

Light Measurement Report

Print date: 30/04/2026

Measurement date and time: 20/04/2026 12:33:41 – Measurement no. VFR-260420-1378-MS

Measurement tracking No. and Link: [VT260420-007284](#)

Operator: LC



Laboratory and Equipment

Laboratory Owner and Location

Goniospectrometer System and Type

Sensor Name, Calibr. Date and Serial No.

Spectrometer Manufacturer and Model

Viso Systems, Copenhagen V, Denmark

LabSpion – Type C, horizontal

LabSensor Model2 – 11/12/2024 – 3532797498

Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

Number of C-planes and Resolution

γ (gamma)-Resolution

Test Distance

Input Power, Power and Displ. Factors

Input RMS Voltage and Current

Frequency of Input Power

Warm-up Time and Variation

56 planes – 6,43°

5°

4,89 m

42,3 W – PF 0,98 – DPF 0,98

239 V – 0,182 A

50 Hz

Lamp stabilized in 15 min 1 sec – 2,0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

LED FRAME PANEL 60X60 3000K DIFFUSE WHITE

10716000309903 – ELECTRUM

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)

Efficiency

Peak Intensity and Beam Angle

Correlated Color Temperature, Target/Measured

Color Rendering Index

Color Rendering TM30-18

Color Shift, CIE duv and MacAdam Steps

Flicker

3728 lm – 10,81% / 89,19%

88 lm/W

946 cd – 128,2°

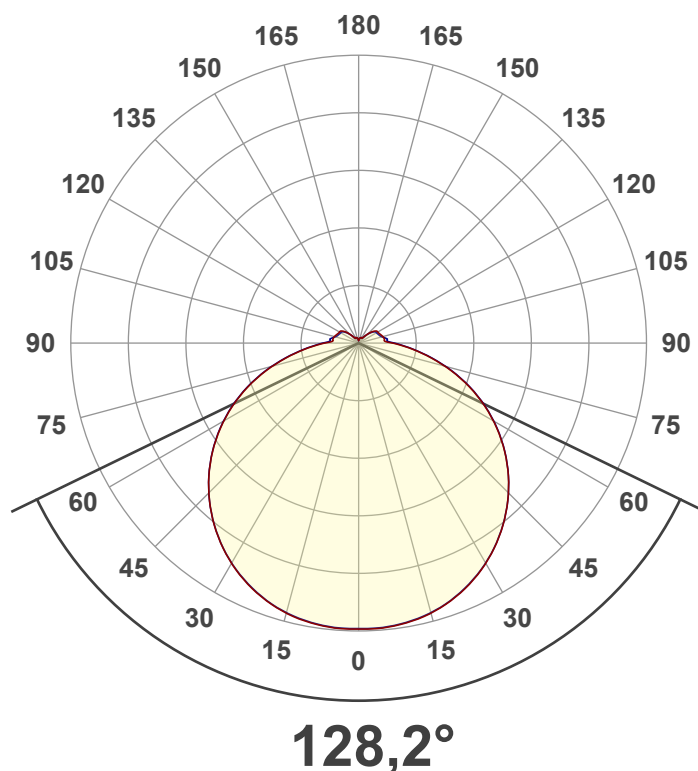
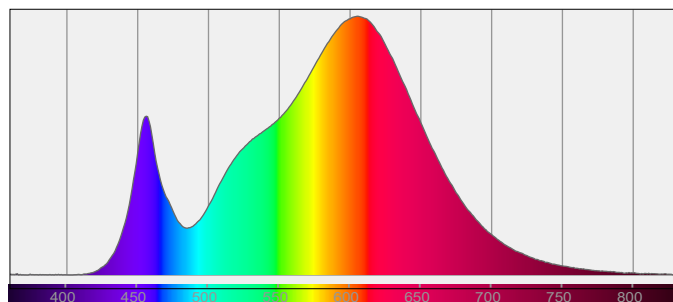
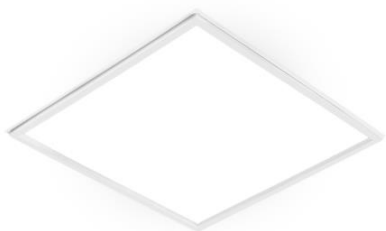
CCT = 3000 K / 3010 K

CRI 83,1

R_f 83,9 – R_g 96,0

Duv -0,0020 – SDCM 2,1

SVM 0,01 – PstLM 0,02



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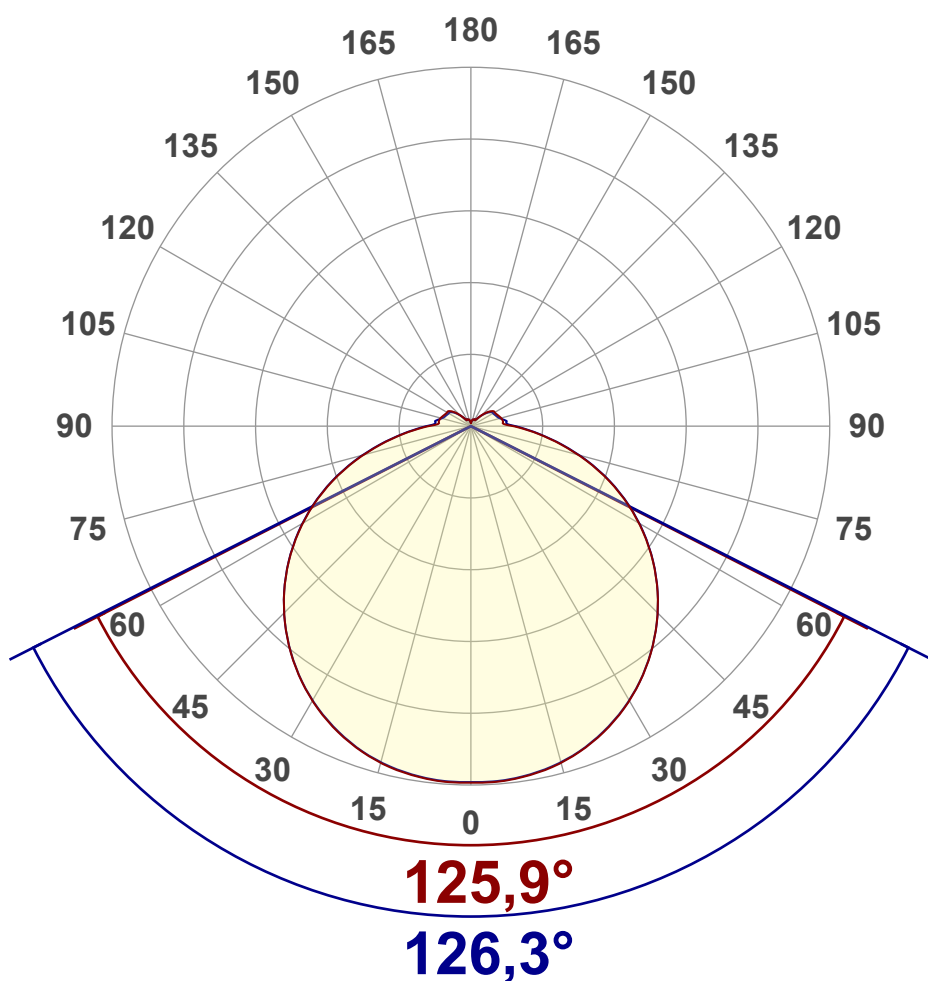
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	3728 lm
Lumen Up% / Down%	10,81% / 89,19%
Peak Intensity	946 cd
Beam Angle (50%-FWHM)	128,17°

Cut-off Angle

Average 2,5%	301,4°
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Field Angle

Average 10%	201,4°
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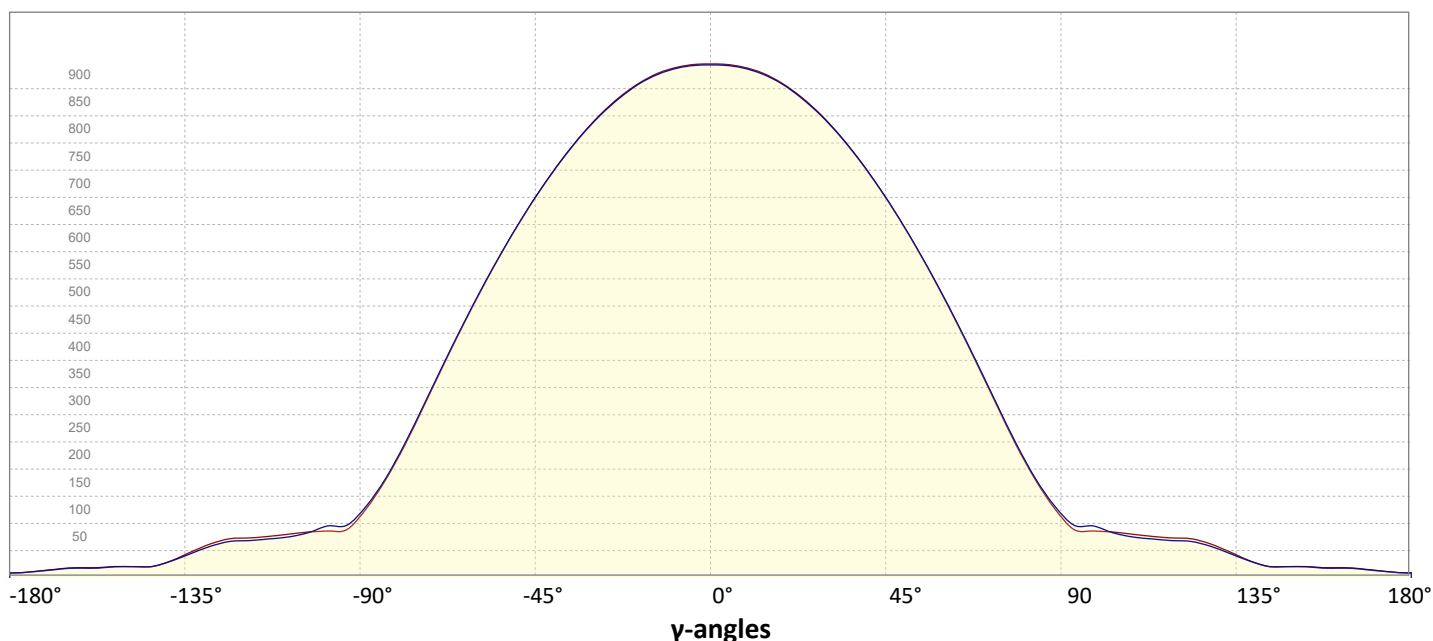
Intensity Ratio

In 120° cone	62,8%
In 90° cone	41,1%

C000-C180

C090-C270

Linear distribution diagram - Intensity (candela) vs γ-angle



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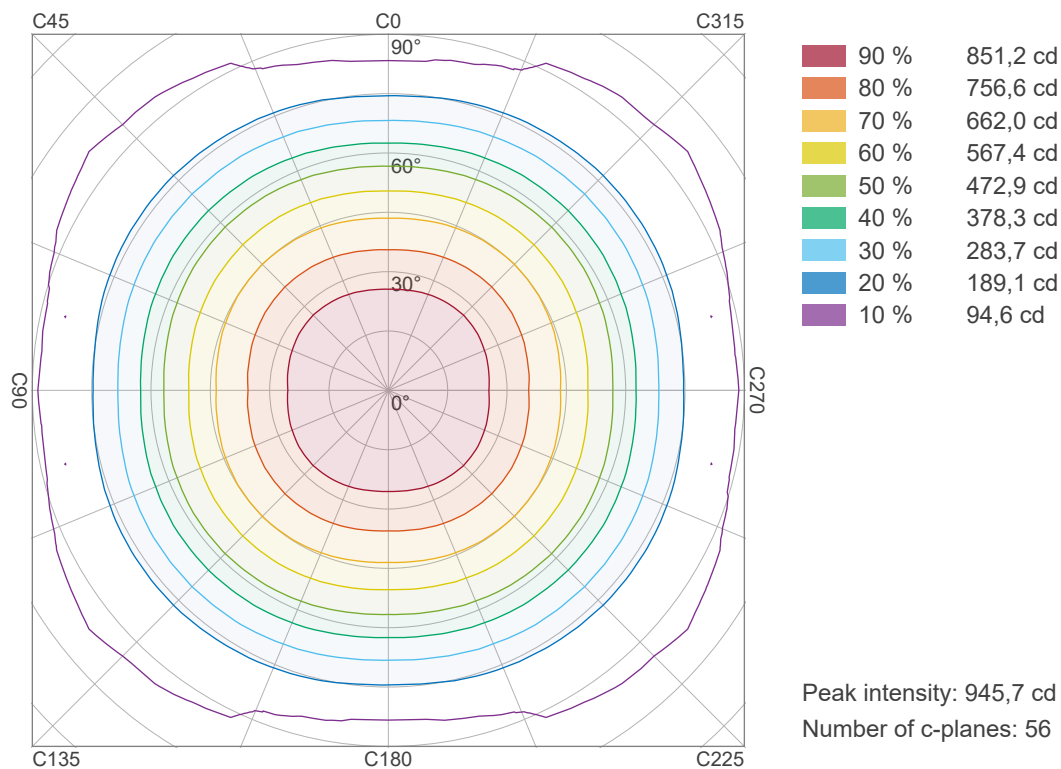
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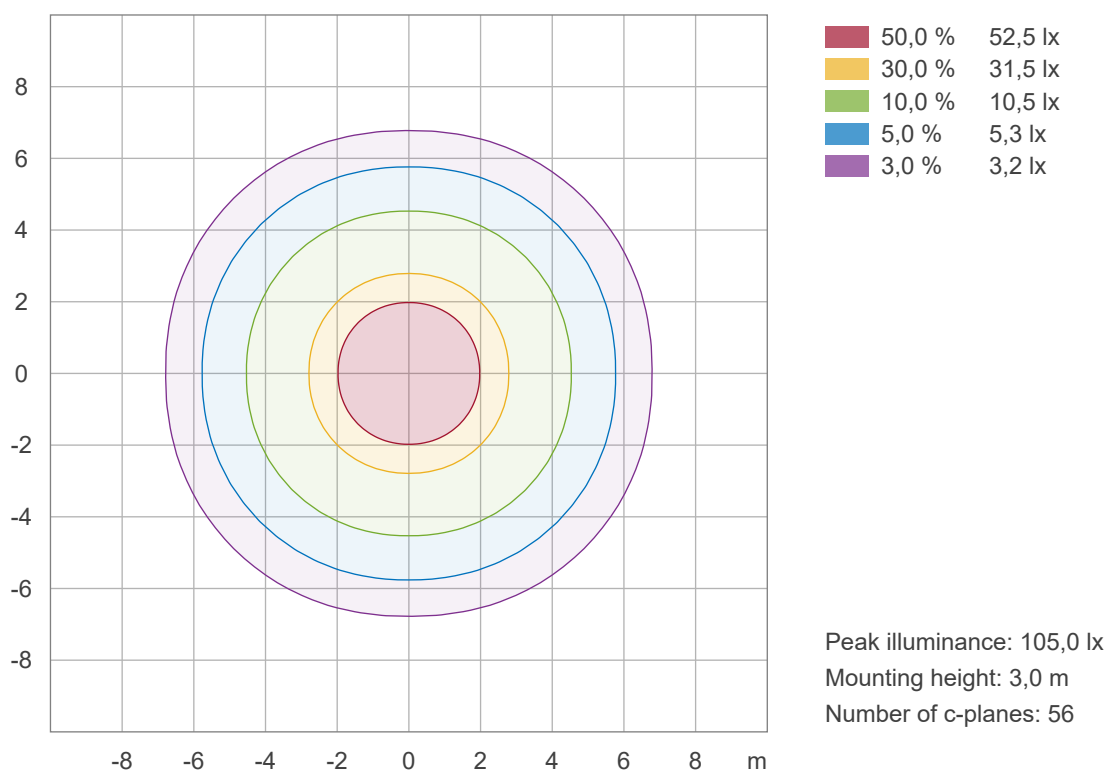
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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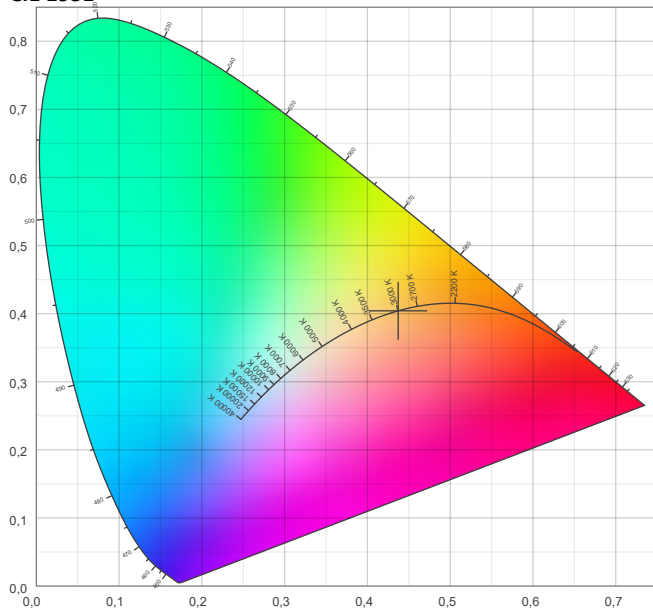


Color details

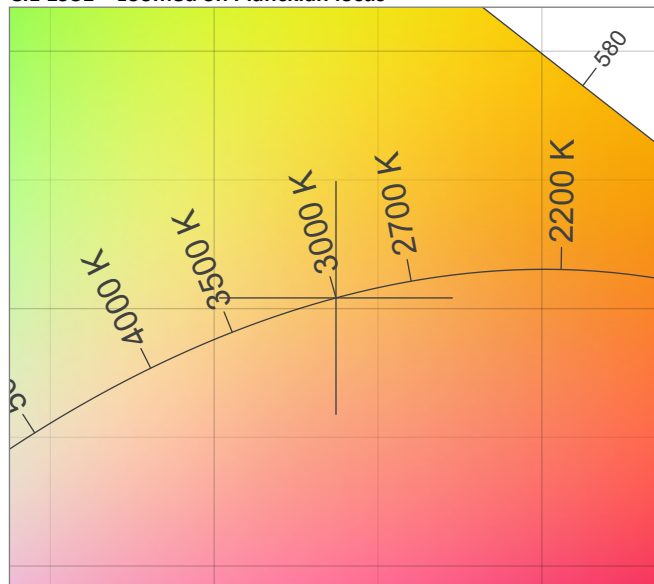
Correlated Color Temperature, Target CCT = 3000 K
Correlated Color Temperature, Measured CCT = 3010 K
Color Rendering Index CRI 83,1
Color Rendering Index, R9 (red component) R9 = 11,1
Color Rendering TM30-18 R_f 83,9 – R_g 96,0
Color Quality Scale CQS = 81,3

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0,437;0,404)
Color coordinate CIEs 1960 (u;v) = (0,251;0,348)
Color deviation from BBL Duv = -0,0020
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,251;0,521)

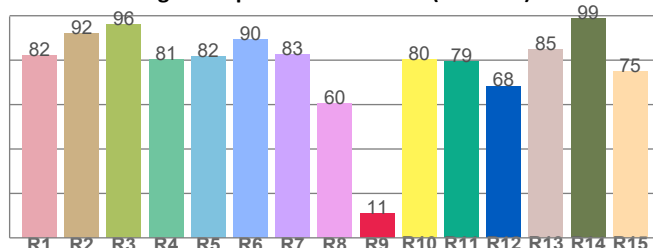
CIE 1931



CIE 1931 – zoomed on Planckian locus



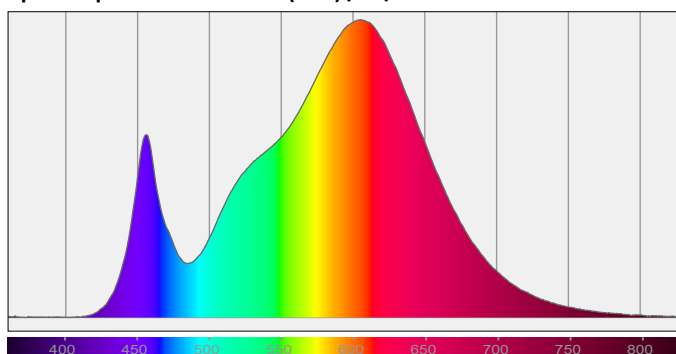
Color Rendering Index per reference color (CIE 1995)



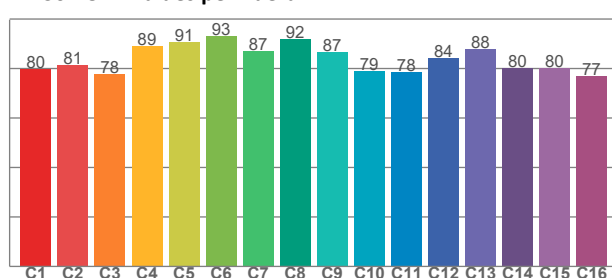
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
82,3	91,9	96,2	80,5	81,8	89,5	82,6	60,4	11,1	80,3	79,3	68,4	84,9	98,7	75,0

Spectral power distribution (SPD) / W/nm – 0-100%



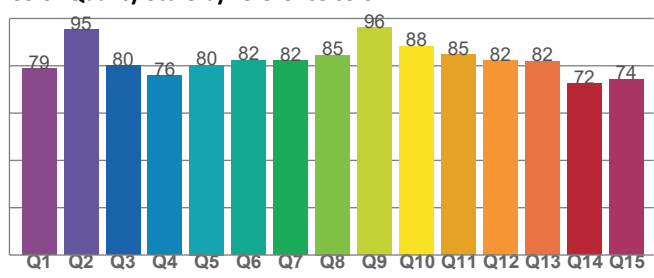
TM30-18 R_f-values per hue bin



TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
79,9	81,3	77,9	89,0	90,8	93,0	87,2	91,9	86,7	78,8	78,5	84,1	88,0	80,3	80,0	77,0

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
78,8	95,2	80,0	75,9	80,3	82,3	82,2	84,6	96,0	88,3	84,6	82,1	81,8	72,3	74,4

Beam Details

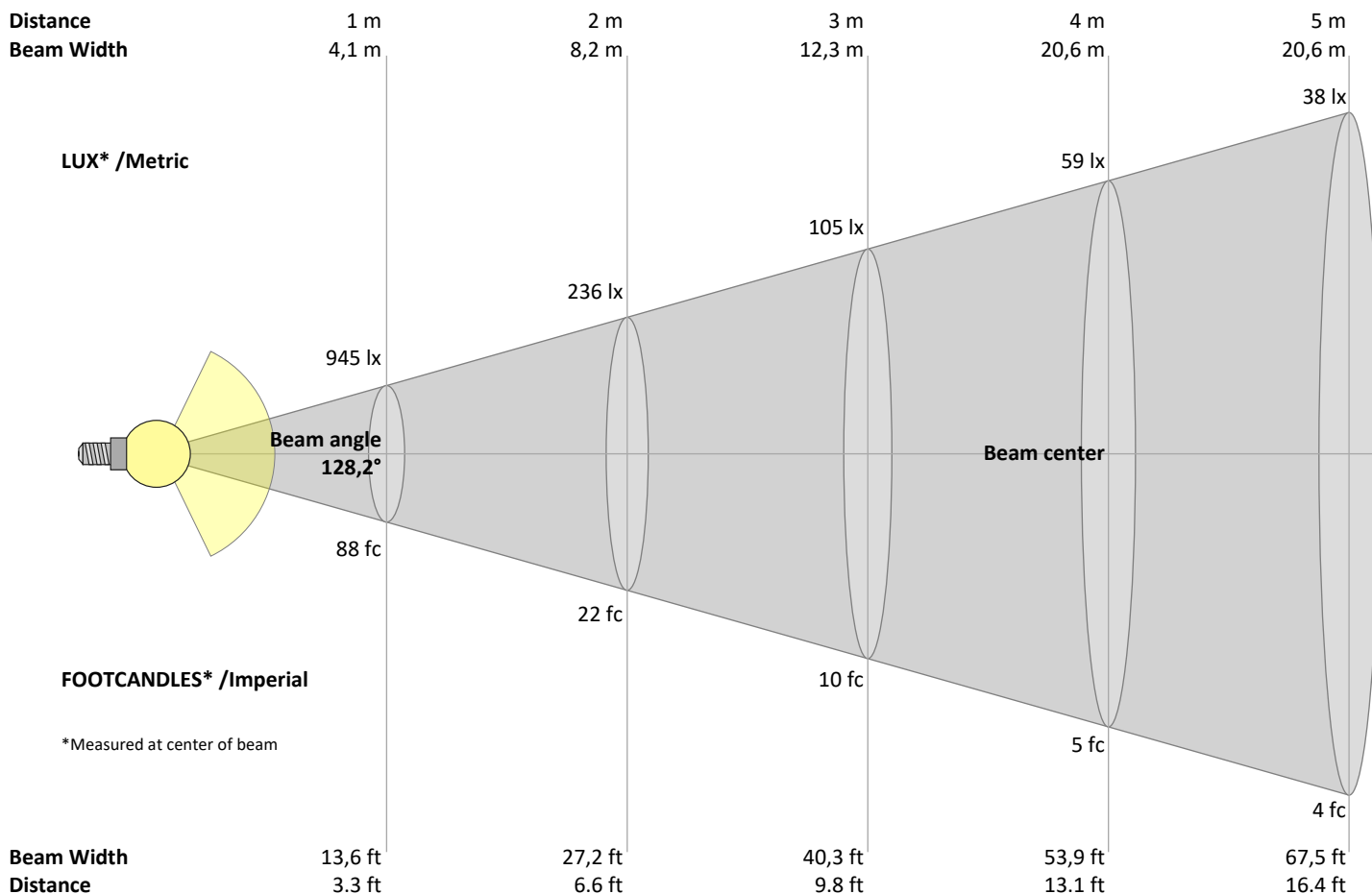
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Beam intensities from 1 – 20 m

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	m
3,3	6,6	9,8	13,1	16,4	19,7	23	26,2	29,5	32,8	36,1	39,4	42,7	45,9	49,2	52,5	55,8	59,1	62,3	65,6	ft
945	236	105	59	38	26	19	15	12	9	8	7	6	5	4	4	3	3	3	2	lux
87,8	22	9,8	5,5	3,5	2,4	1,8	1,4	1,1	0,9	0,7	0,6	0,5	0,4	0,4	0,3	0,3	0,3	0,2	0,2	fc

Intensities in 0° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
945	938	911	861	789	699	593	472	340	212	115	86	80	74	67	42	21	21	18	14	cd
100%	99%	96%	91%	83%	74%	63%	50%	36%	22%	12%	9%	9%	8%	7%	4%	2%	2%	2%	1%	of 0°val

Intensities in 90° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
945	937	910	859	788	699	594	474	342	214	121	94	76	69	62	40	21	20	17	13	cd
100%	99%	96%	91%	83%	74%	63%	50%	36%	23%	13%	10%	8%	7%	7%	4%	2%	2%	2%	1%	of 0°val

Intensities in 180° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
945	938	911	861	789	699	593	472	340	212	115	86	80	74	67	42	21	21	18	14	cd
100%	99%	96%	91%	83%	74%	63%	50%	36%	22%	12%	9%	9%	8%	7%	4%	2%	2%	2%	1%	of 0°val

Intensities in 270° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
945	937	910	859	788	699	594	474	342	214	121	94	76	69	62	40	21	20	17	13	cd
100%	99%	96%	91%	83%	74%	63%	50%	36%	23%	13%	10%	8%	7%	7%	4%	2%	2%	2%	1%	of 0°val

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Light Planning – UGR table

Corrected, comprehensive UGR table according to 117-1995

Reflectances												
ρ Ceiling			70	70	50	50	30	70	70	50	50	30
ρ Walls			50	30	50	30	30	50	30	50	30	30
ρ Floor			20	20	20	20	20	20	20	20	20	20
Room size												
H = mounting height above eye level												
X		Y	Viewed Crosswise					Viewed Endwise				
			(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
2H	2H	2H	27,4	28,6	27,8	29,1	29,5	27,9	29,1	28,3	29,6	30,1
		3H	29,1	30,3	29,6	30,8	31,2	29,8	31,0	30,4	31,5	31,9
		4H	29,9	31,0	30,4	31,5	32,0	30,8	31,9	31,3	32,4	32,9
		6H	30,6	31,6	31,1	32,1	32,6	31,7	32,7	32,2	33,2	33,8
		8H	30,9	31,9	31,4	32,3	32,9	32,2	33,2	32,7	33,6	34,2
		12H	31,1	32,1	31,6	32,6	33,2	32,6	33,6	33,1	34,1	34,7
4H	4H	2H	28,2	29,3	28,7	29,8	30,3	28,6	29,7	29,1	30,2	30,7
		3H	30,2	31,2	30,7	31,7	32,3	30,8	31,8	31,3	32,3	32,9
		4H	31,0	32,0	31,6	32,5	33,2	31,8	32,8	32,4	33,3	34,0
		6H	31,8	32,7	32,5	33,2	33,8	32,8	33,7	33,5	34,2	34,8
		8H	32,2	32,9	32,8	33,5	34,1	33,4	34,1	34,0	34,7	35,3
		12H	32,5	33,1	33,1	33,7	34,4	33,9	34,5	34,5	35,2	35,8
8H	8H	4H	31,5	32,3	32,1	32,8	33,4	32,2	32,9	32,8	33,5	34,1
		6H	32,5	33,1	33,2	33,8	34,5	33,4	34,0	34,1	34,7	35,4
		8H	33,0	33,6	33,7	34,2	35,0	34,1	34,6	34,7	35,3	36,1
		12H	33,5	33,9	34,2	34,6	35,4	34,8	35,2	35,5	35,9	36,7
12H	12H	4H	31,6	32,2	32,2	32,8	33,5	32,2	32,8	32,8	33,4	34,1
		6H	32,7	33,2	33,4	33,9	34,7	33,5	34,1	34,2	34,8	35,6
		8H	33,3	33,7	34,0	34,4	35,2	34,3	34,7	35,0	35,4	36,2
Variations with the observer position for the luminaire spacings, S:												
S = 1.0H			0,1 / -0,1					0,1 / 0,0				
S = 1.5H			0,1 / -0,1					0,1 / -0,1				
S = 2.0H			0,2 / -0,3					0,2 / -0,2				

Coefficients of Utilization

Ceiling reflectance	80			70			50			30			10			0		
Wall reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Floor reflectance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0
RCR (RCR: Room Cavity Ratio)																		
Room Values are expressed as percentage of Lumen delivered to the task surface																		
0	116	116	116	116	113	113	113	113	105	105	105	98	98	98	92	92	92	89
1	104	99	94	89	100	95	91	87	89	85	82	83	80	78	78	76	73	70
2	94	85	77	71	90	82	75	69	77	71	66	72	67	63	67	63	60	57
3	85	74	65	58	82	71	63	57	67	60	54	62	57	52	59	54	50	47
4	78	65	56	48	74	63	54	48	59	51	46	55	49	44	52	47	42	40
5	71	58	48	41	68	56	47	41	52	45	39	49	43	38	46	41	36	34
6	65	52	42	36	63	50	41	35	47	40	34	44	38	33	42	36	32	29
7	61	47	38	31	58	45	37	31	43	35	30	40	34	29	38	32	28	26
8	56	42	34	28	54	41	33	27	39	32	26	37	30	26	35	29	25	23
9	52	39	30	25	50	38	30	24	36	29	24	34	28	23	32	26	22	20
10	49	36	28	22	47	35	27	22	33	26	21	31	25	21	30	24	20	18

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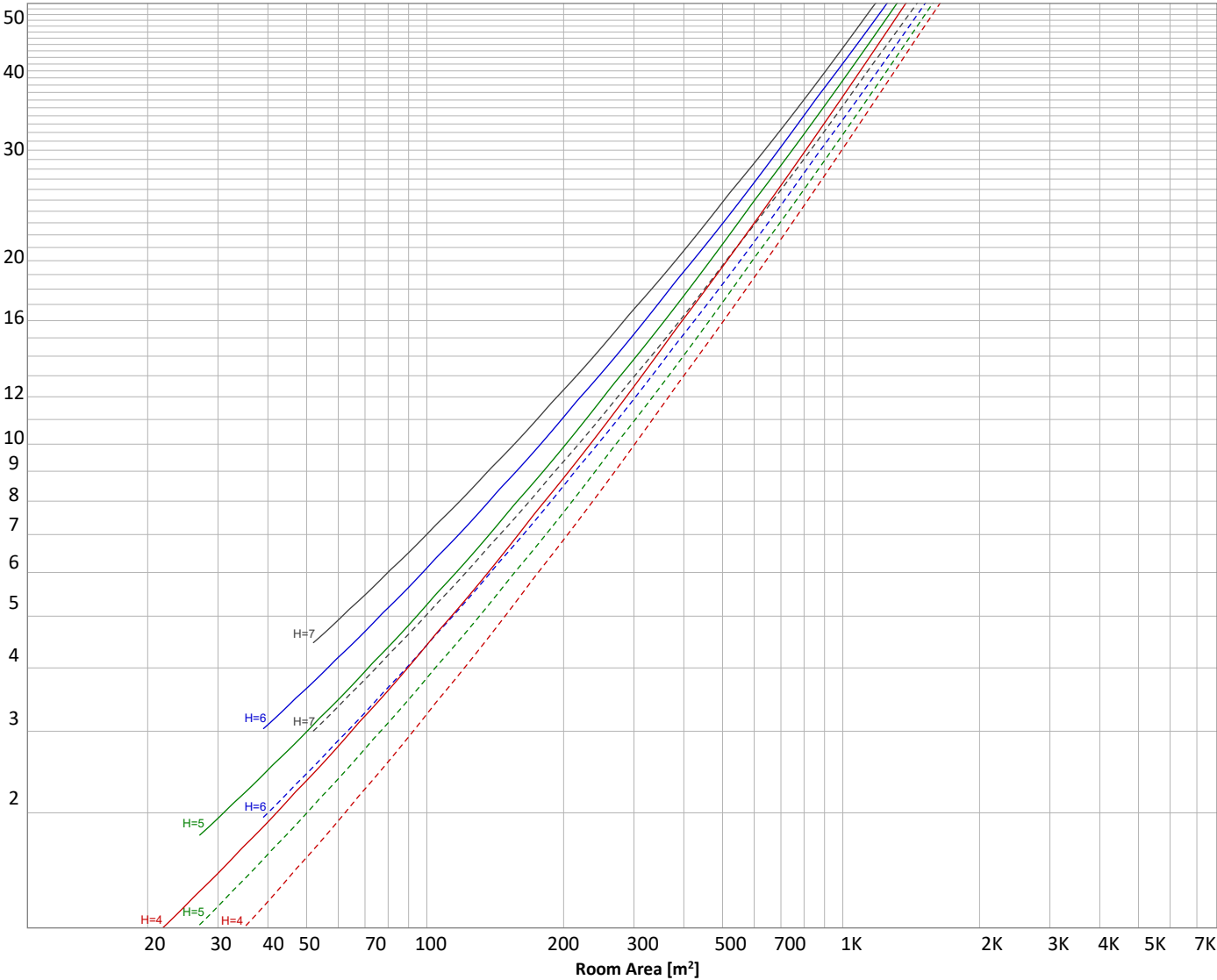
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 3728 lm	p(%)		
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	Wall reflectance
H _{work} = Work area height from floor =	0.00 m	-----	70	50
E _{work} = Average lux on work area =	100 lx	-----	50	30
				Floor reflectance
				20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
89,9 lm	261 lm	405 lm	505 lm	548 lm	531 lm	455 lm	332 lm	197 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
109 lm	93,6 lm	77,6 lm	57,6 lm	31,5 lm	16,7 lm	10,6 lm	5,01 lm	1,10 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	90 lm	2,4%
10-20°	261 lm	7,0%
20-30°	405 lm	10,9%
30-40°	505 lm	13,5%
40-50°	548 lm	14,7%
50-60°	531 lm	14,2%
60-70°	455 lm	12,2%
70-80°	332 lm	8,9%
80-90°	197 lm	5,3%
90-100°	109 lm	2,9%
100-110°	94 lm	2,5%
110-120°	78 lm	2,1%
120-130°	58 lm	1,5%
130-140°	31 lm	0,8%
140-150°	17 lm	0,4%
150-160°	11 lm	0,3%
160-170°	5 lm	0,1%
170-180°	1 lm	0,0%
Total	3728 lm	100,0%

Intensity peaks

Max intensity	946 cd
Intensity, 90°	115 cd
Intensity, 0°	945 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	757 lm	20,3%
0-40°	1261 lm	33,8%
0-60°	2341 lm	62,8%
60-90°	984 lm	26,4%
70-100°	638 lm	17,1%
90-120°	280 lm	7,5%
0-90°	3325 lm	89,2%
90-180°	403 lm	10,8%
0-180°	3728 lm	100,0%

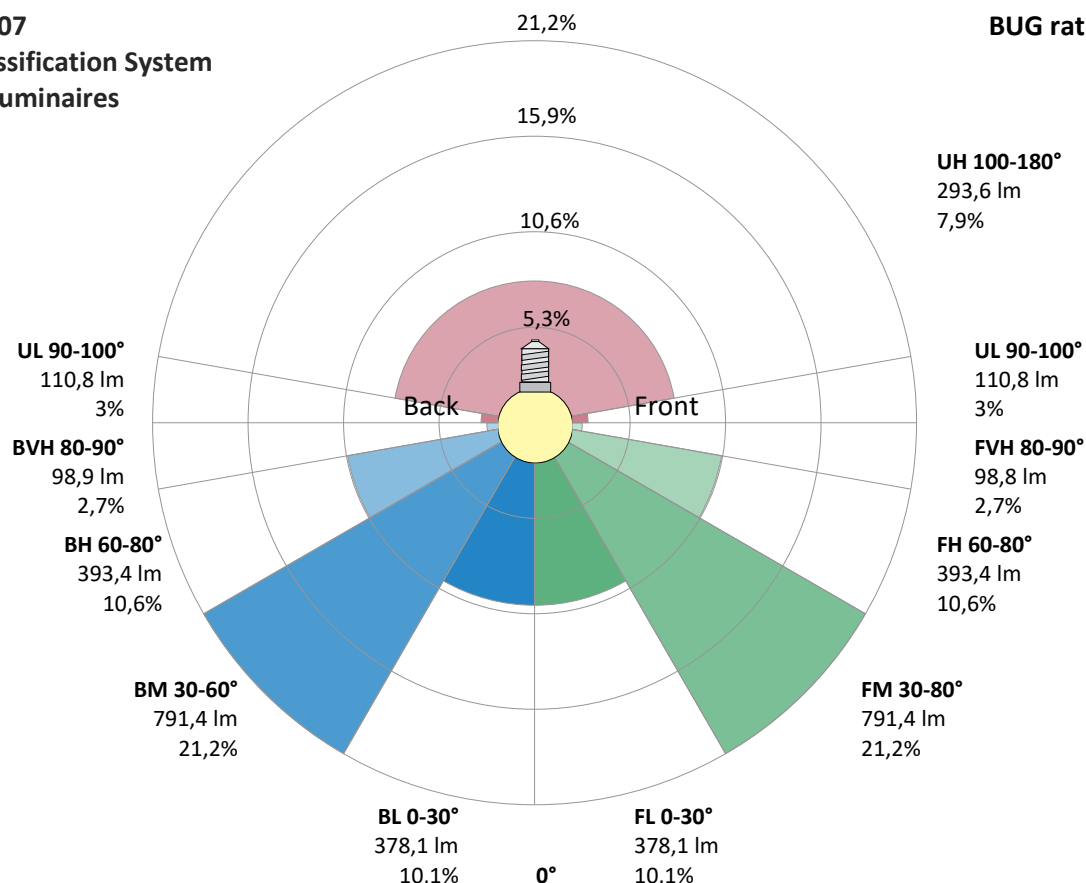
BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	378 lm	10,1%
Medium(30-60°)	791 lm	21,2%
High(60-80°)	393 lm	10,6%
Very high(80-90°)	99 lm	2,7%
Back light		
Low(0-30°)	378 lm	10,1%
Medium(30-60°)	791 lm	21,2%
High(60-80°)	393 lm	10,6%
Very high(80-90°)	99 lm	2,7%
Uplight		
Low(90-100°)	111 lm	3,0%
High(100-180°)	294 lm	7,9%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B1 U3 G1



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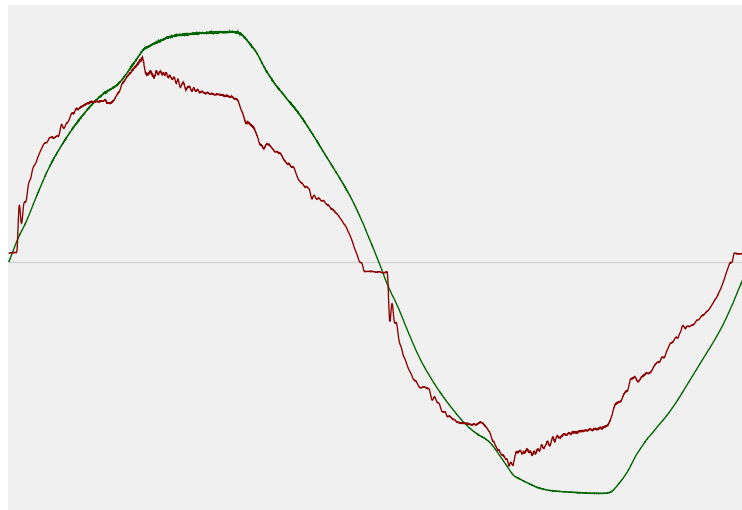


Power Details

Input Power

Power feed to light source	42,3 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	239 V
RMS Input current feed, I_{RMS}	0,182 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	43,41 VA
Displacement factor of AC power feed	0,98
Power factor of AC current feed	0,98
Total harmonic distortion of the current	9,96%
Total harmonic distortion of the voltage	4,4%

Input Power Curve



Efficiency

Radiated power efficiency 27,0%



Lumen efficiency 88 lm/W



Stabilization Details

Warmup Conditions

Stable period	15 min
Stable change max	2,0%
Minimum time	15 min

Color Temperature Change

CCT start	2999 K
CCT shift	+1 K
CCT end	3000 K

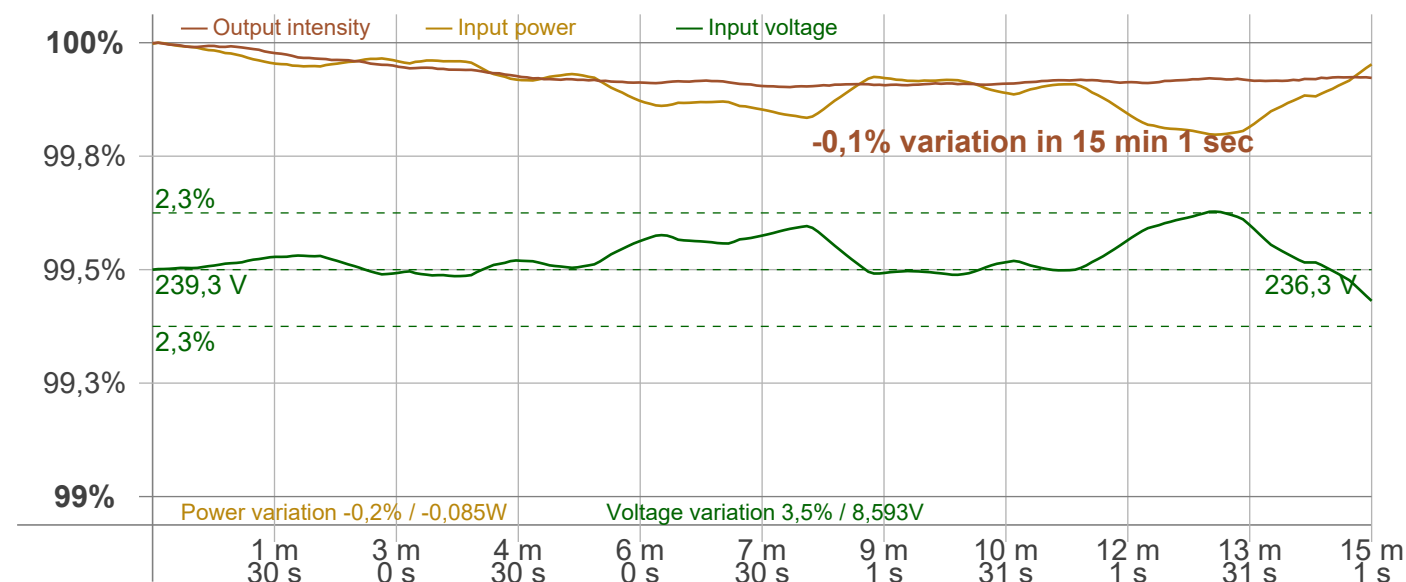
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	-0,1%

Output Change

Output start	3731 lm
Output change	-3 lm
Output end	3728 lm

Stabilization Curve



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Flicker /TLA details

Flicker Meter Type Viso Systems LabFlicker
Frequency of input power 50 Hz
Flicker/TLA sample rate 20000 samples/s

Measurement time
PstLM 180 sec
All other indices 1,2 sec

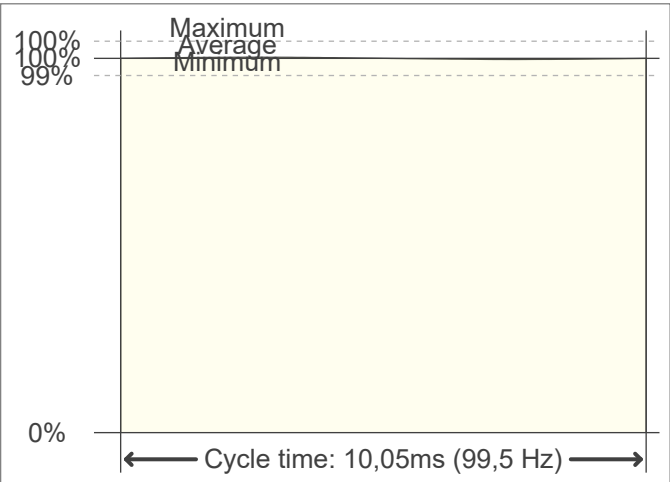
Flicker indices according to Illuminating Engineering Society (IES)
Flicker frequency 99,5 Hz
Percent Flicker 0,33 %
Flicker index 0

Flicker indices according to California Energy Commission (CEC) 2016b
JA8/10 40 Hz 0,02 %
JA8/10 90 Hz 0,03 %
JA8/10 200 Hz 0,32 %
JA8/10 400 Hz 0,33 %
JA8/10 1000 Hz 0,33 %

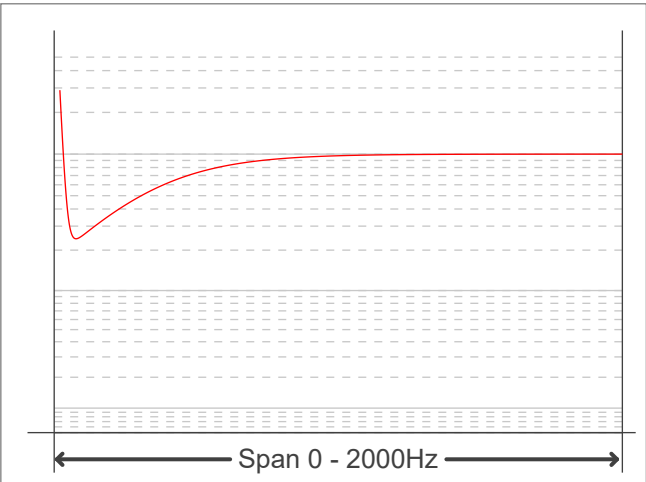
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)
PstLM value (F < 80 Hz) 0,02
SVM value (80 < F < 2000 Hz) 0,01

Flicker indices according to Lighting Research Center (2015)
Perception metric, Assist Mp 0,01

Flicker frame (frame of one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

