

Light Measurement Report

Print date: 8-5-2025

Measurement date and time: 8-5-2025 12:23:22 – Measurement no. VFR-250508-1154-MS

Measurement tracking No. and Link: [VT250508-002801](#)

Operator:



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 – 11-1-2024 – 3130191315

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

16 planes – 22,5°

5°

2,00 m

21,3 W – PF 0,88 – DPF 1,0

230 V – 0,105 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)

270565-5000K

270565-5000K – Dutchfulfillment

3-FASE RAILSPOT | ROSALIN | 20W | WIT | DIMBAAR | CCT SWITCH

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

1702 lm – 0,04% / 99,96%

80 lm/W

2918 cd – 39,9°

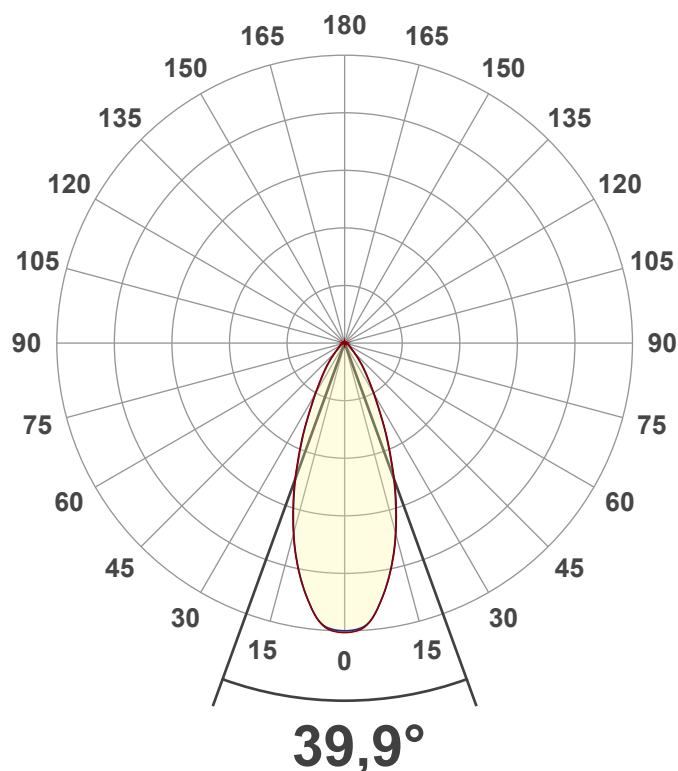
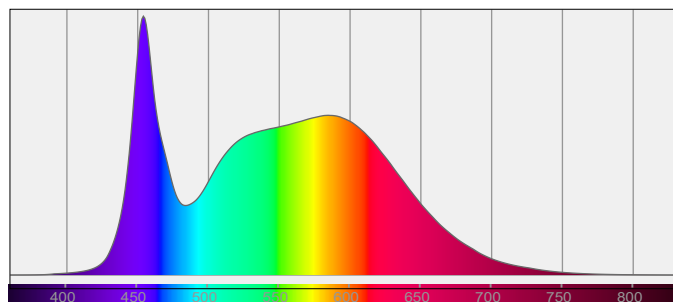
CCT = 5000 K / 5053 K

CRI 82,9

R_f 83,3 – R_g 93,8

Duv 0,0046 – SDCM 4,5

SVM 0,06 – PstLM 0,01



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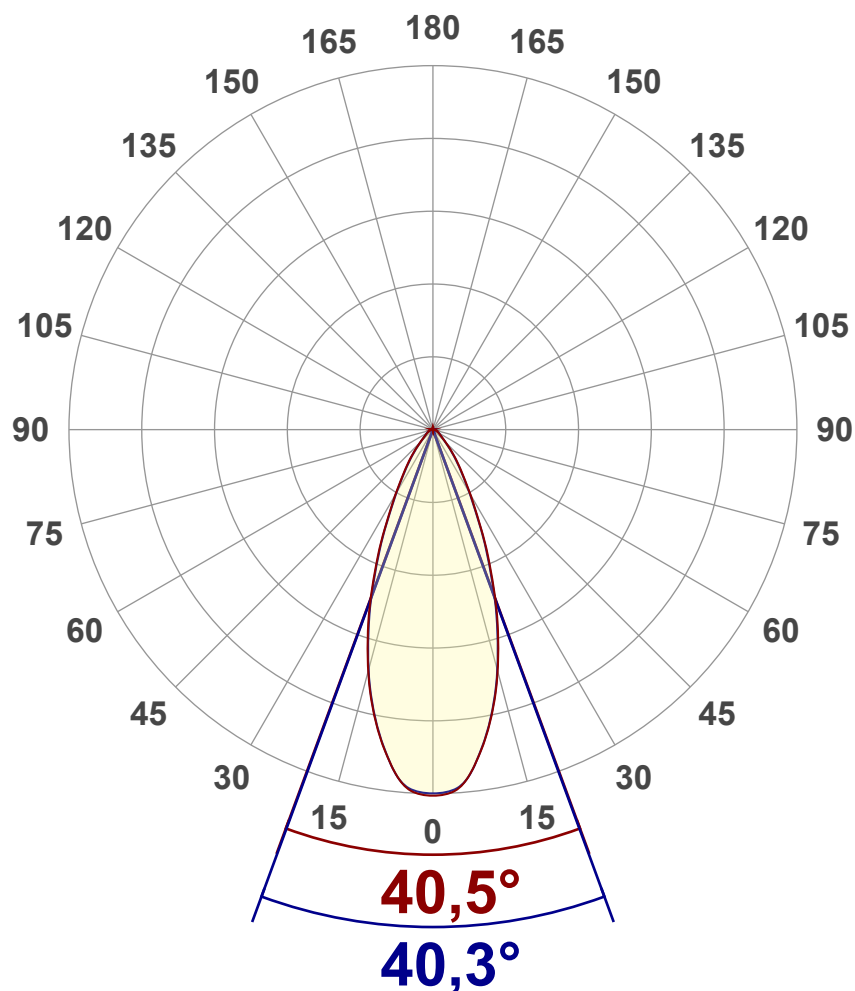
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	1702 lm
Lumen Up% / Down%	0,04% / 99,96%
Peak Intensity	2918 cd
Beam Angle (50%)	39,9°
Beam Angle (90%)	40,3°
Beam Angle (10%)	40,5°

Cut-off Angle

Average 2,5%	107,6°
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Field Angle

Average 10%	75,9°
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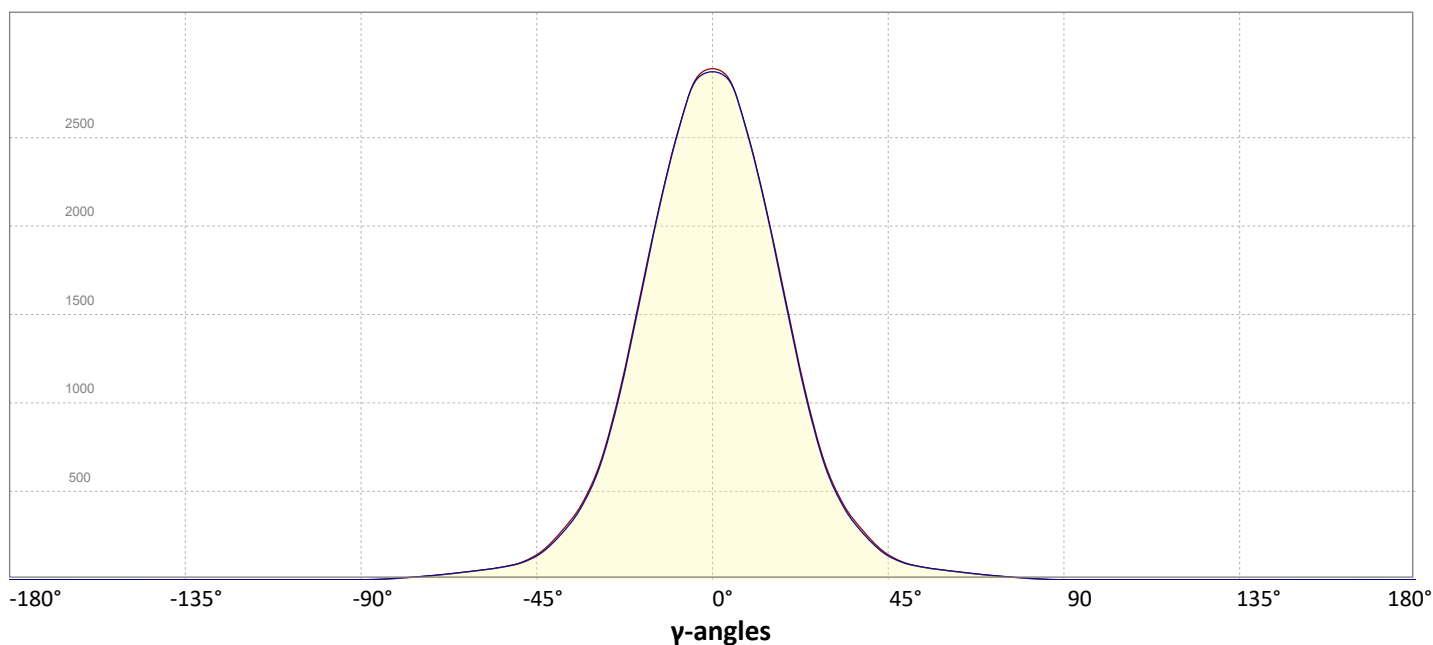
Intensity Ratio

In 120° cone	96,3%
In 90° cone	90,1%

C000-C180

C090-C270

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

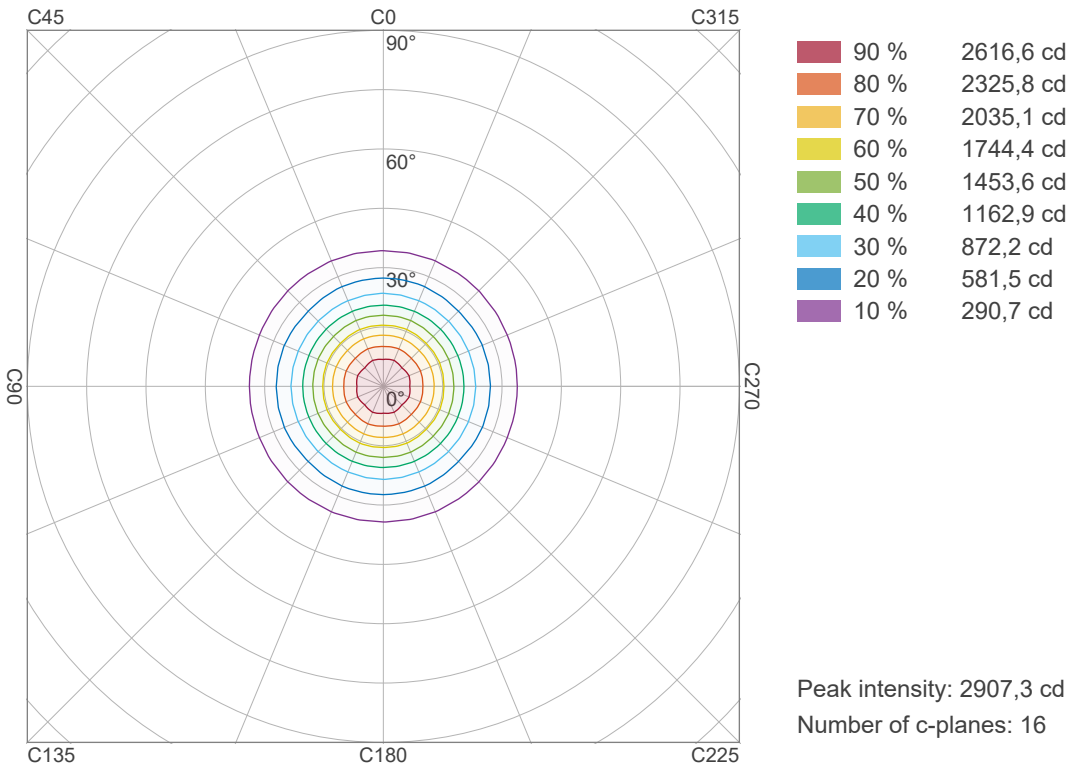


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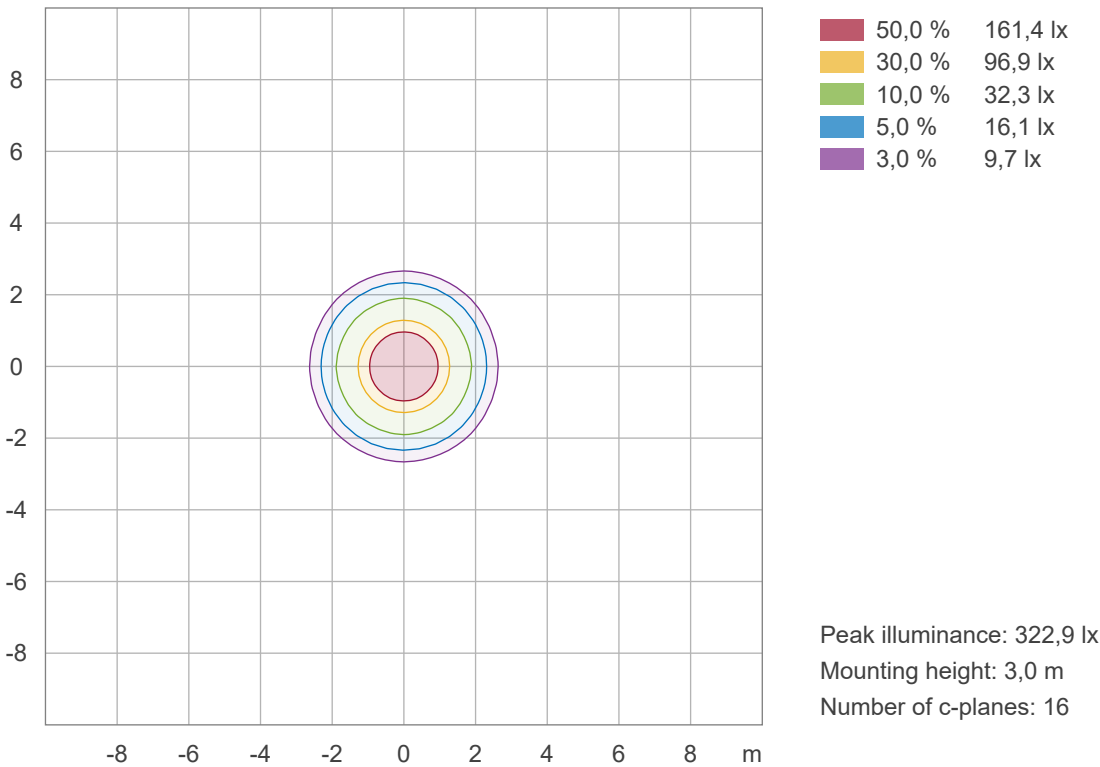
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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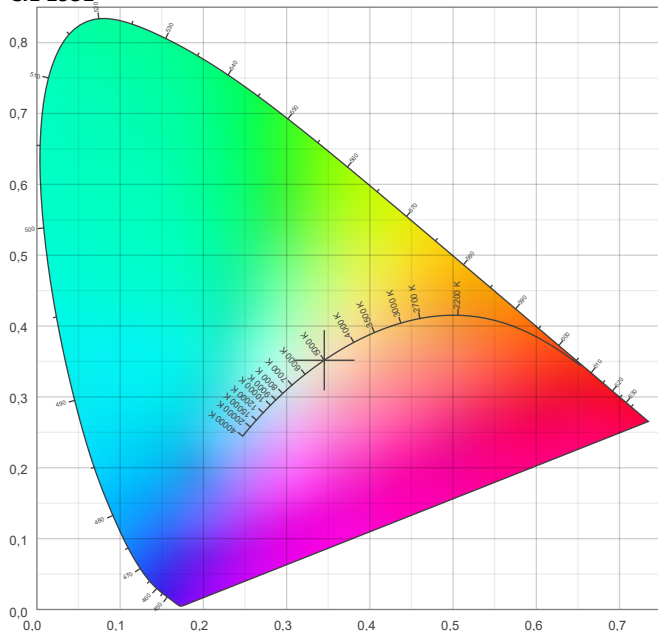


Color details

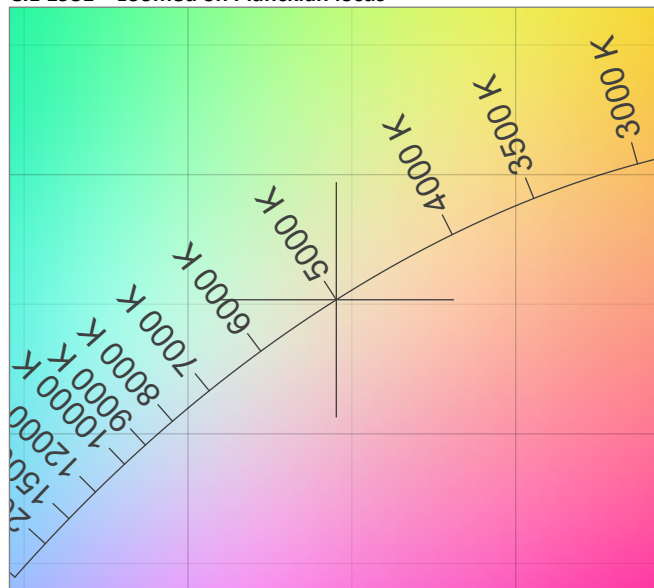
Correlated Color Temperature, Target CCT = 5000 K
Correlated Color Temperature, Measured CCT = 5053 K
Color Rendering Index CRI 82,9
Color Rendering Index, R9 (red component) R9 = 3,6
Color Rendering TM30-18 R_f 83,3 – R_g 93,8
Color Quality Scale CQS = 80,9

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0,345;0,352)
Color coordinate CIEs 1960 (u;v) = (0,211;0,323)
Color deviation from BBL Duv = 0,0046
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,211;0,485)

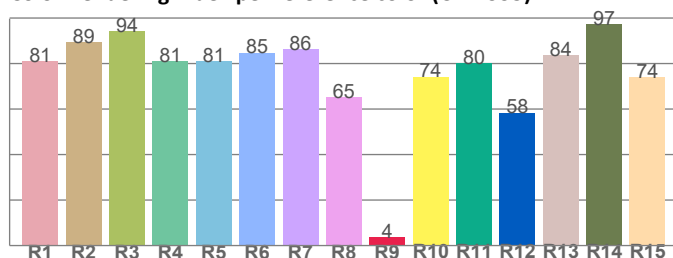
CIE 1931



CIE 1931 – zoomed on Planckian locus



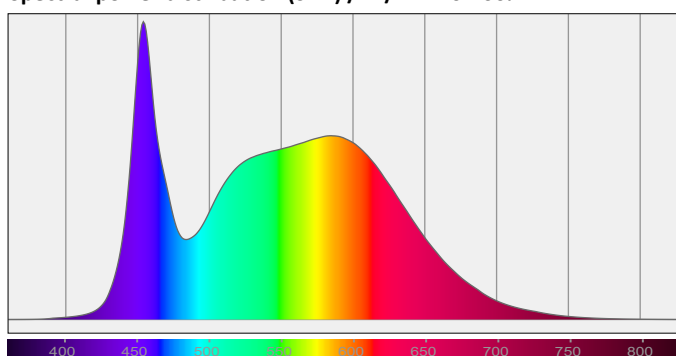
Color Rendering Index per reference color (CIE 1995)



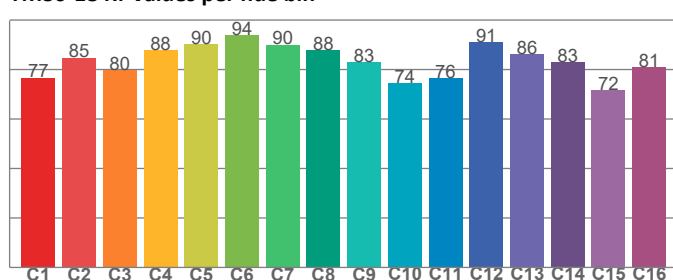
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
80,9	89,5	94,3	81,1	80,9	84,7	86,4	65,2	3,6	74,3	80,1	58,3	83,6	97,2	74,1

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



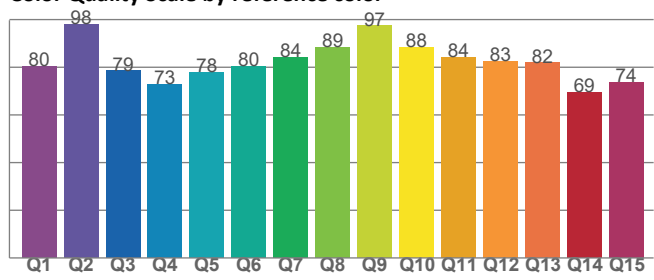
TM30-18 R_f -values per hue bin



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
76,6	84,7	79,6	87,7	90,1	93,9	90,0	87,8	83,0	74,3	76,4	91,1	86,2	83,0	71,7	81,0

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
80,3	98,0	78,6	72,9	77,9	80,4	84,3	88,5	97,3	88,3	84,1	82,6	82,0	69,5	73,8

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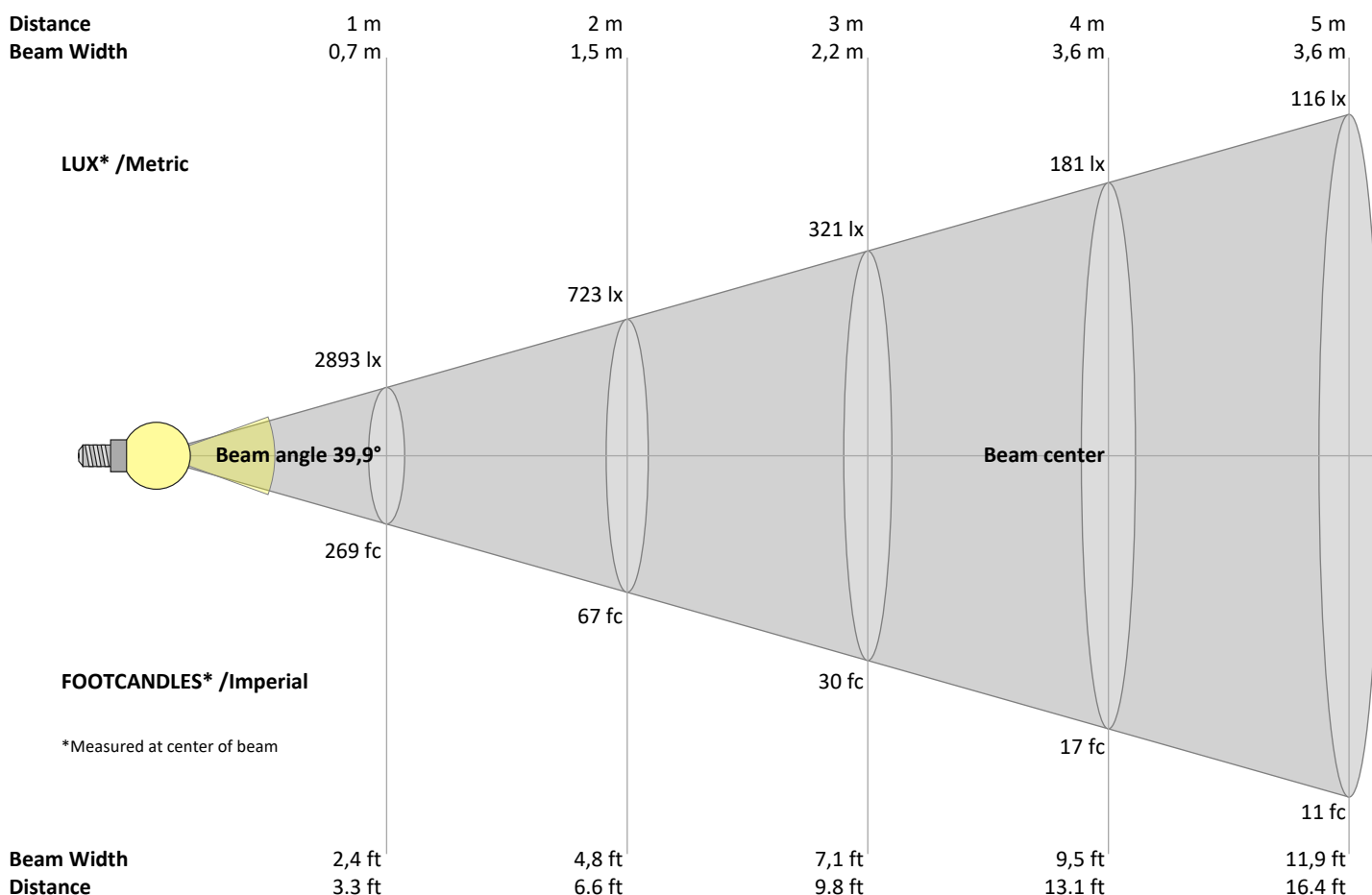
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Beam Details



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
2893	723	321	181	116	80	59	45	36	29	24	20	17	15	13	11	10	9	8	7	lux
268,8	67,2	29,9	16,8	10,8	7,5	5,5	4,2	3,3	2,7	2,2	1,9	1,6	1,4	1,2	1,1	0,9	0,8	0,7	0,7	fc

Intensities in 0° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2893	2853	2825	2708	2590	2430	2255	2072	1865	1658	1452	1245	1049	884	719	602	502	412	353	293	cd
100%	99%	98%	94%	90%	84%	78%	72%	64%	57%	50%	43%	36%	31%	25%	21%	17%	14%	12%	10%	of 0°val

Intensities in 90° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2893	2835	2825	2703	2581	2425	2246	2064	1852	1641	1434	1229	1028	868	708	585	489	396	338	280	cd
100%	98%	98%	93%	89%	84%	78%	71%	64%	57%	50%	42%	36%	30%	24%	20%	17%	14%	12%	10%	of 0°val

Intensities in 180° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2893	2853	2825	2708	2590	2430	2255	2072	1865	1658	1452	1245	1049	884	719	602	502	412	353	293	cd
100%	99%	98%	94%	90%	84%	78%	72%	64%	57%	50%	43%	36%	31%	25%	21%	17%	14%	12%	10%	of 0°val

Intensities in 270° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2893	2835	2825	2703	2581	2425	2246	2064	1852	1641	1434	1229	1028	868	708	585	489	396	338	280	cd
100%	98%	98%	93%	89%	84%	78%	71%	64%	57%	50%	42%	36%	30%	24%	20%	17%	14%	12%	10%	of 0°val

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Light Planning – UGR table

Uncorrected, 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		Viewed Crosswise					Viewed Endwise				
H = mounting height above eye level		(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
X	Y										
2H	2H	23,4	24,1	23,5	24,3	24,5	23,2	23,9	23,4	24,1	24,3
	3H	23,7	24,5	24,1	24,7	24,9	23,6	24,4	23,9	24,6	24,7
	4H	23,8	24,6	24,2	24,8	25,1	23,7	24,5	24,1	24,7	25,0
	6H	24,0	24,6	24,3	24,9	25,3	23,9	24,5	24,2	24,8	25,2
	8H	24,0	24,6	24,3	24,9	25,3	23,9	24,5	24,2	24,8	25,2
	12H	23,9	24,5	24,3	24,9	25,3	23,8	24,4	24,2	24,8	25,2
4H	2H	23,4	24,2	23,8	24,4	24,6	23,2	24,0	23,6	24,2	24,5
	3H	24,0	24,6	24,4	25,0	25,4	23,9	24,5	24,3	24,9	25,3
	4H	24,2	24,7	24,6	25,2	25,7	24,1	24,6	24,5	25,1	25,6
	6H	24,3	24,9	24,8	25,2	25,6	24,2	24,8	24,7	25,2	25,5
	8H	24,3	24,9	24,8	25,2	25,6	24,2	24,8	24,8	25,1	25,5
	12H	24,3	24,7	24,8	25,1	25,6	24,2	24,6	24,7	25,1	25,5
8H	4H	24,2	24,8	24,7	25,1	25,5	24,1	24,7	24,6	25,0	25,4
	6H	24,4	24,8	24,9	25,3	25,8	24,4	24,7	24,9	25,2	25,7
	8H	24,5	24,8	25,0	25,3	25,9	24,4	24,7	24,9	25,2	25,9
	12H	24,5	24,7	25,1	25,2	25,9	24,4	24,7	25,0	25,2	25,8
12H	4H	24,2	24,6	24,7	25,0	25,5	24,1	24,5	24,6	24,9	25,4
	6H	24,5	24,7	25,0	25,3	25,9	24,4	24,7	24,9	25,2	25,8
	8H	24,5	24,7	25,1	25,2	25,8	24,4	24,7	25,0	25,2	25,8
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H		1,8 / -1,3					1,8 / -1,3				
S = 1.5H		3,6 / -1,9					3,5 / -1,8				
S = 2.0H		5,2 / -2,5					5,0 / -2,4				

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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	113	110	108	105	111	108	106	104	104	102	100	100	99	97	97	96	95	93
2	107	102	98	95	105	101	97	94	97	94	92	94	92	90	92	90	88	86
3	102	95	90	86	100	94	89	86	91	87	84	89	86	83	87	84	82	80
4	97	89	84	79	95	88	83	79	86	82	78	84	80	77	82	79	76	75
5	92	84	78	74	91	83	77	73	81	76	73	79	75	72	78	74	71	70
6	88	79	73	69	86	78	73	69	77	72	68	75	71	68	74	70	67	66
7	84	75	69	65	83	74	68	64	73	68	64	72	67	64	70	66	63	62
8	80	71	65	61	79	70	65	61	69	64	61	68	64	60	67	63	60	59
9	77	67	62	58	76	67	61	58	66	61	57	65	60	57	64	60	57	56
10	73	64	58	55	72	64	58	55	63	58	54	62	58	54	61	57	54	53

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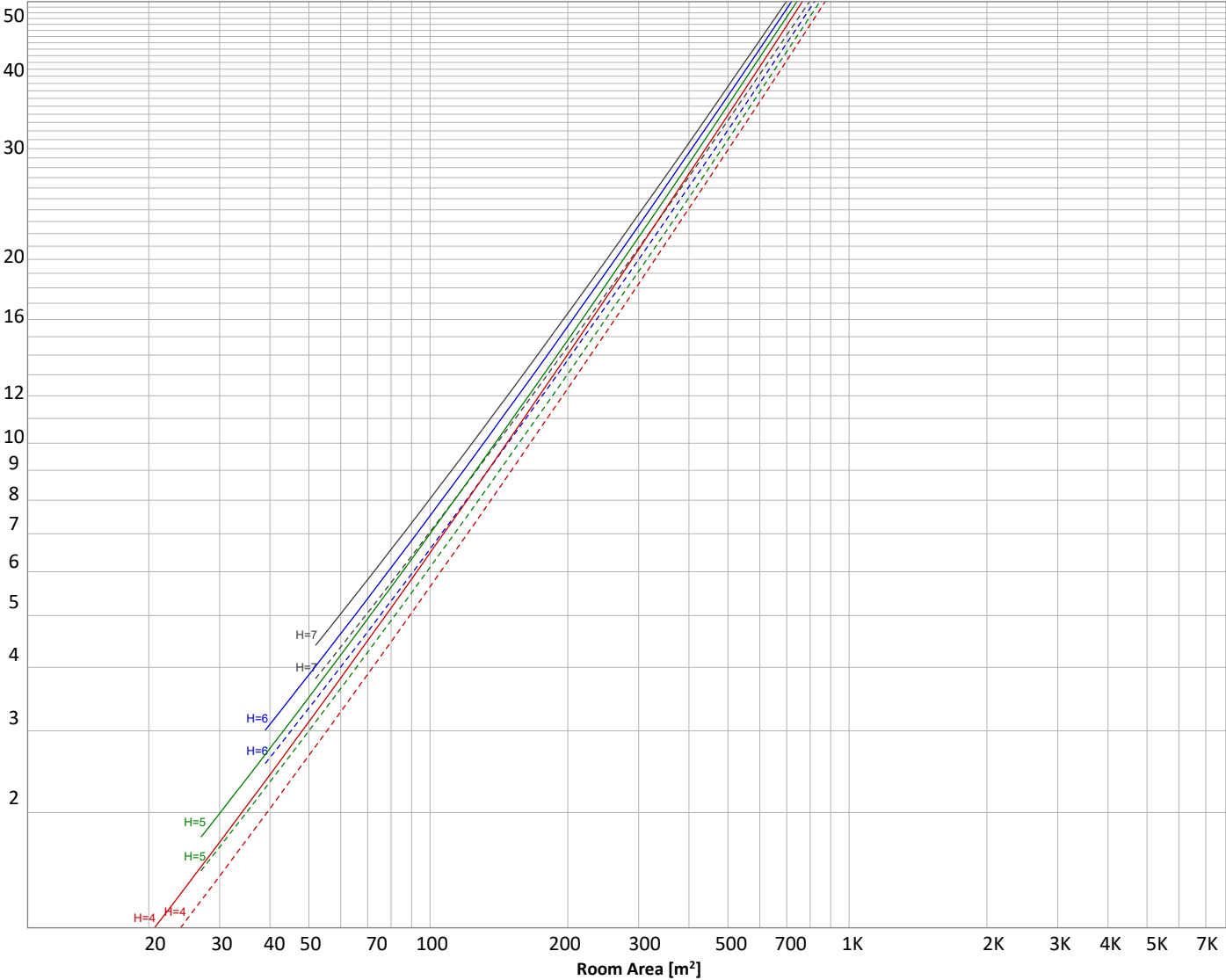
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 1702 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°
256 lm	542 lm	434 lm	236 lm	111 lm	61,3 lm	39,1 lm	18,9 lm	3,66 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,017 lm	0,007 lm	0,007 lm	0,006 lm	0,034 lm	0,095 lm	0,208 lm	0,184 lm	0,060 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	256 lm	15,0%
10-20°	542 lm	31,8%
20-30°	434 lm	25,5%
30-40°	236 lm	13,8%
40-50°	111 lm	6,5%
50-60°	61 lm	3,6%
60-70°	39 lm	2,3%
70-80°	19 lm	1,1%
80-90°	4 lm	0,2%
90-100°	0 lm	0,0%
100-110°	0 lm	0,0%
110-120°	0 lm	0,0%
120-130°	0 lm	0,0%
130-140°	0 lm	0,0%
140-150°	0 lm	0,0%
150-160°	0 lm	0,0%
160-170°	0 lm	0,0%
170-180°	0 lm	0,0%
Total	1702 lm	100,0%

Intensity peaks

Max intensity	2918 cd
Intensity, 90°	0 cd
Intensity, 0°	2893 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	1232 lm	72,4%
0-40°	1467 lm	86,2%
0-60°	1640 lm	96,3%
60-90°	62 lm	3,6%
70-100°	23 lm	1,3%
90-120°	0 lm	0,0%
0-90°	1702 lm	100,0%
90-180°	1 lm	0,0%
0-180°	1702 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	613 lm	36,0%
Medium(30-60°)	207 lm	12,1%
High(60-80°)	29 lm	1,7%
Very high(80-90°)	2 lm	0,1%
Back light		
Low(0-30°)	613 lm	36,0%
Medium(30-60°)	207 lm	12,1%
High(60-80°)	29 lm	1,7%
Very high(80-90°)	2 lm	0,1%

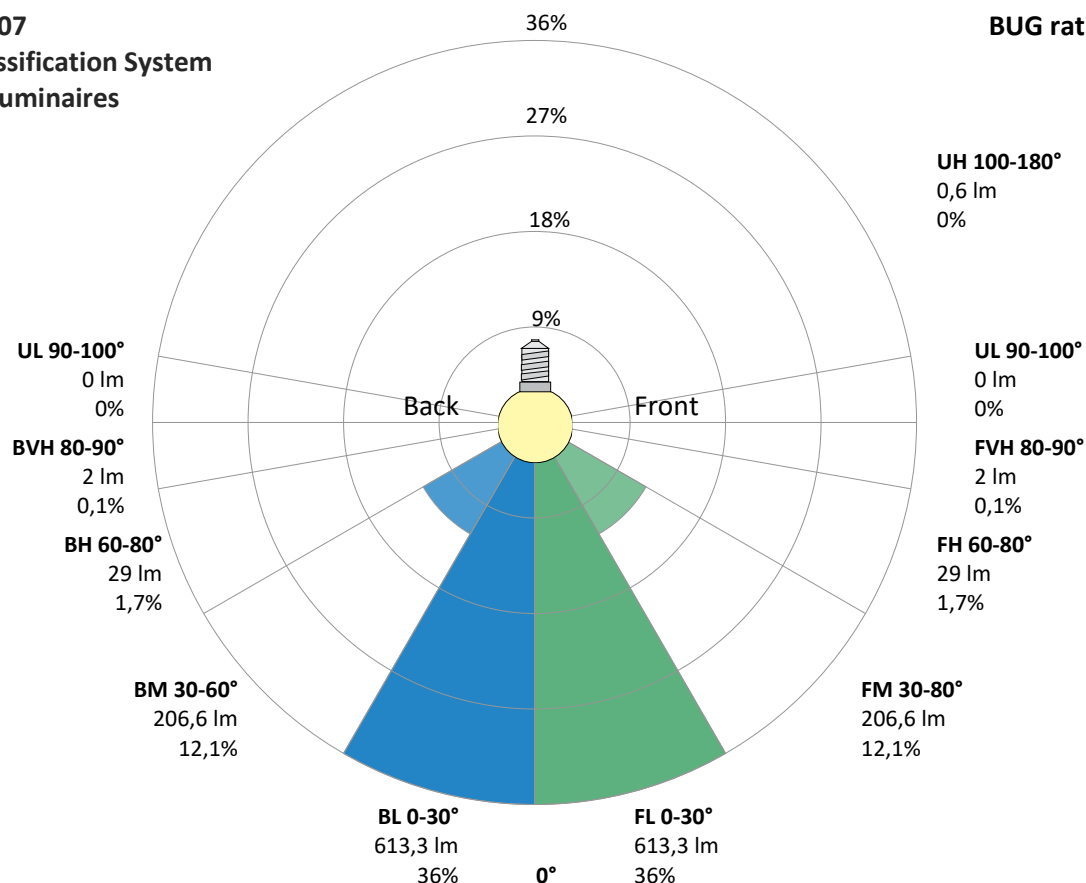
Uplight

Low(90-100°)	0 lm	0,0%
High(100-180°)	1 lm	0,0%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B2 U1 G0



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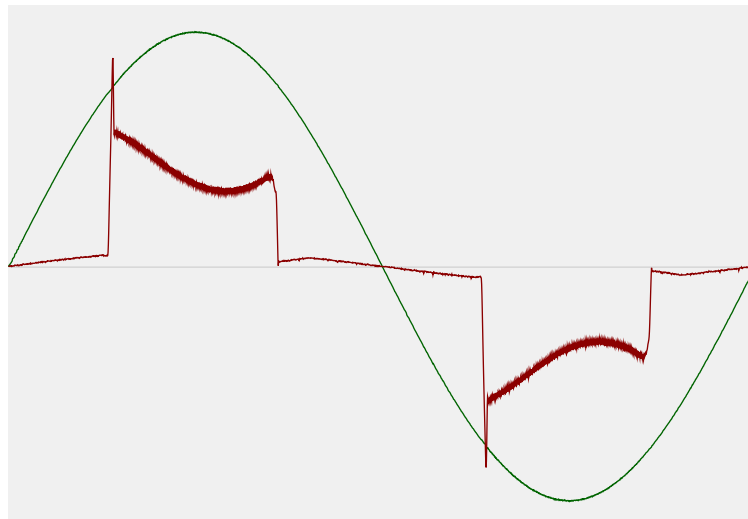


Power Details

Input Power

Power feed to light source	21,3 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,105 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	24,26 VA
Displacement factor of AC power feed	1,0
Power factor of AC current feed	0,88
Total harmonic distortion of the current	52,67%
Total harmonic distortion of the voltage	0,06%

Input Power Curve



Efficiency

Radiated power efficiency 24,5%



Lumen efficiency 80 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	5002 K
CCT shift	-2 K
CCT end	5000 K

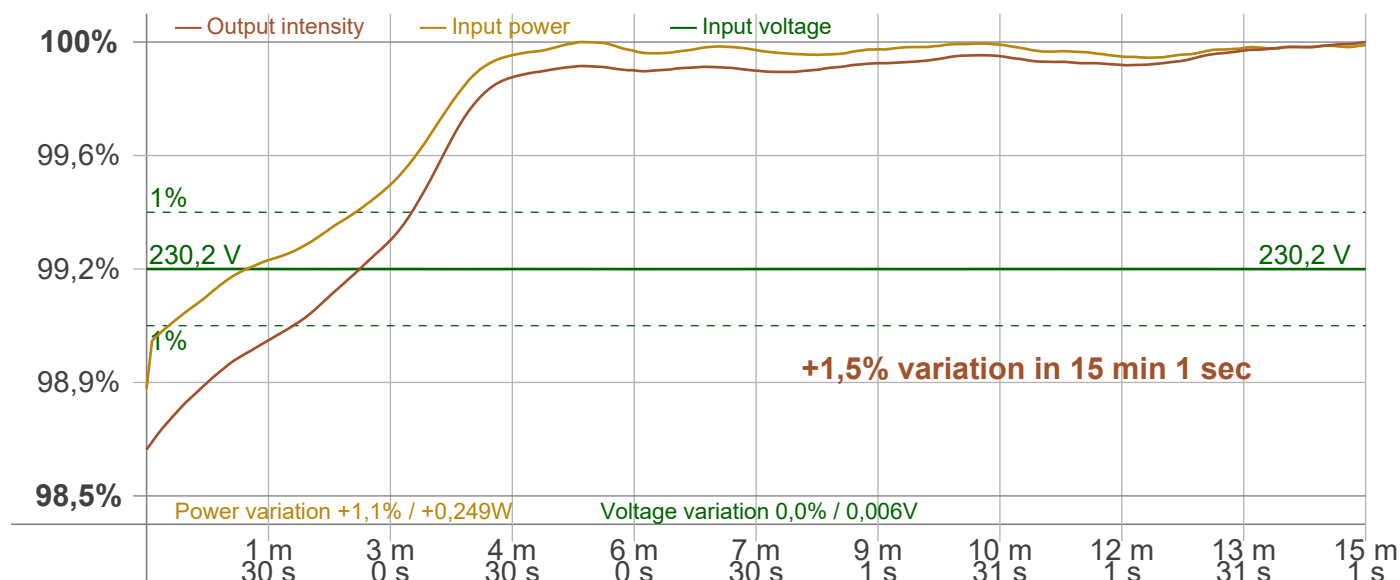
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	+1,5%

Output Change

Output start	1678 lm
Output change	+24 lm
Output end	1702 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 100 Hz
Percent Flicker 2,17 %
Flicker index 0,01

Flicker indices according to California Energy Commission (CEC) 2016b

JA8/10 40 Hz 0,01 %
JA8/10 90 Hz 0,03 %
JA8/10 200 Hz 1,67 %
JA8/10 400 Hz 1,95 %
JA8/10 1000 Hz 2,11 %

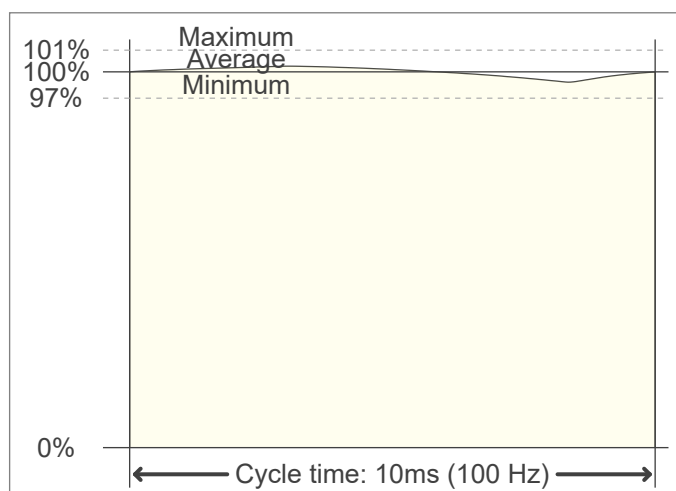
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value ($F < 80$ Hz) 0,01
SVM value ($80 < F < 2000$ Hz) 0,06

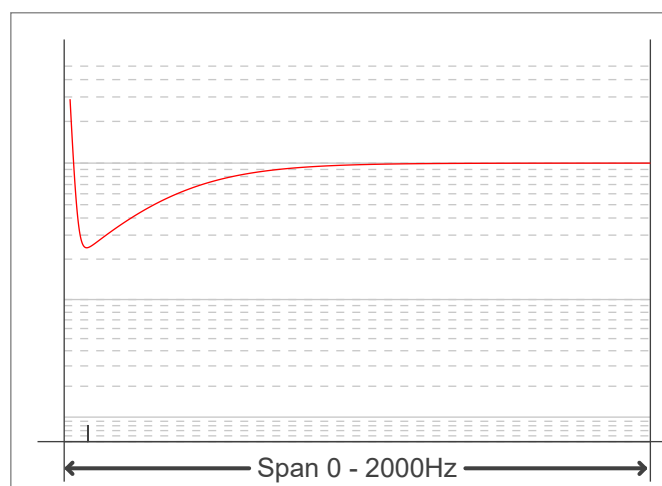
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp 0

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

