

LED Flux measurement

FORM-L-41 ED1 REV 0

Date : **3/03/2015**

Operator : **FC**

Filename : **2015_146.xml**



226 - TEST

LEDs

NBN EN ISO/IEC 17025 : 2005

Trademark : **LG Innotek**

Entry number : **35R036**

Type : **3535 Gen4**

Power (Catalogue) : **0.00** W

BIN Description : **X9-J32-9**

Flux : **160** lm/LED

Part number : **LLRMA97-25K400B**

Color or CCT (Theoretical) : **NW**

Number of LEDs : **8**

Lenses

Trademark : **None**

Type : **None**

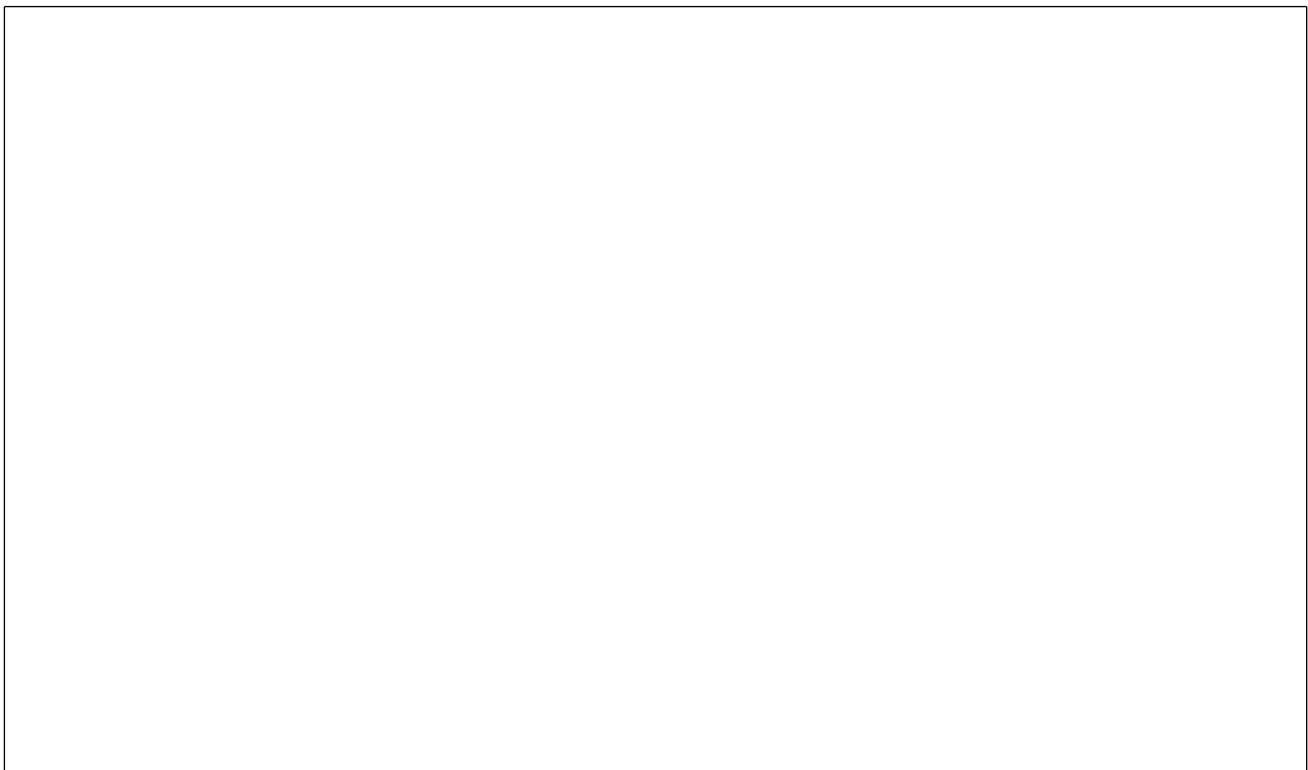
Power & Print

Type : **DELTA SM400-AR-4**

Print description : **8 leds voltana 1**

Active

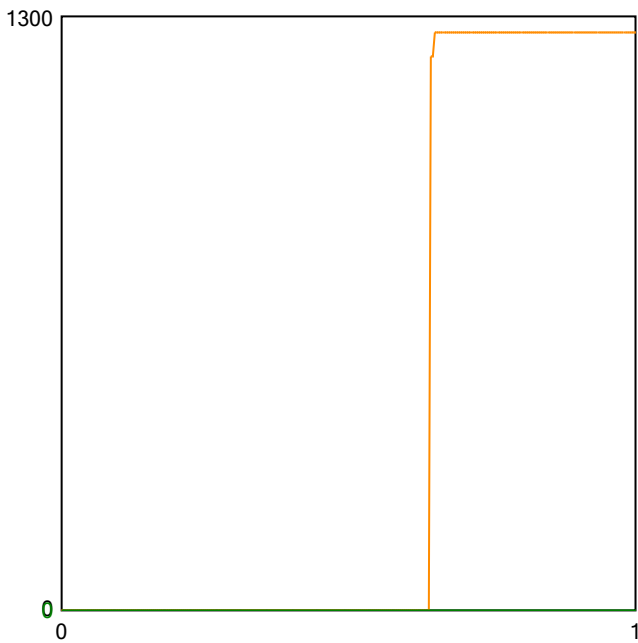
Picture



Sphere photometric measurement

Average flux : **458** lumens

Maximum flux : **1269** lumens



Position in sphere :



Electrical measurement

● Secondary electrical measurement

Voltage : **23.57** V

Current : **0.350** A

Power : **8.26** Watt

→ LEDs light efficiency at thermal stabilization :

55.5 lm/W

57.3 lm/Led

→ LEDs light efficiency at 25° :

153.6 lm/W

158.6 lm/Led

● Primary electrical measurement

Voltage : **N/A** V

Current : **N/A** A

Power : **N/A** Watt

Cos φ : **N/A**

→ Driver losses : **N/A** %

→ LEDS & Driver light efficiency :

N/A lm/W

Description :

Flux @25°/350mA pcb N°2 - Voltana 1

Comment :

FORM-L-41 ED1 REV 0



226 - TEST

NBN EN ISO/IEC 17025 : 2005

Approved by :

LED 2015/146 2/3



226 - TEST

NBN EN ISO/IEC 17025 : 2005

Colorimetry

CIE 1931 Colour Rendering Index

File Name: #1

Reference Illuminant: natural Particular radiator

Observer: 2°

Chromaticity Difference DCP: 100.3

CCT: 3996 K

CIE color samples		JIS color sample	
R1+ 43.8	R6+ 44.0	R15+ 52.0	Rd
R2+ 77.0	R8+ 51.1		(mean value of R1+ - R8)
R3+ 00.1	R10+ 47.0		68.89
R4+ 06.5	R11+ 91.0		
R5+ 65.2	R12+ 48.2		
R6+ 00.0	R13+ 65.7		
R7+ 76.8	R14+ 93.3		

Close

Zoom to Rectangle [RESET]

Target

Calibration File: #1 100cd/m²

Measurement Mode: Radiance

Average: 1

Measurement

Luminance	LV	2.078E+2	$\frac{cd}{m^2}$	
Radiance	L ₀	5.886E-1	$\frac{W}{sr \times m^2}$	
Corr. Colour Temp CCT		3996	K	
Dom. Wavelength	W	579.7	nm	
Colour Purity	PE	26.3	%	
Chromaticity	X	0.3799	Y	0.3742
	u'	0.2258	v'	0.5004

Interval (seconds): 10

Continuous Scan:

Hold Integration Time:


Auto:

Transfer **QUIT**

RTECH-PHOTOMETRY LABORATORY

Testreport : Measurement of luminous intensity distribution related to the standard
 NBN-EN 13032-1; CIE 121-1996; IES LM-79-08 and procedures PT-P-01 and PT-P-02
 rue de Mons, 3 B-4000 LIEGE - Tel : 04/224.71.40 - Fax : 04/224.25.90
 Measurement for Schröder group.

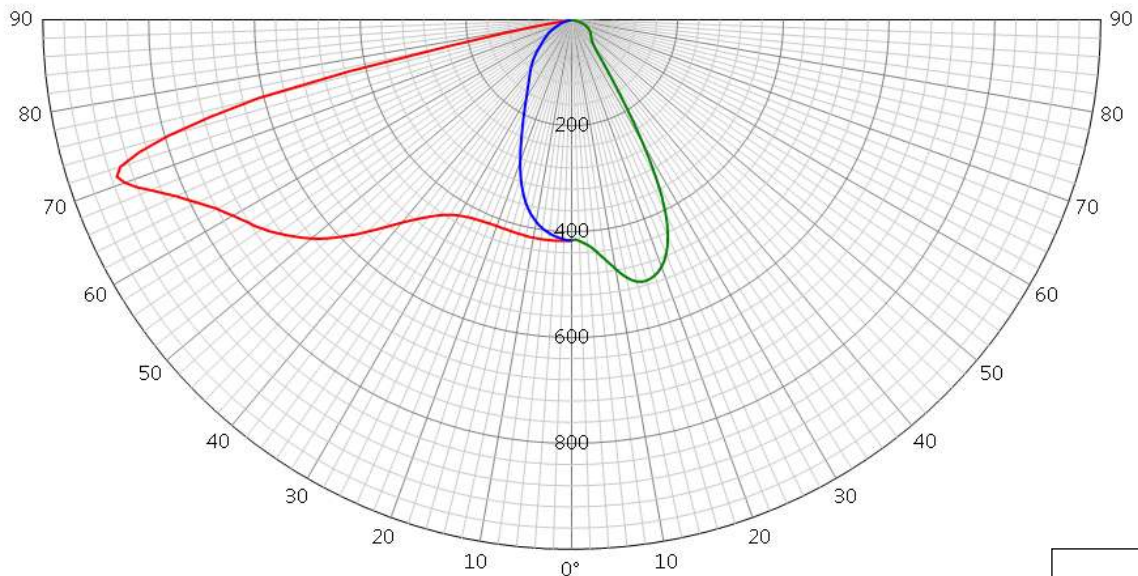
LED

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 1		Request # FD35048
Source						
Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Master Reflector						
Gaggione Led assembly [Without] Narrow Assembled 0,0°				No	5136	
Protector Refractor Lens						
Protector Lens	Glass Extra Clear Flat Smooth Gaggione 5136 PMMA					
Laboratory observation						
VOLTANA 1 with 8 LG 3535 Gen 4 Used flux for efficiency matrix calculation = 1269 lm - CCT = 3996 K - CRI = 68,68 (see sphere test report 2015/146 on appendix).						
Purpose DOC				Sample date 11/07/2014	Sample # 34R179	
Observation						
DOC VOLTANA 1 with lenses 5136						
Flux coefficient multiplicator (only for efficiency matrix): From 350 to 500 mA : 1,354 From 350 to 700 mA : 1,781 From 350 to 1000mA: 2,334						
Fixture powered @350/500/700mA with driver Philips XITANUIM 27W - 1A Prog 230V-J-Sxt Fixture powered @1000mA with driver LG INNOTEK LLP 27W 1A - 22~27V PISE-A027A						
Asked by LMA	Measured by CL	Approved by LMA	Appendix 1	 226-TEST NBN EN ISO/IEC 17025 : 2005		36011

LUMINOUS INTENSITY DIAGRAM

Origin Tungram-Schröder Plc. Hungary		Production Tungram-Schröder Plc. Hungary		Luminaire VOLTANA 1		Request # FD35048	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly [Without] Narrow Assembled 0,0°					No 5136	
Matrices	360111 Φ 0-90° = 1080lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	<p>Matrix in total flux @350 mA</p> <p>Light losses due to thermal stabilisation : 0,5 %</p> <p>Electrical measurement on LED (#1) : Voltage = 23,29 V Current = 0,350 A Power = 8,15 W</p> <p>Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,049 A Power = 10,83 W PF = 0,946</p> <p>Total luminaire power = 10,83 W : Lm/Watt = 99,70 lm/W</p> <p>Driver #1 : See observations for driver details - pcb n° LLRMA97-25K4005</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
5 - 175	910	71	G				
90	512	16	D				
270	417	1	G	416	25,0°	23/03/2015	

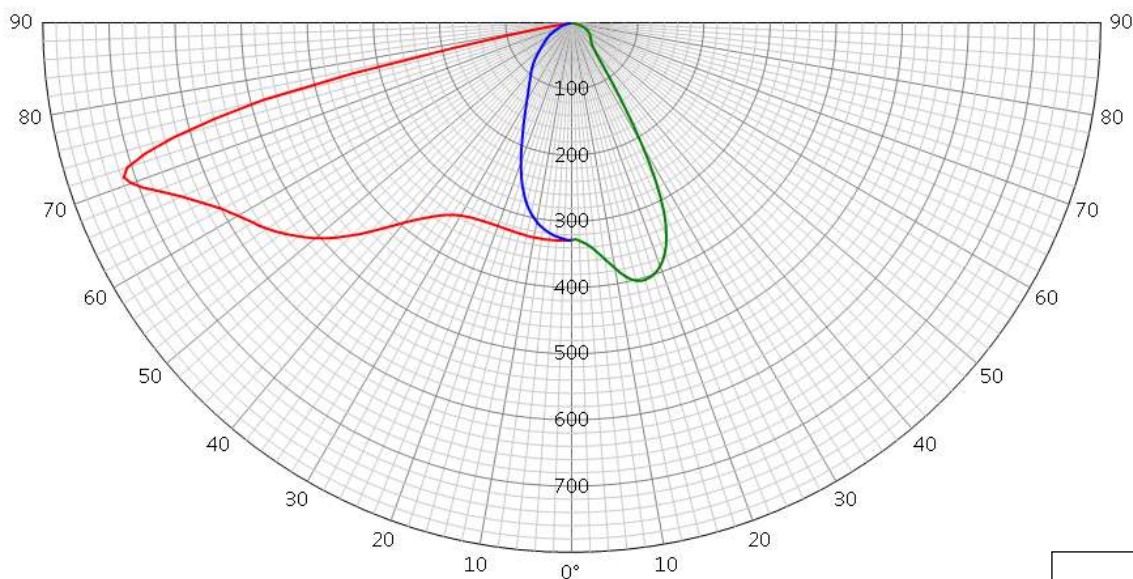


360111

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 1		Request # FD35048	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly [Without] Narrow Assembled 0,0°					No	5136
Matrices	360112 η 0-90° = 85,1% - 90-99° = 0,0%					Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	<p>Matrix in efficiency @350 mA</p> <p>Light losses due to thermal stabilisation : 0,5 %</p> <p>Electrical measurement on LED (#1) : Voltage = 23,29 V Current = 0,350 A Power = 8,15 W</p> <p>Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,049 A Power = 10,83 W PF = 0,946</p> <p style="text-align: center;">Total luminaire power = 10,83 W</p> <p>Driver #1 : See observations for driver details - pcb n° LLRMA97-25K4005</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
5 - 175	717	71	G				
90	404	16	D				
270	328	1	G	328	25,0°	23/03/2015	

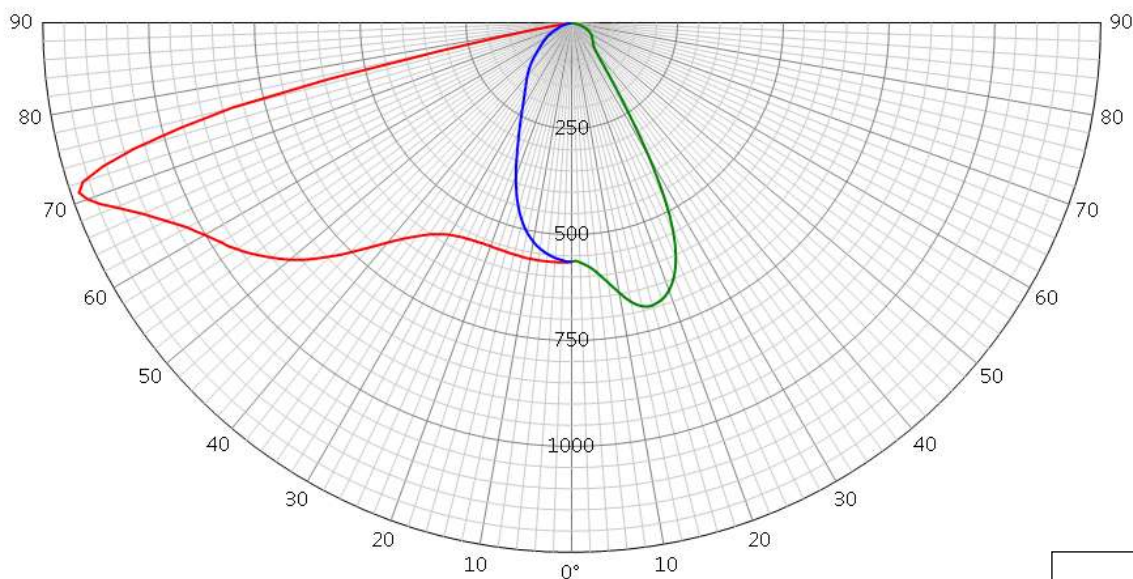


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LUMINOUS INTENSITY DIAGRAM

Origin Tungram-Schröder Plc. Hungary		Production Tungram-Schröder Plc. Hungary		Luminaire VOLTANA 1		Request # FD35048	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly [Without] Narrow Assembled 0,0°					No 5136	
Matrices	360113 Φ 0-90° = 1462lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	<p>Matrix in total flux @500 mA</p> <p>Light losses due to thermal stabilisation : 1 %</p> <p>Electrical measurement on LED (#1) : Voltage = 23,84 V Current = 0,500 A Power = 11,92 W</p> <p>Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,067 A Power = 14,88 W PF = 0,968</p> <p>Total luminaire power = 14,88 W : Lm/Watt = 98,25 lm/W</p> <p>Driver #1 : See observations for driver details - pcb n° LLRMA97-25K4005</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
5 - 175	1232	71	G				
90	694	16	D				
270	564	1	G	564	25,0°	23/03/2015	

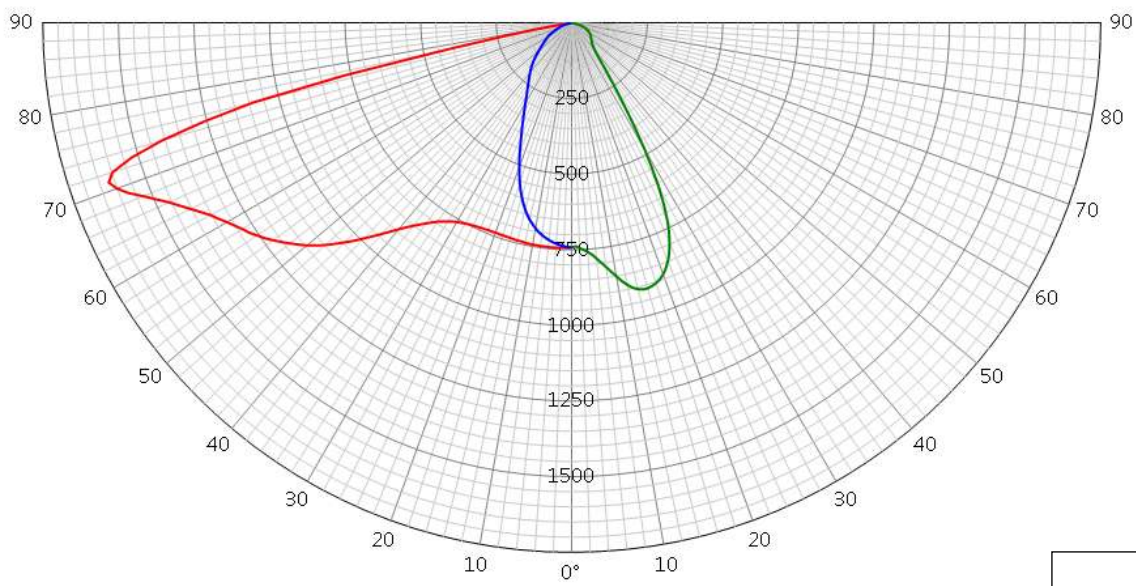


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 1		Request # FD35048	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly [Without] Narrow Assembled 0,0°					No	5136
Matrices	360114 Φ 0-90° = 1923lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	<p>Matrix in total flux @700 mA</p> <p>Light losses due to thermal stabilisation : 1,5 %</p> <p>Electrical measurement on LED (#1) : Voltage = 24,48 V Current = 0,700 A Power = 17,14 W</p> <p>Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,091 A Power = 20,66 W PF = 0,981</p> <p>Total luminaire power = 20,66 W : Lm/Watt = 93,08 lm/W</p> <p>Driver #1 : See observations for driver details - pcb n° LLRMA97-25K4005</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
5 - 175	1620	71	G				
90	913	16	D				
270	742	1	G	742	25,0°	23/03/2015	

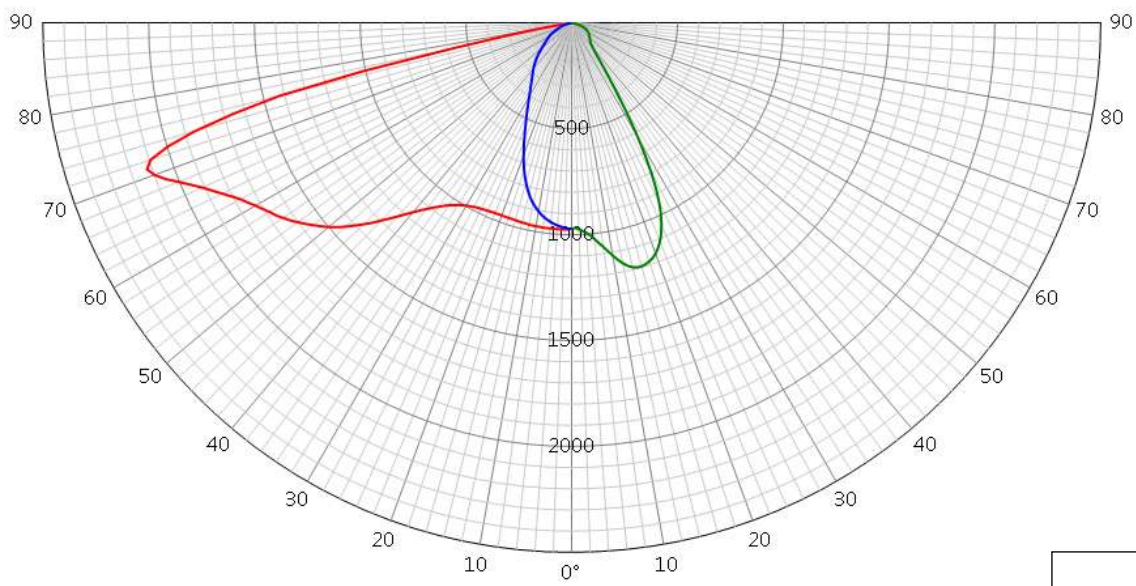


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LUMINOUS INTENSITY DIAGRAM

Origin Tungram-Schröder Plc. Hungary		Production Tungram-Schröder Plc. Hungary		Luminaire VOLTANA 1		Request # FD35048	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly [Without] Narrow Assembled 0,0°					No 5136	
Matrices	360115 Φ 0-90° = 2520lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	<p>Matrix in total flux @1000 mA</p> <p>Light losses due to thermal stabilisation : 2 %</p> <p>Electrical measurement on LED (#1) : Voltage = 25,38 V Current = 1,000 A Power = 25,38 W</p> <p>Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,137 A Power = 30,74 W PF = 0,970</p> <p>Total luminaire power = 30,74 W : Lm/Watt = 81,98 lm/W</p> <p>Driver #1 : See observations for driver details - pcb n° LLRMA97-25K4005</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
5 - 175	2123	71	G				
90	1196	16	D				
270	973	1	G	972	25,0°	23/03/2015	



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Measurement fulfil Standards:

- NBN-EN 13032-1
- NBN-EN 17025:2005
- CIE 121-1996
- LM79-08

Measurement quantities measured:

- Light distribution in relative or absolute photometry
- Led alone cold lumen package
- Led CCT and CRI
- Power consumption of the fitting
- Lm/watt

Electrical measurment, If not specified:

- Primary values are AC with 50Hz frequency
- Secondary values on SSL are DC

CCT, CRI and chromaticity coordinates: are Measured on sphere.
if specified Main test report refer to sphere extra test report.

Light distribution : are measured on gonio.

Number of hours operated prior to measurement: If no other specified, 0 hours (no aging)

Stabilization time: If no other specified, a minimal stabilization time of 1 hour is applied.

Total operating time of the product including stabilization:

45 minutes have to be added by measurement.

Minimal operating time is 105 minutes

Luminous intensity distribution: available on electronic file with

.mat format (internal schreder format)

.ldt format (European standard)

.IES format (American standard)

Statement of uncertainties (K=2 95% of confidence level):

Intensity measurement: +/- 3%

Angle: +/- 0.5°

Flux: +/- 2.5%

Electrical DC

Power: +/- 0.25%

Voltage: +/- 0.1%

Current: +/- 0.2%

Electrical AC

Power: +/- 0.1%

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Voltage: +/- 0.1%
Current: +/- 0.4%
Temperature: +/- 1.5%
CCT: +/- 5%
CRI: +/- 2%
x/y: +/- 2%

Measuring instruments in use:

Gonio

Type C with Moving mirror

Manufacturer: LMT Lichtmesstechnik GmbH Berlin, Helmholtzstrasse 9 10587 Berlin, Germany

Type: GO-DS 2000

Calibration: traceable to PTB (Physikalisch-Technische Bundesanstalt D-Braunschweig)

Photometric test distance : By default 10 meter, on request 30 meter.

Sphere n°1

4p geometry

Manufacturer: LMT Lichtmesstechnik GmbH, Helmholtzstrasse 9 10587 Berlin, Germany

Type: UL2000 + U1000 V-Lambda photometer

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Sphere n°2

4p geometry

Manufacturer: Instrument Systems GmbH, Neumarkter Str. 83, 81673 Muenchen, Germany

Type ISP2000 + Spectroradiometer CAS120 and CAS140

Calibration: traceable to NIST

Colorimetric portable spectroradiometer

Manufacturer: JETI Technische Instrumente GmbH, Tatzendpromenade 2 07745 Jena

Type: SPECBOS 1201

Calibration: traceable to NIST

Multimeters

Manufacturer: Agilent

Type: 34401A

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Wattmeters

Manufacturer: Yokogawa

Type: WT210

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Thermometers

Voltcraft K101 (Sphere IS2000)

LMT U1000 (Sphere LMT)

Gossen digem f96x48 CK/EK (gonio)

Calibration: traceable to PTB (Physikalisch-Technische Bundesanstalt)

36011

LICENCE

No. 20497 replaces No.20458

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

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



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

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

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

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

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

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

This licence is issued on: 09/10/2017

Ir. C. Lana,
Certification Manager

© Only integral publication of this certificate, including the annex, is allowed
This certificate is only valid combined with the publication on the following web address: www.sgs.com/ee



SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

Product : road, square, street, flood lighting
 Trade name(s) : SCHREDER
 Type(s)/Model(s) : VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4, VOLTANA 5
 description : Street lighting
 rated voltage (Un) : 120-240 V
 rated frequency : 50-60 Hz
 rated secondary current (In SEC) : 350, 500, 700, 1000 mA (LED)
 class : class I
 degree of protection : IP66
 additional information : IK08

Product data - type VOLTANA 1

lamp(s) : 8 LED's
 rated ambient temperature (ta) : max. 55°C

Product data - type VOLTANA 2

lamp(s) : 16 LED's
 rated ambient temperature (ta) : max. 55°C

Product data - type VOLTANA 3

lamp(s) : 24 LED's
 rated ambient temperature (ta) : max. 55°C

Product data - type VOLTANA 4

lamp(s) : 32 LED's
 rated ambient temperature (ta) : max. 55°C

Product data - type VOLTANA 5

lamp(s) : 64 LED's
 rated ambient temperature (ta) : max. 55°C

TESTS

Test requirements

EN 60598-1:2015

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

Test results

The test results are laid down in certification file 618719/12.

Remarks

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

Conclusion

The examination proved that all test requirements were met.

Checked by, project leader : Christian Maes - 09/10/2017

Department Manager,
Product Certification :

Certification Manager :



Maes 2017-10-09

FACTORY LOCATION(S)

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

Schreder TOV
Vul. Mykulynetska 46B
46000 TERNOPIIL
Ukraine

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

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

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

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

Tungram-Schröder Világítási Berendezések Zrt
Tópart 2
2084 PILISSZENTIVAN
Hungary

VOLTANA 1

5136

Optic	5136
Protector	Flat, Glass Extra Clear, Smooth
Source	8 LG Innotek 3535 Gen4
Matrix	360112



Features

Long lasting performance and significant savings

- Cost-effective and efficient lighting solution for a fast return on investment
- LensoFlex®2 photometric engine with photometry adapted to various applications
- 5 sizes for flexibility
- Designed to incorporate Owlet control and sensor solutions
- ThermiX®: withstands high temperatures (Ta 50°C)
- Mounting : side entry (42-60 mm) with inclination steps -10° to +5°
- Surge protection 10kV (optional)

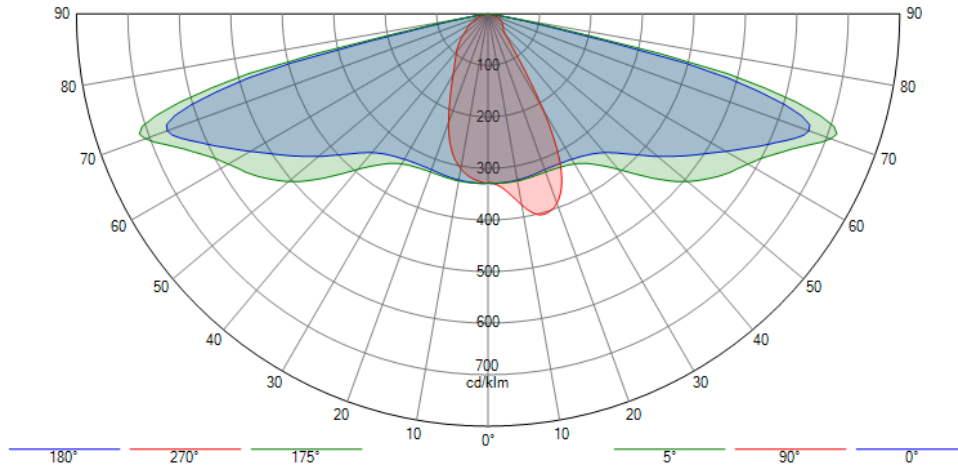
Types of application

- Squares and pedestrian areas
- Bridges
- Parks
- Roundabouts
- Pedestrian crossings
- Car parks
- Roads and highways
- Residential streets
- Bike paths
- Urban roads and streets

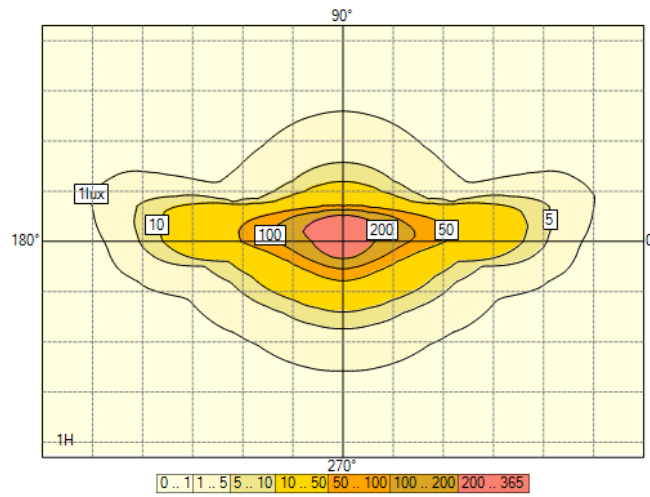
Information for 1000 lm matrix

Efficacy (%)	85.1	G Class (EN 13201-2)	G3	I 70-80-90-95 (cd)	709 - 63 - X - X
ULOR (%)	0.0	Imax (cd)	717		
DLOR (%)	85.1	Aperture 0-180°	41 - 41		
UWLR (%)	0.0	Aperture 90-270°	8 - X		

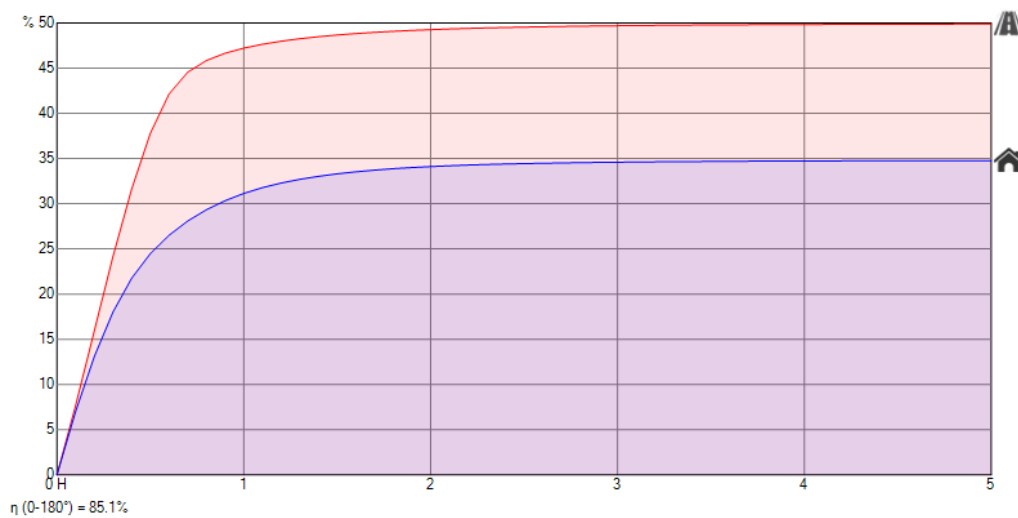
Polar/Cartesian diagram



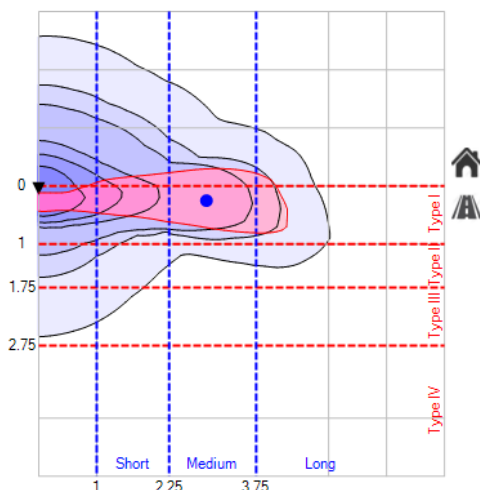
Isolux



K-Curve

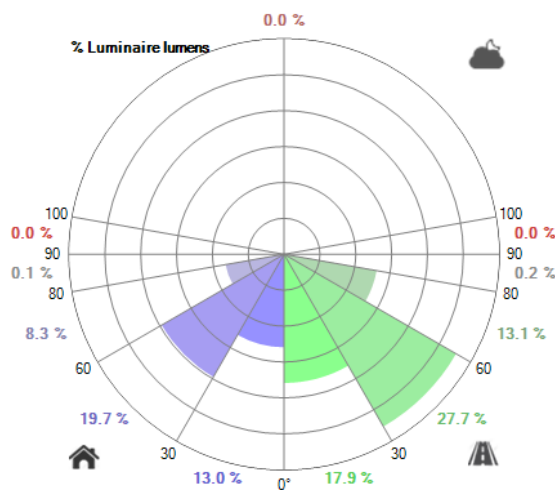


IES Roadway Classification / Nema Classification

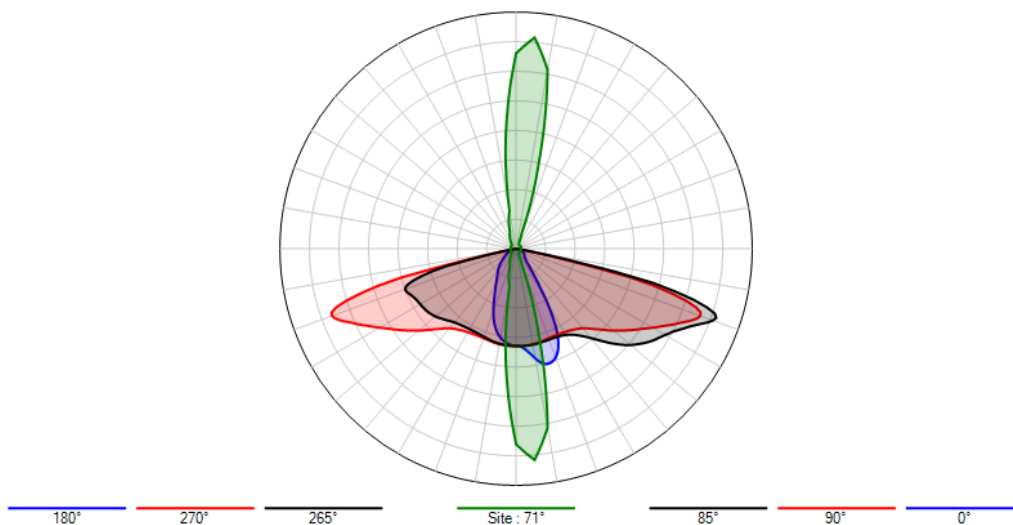


I - Medium

Luminaire classification system (LCS)



Intensity diagram in max Cone and in CPlane



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<http://www.schreder.com>

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1 8 led's

Sample n°: P-E14349

Test purpose: Electrical measurements @ 1A

Remarks:

Test request n°: P-D14673

Folder n°: P-F14057

TEST CONDITIONS:

Operator: ABRY Marc

Driver: Tridonic LCI 27 W 1000 mA

Load: 8 led's (Typ. Vf: 3,18 V)

Power Supply:

Elgar Tw 3500-4

Supply voltage: 230 V 50 Hz

Measurement device:

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

CONCLUSIONS:

- Efficiency: 83,2 %
- PF: 0,94
- THD: 19,0 %
- Harmonics distribution complies with the IEC/EN 61000-3-2 Standard.

Duplicate to: Mr M. Thijs

LAB 16/09/2014

J.P. Harchies

//P-14E673

A handwritten signature in blue ink, appearing to read "Harchies", with a horizontal line drawn underneath it.

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1 8 led's @ 1A – Class I

Sample n°:

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

Remarks:

Test request n°: P-D14689

Folder n°: P-F14057

TEST CONDITIONS:

Operator: ULg - EMC

Test Summary

EN 55015 & EN 61547 Standards

Emission

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

Immunity

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

Driver: LG Innotek PISE-A 027A – 27W 1A – Rev.0.4

CONCLUSIONS:

VOLTANA-1 8 led's driven by LG Innotek PISE-A 027A 27 W driver @ 1A complies with the CISPR/EN 55015 and EN 61547 Standards.

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

Duplicate to: Mr M. Thijs
LAB 18/09/2014
J.P. Harchies

//P-14E689

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1 Extra clear glass protector

Sample n°: P-E15377

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

Remarks:

Test request n°: P-D15558

Folder n°: P-F14057

TEST CONDITIONS:

Operator: BOMBIL Patrick

3 samples under test
Glass thickness: 5 mm



Fragmentation test

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

Results:

Sample 1: 131 pieces

Sample 2: 99 pieces

Sample 3: 116 pieces

CONCLUSIONS:

VOLTANA-1 Extra Clear Glass protector complies with fragmentation test following IEC/EN 60598-2-3 Standard.

Duplicate to: Mr M. Thijs

LAB 21/08/2015

L. Maghe

//P-15CR558

A handwritten signature in blue ink, appearing to read "L. Maghe".

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1

Sample n°: P-E14350

Test purpose: Mechanical impact IK08 test following IEC/EN 62262 Standard

Remarks:

Test request n°: P-D14679

Folder n°: P-F14057

TEST CONDITIONS:

Operator: BOMBIL Patrick

Smooth extra clear glass
Glass thickness: 5 mm

At pendulum hammer

5 impact points distributed on protector surface
One impact on each point

Test on 5 samples

Test

IK08 : Impact energy: 5 joules
Hammer weight: 1,7 kg
Height of fall: 29,4 cm

Result

OK for the 5 samples for all tested points

CONCLUSIONS:

VOLTANA-1 satisfies the IK08 test following IEC/EN 62262 Standard.

Duplicate to: Mr M. Thijs
LAB 17/09/2014
J.P. Harchies

//P-14E679

A handwritten signature in blue ink, appearing to read "Harchies", with a horizontal line drawn underneath it.

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1 8 led's @ 1A

Sample n°:

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

Remarks:

Test request n°: P-D14677

Folder n°: P-F14057

TEST CONDITIONS:

Operator: BOMBIL Patrick

Preconditioning: endurance test

Test	Result
IP6X : -Luminaire switched ON until stable T° -Talcum in suspension (blowing ON) -After 1', luminaire OFF -Talcum for 3 hours	OK.
IPX6 : - Luminaire switched ON until stable T° - Luminaire switched OFF and immediately sprayed with water jet - Hose Φ 12,5 mm - Water pressure: 1 kg/cm ² - Spraying distance: 3 m - Duration of test: 3 minutes	OK.

CONCLUSIONS:

VOLTANA-1 8 led's @ 1A satisfies the IP66 test following IEC/EN 60598-1 Standard.

Duplicate to: Mr M. Thijs
LAB 17/09/2014
J.P. Harchies

//P-14E677

A handwritten signature in blue ink, appearing to read "Harchies", with a long horizontal stroke extending to the right.

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1 8 led's

Sample n°: P-E14349

Test purpose: Thermal test evaluation @ 1A

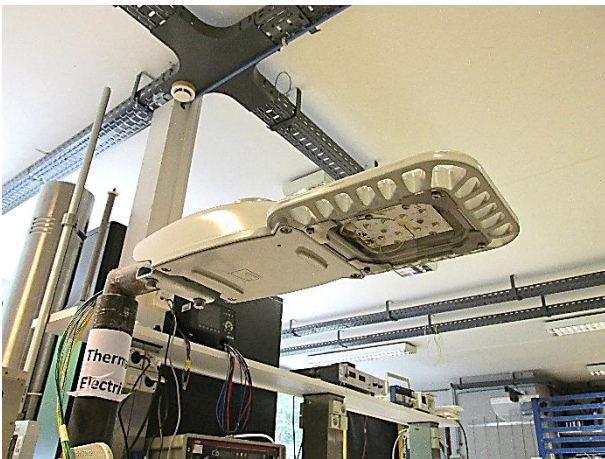
Remarks:

Test request n°: P-D14678

Folder n°: P-F14057

TEST CONDITIONS:

Operator: ABRY Marc



Load: 8 led's

Driver: TRIDONIC LCI 27 W 1000 mA
1-10 V Outdoor
N° 87 500 318
Tc 70 °C

Measurement device:

Yokogawa TX10: thermal measurement

Yokogawa WT 210: primary EM

Fluke 87: secondary and led's EM

Junction Temperature measurement method

Junction temperature measurement by base temperature measurement and electrical measurement.

$$T^{\circ}_j = T^{\circ}_b + R_{jb} \times P_{led}$$

CONCLUSIONS:

According to "Led's Lumen Maintenance Criterion" LM80 extrapolation 6.000 hrs, we can state VOLTANA-1 8 led's driven @ 1A by Tridonic LCI 27 W driver satisfies:

Tq (CEI): 35 °C for led's with L80 – 100 Khrs target

Tq (CEI): 35 °C for lenses in Diakon material

Tq (CEI): 35 °C for Tridonic LCI 27 W driver

Ta (CEI): 55 °C

Duplicate to: Mr M. Thijs

LAB 17/09/2014

J.P. Harchies

A handwritten signature in blue ink, appearing to read "Harchies".

//P-14E678

Laboratory Service PHYSICAL TEST REPORT



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

Subject: VOLTANA-1 – Side Entry configuration

Sample n°: P-E14351

Test purpose: Vibration test: ANSI C 136-31 Standard (3G)

Remarks:

Test request n°: P-D14688

Folder n°: P-F14057

TEST CONDITIONS:

Operator: ULg

	Testing protocol	
		ANSI C 136-31 Standard Amplitude: 3,0g
	Test Item	Luminaire for bridge and overpass applications
	Excitation Direction	3 directions
	Search for frequencies	Excitation: sine sweep Frequency band: 5 - 100 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g
	Test	Excitation: sine dwel Frequency: at or near f_0 Amplitude: 3,0g at gravity center Duration: 100,000 cycles
	N.B.	A separate sample luminaire may be used for each excitation direction
	Search for frequencies	Excitation: sine sweep Frequency band: 5 - 100 Hz Sweep speed : 1 oct/min. Acceleration : 0.5g

CONCLUSIONS:

VOLTANA-1 in side entry configuration complies with the requirements of ANSI C 136-31 (3G) Standard.

Duplicate to: Mr M. Thijs
LAB 18/09/2014
J.P. Harchies

//P-14E688

VOLTANA

ILUMINAT CU LEDURI,
POTRIVIT ORICUI



EFICIENTIZAREA COSTURILOR

PERFORMANȚĂ RIDICATĂ

BENEFICII REMARCABILE

NU NECESITĂ ÎNTREȚINERE

Schröder



VOLTANA



CEA MAI NOUĂ, RENTABILĂ ȘI PERFORMANTĂ GAMĂ DE APARATE DE ILUMINAT, CARE ÎȘI ACOPERĂ INVESTIȚIA ÎN TIMP

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

CALITATE FĂRĂ COMPROMISURI

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

INVESTIȚII MINIME

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

RECUPERARE RAPIDĂ, ECONOMII DE DURATĂ

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



VOLTANA 0

VOLTANA 1

VOLTANA 2

VOLTANA 3

VOLTANA 4

VOLTANA 5

ZONE PIETONALE

Străzi, alei și piste
\de biciclete



20/50W

STRADAL

Străzi rezidențiale

Spații comune, zone
comerciale din mediul
urban



70W



100W

CĂI DE CIRCULAȚIE

Căi de circulație
din mediul rural

Căi de circulație
din mediul urban



150W



250W

substituit HID



VOLTANA 0



VOLTANA 1



VOLTANA 2



VOLTANA 3



VOLTANA 4



VOLTANA 5

ALTE MEDII ÎN CARE VOLTANA OFERĂ BENEFICII-CHEIE PENTRU CLIENT



FACILITĂȚI DE TRANSPORT



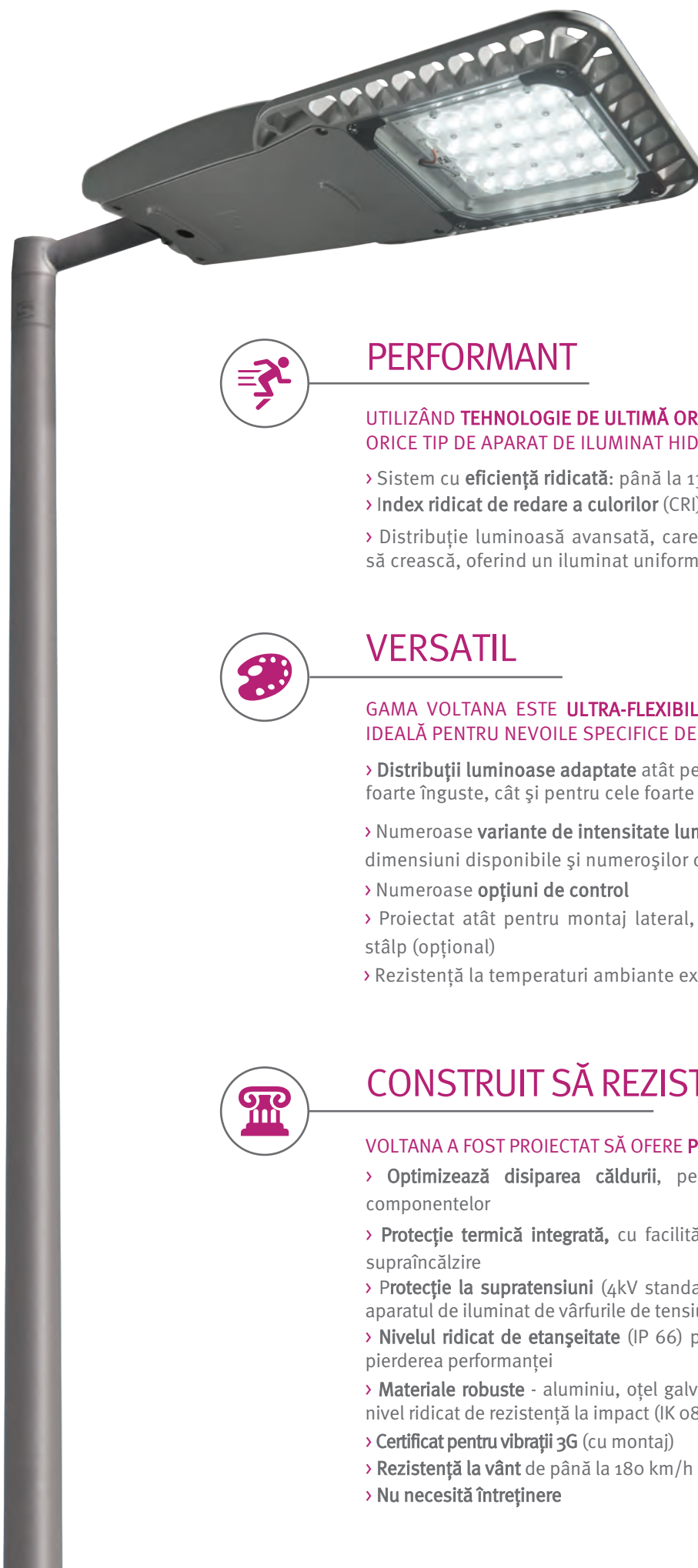
ZONE INDUSTRIALE



ZONE COMERCIALE



FACILITĂȚI SPORTIVE



PERFORMANT

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

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



VERSATIL

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

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



CONSTRUIT SĂ REZISTE

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

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



CONFORM

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

- > ENEC
- > ETL / UL
- > date despre iluminatul cu LEDuri



DEZVOLTARE DURABILĂ

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

- > **Materiale reciclabile** (aluminiu, oțel și sticlă)
- > **Profil destinat protejării mediului** (PEP) pentru scăderea ampretei ecologice
- > **Emisii de CO₂ reduse** (economie și întreținere)
- > Fără poluare luminoasă (**ULOR 0%**), mulțumită distribuției luminoase precise



SOCIAL

VOLTANA ADUCE NUMEROASE **BENEFICII COLECTIVE**

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



PRECIS

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

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



INTELIGENT

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

- > Disponibil cu profil **DALI 1-10 V** sau **profil de reducere personalizat**
- > **Flux Luminos Constant (CLO)**, pentru compensarea automată a deprecierei fluxului
- > Poate funcționa într-o **rețea independentă** limitată sau în **rețeaua unui oraș**, prin comunicație fără fir. Scenariile pot fi îmbunătățite prin **senzori externi**.*
- > Disponibil cu **fotocelulă** sau **priză NEMA P7**, pentru a opera în noua platformă Owlet IoT

* indisponibil pentru Voltana 0

CARACTERISTICI - CHEIE

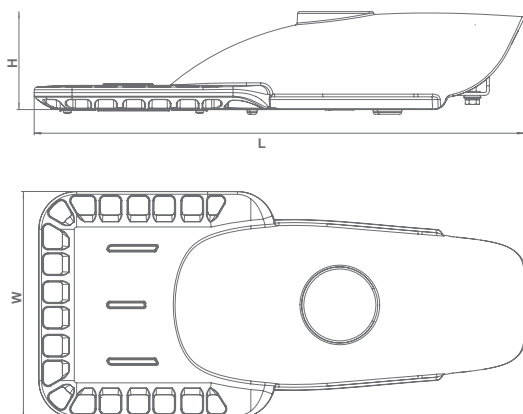
	Voltana 0	Voltana 1	Voltana 2	Voltana 3	Voltana 4	Voltana 5
Flux luminos standard (gamă) (*)	700 - 2,500lm	800 - 3,000lm	1,800 - 6,100lm	2,700 - 9,200lm	3,700 - 12,700lm	7,500 - 25,200lm
Consum de energie (W) (**)	8 - 30W	10 - 31W	20 - 56W	28 - 82W	36 - 110W	70 - 215W
Flux rezidual pe durata de viață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

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

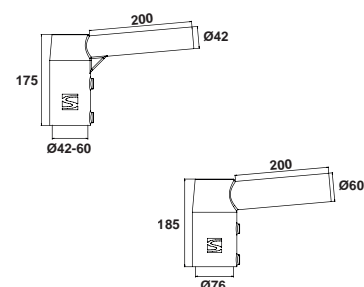
(**) conform standardului IEC - EN 60598 (doar Voltana 0 este disponibil cu Clasa I) - (***) conform standardului IEC - EN 62262

DIMENSIUNI | GREUTATE

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

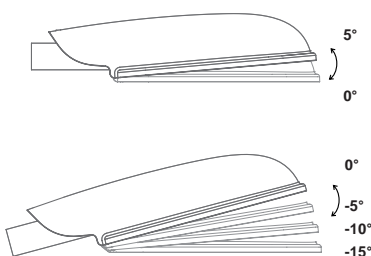


ADAPTOR VÂRF DE STÂLP

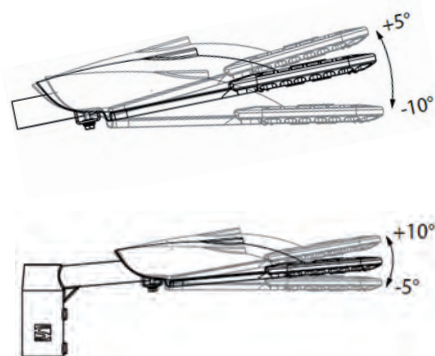


REGLAJE UNGHI ÎNCLINARE

VOLTANA 0

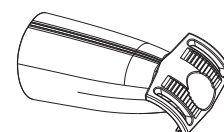


VOLTANA 1 - 5



MONTAJ UNIVERSAL

(OPȚIONAL PENTRU VOLTANA 0-1-2-3-4)



Ø 32 - 48mm

Ø 42 - 60mm

Ø 76mm

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

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

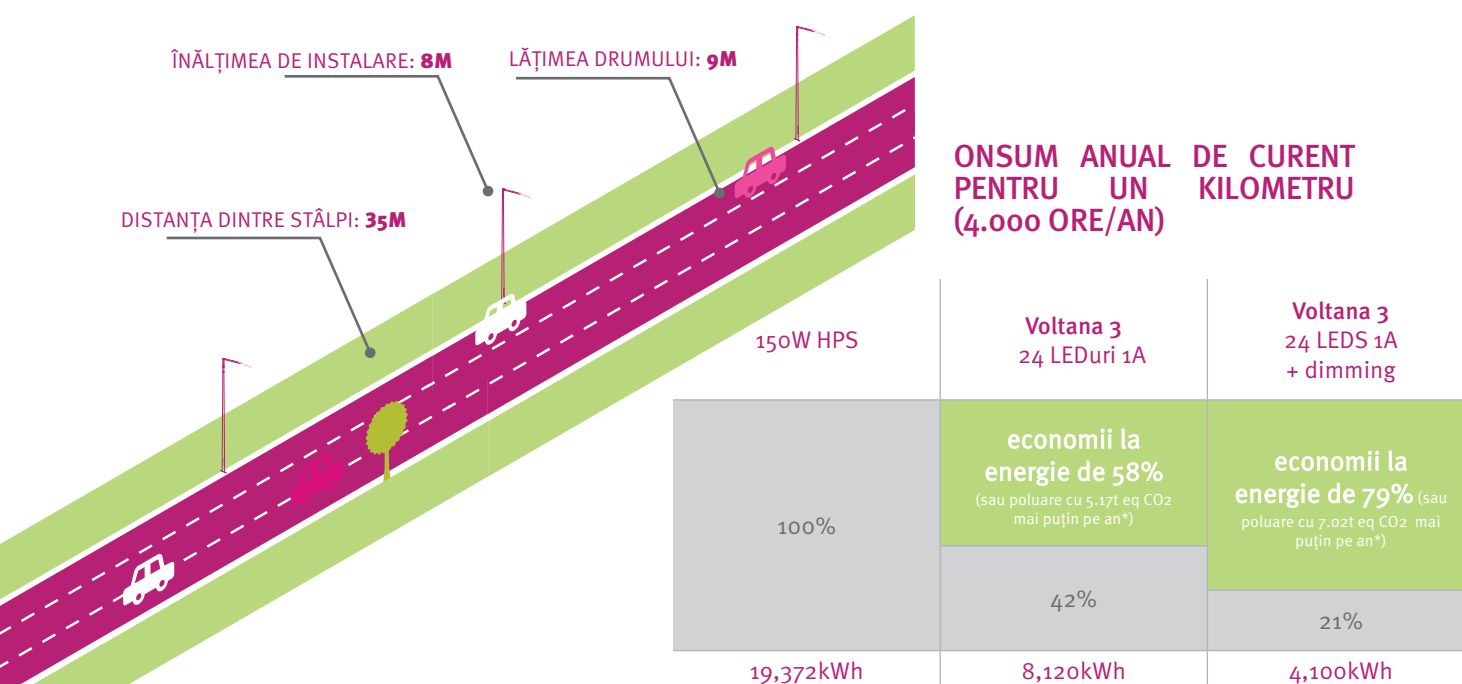
zone pietonale P5-P2		zone pietonale P1		căi de circulație clasificate M6-M5		căi de circulație clasificate M4		căi de circulație clasificate M3		căi de circulație clasificate M2	
aparat HPS 70W	Voltana 1	aparat HPS 100W	Voltana 2	aparat HPS 100W	Voltana 2	aparat HPS 150W	Voltana 3	aparat HPS 150W	Voltana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

(*) Consum de energie total al sistemului

STUDIU DE CAZ

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

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



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



SIGURANȚĂ



STARE DE BINE



DEZVOLTARE DURABILĂ



ECONOMII



SOLUȚII



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