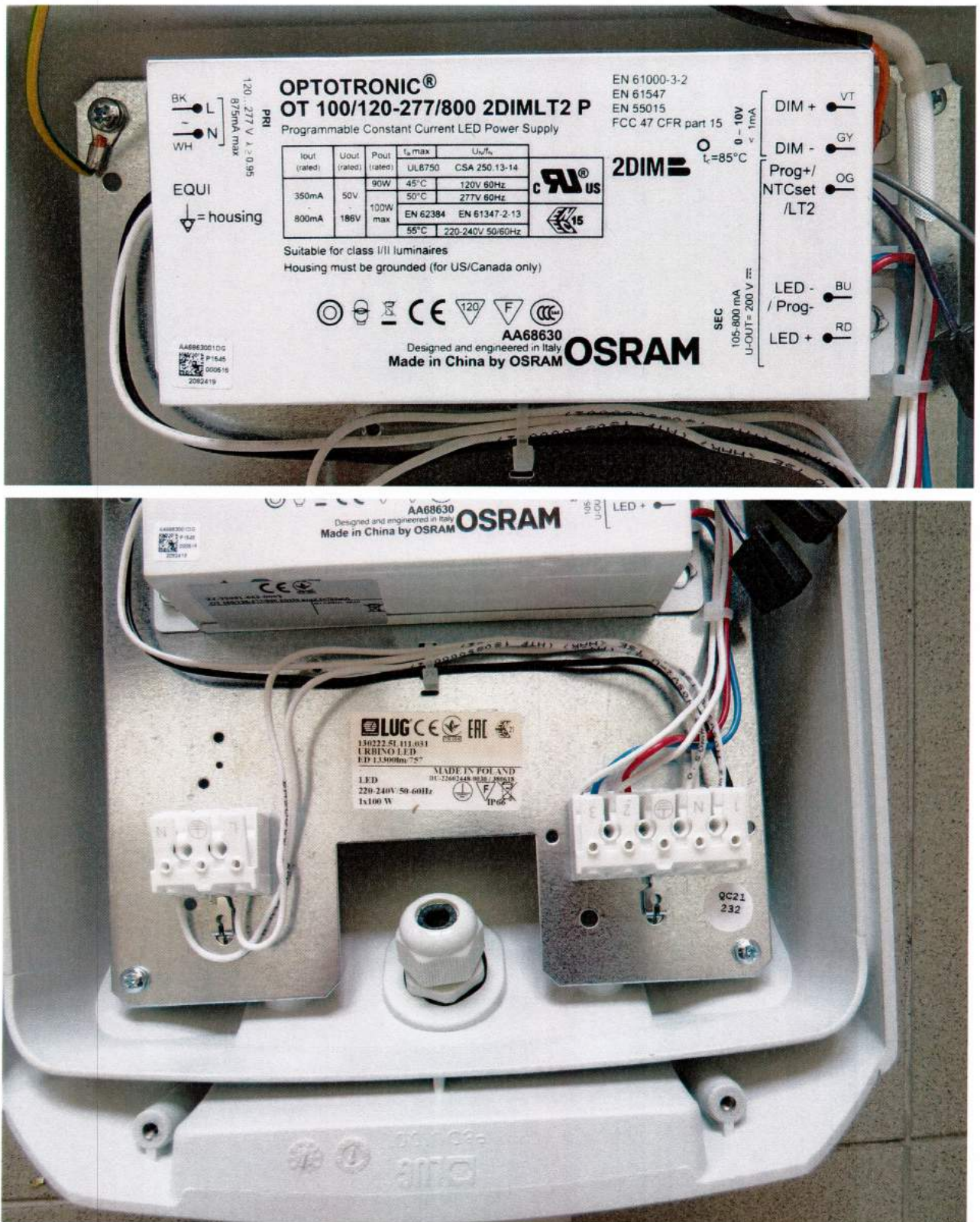
ANNEX 3	Screw terminals (part of the luminaire)						
	not applicable						---
ANNEX 4	Screwless terminals (part of the luminaire)						
	not applicable						---

ANNEX 3 Photo



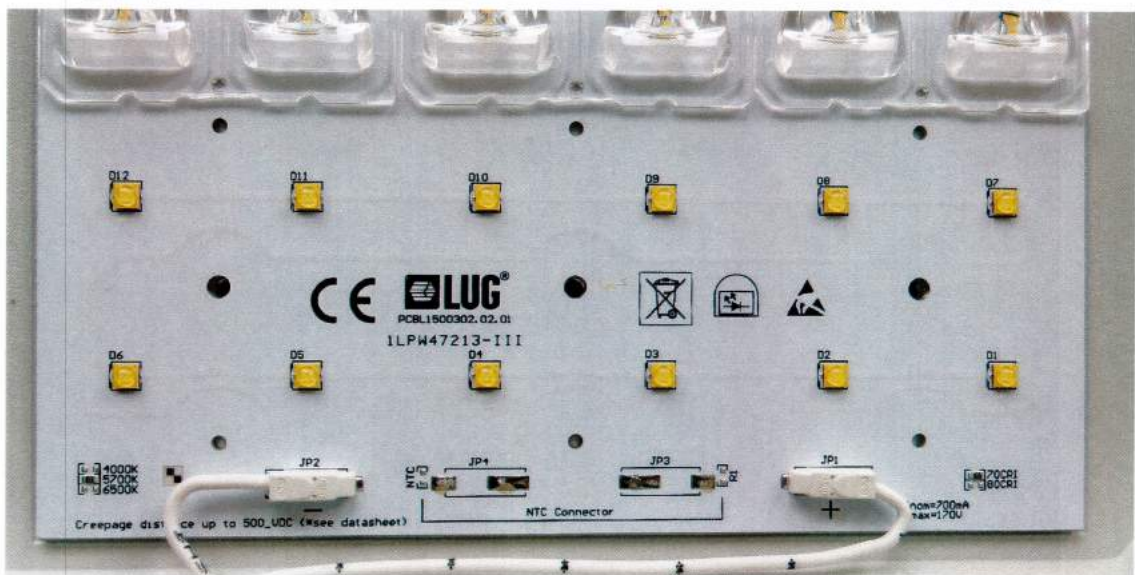
ANNEX 3

Photo



ANNEX 3

Photo



IEC60598_2_3J - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-3 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Luminaires Part 2: Particular requirements Section 3: Luminaires for road and street lighting			
Differences according to : EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015			
Annex Form No. : EU_GD_IEC60598_2_3J			
Annex Form Originator : OVE			
Master Annex Form : 2015-04			
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	CENELEC COMMON MODIFICATIONS (EN)	
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3.5 (3)	MARKING	
3.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package	---

3.6 (4)	CONSTRUCTION	
3.6 (4.11.6)	Electro-mechanical contact systems	---

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

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

IEC60598_2_3J - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		
(3.3)	DK: power supply cords of class I luminaires with label		---
(4.5.1)	DK: socket-outlets		---
(5.2.1)	CY, DK, FI, GB: type of plug		---
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		
(4 & 5)	FR: Shuttered socket-outlets 10/16A		---
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		---
	- 850°C for luminaires in stairways and horizontal travel paths		---
	- 650°C for indoor luminaires		---
	GB: Requirements according to United Kingdom Building Regulation		---



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No. of pages: 36
No. of annexes/No. of an. pages: 0/0

No. of the Test Report: 601205-01/02

Issued: 6. 5. 2016



TEST REPORT

Name of product: Fixed general purpose luminaires, road and street lighting

Type of product: URBINO LED

Ratings: 220-240 V, 50/60 Hz, 28, 37, 55, 84, 110 W, IP 66, IK 09, class I

Serial number: Not specified

Manufacturer: LUG Light Factory Sp. z o.o., ul. Gorzowska 11, 65-127 Zielona Góra, the Republic of Poland

Production site: LUG Light Factory Sp. z o.o., ul. Gorzowska 11, 65-127 Zielona Góra, Poland

Ordering firm: LUG Light Factory Sp. z o.o., ul. Gorzowska 11, 65-127 Zielona Góra, the Republic of Poland

Number of tested samples: 1 + 1

Samples submitted on: 25.4.2016

Location of testing: EZÚ

Tested from 28 April **through** 3 May 2016

Other data: Tested type representative: 130222.5L021.031 and 130222.5L111.031

The product was tested according to: ČSN EN 55015 ed. 4:14,
ČSN EN 61547: ed. 2:10,
ČSN EN 61000-3-3 ed. 3 :14,
ČSN EN 61000-3-2 ed.4:15

Compiled by: Karel Pařízek



Approved by: Miroslav Vondra
Testing laboratory
technical manager

Test results stated in the test report apply only to the tested subject and unless specified otherwise in the test report, the tests were performed using the method and under the conditions determined in the test regulations, technical norm, instructions for use and information provided by the manufacturer on the tested subject and using accessories required by the manufacturer.
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1. Emise - Emission

ČSN EN 55015 ed.4:2014	<i>Meze a metody měření charakteristik rádiového rušení způsobeného elektrickými svítidly a podobným zařízením</i>
EN 55015:2013	<i>Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment</i>
ČSN EN 61000-3-2 ed.4:2015	<i>Elektromagnetická kompatibilita (EMC) - Meze - Meze pro emise harmonického proudu</i>
EN 61000-3-2:2014	<i>Electromagnetic compatibility (EMC) - Limits - Limits for harmonic current emission</i>
ČSN EN 61000-3-3: ed. 3:2014	<i>Elektromagnetická kompatibilita (EMC) - Část 3-3: Meze - Omezování změn napětí, kolísání napětí a flikru v rozvodných sítích nízkého napětí pro zařízení se jmenovitým fázovým proudem ≤16A, které není přemětem podmíněného připojení</i>
EN 61000-3-3 :2013	<i>Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16A per phase and not subject to conditional connection</i>

Výrobek - Product: Fixed general purpose luminaires, road and street lighting

Typ - Type: URBINO LED IP66

Varianty – Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Požadavky při zkouškách - Requirements at tests:

Norma -Standard	Kmitočtové pásmo - Frequency band	Mezní hodnoty - Allowed values	Poznámka - Note
(ČSN) EN 55015 Čl. - Art. 4.3.1	f [MHz] 0.009 - 0.05 0.05 - 0.15 0.15 - 0.5 0.5 - 5 5 - 30	QP / AV [dB(μV)] 110 / --- 90 - 80 / --- 66 - 56 / 56 - 46 56 / 46 60 / 50	Vyhovuje - Pass
(ČSN) EN 55015 Čl. - Art. 4.4.1 (d=2m)	f [MHz] 0.009 - 0.07 0.07 - 0.15 0.15 - 3 3 - 30	QP [dB(μA)] 88 88 - 58 58 - 22 22	Vyhovuje - Pass
(ČSN) EN 55015 Čl. - Art. 4.4.2	f [MHz] 30 - 230 230 - 300	QP [dB(μV/m)] 30 d=10m 37	Vyhovuje - Pass
(ČSN) EN 6100-3-2 Čl. - Art. 7.3	0 - 2 kHz	Třída C/ Class C	Vyhovuje - Pass
(ČSN) EN 6100-3-3	50Hz	---	Nevztahuje se - Not applicable *)



Poznámky - Notes:

Testovány reprezentativní typy - Tested representative types: 130222.5L021.031, 130222.5L111.031

Výsledky zkoušek uvedených v protokolu se týkají zařízení s elektronickými předřadníky - The results of the tests specified in the protocol relating to device with electronic ballasts:

Varianta –Variant: 130222.5L021.031 (25W):

OSRAM OPTOTRONIC OT 50/120-277/800 2DIMLT2 P

Varianty –Variants: 130222.5L051.031, 130222.5L111.031 (50W, 100W):

OSRAM OPTOTRONIC OT 100/120-277/800 2DIMLT2 P

*) Podle ČSN EN61000-3-3, čl. A2 - According to EN 61000-3-3, Art. A2

Výsledek - Test result: Vyhovuje - Pass

Zpracoval - Compiled by: Pařízek

Datum - Date: 6.5. 2016

Místo měření - Measured at: EZÚ



Měření rušivých napětí zaváděných do sítě
Measurement of interference voltages introduced into the mains
Podle - According to: (ČSN) EN 55015 čl. 4.3.1 - art. 4.3.1

Výrobek - Product: Fixed general purpose luminaires, road and street lighting
Typ - Type: URBINO LED IP66
Varianty - Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 23°C Rel. vlhkost - Rel. humidity: 28%

Aplikované meze - Applied limits:

Pásmo - Band	Meze dB(μV), kvazivrcholová/střední Limits dB(μV), quasi-peak/average
9kHz - 50kHz	110 / ∞
50kHz - 150kHz	90 - 80 / ∞
150kHz - 0,5MHz	66 - 56 / 56 - 46
0,5MHz - 5,0MHz	56 / 46
5,0MHz - 30MHz	60 / 50

Uspořádání při měření - Measuring arrangement:



Poznámky - Notes:

Naměřené hodnoty viz následující stránky - For measured values see next pages

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZU

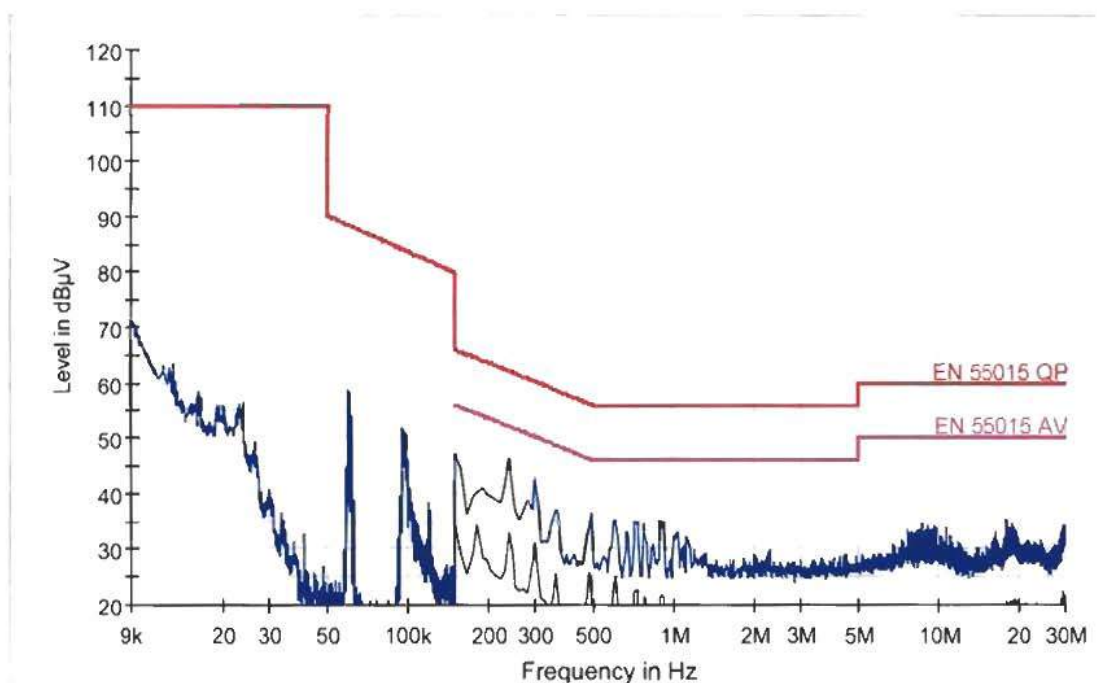


EMI Measurement

Common Information

EUT Name:	URBINO LED
Type	130222.5L021.031
Test Description	EN 55015
Operating Conditions	230V, 50Hz, P=25W
Operator Name:	Pařízek
Comment:	L, N

Voltage 55015



2.5.2016

11:18:08

Měřil - Measured by: Pařízek

Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

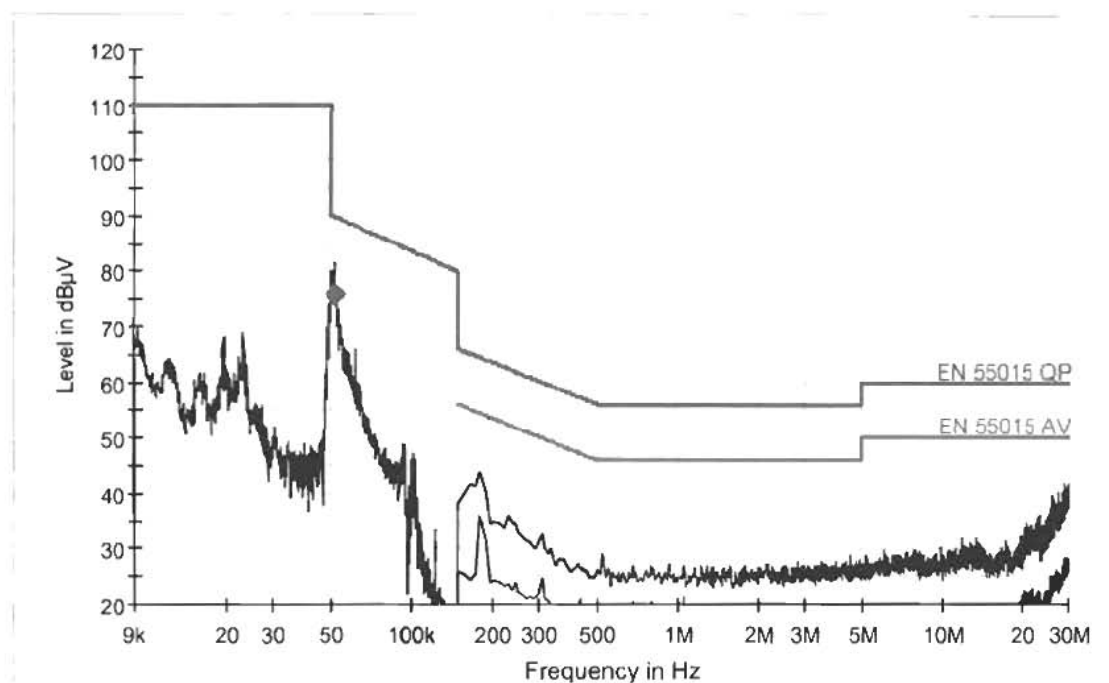


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222.5L111.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=100W
Operator Name: Pařízek
Comment: L, N

Voltage 55015



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.051480	75.8	1000.000	0.200	GN	N	11.1	14.2	90

2.5.2016

11:07:09

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ



Měření rušivého elektromagnetického vyzařování v pásmu 9 kHz - 30 MHz
Measurement of interfering radiation in the 9 kHz - 30 MHz band
Podle - According to: (ČSN) EN 55015 čl.- art. 4.4.1

Výrobek - Product: Fixed general purpose luminaires, road and street lighting
Typ - Type: URBINO LED IP66
Varianty - Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

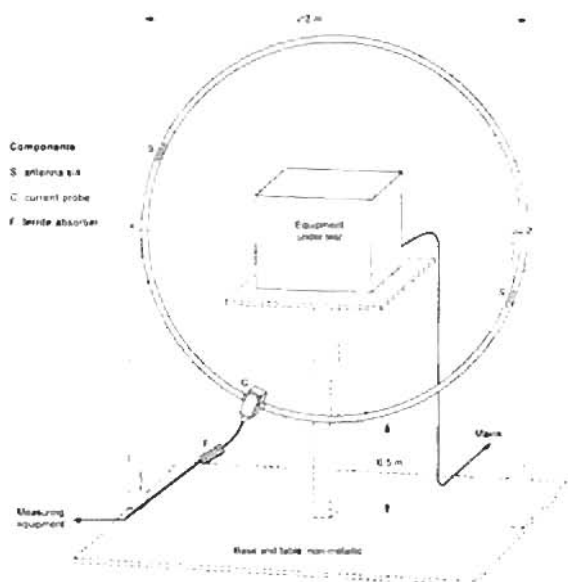
Teplota - Temperature: 23°C

Rel. vlhkost - Rel. humidity: 28%

Aplikované meze - Applied limits:

Pásmo - Band	Meze dB(μA), kvazivrcholová Limits dB(μA), quasi-peak
9 - 70 kHz	88
70 - 150 kHz	88 - 58
150 kHz - 3 MHz	58 - 22
3 - 30 MHz	22

Uspořádání při měření - Measuring arrangement:



Poznámky - Notes:

Naměřené hodnoty viz následující stránky - For measured values see next pages

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

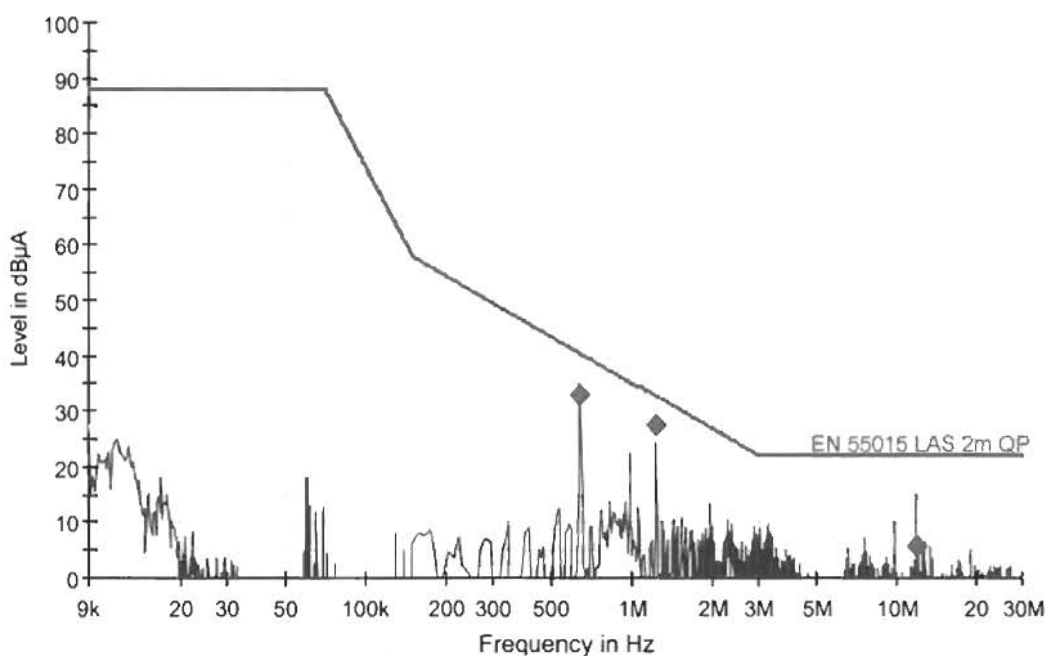


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222.5L021.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=25W
Operator Name: Pařízek
Comment: Axis x

EFS with Scans EZU KRUH2M2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµA)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin (dB)	Limit (dBµA)
0.638000	32.9	1000.00	9.000	1.0	7.7	40.6
1.230000	27.5	1000.00	9.000	0.9	5.2	32.7
11.854000	5.9	1000.00	9.000	0.8	16.1	22.0

2.5.2016

9:23:55

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

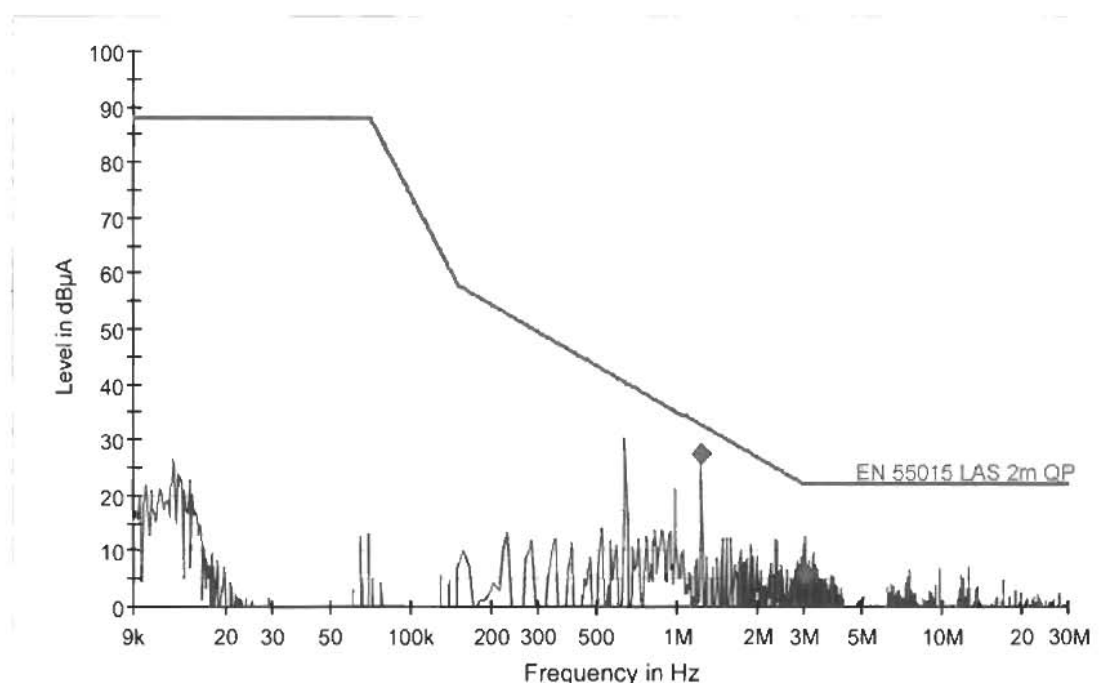


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222.5L021.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=25W
Operator Name: Parizek
Comment: Axis y

EFS with Scans EZU KRUH2M2



Final Result 1

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin (dB)	Limit (dBμA)
1.230000	27.6	1000.00	9.000	0.9	5.1	32.7
3.030000	5.9	1000.00	9.000	0.8	16.1	22.0

2.5.2016

9:29:02

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

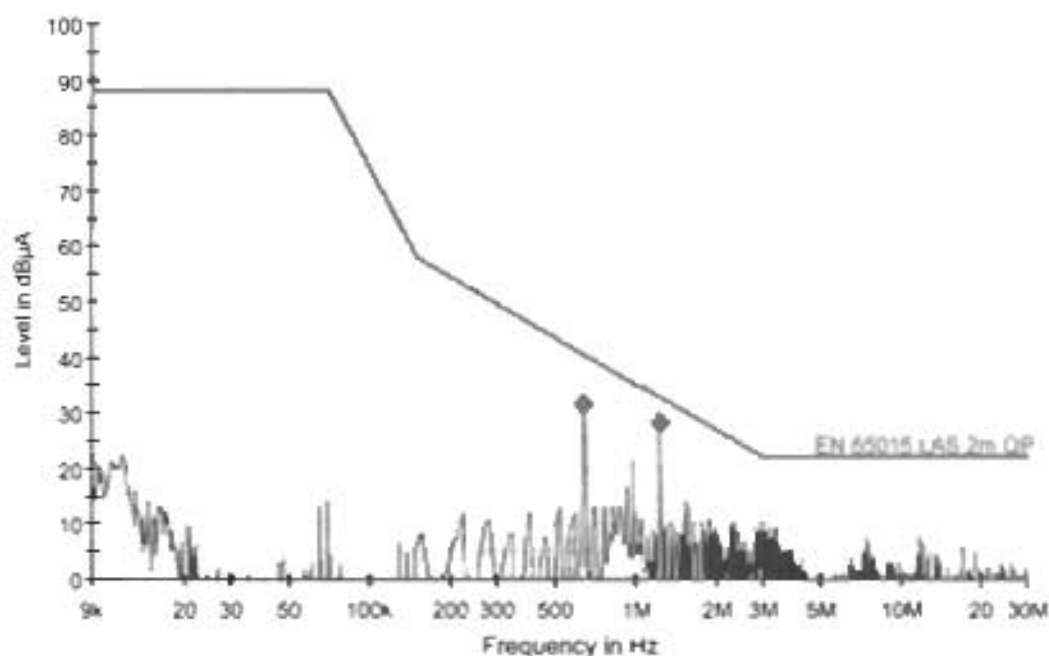


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222 5L021 031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=25W
Operator Name: Pařízek
Comment: Axis z

EFS with Scans EZU KRUK2M2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµA)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin (dB)	Limit (dBµA)
0.638000	31.5	1000.00	9.000	1.0	9.1	40.6
1.230000	28.4	1000.00	9.000	0.9	4.3	32.7

2.5.2016

9:32:13

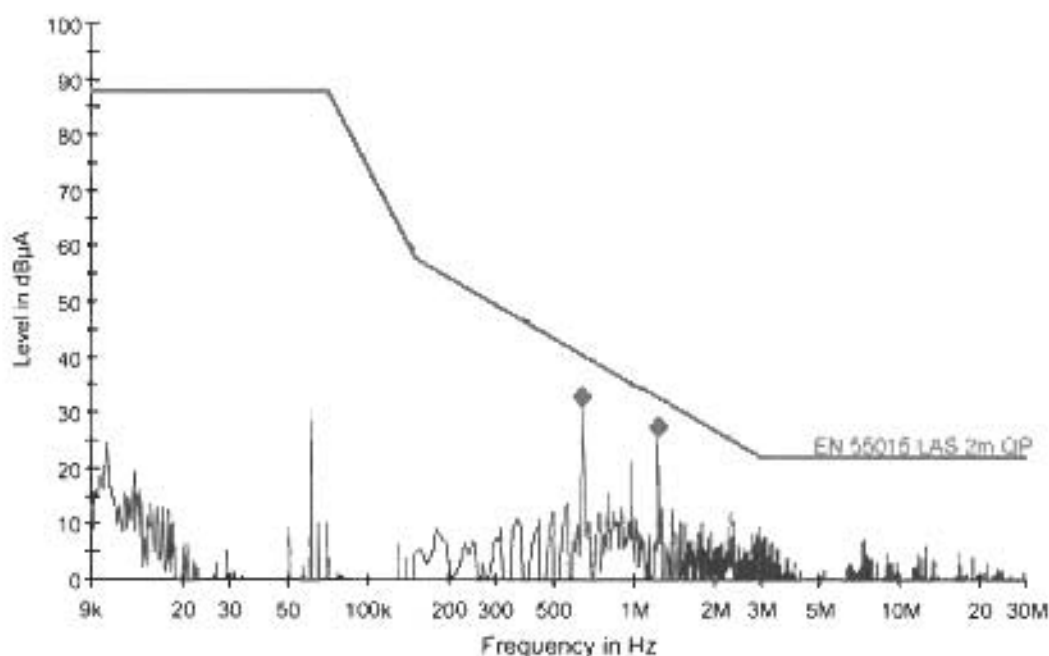


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222 5L111.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=100W
Operator Name: Pařízek
Comment: Axis x

EFS with Scans EZU KRUH2M2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµA)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin (dB)	Limit (dBµA)
0.638000	32.9	1000.00	9.000	1.0	7.7	40.6
1.230000	27.5	1000.00	9.000	0.9	5.2	32.7

2.5.2016

9:37:44

Měřil - Measured by: Pařízek

Datum - Date: 2.5.2016

Místo měření - Measured at: EZÚ

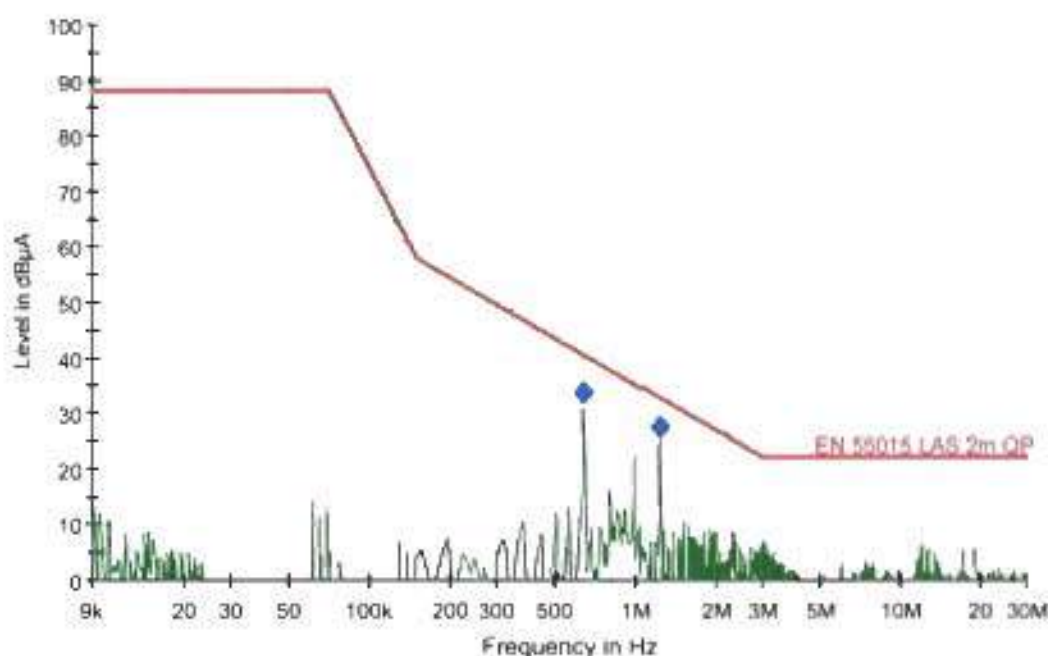


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222 5L111.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=100W
Operator Name: Parizek
Comment: Axis y

EFS with Scans EZU KRUH2M2



Final Result 1

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin (dB)	Limit (dBμA)
0.638000	33.6	1000.00	9.000	1.0	7.0	40.6
1.230000	27.5	1000.00	9.000	0.9	5.2	32.7

2.5.2016

9:42:15

Měřil - Measured by: Parizek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZU

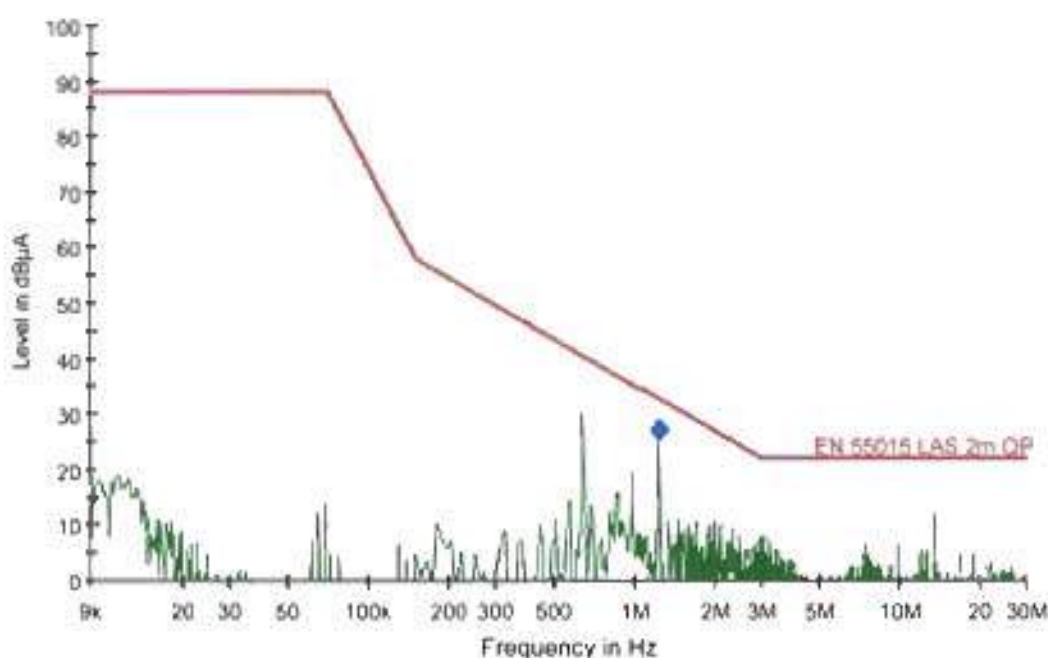


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222 5L111 031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=100W
Operator Name: Pařízek
Comment: Axis z

EFS with Scans EZU KRIJH2M2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµA)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin (dB)	Limit (dBµA)
1.230000	27.0	1000.00	9.000	0.9	5.7	32.7

2.5.2016

9:46:45

Pařízek



Měření rušivého vyzařování v pásmu 30 - 300 MHz
Measurement of interfering radiation in the 30 - 300 MHz band
Podle - According to: (ČSN) EN 55015 čl. - art. 4.4.2

Výrobek - Product: Fixed general purpose luminaires, road and street lighting

Typ - Type: URBINO LED IP66

Varianty - Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 23°C Rel. vlhkost - Rel. humidity: 28%

Aplikované meze - Applied limits:

Pásmo - Band (MHz)	Meze dB(μV/m), kvazivrcholová Limits dB(μV/m), quasi-peak
30 - 300	*) 30 (d=10m)
230 - 300	*) 37 (d=10m)

Uspořádání při měření - Measuring arrangement:



Poznámky - Notes:

Naměřené hodnoty viz následující stránky - For measured values see next pages

*) Limity a hodnoty přepočteny na měřicí vzdálenost 3m - Limits and values converted to 3 m measuring distance

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

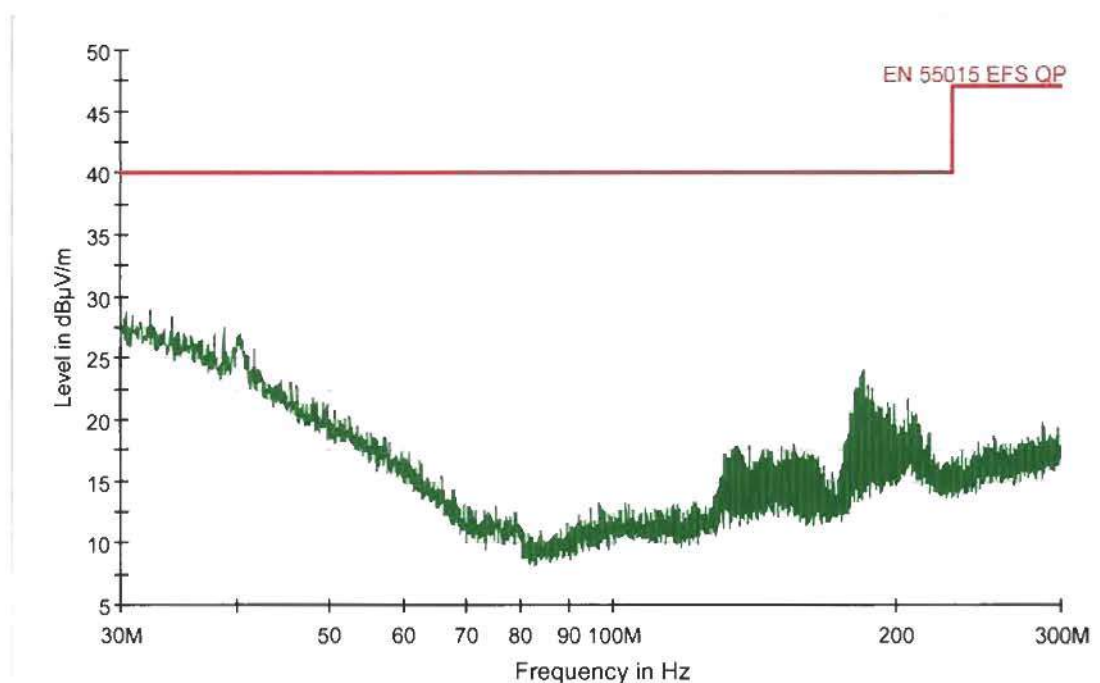


EMI Measurement

Common Information

EUT Name:	URBINO LED
Type	130222.5L021.031
Test Description	EN 55015
Operating Conditions	230V, 50Hz, P=25W
Operator Name:	Parizek
Comment:	H polarization

EFS EZU Luminaire



2.5.2016

9:05:06

Měřil - Measured by: Parizek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

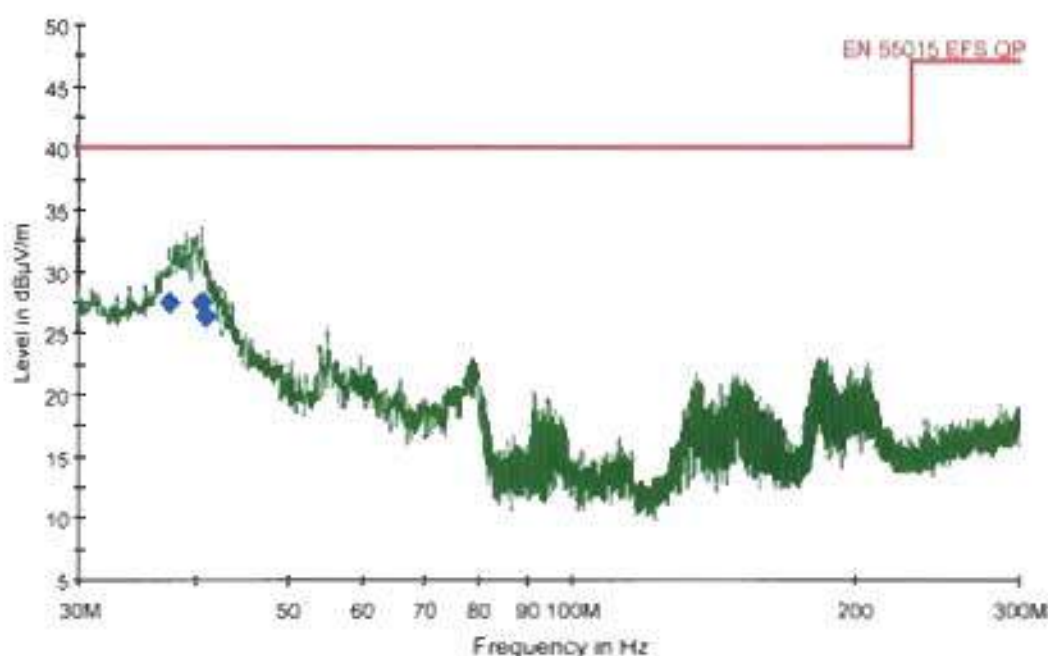


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222 5L021.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=25W
Operator Name: Pařízek
Comment: V polarization

EFS EZU Luminaire



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
37.440000	27.5	116.0	V	189.0	23.8	12.5	40.0
40.500000	27.6	150.0	V	188.0	22.4	12.4	40.0
40.920000	26.4	115.0	V	90.0	22.2	13.6	40.0

2.5.2016

8:51:09

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZU

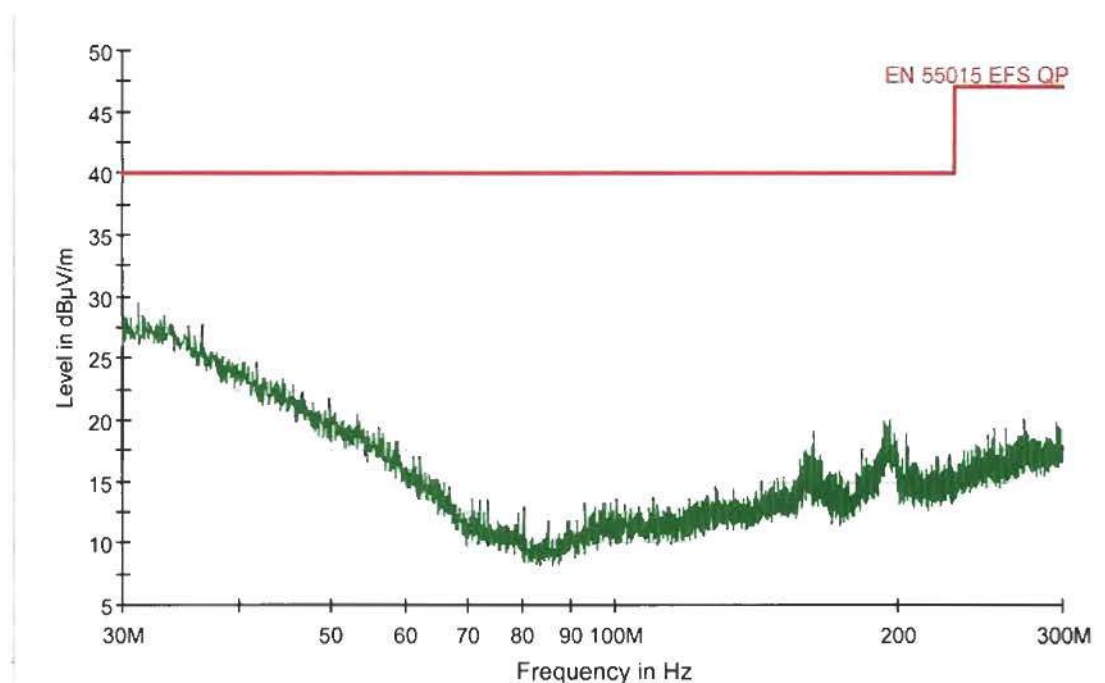


EMI Measurement

Common Information

EUT Name:	URBINO LED
Type	130222.5L111.031
Test Description	EN 55015
Operating Conditions	230V, 50Hz, P=100W
Operator Name:	Pařízek
Comment:	H polarization

EFS EZU Luminaire



2.5.2016

8:25:35

Měřil - Measured by: Pařízek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZÚ

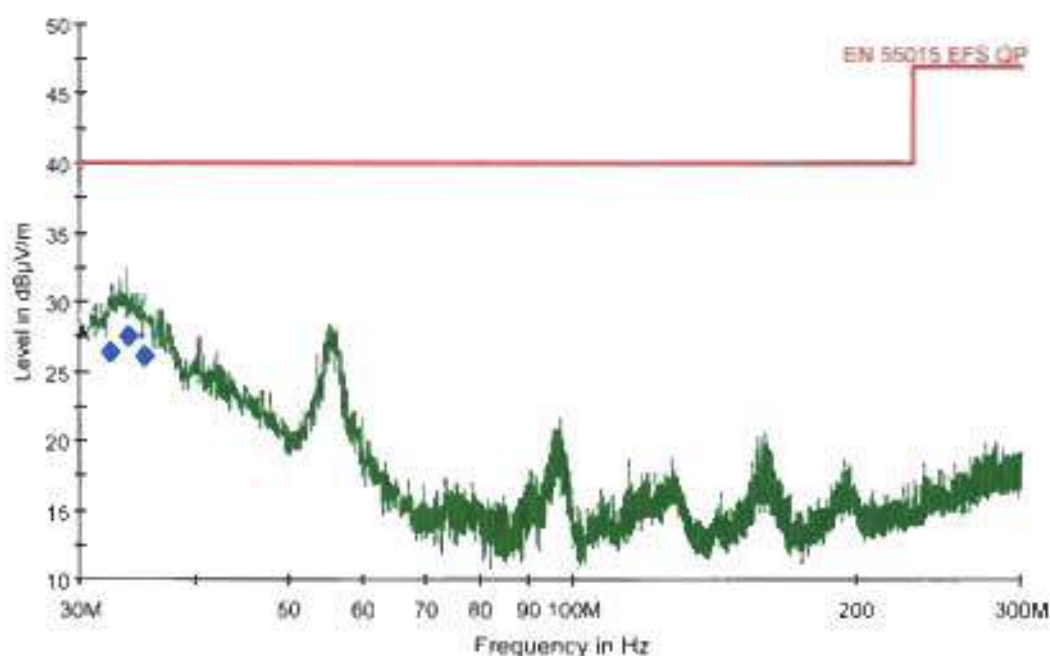


EMI Measurement

Common Information

EUT Name: URBINO LED
Type: 130222 5L111.031
Test Description: EN 55015
Operating Conditions: 230V, 50Hz, P=100W
Operator Name: Parizek
Comment: V polarization

EFS EZU Luminaire



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
32.280000	26.4	115.0	V	90.0	26.4	13.6	40.0
33.780000	27.6	115.0	V	115.0	25.3	12.4	40.0
35.040000	26.1	110.0	V	197.0	25.2	13.9	40.0

2.5.2016

8.34 10

Měřil - Measured by: Parizek

Datum - Date: 2.5. 2016

Místo měření - Measured at: EZU



Elektromagnetická kompatibilita (EMC) - Meze -
Meze pro emise harmonického proudu
Electromagnetic compatibility (EMC) - Limits -
Limits for harmonic current emission
Podle - According to: (ČSN) EN 61000-3-2 čl. 7.3 - art. 7.3

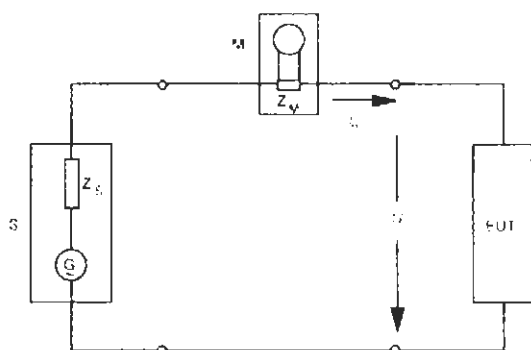
Výrobek - Product: Fixed general purpose luminaires, road and street lighting
Typ - Type: URBINO LED IP66
Varianty - Variants: I30222.5L021.031, I30222.5L051.031, I30222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 22°C Rel. vlhkost - Rel. humidity: 30%

Uspořádání při měření - Measuring arrangement:



S napájecí zdroj - source
EUT zkoušené zařízení - tested equipment
M analyzátor harmonických - harmonic analyser
Z_M měřicí bočník - measuring shunt
Z_S vnitřní impedance napájecího zdroje - internal impedance of source
I_n n-té harmonické proudu ve fázovém/středním vodiči - nth harmonic component of current in the phase/neutral line

Aplikované meze - Applied limits:

Řád harmonické - Order of harmonics	Limit (%I _L)	Limit (%I _L)
	P > 25W	P ≤ 25W
2	2	--
3	30.λ	86
5	10	61
7	7	--
9	5	--
n 11 - 39 (jen liché - only odd)	3	--

λ = účinnost - power factor

Poznámky - Notes:

Zařízení třídy C - Equipment class C

Naměřené hodnoty viz následující stránky - For measured values see next pages

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 29.4. 2016

Místo měření - Measured at: EZÚ

**Test Report ISMDPA**

Report title:	601205-01/02
Company Name:	EZU
Date of test:	7:33 29.Apr 2016
Measurement file name:	Harmonics_3_2_Ed4.rsd
Tester:	Pařízek
Standard used:	EN/IEC 61000-3-2 Ed.4 Quasi-stationary Equipment class C
Observation time:	10s
Windows width:	10 periods - (EN/IEC 61000-4-7 Edition 2002 + A1:2008)
Customer:	NAREX
E. U. T.:	URBINO LED 130222.5L021.031
Temperature :	22
Humidity :	30
Comment:	230 V, 50 Hz, P=33W
Measurement smoothed data:	Fund. Current: 0.144A Power Factor: 0.945

Test Result	
E. U. T.:	PASS
Power Source:	PASS

29.Apr 2016

(Date)

Pařízek

(Sign)

E. U. T. Result**Check harmonics 2..40 [exception odd 21..39]:**

Harmonic(s) > 150%:		
Order (n):	None	
Harmonic(s) with average > 100%:		
Order (n):	None	

Check odd harmonics 21..39:

All Partial Odd Harmonics below partial limits.		
Harmonic(s) > 150%:		
Order (n):	None	
Harmonic(s) with average > 150%:		
Order (n):	None	

Power Source Result

First dataset out of limit:		
DS (time):	None	
Harmonic(s) out of limit:		
Order (n):	None	

**Average harmonic current results**

Hn	I _{eff} [A]	I _{eff} [%]	Limit [%]	Result
1	144.211E-3	99.967		
2	575.446E-6	0.399		PASS
3	18.680E-3	12.949	28.36	PASS
4	470.560E-6	0.326		PASS
5	7.109E-3	4.928	10.00	PASS
6	480.496E-6	0.333		PASS
7	4.370E-3	3.029		PASS
8	441.514E-6	0.306		PASS
9	2.894E-3	2.006		PASS
10	436.638E-6	0.303		PASS
11	1.784E-3	1.237		PASS
12	406.854E-6	0.282		PASS
13	744.416E-6	0.516		PASS
14	395.683E-6	0.274		PASS
15	411.544E-6	0.285		PASS
16	412.329E-6	0.286		PASS
17	548.328E-6	0.380		PASS
18	403.445E-6	0.280		PASS
19	744.938E-6	0.516		PASS
20	455.536E-6	0.316		PASS
21	747.293E-6	0.518		PASS
22	431.778E-6	0.299		PASS
23	601.700E-6	0.417		PASS
24	431.307E-6	0.299		PASS
25	590.051E-6	0.409		PASS
26	417.861E-6	0.290		PASS
27	462.597E-6	0.321		PASS
28	386.157E-6	0.268		PASS
29	395.828E-6	0.274		PASS
30	396.636E-6	0.275		PASS
31	386.496E-6	0.268		PASS
32	401.925E-6	0.279		PASS
33	433.972E-6	0.301		PASS
34	385.419E-6	0.267		PASS
35	457.373E-6	0.317		PASS
36	386.779E-6	0.268		PASS
37	446.058E-6	0.309		PASS
38	365.642E-6	0.253		PASS
39	503.804E-6	0.349		PASS
40	372.236E-6	0.258		PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

**Test Report ISMDPA**

Report title:	601205-01/02
Company Name:	EZU
Date of test:	7:59 29.Apr 2016
Measurement file name:	Harmonics_3_2_Ed4.rsd
Tester:	Pařízek
Standard used:	EN/IEC 61000-3-2 Ed.4 Quasi-stationary Equipment class C
Observation time:	10s
Windows width:	10 periods - (EN/IEC 61000-4-7 Edition 2002 + A1:2008)
Customer:	LUG
E. U. T.:	URBINO LED 130222.5L111.031
Temperature :	22
Humidity :	30
Comment:	230 V, 50 Hz, P=117W
Measurement smoothed data:	Fund. Current: 0.509A Power Factor: 0.983

Test Result	
E. U. T.:	PASS
Power Source:	PASS

29.Apr 2016

(Date)

Pařízek

(Sign)

E. U. T. Result**Check harmonics 2..40 [exception odd 21..39]:**

Harmonic(s) > 150%:		
Order (n):	None	
Harmonic(s) with average > 100%:		
Order (n):	None	

Check odd harmonics 21..39:

All Partial Odd Harmonics below partial limits.		
Harmonic(s) > 150%:		
Order (n):	None	
Harmonic(s) with average > 150%:		
Order (n):	None	

Power Source Result

First dataset out of limit:		
DS (time):	None	
Harmonic(s) out of limit:		
Order (n):	None	

**Average harmonic current results**

Hn	I _{eff} [A]	I _{eff} [%]	Limit [%]	Result
1	509.057E-3	99.949		
2	993.964E-6	0.195		PASS
3	40.048E-3	7.863	29.49	PASS
4	1.410E-3	0.277		PASS
5	17.901E-3	3.515	10.00	PASS
6	965.849E-6	0.190		PASS
7	12.428E-3	2.440	7.00	PASS
8	909.569E-6	0.179		PASS
9	9.779E-3	1.920	5.00	PASS
10	882.364E-6	0.173		PASS
11	7.073E-3	1.389	3.00	PASS
12	879.482E-6	0.173		PASS
13	4.446E-3	0.873		PASS
14	971.053E-6	0.191		PASS
15	2.833E-3	0.556		PASS
16	1.012E-3	0.199		PASS
17	1.938E-3	0.381		PASS
18	990.428E-6	0.194		PASS
19	1.444E-3	0.283		PASS
20	1.065E-3	0.209		PASS
21	1.072E-3	0.210		PASS
22	1.111E-3	0.218		PASS
23	1.064E-3	0.209		PASS
24	1.056E-3	0.207		PASS
25	1.096E-3	0.215		PASS
26	1.062E-3	0.209		PASS
27	1.167E-3	0.229		PASS
28	1.047E-3	0.206		PASS
29	1.153E-3	0.226		PASS
30	1.067E-3	0.210		PASS
31	1.298E-3	0.255		PASS
32	1.042E-3	0.205		PASS
33	1.141E-3	0.224		PASS
34	976.366E-6	0.192		PASS
35	1.081E-3	0.212		PASS
36	981.026E-6	0.193		PASS
37	1.018E-3	0.200		PASS
38	954.208E-6	0.187		PASS
39	968.726E-6	0.190		PASS
40	882.122E-6	0.173		PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



2. Odolnost - Immunity

(ČSN) EN 61547 *Zařízení pro všeobecné osvětlovací účely - EMC - požadavky odolnosti*
Equipment for general lighting purposes - EMC - immunity requirements

Výrobek - Product: LED svítidlo - LED luminaire

Typ - Type: UQ3A/600/700ND/IP54

Požadavky při zkouškách - Requirements at tests:

Kmenová norma - Generic standard	Úroveň - Level	Povolená chyba - Allowed error *1)	Poznámka - Note
(ČSN) EN61000-4-2	±4kV / ±8 kV	B	Vyhovuje - Pass
(ČSN) EN61000-4-3	3V/m 80 - 1000 MHz	A	Vyhovuje - Pass
(ČSN) EN61000-4-4	±1kV	B	Vyhovuje - Pass
(ČSN) EN61000-4-5	±1kV / ±2kV	C	Vyhovuje - Pass
(ČSN) EN61000-4-6	3 V 0,15 - 80 MHz	A	Vyhovuje - Pass
(ČSN) EN61000-4-8	3 A/m	A	*2) Vyhovuje - Pass
(ČSN) EN61000-4-11	200 ms / 70%U _T 10 ms / 0% U _T	C B	Vyhovuje - Pass

Poznámky - Notes:

Testovány reprezentativní typy - Tested representative types: 130222.5L021.031, 130222.5L111.031

Výsledky zkoušek uvedených v protokolu se týkají zařízení s elektronickými předřadníky - The results of the tests specified in the protocol relating to device with electronic ballasts:

Varianta - Variant: 130222.5L021.031 (25W):

OSRAM OPTOTRONIC OT 50/120-277/800 2DIMLT2 P

Varianty - Variants: 130222.5L051.031, 130222.5L111.031 (50W, 100W):

OSRAM OPTOTRONIC OT 100/120-277/800 2DIMLT2 P

*1) Funkční kritéria A, B, C dle (ČSN) EN 61547, čl.4.2 -

Performance criteria according (ČSN) EN 61547, art. 4.2

*2) Zařízení neobsahují prvky citlivé na magnetické pole -

Devices do not contain parts sensitive to the magnetic field

Výsledek - Test result: Vyhovuje - Pass

Zpracoval - Compiled by: Pařízek

Datum - Date: 6.5. 2016

Místo měření - Measured at: EZÚ



Zkouška odolnosti proti elektrostatickým výbojům
Test of electric discharge resistance
Podle - According to: (ČSN) EN 61000-4-2

Výrobek - Product: Fixed general purpose luminaires, road and street lighting
Typ - Type: URBINO LED IP66
Varianty - Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 24°C Rel. vlhkost - Rel. humidity: 29%

Požadované kritérium - Allowed criterion: B

Počet zkušebních výbojů: 10/10 kontaktních/vzduchových výbojů do každého testovaného místa v obou polaritách, mimo to nepřímé kontaktní výboje do vodorovné a svislé vazební desky

Number of testing discharges: 10/10 contact/air discharge to every test-places in each polarity, besides indirect contact discharges into a horizontal and vertical coupling plane

Testovaná místa: Kontaktní výboj do kovových částí a do vodorovné a svislé vazební desky.

Vzduchový výboj do skleněného krytu

Tested points: Contact discharge into the metal parts and to the horizontal and vertical coupling plane. Air discharge to the glass cover

Zkušební napětí - Testing voltage [kV]: ± 4 - kontaktní výboj - contact / ± 8 - vzduchový výboj - air

Splněné kritérium - Achieved criterion: A

Zkušební uspořádání - Measuring arrangement:



Poznámky - Notes:  kontakt – contact,  vzduch. výboj - air

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek
Hec.

Datum - Date: 28.4. 2016

Místo měření - Measured at: EZÚ



Zkouška odolnosti proti vf elektromagnetickým polím
Immunity test - radiated electromagnetic field requirements
Podle - According to: (ČSN) EN 61000-4-3

Výrobek - Product: Fixed general purpose luminaires, road and street lighting

Typ - Type: URBINO LED IP66

Varianty - Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 23°C Rel. vlhkost - Rel. humidity: 29%

Aplikované meze - Applied limits:

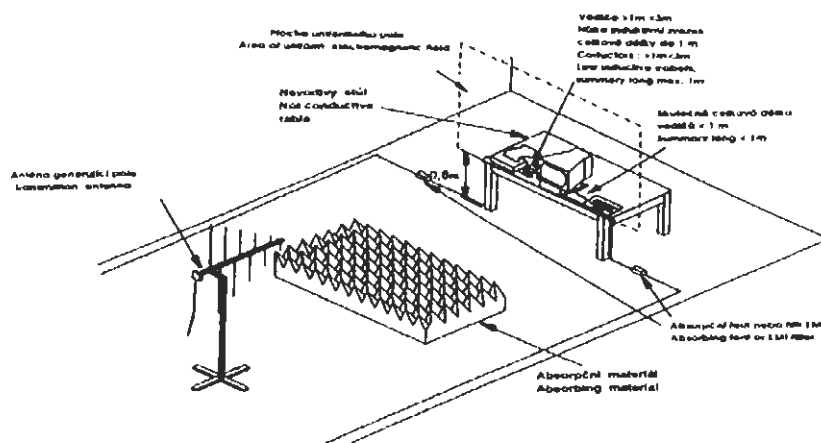
Kmitočtový rozsah - Scan spectrum: 80 - 1000 MHz

Intenzita pole - Intensity of field: 3 V/m (80% AM, 1kHz)

Požadované kritérium - Allowed criterion: A

Splněné kritérium - Achieved criterion: A

Uspořádání při měření - Measuring arrangement:



Poznámky - Notes:

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 3.5. 2016

Místo měření - Measured at: EZÚ



Zkouška rychlými přechodovými jevy
Test by quick transient burst
Podle - According to: (ČSN) EN 61000-4-4

Výrobek - Product: Fixed general purpose luminaires, road and street lighting

Typ - Type: URBINO LED IP66

Varianty - Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

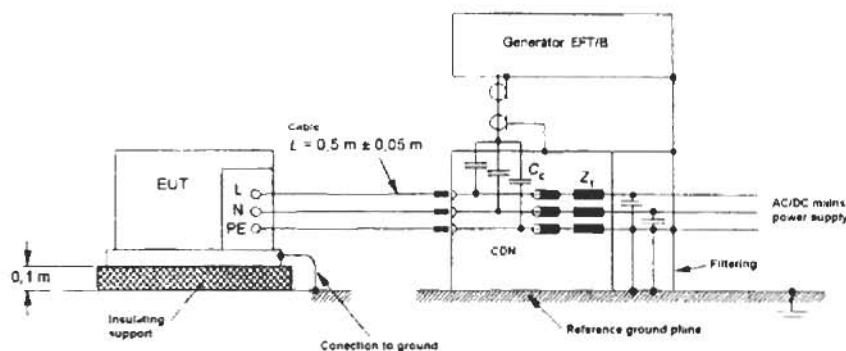
Teplota - Temperature: 24°C Rel. vlhkost - Rel. humidity: 29%

Požadované kritérium - Allowed criterion: B

Aplikované zkušební napětí: - Testing voltage applied:

Aplikované napětí - Applied voltage	Zkušební úroveň - Testing level	Splněné kritérium - Performance criterion	Poznámka - Remark
L,N,L+N	±1kV	A	Vazební sítě do napájení - Coupling networks to power supply
L+PE	±1kV	A	
N+PE	±1kV	A	
L+N+PE	±1kV	A	

Zkušební uspořádání - Measuring arrangement:



Poznámky - Notes:

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 28.4. 2016

Místo měření - Measured at: EZÚ



Zkouška rázovou vlnou
Surge immunity test
Podle - According to: (ČSN) EN 61000-4-5

Výrobek - Product: Fixed general purpose luminaires, road and street lighting
Typ - Type: URBINO LED IP66
Varianty – Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

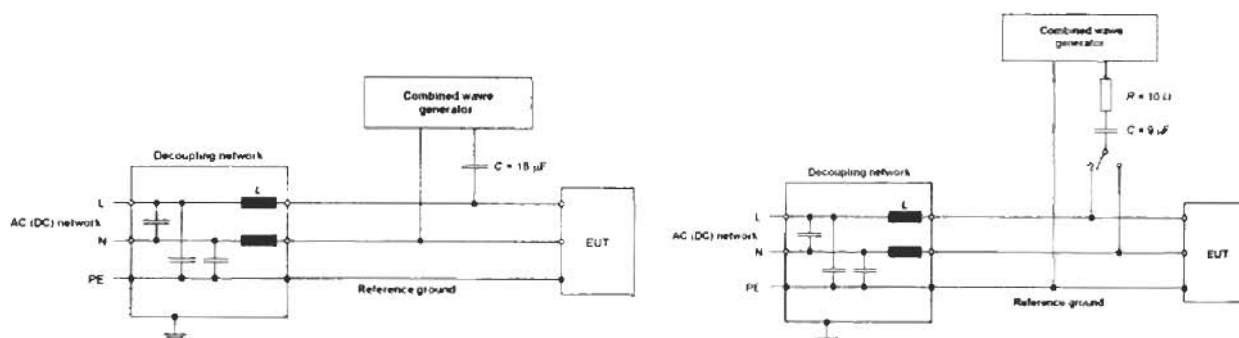
230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 24°C

Rel. vlhkost - Rel. humidity: 29%

Požadované kritérium - Allowed criterion: C**Aplikované zkušební napětí:**

Aplikované napětí - Applied voltage	Zkušební úroveň - Testing level	Splněné kritérium - Performance criterion	Poznámka - Remark
L-N	±1kV	B	90°, 270°
L-PE, N-PE, L+N-PE	±2kV	B	90°, 270°

Uspořádání při měření - Measuring arrangement:**Poznámky - Notes:****Výsledek - Test result: Vyhovuje - Pass**

Měřil - Measured by: Pařízek

Datum - Date: 28.4. 2016

Místo měření - Measured at: EZÚ



Zkouška odolnosti proti vf polím šířeným vedením
Immunity test - conducted disturbances induced by radio-frequency fields
Podle - According to: (ČSN) EN 61000-4-6

Výrobek - Product: Fixed general purpose luminaires, road and street lighting
Typ - Type: URBINO LED IP66
Varianty – Variants: 130222.5L021.031, 130222.5L051.031, 130222.5L111.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 24°C Rel. vlhkost - Rel. humidity: 29%

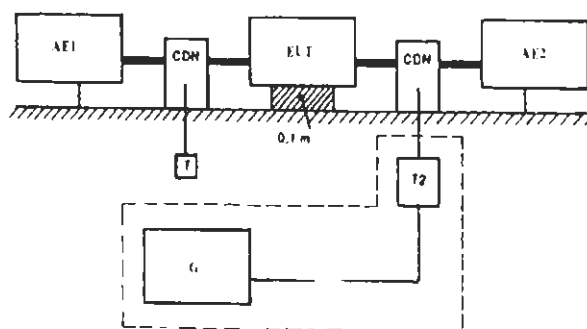
Požadované kritérium - Allowed criterion: A

Aplikované zkušební napětí:

Frekvenční pásmo - Frequency band	Zkušební napětí - Testing voltage level	Poznámka - Note
150kHz - 80MHz	3V (mod. 80% AM / 1 kHz)	Vazebním obvodem do napájení - Applied by coupling network to mains

Splněné kritérium - Achieved criterion: A

Uspořádání při měření - Measuring arrangement:



AE1, AE2 Přidružené zařízení - Associated Equipment
CDN Vazební/oddělovací síť - Coupling/decoupling network

G VF generátor - RF generator
T2 Útlumový člen - Attenuator
T Přizpůsobovací člen 50Ω - Matching circuit 50Ω
EUT Zkoušené zařízení - Equipment under test

Poznámky - Notes:

Výsledek-Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 28.4. 2016

Místo měření - Measured at: EZÚ



Krátkodobé poklesy napětí, krátká přerušení a pomalé změny napětí
Voltage dips, short interruptions and voltage variations
Podle - According to: (ČSN) EN 61000-4-11

Výrobek - Product: Fixed general purpose luminaires, road and street lighting

Typ - Type: URBINO LED IP66

Varianty – Variants: 130222.5L021.031, 130222.5L051.031, 130222.5LI11.031

Provozní podmínky - Operating conditions:

230V, 50Hz, minimálně 15 minut v provozu - minimally 15 minutes in operation

Teplota - Temperature: 24°C Rel. vlhkost - Rel. humidity: 29%

Požadované kritérium - Allowed criterion: C, B

Požadavky při zkouškách - Tests requirements:

Zkušební úroveň - Test level [%] Ut	Doba trvání - Duration [ms]	Požadované kritérium - Allowed criterion	Splněné kritérium - Achieved criterion
0	10	B	B
70	200	C	B

Poznámky - Notes:

Výsledek - Test result: Vyhovuje - Pass

Měřil - Measured by: Pařízek

Datum - Date: 28.4. 2016

Místo měření - Measured at: EZÚ

**Zkušební zařízení - Measuring equipment used:**

☒ Měřicí přijímač- Test receiver RaS	ESIB26	110097	01.2017
☐ Harmonic analyser SEAWARD	ORB	97-5947	09.2016
☒ Harmonic analyzer EM TEST	DPA503N	110272	08.2017
☒ Continuous wave simulator EM Test	CWS500N1	110233	03.2017
☐ Combination Wave Simulator EM Test	VCS 500N	110182	08.2017
☐ Combined 3-Phase CDN EM Test	CNI503	110181	08.2017
☒ EM Test	PFS 500	98-6040	10.2017
☒ Ultra Compact Simulator EM Test	UCS 500N	110235	01.2017
☒ ESD generator	ESD30N	110196	03.2017
☒ Artificial mains EMCO	3825/2	95-5852	06.2016
☐ Artificial mains Narda	PMM L3-32	110250	10.2016
☒ Antenna Frankonia	BTA-M	00-6321	10.2017

Pomocná zařízení - Auxiliary equipment:

☒ Field probe Narda	EP603	110273	10.2016
☐ Amplifier BONN ELEKTRONIK	BLWA0810-100	96-5871	
☐ Amplifier BONN ELEKTRONIK	BSA0115-50	98-6038	
☒ Amplifier PRÁNA	AP32 LT225	07-110145	
☐ Amplifier MILMEGA	AS0822-100	98-6038	
☐ Amplifier MILMEGA	AS0204-125	110144	
☐ Amplifier MILMEGA	AS1860-100	110219	
☒ Signal generator RaS	SMF100A	110167	11.2016
☐ MPEG2 Measurement generator	DVG	110120	
☐ TV Test Transmitter	SFL-T	110121	
☐ Tester mag. pole - Exposure Level Tester Narda	ELT-40	110130	09.2016
☐ Antenna Van den Hoofden	VDH-01	000WX30108	
☐ Antenna Double Ridged R&S	HF907	110177	08.2016
☐ Counter	PM6613	20200	
☐ Probe RFT	TK12	700044	
☐ Coupling/dec. EM TEST	CDN M2N	552097	10.2016
☒ Coupling/dec. EM TEST	CDN M3N	110233/1	10.2016
☐ Coupling/dec. EM TEST	CDN M5N	552097	06.2018
☐ Coupling. SCHAFFNER	T440		
☐ Capacitive coupling clamp	Haefely		
☐ Coupling filter Haefely	FP 16 / 3-1		
☐ Current probe	P MP-120		
☐ Current probe	AM503	79-4221	
☐ 8-Wire network Schwarzbeck	NTFM8158	110270	08.2017
☐ Elektromag. kleště- Electromag. injection clamp	EM-101	110233	10.2016
☐ Ferite clamp 1-1000 MHz	EZ-24	10003	
☒ Anechoic chamber - Euroshield Oy	RFMSD-F/A	EZÚ	06.2016
☒ Notebook Dell	Dell D531	551492	
☒ Notebook Dell	Dell D531	551171	
☒ Notebook Dell	Dell E6520	552020	

Kabely - Cables:

- ☐ K1
- ☒ K22, ESH3-Z2
- ☐ K14, K15a, K16
- ☐ KB01, KB02, KB04
- ☐ K7, K10, ESH3-Z2
- ☒ KB12
- ☐ K23
- ☒ K24

EZU přípravky - EZU equipments:

- ☐ PR-01 - Coupling resistance 40 Ω
- ☐ PR-02 - Coupling capacitor 0,5 μ F
- ☒ Regulating transformer - ZPA RA20
- ☐ PR-21 - Stabilized power supply DF 3010
- ☐ PR-15 - Variable resistor 2,35 Ω /16A
- ☐ PR-57 - Isolation transformer 0 - 2kV
- ☐ P13 - Oddělovací přípravek - Separating preparation
- ☒ PR52 - VCP



Fotodokumentace - Photo-documentation

Výrobek - Product: Fixed general purpose luminaires, road and street lighting

Typ - Type: URBINO LED IP66

Varianta - Variant: 130222.5L021.031



Celkový pohled - Overview



Zdroj s předřadníkem - Source and LED controller



Výrobní štítek - Name plate



Varianta - Variant: 130222.5L.051.031



Celkový pohled - Overview



Zdroj s předřadníkem - Source and LED controller



Výrobní štítek - Name plate

flor



Varianta – Variant: 130222.5L111.031



Celkový pohled – Overview



Výrobní štítek - Name plate

Handwritten signature



No. of the Test Report: 601205-01/03

Issued: 13. 6. 2016



TEST REPORT

Name of product: Fixed general purpose luminaires,
road and street lighting

Type of product: URBINO LED

Ratings: 220-240 V, 50/60 Hz, 28, 37, 55, 84, 110 W, IP 66,
class I

Serial number: -

Manufacturer: LUG Light Factory Sp. z o.o., ul. Gorzowska 11,
65-127 Zielona Góra, the Republic of Poland

Production site: LUG Light Factory Sp. z o.o., ul. Gorzowska 11,
65-127 Zielona Góra, Poland

Ordering firm: LUG Light Factory Sp. z o.o., ul. Gorzowska 11,
65-127 Zielona Góra, the Republic of Poland

Number of tested samples: 1

Samples submitted on: 8. 6. 2016

Location of testing: EZÚ

Tested from 9. 6. 2016 **through** 9. 6. 2016

Other data: Tested on: 1300222.5L111.031

The product was tested according to: ČSN EN 62471.09

Compiled by: Pavel Vodrážka



Approved by: Lukáš Burda
Testing laboratory
technical manager

Test results stated in the test report apply only to the tested subject and unless specified otherwise in the test report, the tests were performed using the method and under the conditions determined in the test regulations, technical norm, instructions for use and information provided by the manufacturer on the tested subject and using accessories required by the manufacturer. Without written consent, this report must not be reproduced in any other way than as a whole.

Measured values

Risk	Symbol	Measured value	Group
Blue light	L_B	$161 \text{ W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	exempt

Measured with supply voltage 230 V. Ambient temperature 25 °C. Measured at 500 lx distance.

Conclusion

Light source can be considered as low risk light source – Risk Group 1 (RG 1).

Emission limits for risk groups of continuous wave lamps						
Risk	Action spectrum	Symbol	Units	Emission Measurement		
				Exempt	Low risk	Mod risk
				Limit	Limit	Limit
Blue light	B(λ)	L_B	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	100	10000	4000000

Measured by:  Lukáš Burda



Zakłady Badań i Atestacji "ZETOM"
im. Prof. F. Stauba w Katowicach sp. z o.o.
Institutions for Research and Certification "ZETOM" Ltd.
ul. Ks. Bpa H. Bądnorza 17, 40-384 Katowice; tel. 032 2569257 e-mail: zetom@zetomkatowice.com.pl

Laboratorium Badawcze i Wzorcujące

Laboratorium badawcze akredytowane przez
Polskie Centrum Akredytacji, sygnatariusza porozumień EA MLA i ILAC MRA
dotyczących wzajemnego uznawania świadectw wzorcowania.
Nr akredytacji AB 024



AB 024



TEST REPORT

Ref. no. B/2017/158 dated 12/06/2017

Subject: Examination of the degree of protection IK09 for the URBINO street lighting fixture.

Tested for:	LUG Light Factory Sp. z o.o.		
	ul. Gorzowska 11		
	65-127 Zielona Góra		
Tested at:	Institutes for Research and Certification "ZETOM" Katowice		
	Testing and Calibration Laboratory "ZETOM" Katowice.		
Customer Order Index:	Order (e-mail)	dated:	26/05/2017
Laboratory Log Reference No. of Order: B/2017/144			
Test start date:	06/06/2017	Test end date:	08/06/2017
This Test Report contains:	5 pages		
3 copies hereof are issued to the following recipients:			
	1. LUG Light Factory Sp. z o.o.		
	2. LUG Light Factory Sp. z o.o.		
	3. LT		
Test supervisor:	Katarzyna Hadam Ph.D.		
Tested and measured by:	Piotr Jureczko, MSc Eng.	Lab Section: WE	
	Kamil Długajczyk	Lab Section: WE	
Test Report prepared by:	Kamil Długajczyk		

Authorised by:

Z-ca Kierownika
Zespołu ds. Badań
mgr inż. Piotr Jureczko



Approved by:

p.o. Z-ca Dyrektora
ds. Badań i Wzorcowania
Kierownik Laboratorium
Badawczego i Wzorcującego
dr Katarzyna Hadam

Zakłady Badań i Atestacji „ZETOM”
im. Prof. F. Stauba w Katowicach sp. z o.o.
Institutions for Research and Certification “ZETOM” Ltd.
EU Notified Body no. 1436,
for the following Directives: Construction, Low Voltage & Machinery
ul. Ks. Bpa H. Bednorza 17; 40-384 Katowice, Poland
Phone: 0048(032) 2569-257, 0048(032) 2569-273, 0048(032) 2569-353

PROVISIONS

A. Obligatory:

1. The Test Report shall be property of the Customer who has ordered to have the test done.
2. The Test Report and all information contained therein shall only be used with the consent of the Test Report owner.
3. This Test Report shall only be used in full.
4. All test and measurement reports listed herein refer to the test objects only and shall not be construed as a quality approval thereof.
5. The work covered herein has been carried out according to its Work Plan and in line with the Management System requirements specified in the Testing and Calibration Laboratory Quality Manual.
6. All reference to this Test Report shall be made with the following statement (or its equivalent in meaning):

Tested by the Testing and Calibration Laboratory "ZETOM" in Katowice, a unit accredited by the Polish Centre for Accreditation seated in Warsaw within the scope of the Certificate No. AB 024 Annex.

B. Complementary (listed in this Test Report) Section

C. Anomalies (listed in this Test Report) Section

When using the contents of this Test Report, the owner hereof shall state that they use the results produced by the Testing and Calibration Laboratory at the Institutes for Research and Certification "ZETOM" in Katowice, accredited by the Polish Centre for Accreditation in Warsaw.

1. BASIS OF TESTING

1.1. Customer's document title: Order LUG Light Factory Sp. z o.o. to do the research in the Research and Calibration Laboratory "ZETOM" Katowice

1.2. Customer's document identification: Order (e-mail)

dated: 26/05/2017

1.3. Subject: Performance test IK09 degree for lighting fixture

2. TESTING OBJECTIVE Verification of properties and characteristics according to PN-EN 50102:2001

3. TEST OBJECT

3.1. Nazwa przedmiotu: URBINO street lighting luminaire

3.2. Customer: LUG Light Factory Sp. z o.o.

3.3. Supplier/Manufacturer: LUG Light Factory Sp. z o.o.

3.4. Place of production: ul. Gorzowska 11; 65-127 Zielona Góra

3.5. Method of object delivery for testing: delivered by the Customer

3.6. Objects collected at: LUG Light Factory Sp. z o.o.

3.7. Collect Report: -

3.8. Date of receiving the test objects: 31/05/2017

3.9. Collector's additional labelling applied: -

3.10. Object packaging: cardboard box

3.11. In-laboratory labelling of objects:

Object labelling in prior of delivery to the Lab	Labelling of objects made at the Lab ¹⁾	Notes
-	2017/144	-
¹⁾ Remains the Sample Index		

4. TESTING PROGRAM

The Testing Program includes the testing's cope of the following reference standards:

- PN-EN 50102:2001 "Degree of protection against external mechanical impacts provided by enclosures of electrical equipment (IK code)".

5. Results

5.1 Results of the IK degree of protection provided by the URBINO street lighting fixture

Degree of protection IK09
The test was done by hitting a 5.0 kg hammer with an energy equivalent to 10 J impact on the outside of the luminaire. Three hits in different lighting fixtures (total with a translucent glass shade) did not cause distortion of the housing body or cracks in the glass cover. Proper protection provided by the luminaire is ensured.

Photos of the lighting fixture tested:





ELECTROTECHNICAL TESTING INSTITUTE
Pod Lisem 129
171 02 Praha 8 - Troja

No. of pages: 4
No. of annexes/No. of an. pages: 0/0

No. of the Test Report: 604927-01/01

Issued: 8. 11. 2016



TEST REPORT

Name of product: LED lamp
Type of product: URBINO LED, URBANO LED
Ratings: -
Serial number: -
Manufacturer: LUG Light Factory Sp. z o.o.,
ul. Gorzowska 11, 65-127 Zielona Góra,
the Republic of Poland
Production site: LUG Light Factory Sp. z o.o.,
ul. Gorzowska 11, 65-127 Zielona Góra,
the Republic of Poland
Ordering firm: LUG Light Factory Sp. z o.o.,
ul. Gorzowska 11, 65-127 Zielona Góra,
the Republic of Poland
Number of tested samples: 2
Samples submitted on: 24. 10. 2016
Location of testing: EZÚ
Tested from 2. 11. 2016 **through** 4. 11. 2016
Other data: -
The product was tested according to: ČSN EN 60068-2-6 ed.2:08, idt EN 60068-2-6:08
idt. IEC 60068-2-6:07

Compiled by: Jiří Bažant



Approved by: Jarmil Mikulík
Testing laboratory manager

Test results stated in the test report apply only to the tested subject and unless specified otherwise in the test report, the tests were performed using the method and under the conditions determined in the test regulations, technical norm, instructions for use and information provided by the manufacturer on the tested subject and using accessories required by the manufacturer.
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SPECIMEN DESCRIPTION

There were submitted LED lamps for testing, type URBINO LED and URBANO LED.

TESTING

The tests were performed according to ČSN EN 60068-2-6 ed.2:2008 (idt EN 60068-2-6:08, idt. IEC 60068-2-6:2007), Vibration test with parameters according to ČSN EN 60598-1 ed. 6:2015 (mod IEC 60598-1:2014).

Testing equipment

Vibration testing system LDS - V830-335 SPA8-16K
Control system PUMA, testing program SINUS
Acceleration sensor 353B33, manufacturer PCB

inv. No. 110128/1-5
inv. No. 110148
inv. No. 551333

Parameters of test

Frequency range	10 Hz, 55 Hz, 10 Hz
Amplitude	0,35 mm
Sweep rate	1 octave / min
Duration	30 min
Direction	the most onerous direction

Specimen 1

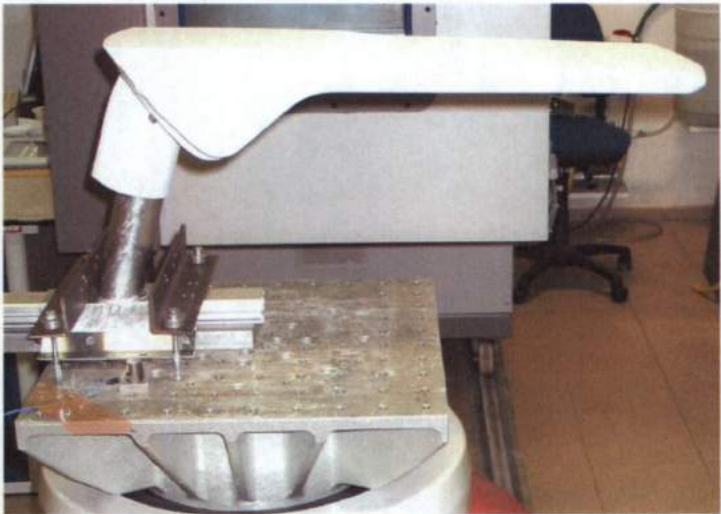


clamping of specimen



functional test

Specimen 2



clamping of specimen

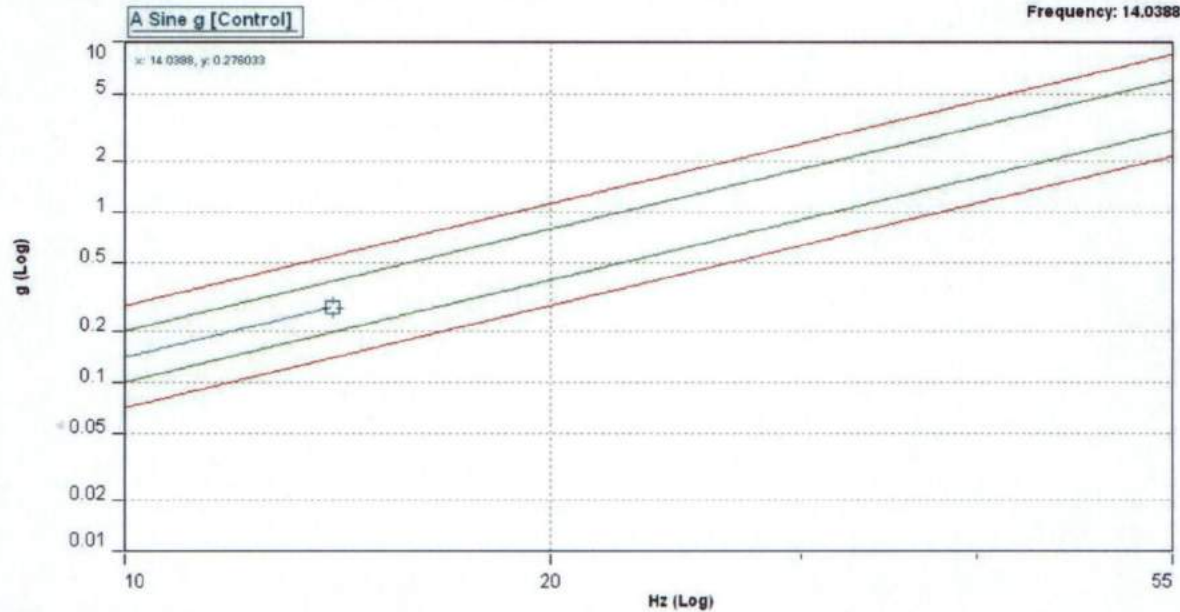


functional test

Record of test courses - Vibration test (operation)

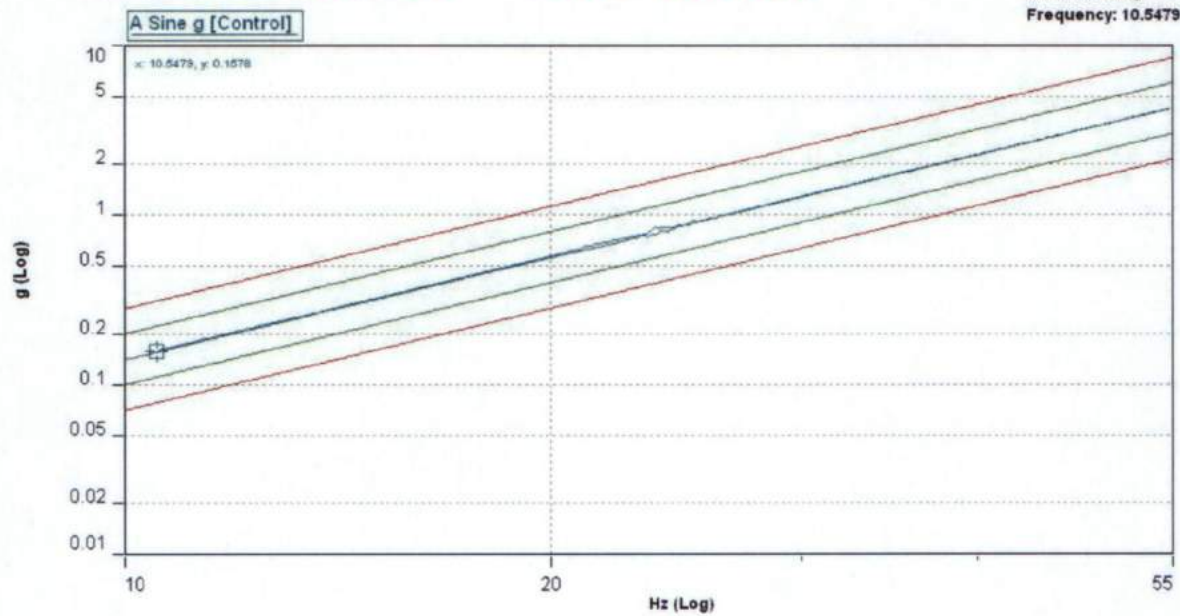
Sweep #: 12.2000
Sweeps Remaining: 0.0000 **LUG 1** **Date: 11/03/16**

CTRL: 0.2760 g
Frequency: 14.0388



Sweep #: 1.9695
Sweeps Remaining: 10.2305 **LUG 2** **Date: 11/04/16**

CTRL: 0.1578 g
Frequency: 10.5479

**TEST RESULT**

After the tests there were detected no visible mechanical damage on the specimen, the test did not affected the specimen's functionality.


Tested by: J. Bažant