

Light Measurement Report

Print date: 8-5-2025

Measurement date and time: 8-5-2025 10:51:03 – Measurement no. VFR-250508-1148-MS

Measurement tracking No. and Link: [VT250508-000685](#)

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 2 sec – 2,0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

270565-3000K

270565-3000K – 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

1509 lm – 0,04% / 99,96%

71 lm/W

2425 cd – 41,2°

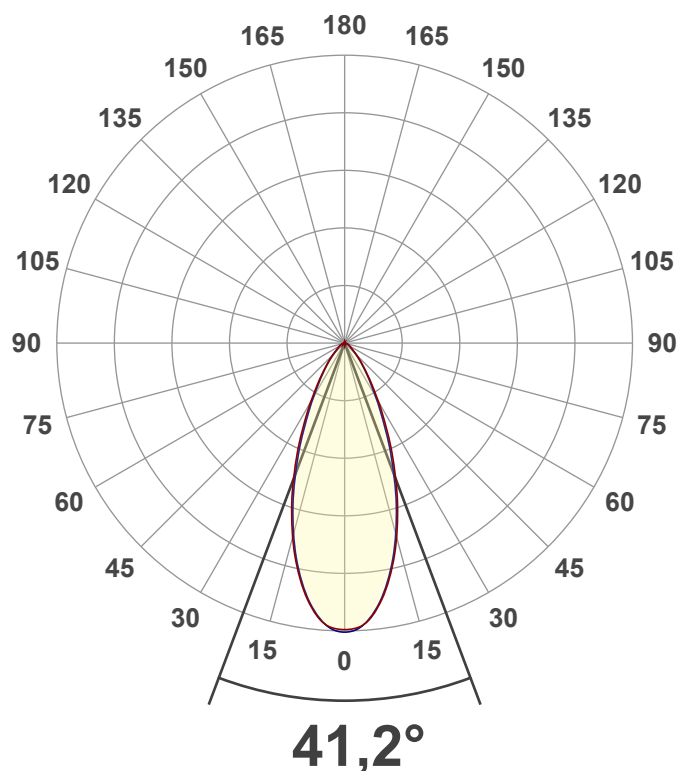
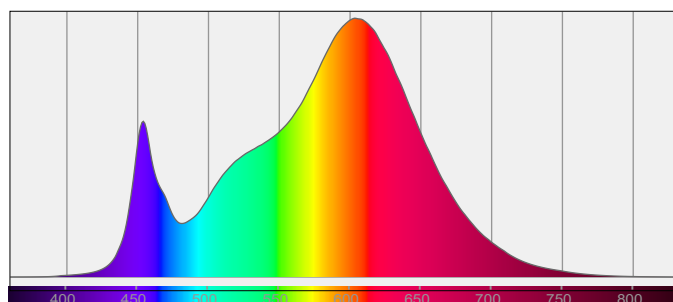
CCT = 3000 K / 2979 K

CRI 84,1

R_f 85,2 – R_g 95,8

Duv -0,0027 – SDCM 2,6

SVM 0,06 – PstLM 0,01



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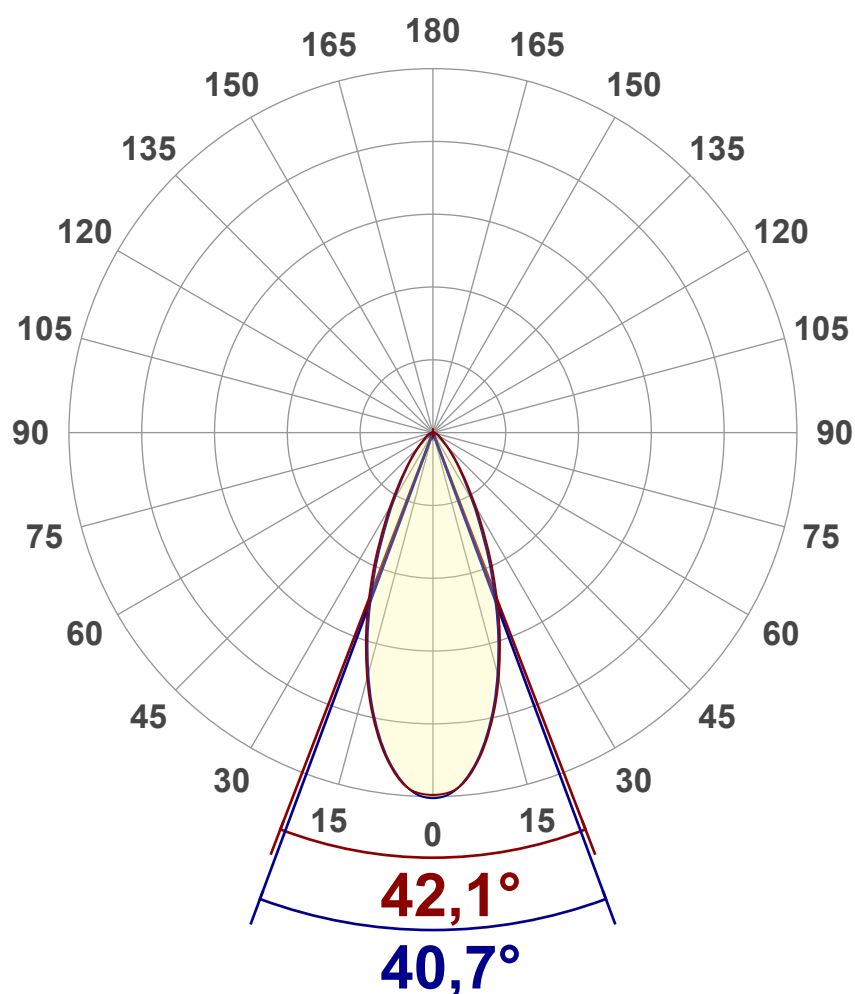
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	1509 lm
Lumen Up% / Down%	0,04% / 99,96%
Peak Intensity	2425 cd
Beam Angle (50%)	41,2°
Beam Angle (90%)	40,7°
Beam Angle (10%)	42,1°

Cut-off Angle

Average 2,5%	111,1°
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Field Angle

Average 10%	78,3°
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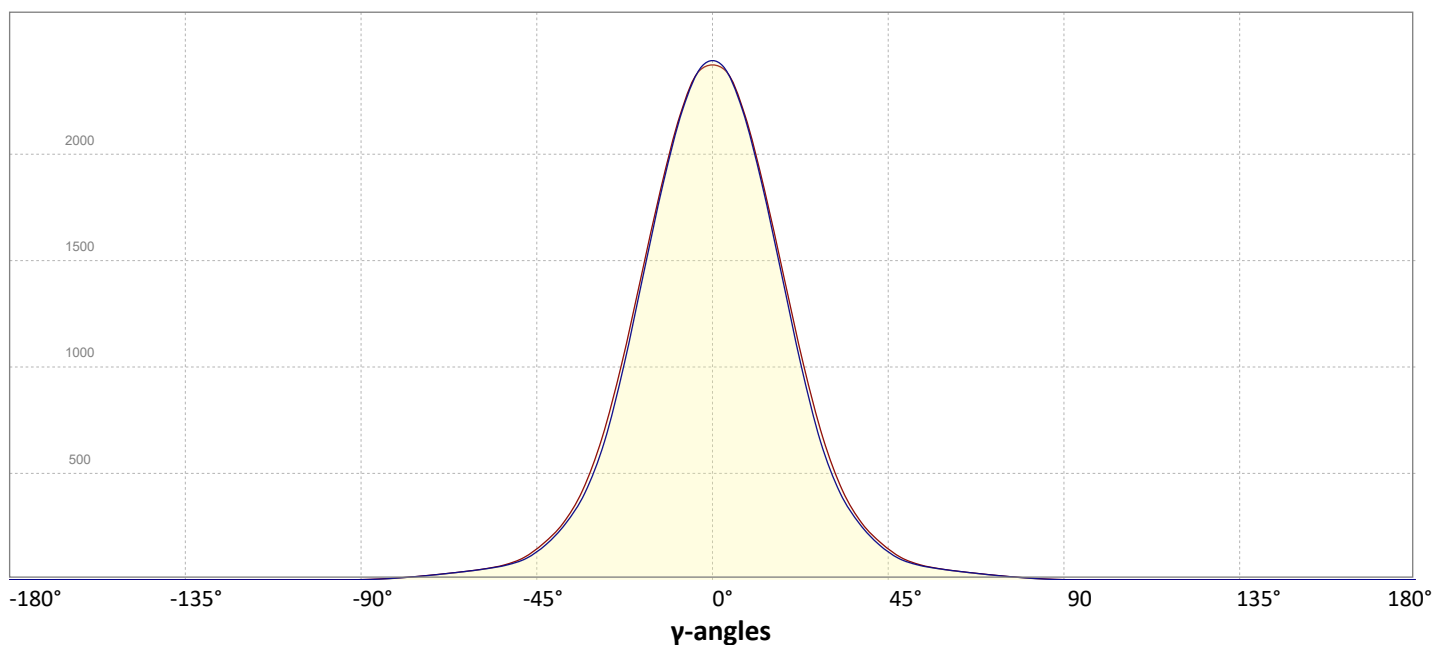
Intensity Ratio

In 120° cone	96,2%
In 90° cone	89,6%

C000-C180

C090-C270

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

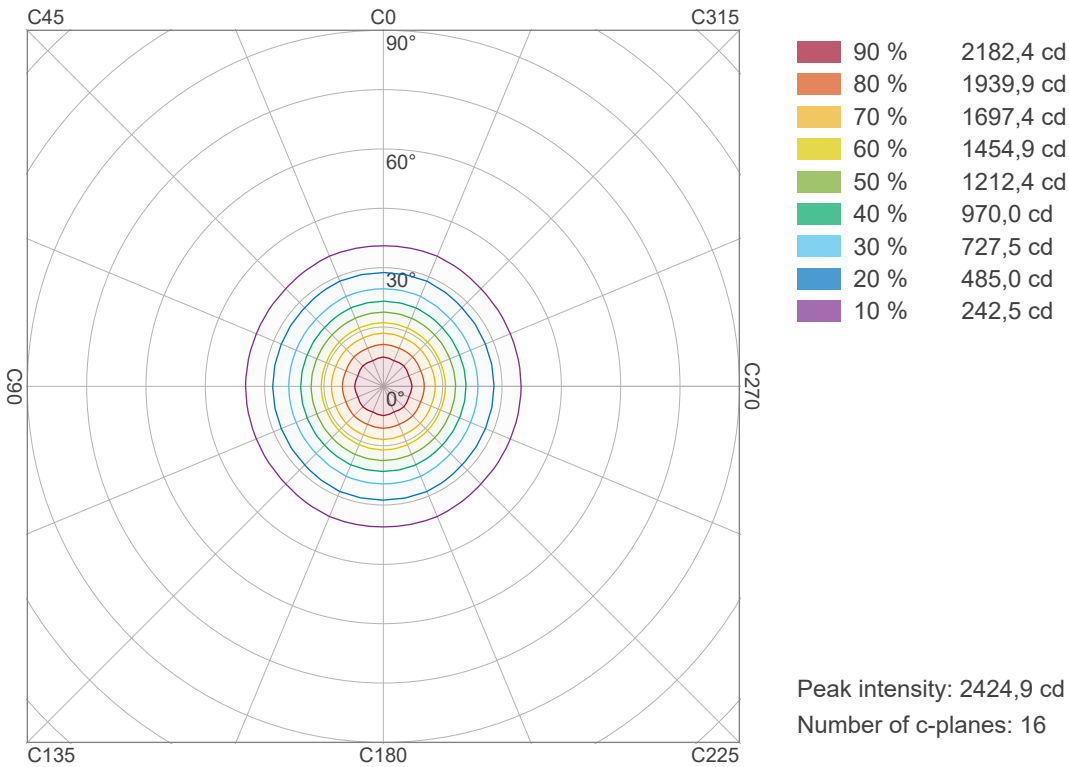


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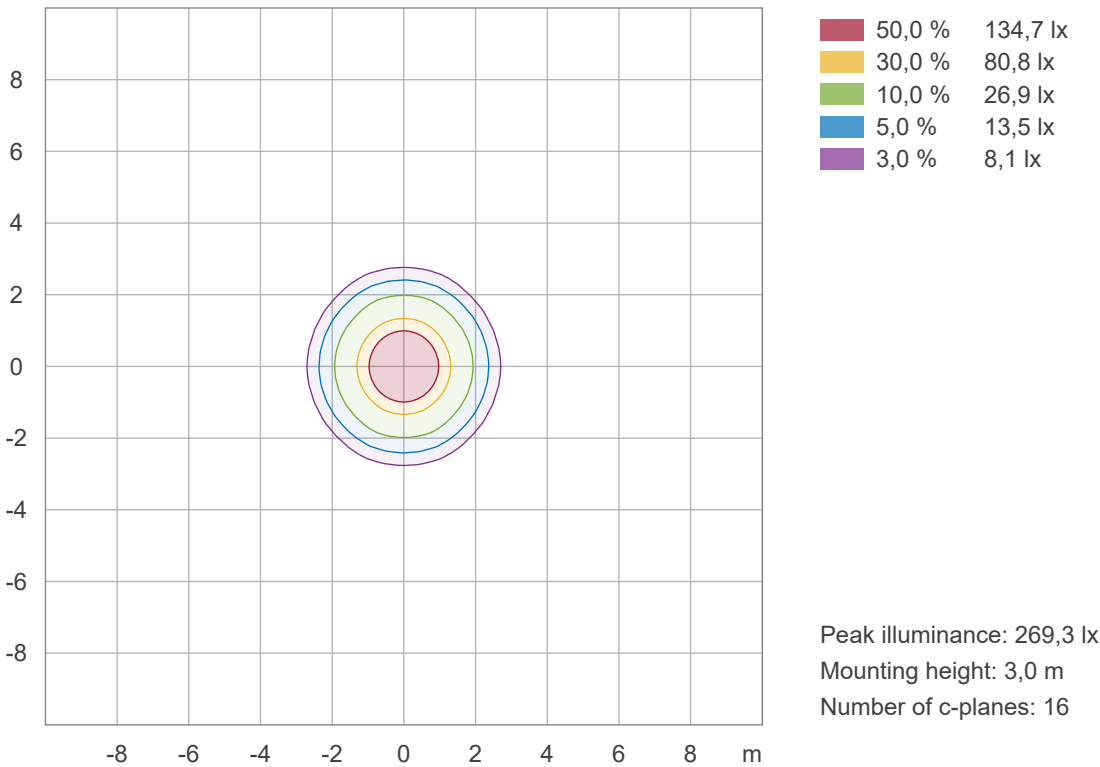
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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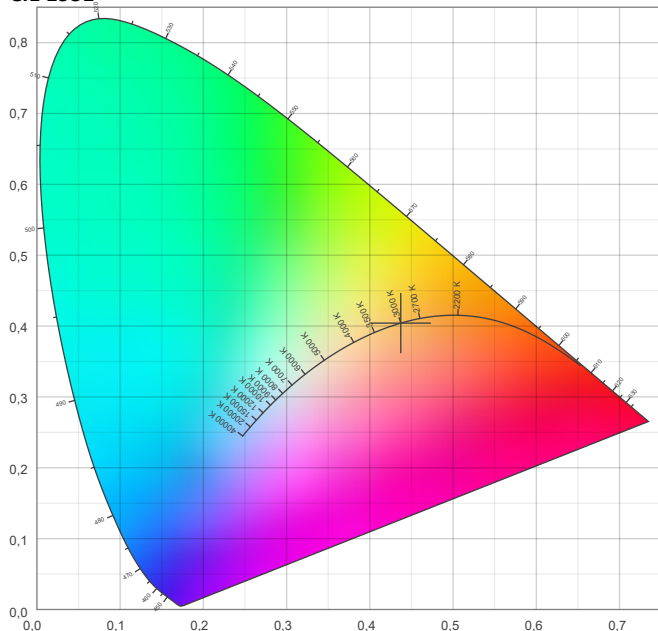


Color details

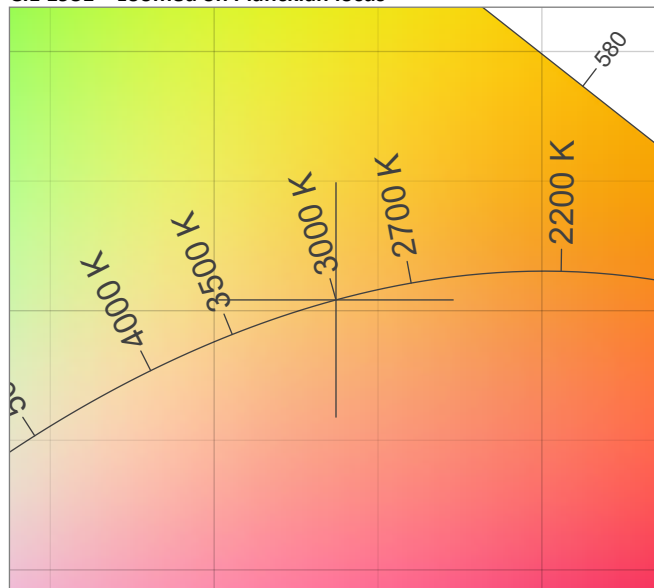
Correlated Color Temperature, Target CCT = 3000 K
Correlated Color Temperature, Measured CCT = 2979 K
Color Rendering Index CRI 84,1
Color Rendering Index, R9 (red component) R9 = 10,6
Color Rendering TM30-18 R_f 85,2 – R_g 95,8
Color Quality Scale CQS = 82,7

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 = -0,0027
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,251;0,521)

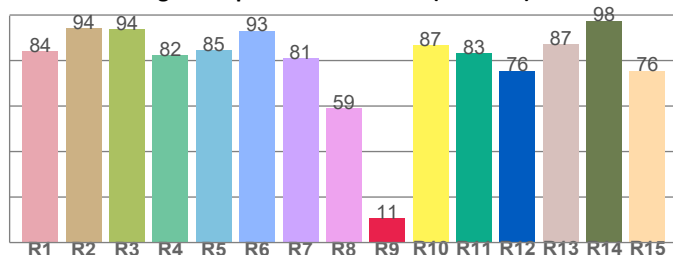
CIE 1931



CIE 1931 – zoomed on Planckian locus



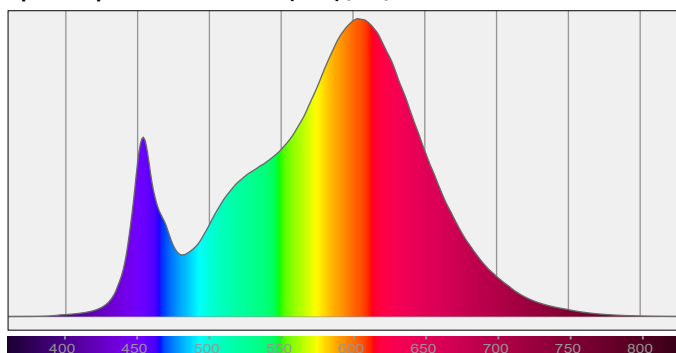
Color Rendering Index per reference color (CIE 1995)



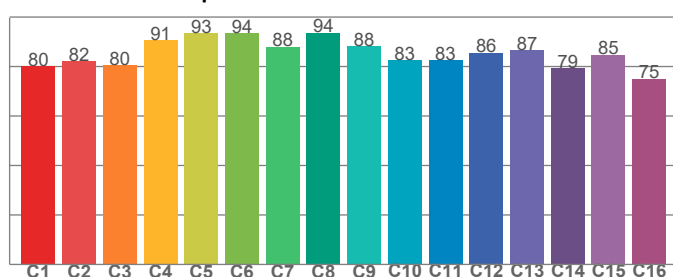
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
84,1	94,3	93,9	82,4	84,6	93,2	81,0	59,1	10,6	86,8	83,1	75,5	87,1	97,6	75,6

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



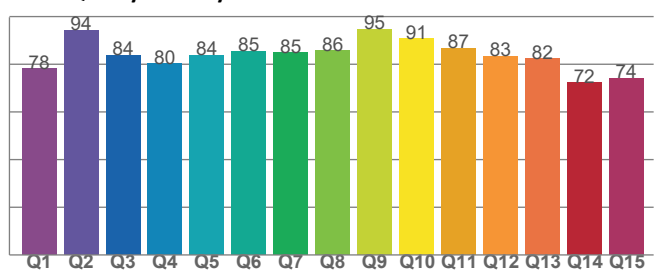
TM30-18 R_f -values per hue bin



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
80,2	82,1	80,4	90,6	93,4	93,6	88,0	93,7	88,2	82,6	82,7	85,5	86,7	79,3	84,7	75,0

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
78,1	94,3	83,7	80,1	83,7	85,5	84,8	85,6	94,7	90,6	86,8	83,4	82,2	72,3	74,1

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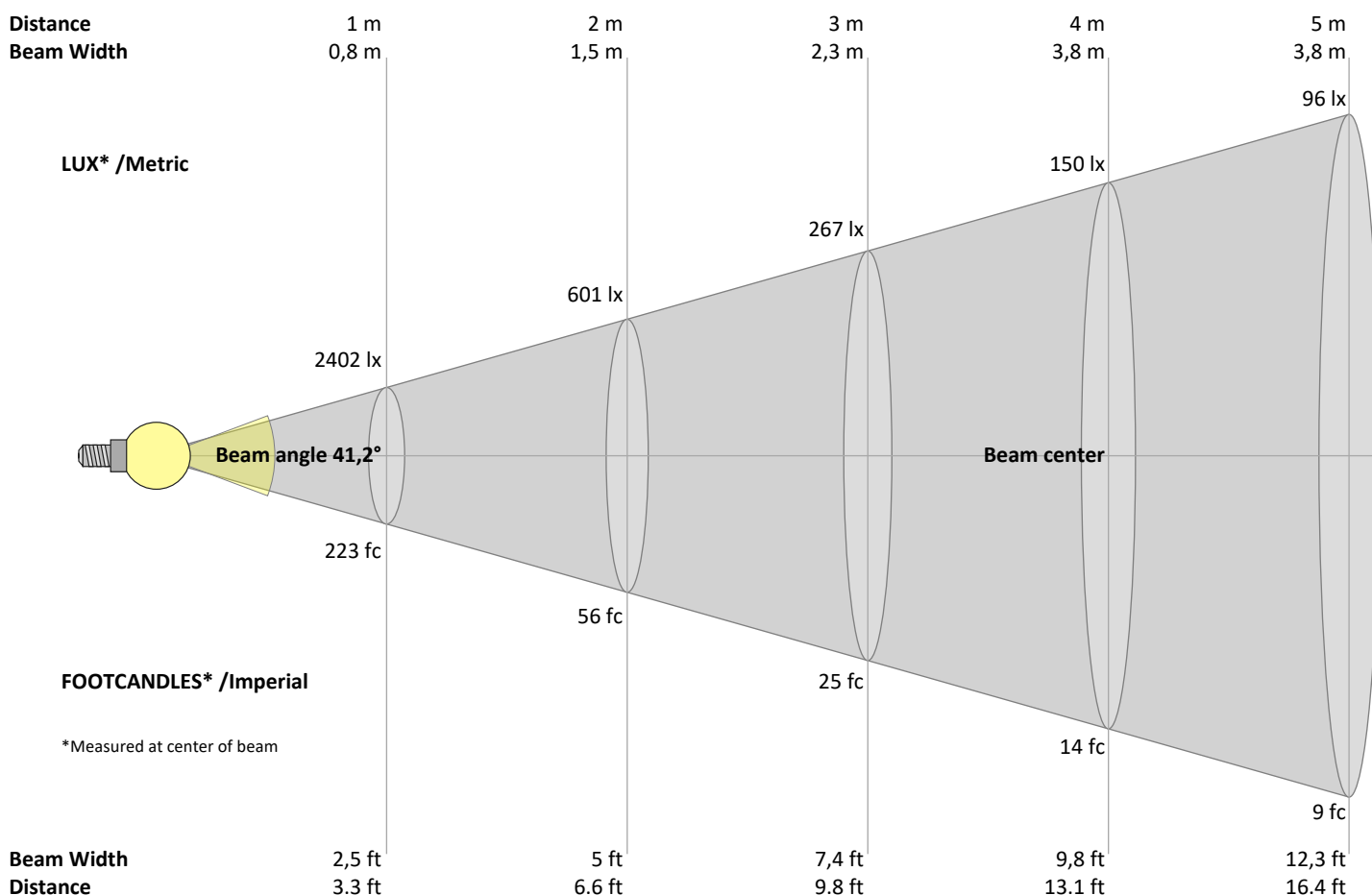
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Beam Details



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
2402	601	267	150	96	67	49	38	30	24	20	17	14	12	11	9	8	7	7	6	lux
223,2	55,8	24,8	13,9	8,9	6,2	4,6	3,5	2,8	2,2	1,8	1,5	1,3	1,1	1	0,9	0,8	0,7	0,6	0,6	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
2402	2393	2364	2280	2196	2064	1924	1775	1611	1446	1282	1117	963	824	686	582	483	397	336	274	cd
100%	100%	98%	95%	91%	86%	80%	74%	67%	60%	53%	47%	40%	34%	29%	24%	20%	17%	14%	11%	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
2402	2414	2359	2277	2185	2045	1906	1746	1578	1409	1237	1066	913	769	633	537	440	369	311	256	cd
100%	100%	98%	95%	91%	85%	79%	73%	66%	59%	51%	44%	38%	32%	26%	22%	18%	15%	13%	11%	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
2402	2393	2364	2280	2196	2064	1924	1775	1611	1446	1282	1117	963	824	686	582	483	397	336	274	cd
100%	100%	98%	95%	91%	86%	80%	74%	67%	60%	53%	47%	40%	34%	29%	24%	20%	17%	14%	11%	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
2402	2414	2359	2277	2185	2045	1906	1746	1578	1409	1237	1066	913	769	633	537	440	369	311	256	cd
100%	100%	98%	95%	91%	85%	79%	73%	66%	59%	51%	44%	38%	32%	26%	22%	18%	15%	13%	11%	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											
H = mounting height above eye level											
X	Y	Viewed Crosswise (Viewing direction orthogonal to lamp length axis)					Viewed Endwise (Viewing direction parallel to lamp length axis)				
2H	2H	23,5	24,2	23,6	24,4	24,6	23,1	23,8	23,2	24,0	24,2
	3H	23,8	24,6	24,2	24,8	25,0	23,4	24,2	23,7	24,4	24,6
	4H	23,9	24,7	24,3	24,9	25,2	23,5	24,3	23,9	24,5	24,8
	6H	24,1	24,7	24,4	25,0	25,4	23,7	24,3	24,0	24,6	25,0
	8H	24,1	24,7	24,4	25,0	25,4	23,7	24,3	24,0	24,6	25,0
	12H	24,0	24,7	24,4	25,0	25,4	23,6	24,3	24,0	24,6	25,0
4H	2H	23,5	24,2	23,9	24,5	24,7	23,1	23,8	23,5	24,1	24,3
	3H	24,1	24,7	24,4	25,0	25,5	23,7	24,3	24,1	24,7	25,1
	4H	24,2	24,8	24,7	25,2	25,7	23,9	24,4	24,3	24,9	25,4
	6H	24,4	25,0	24,9	25,3	25,7	24,0	24,6	24,5	25,0	25,3
	8H	24,4	24,9	24,9	25,3	25,7	24,0	24,6	24,6	24,9	25,3
	12H	24,4	24,8	24,9	25,2	25,7	24,0	24,5	24,5	24,9	25,3
8H	4H	24,3	24,8	24,8	25,1	25,5	23,9	24,5	24,4	24,8	25,2
	6H	24,5	24,9	25,0	25,3	25,8	24,1	24,5	24,7	25,0	25,5
	8H	24,6	24,9	25,1	25,4	26,0	24,2	24,5	24,8	25,1	25,7
	12H	24,6	24,9	25,2	25,4	26,0	24,2	24,5	24,8	25,0	25,6
12H	4H	24,2	24,6	24,7	25,0	25,5	23,9	24,3	24,4	24,7	25,2
	6H	24,5	24,8	25,0	25,3	26,0	24,2	24,5	24,7	25,0	25,6
	8H	24,6	24,8	25,2	25,3	25,9	24,2	24,5	24,8	25,0	25,6
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H		1,8 / -1,4					1,7 / -1,3				
S = 1.5H		3,6 / -2,0					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	103	104	102	100	100	99	97	97	96	94	93
2	107	102	98	94	105	100	96	93	97	94	91	94	91	89	91	89	87	86
3	102	95	90	86	100	94	89	85	91	87	84	89	85	82	86	83	81	79
4	97	89	83	79	95	88	82	78	85	81	77	83	80	76	82	78	76	74
5	92	83	77	73	90	82	77	73	81	76	72	79	75	71	77	74	71	69
6	87	78	72	68	86	78	72	68	76	71	67	75	70	67	73	69	66	65
7	83	74	68	64	82	73	68	64	72	67	63	71	66	63	70	66	63	61
8	79	70	64	60	78	69	64	60	68	63	60	67	63	59	66	62	59	58
9	76	66	61	57	75	66	60	57	65	60	56	64	59	56	63	59	56	55
10	73	63	57	54	72	63	57	54	62	57	53	61	57	53	60	56	53	52

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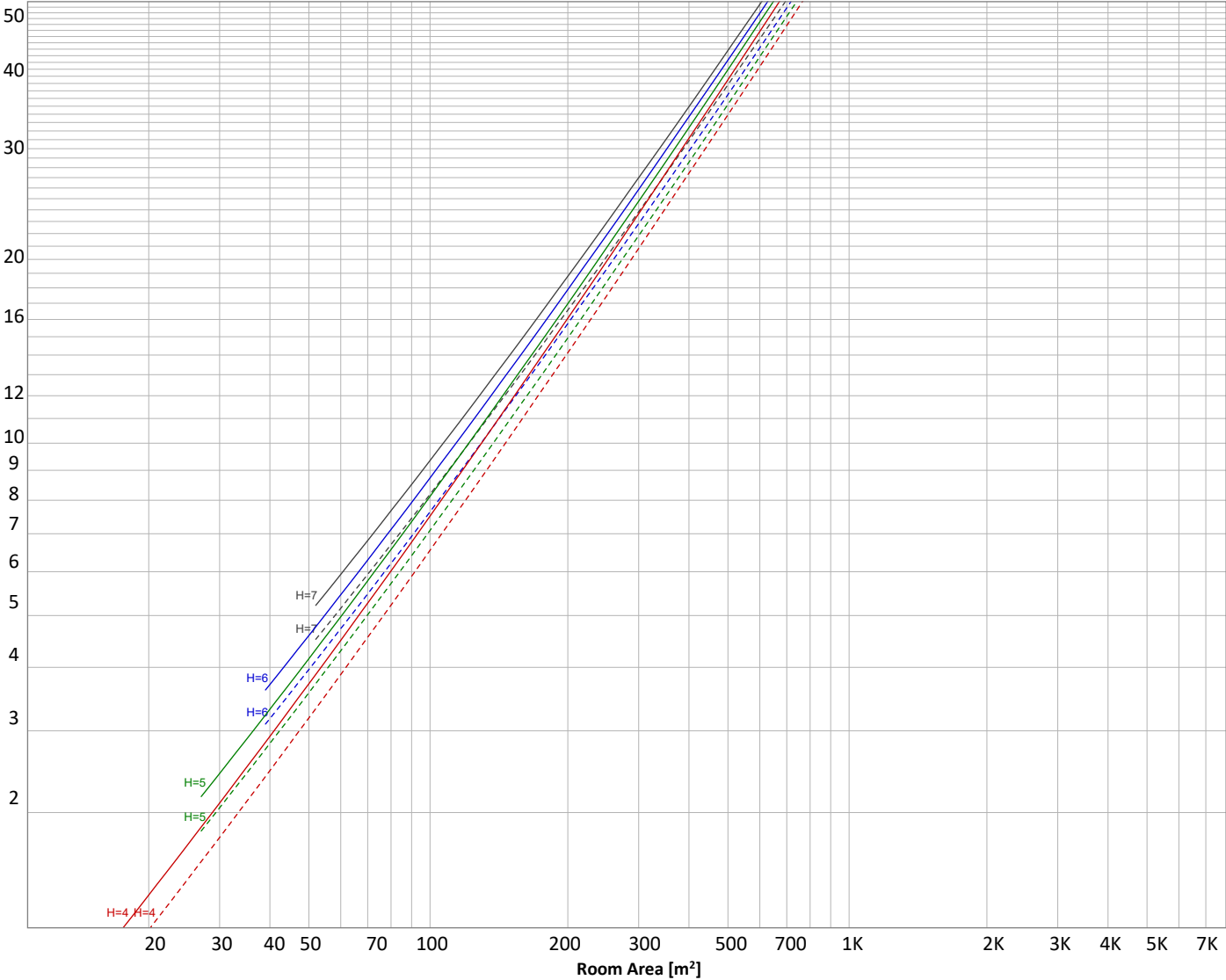
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 1509 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°
216 lm	463 lm	391 lm	218 lm	108 lm	55,8 lm	34,9 lm	17,4 lm	4,19 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,047 lm	0,000 lm	0,003 lm	0,009 lm	0,030 lm	0,103 lm	0,165 lm	0,140 lm	0,045 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	216 lm	14,3%
10-20°	463 lm	30,7%
20-30°	391 lm	25,9%
30-40°	218 lm	14,5%
40-50°	108 lm	7,1%
50-60°	56 lm	3,7%
60-70°	35 lm	2,3%
70-80°	17 lm	1,2%
80-90°	4 lm	0,3%
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	1509 lm	100,0%

Intensity peaks

Max intensity	2425 cd
Intensity, 90°	1 cd
Intensity, 0°	2402 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	1069 lm	70,9%
0-40°	1288 lm	85,4%
0-60°	1451 lm	96,2%
60-90°	57 lm	3,8%
70-100°	22 lm	1,4%
90-120°	0 lm	0,0%
0-90°	1508 lm	100,0%
90-180°	1 lm	0,0%
0-180°	1509 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	531 lm	35,2%
Medium(30-60°)	194 lm	12,9%
High(60-80°)	26 lm	1,7%
Very high(80-90°)	2 lm	0,1%
Back light		
Low(0-30°)	531 lm	35,2%
Medium(30-60°)	194 lm	12,9%
High(60-80°)	26 lm	1,7%
Very high(80-90°)	2 lm	0,1%

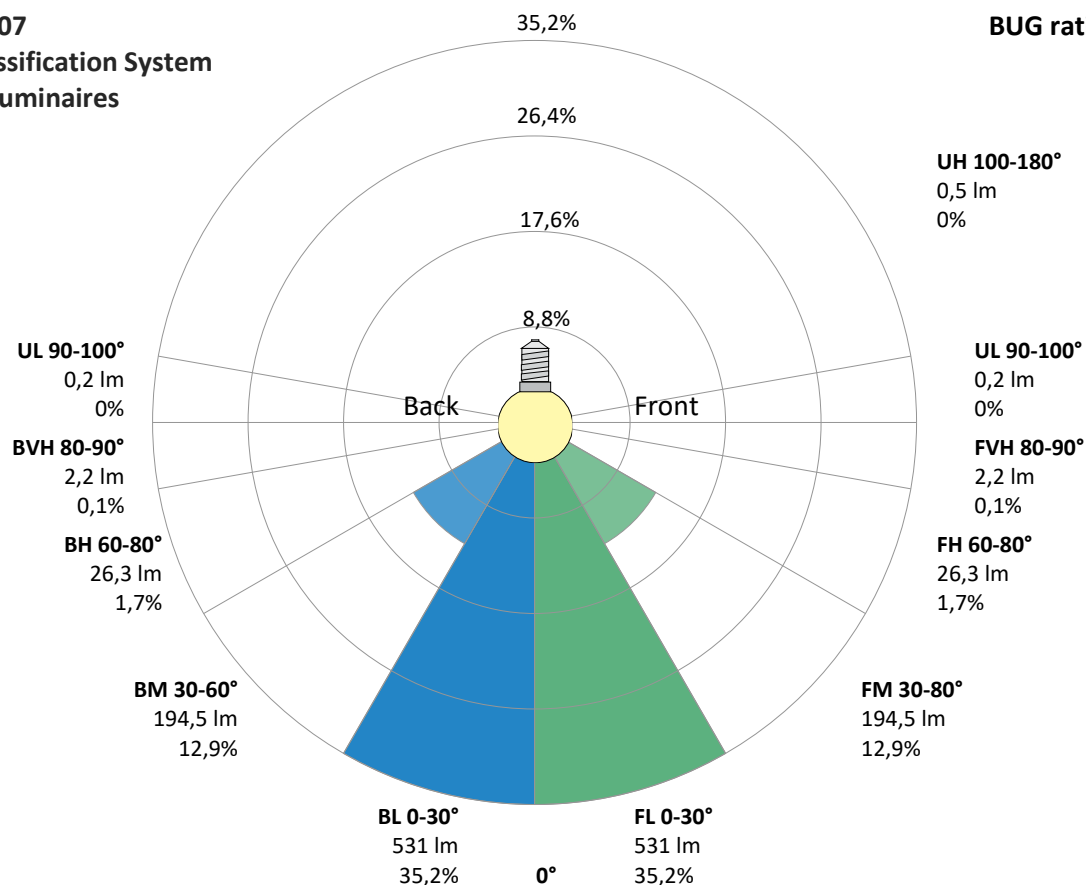
Uplight

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

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B2 U0 G0



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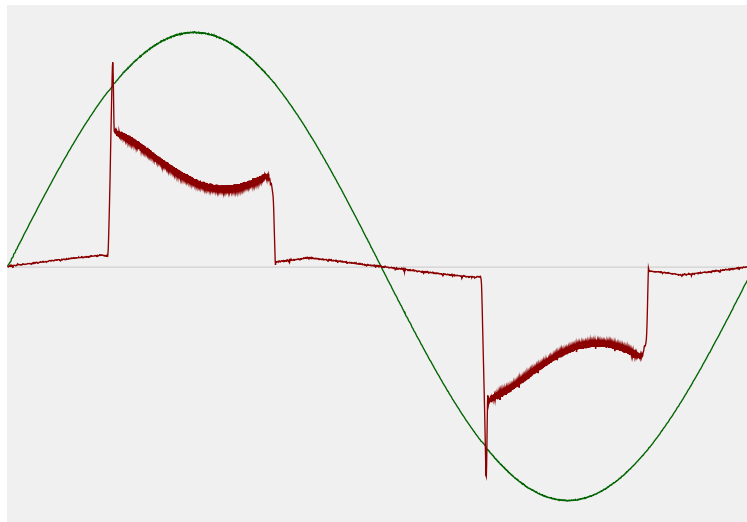


Power Details

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 = $V_{RMS} * I_{RMS}$	24,28 VA
Displacement factor of AC power feed	1,0
Power factor of AC current feed	0,88
Total harmonic distortion of the current	53,54%
Total harmonic distortion of the voltage	0,06%

Input Power Curve



Efficiency

Radiated power efficiency 21,7%



Lumen efficiency 71 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	2982 K
CCT shift	+18 K
CCT end	3000 K

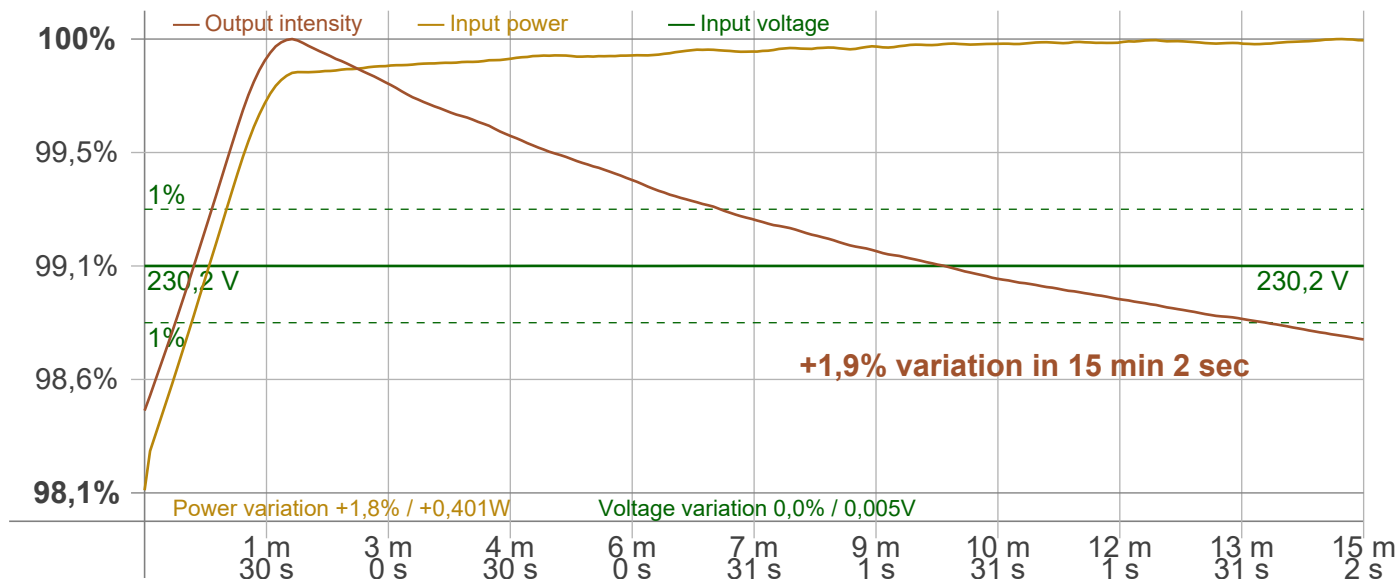
Warmup Result

Total warmup time	Lamp stabilized in 15 min 2 sec
Warmup variation	+1,9%

Output Change

Output start	1501 lm
Output change	+8 lm
Output end	1509 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 99,01 Hz
Percent Flicker 2,19 %
Flicker index 0,01

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

JA8/10 40 Hz 0,01 %
JA8/10 90 Hz 0,05 %
JA8/10 200 Hz 1,69 %
JA8/10 400 Hz 1,96 %
JA8/10 1000 Hz 2,13 %

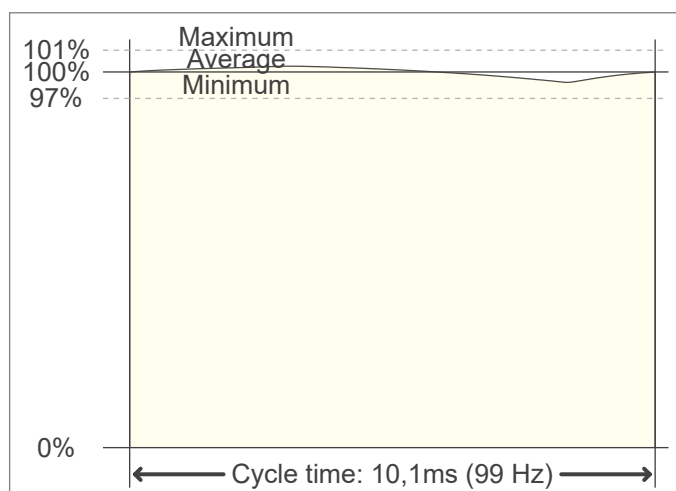
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

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

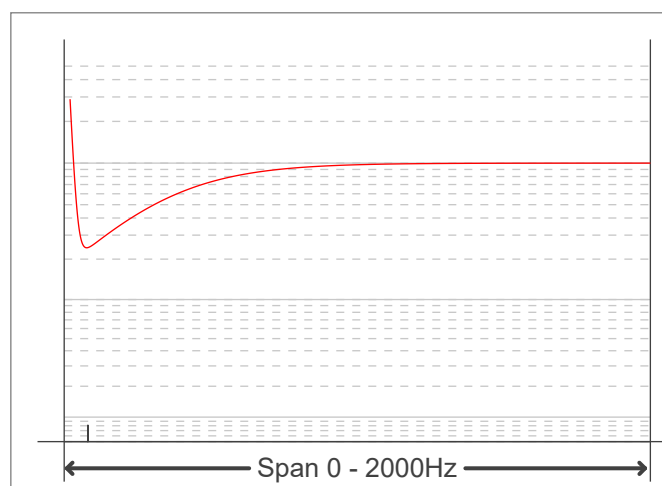
Flicker indices according to Lighting Research Center (2015)

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

