

Light Measurement Report

Print date: 12-5-2025

Measurement date and time: 12-5-2025 14:15:40 – Measurement no. VFR-250512-1192-MS

Measurement tracking No. and Link: [VT250512-004571](#)

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

30,2 W – PF 0,91 – DPF 0,94

230 V – 0,143 A

50 Hz

Lamp stabilized in 25 min 32 sec – 2,0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

272033-3000K

272033-3000K – Dutchfulfillment

3-FASE RAILSPOT | RHEA | 10°-60° | 30W | WIT | 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

2060 lm – 0,05% / 99,95%

68 lm/W

2134 cd – 57,7°

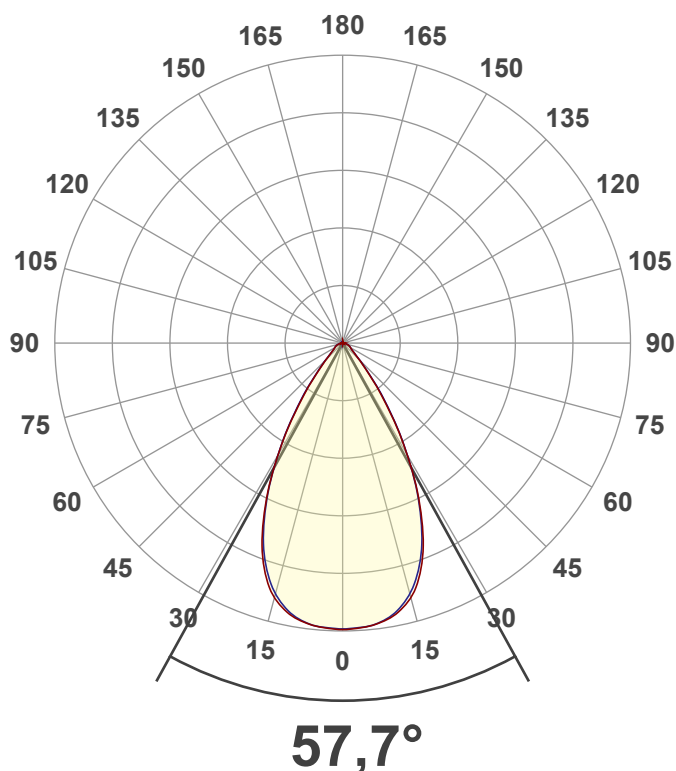
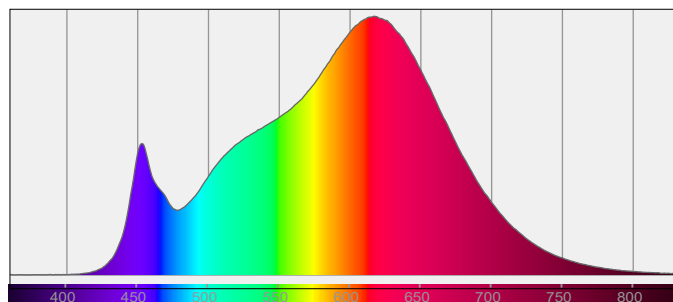
CCT = 3000 K / 2992 K

CRI 93,2

R_f 91,7 – R_g 98,0

Duv -0,0004 – SDCM 0,5

SVM 1,07 – PstLM 0,37



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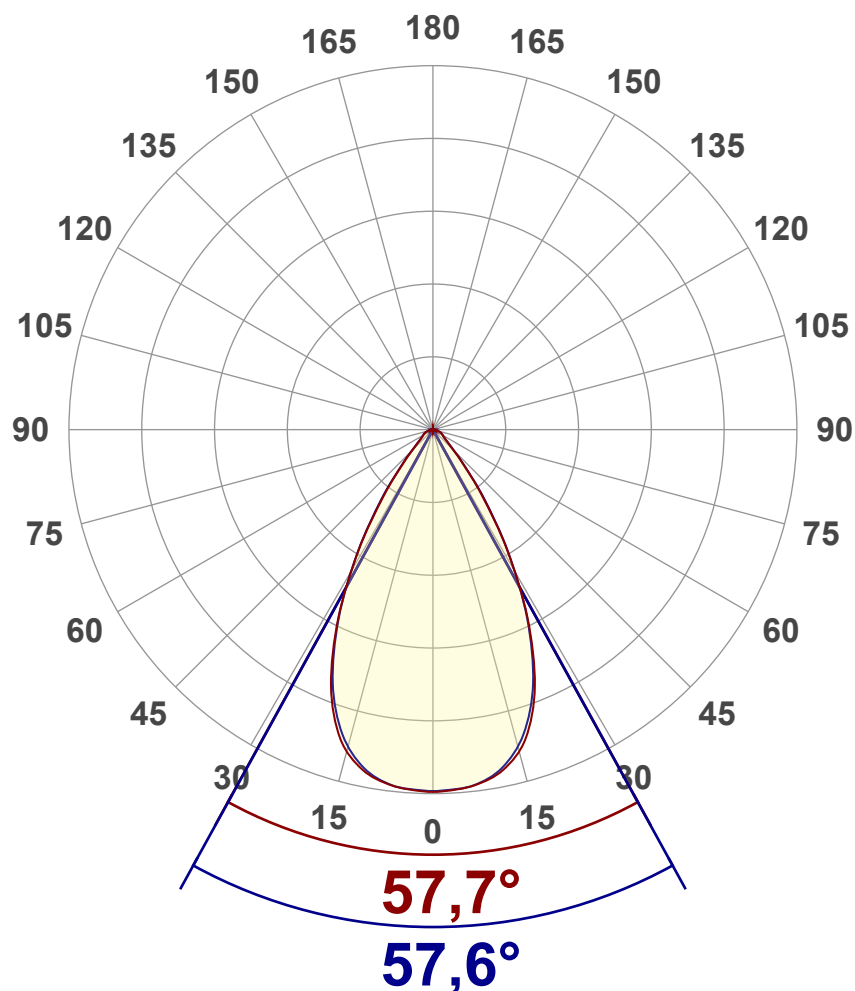
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2060 lm
Lumen Up% / Down%	0,05% / 99,95%
Peak Intensity	2134 cd
Beam Angle (50%)	57,7°
Beam Angle (90%)	57,6°
Beam Angle (10%)	57,7°

Cut-off Angle

Average 2,5%	132,8°
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Field Angle

Average 10%	87,5°
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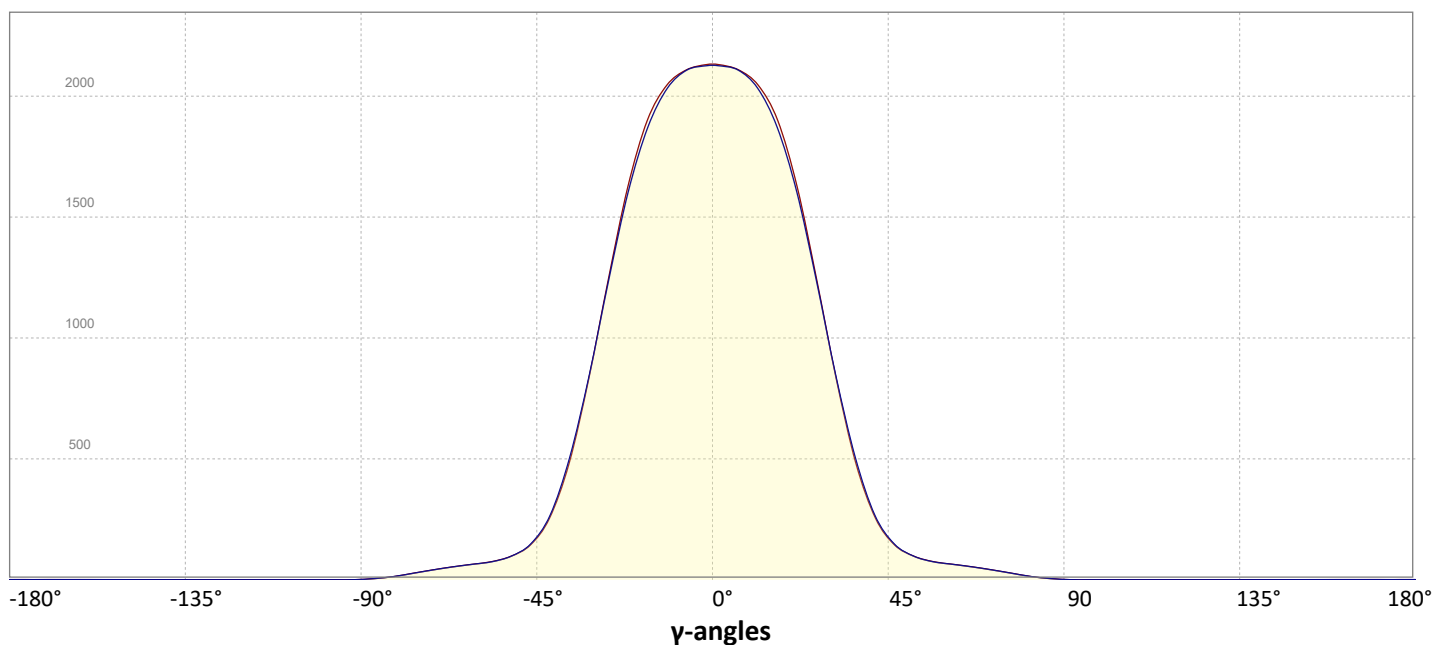
Intensity Ratio

In 120° cone	95,3%
In 90° cone	89,0%

C000-C180

C090-C270

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

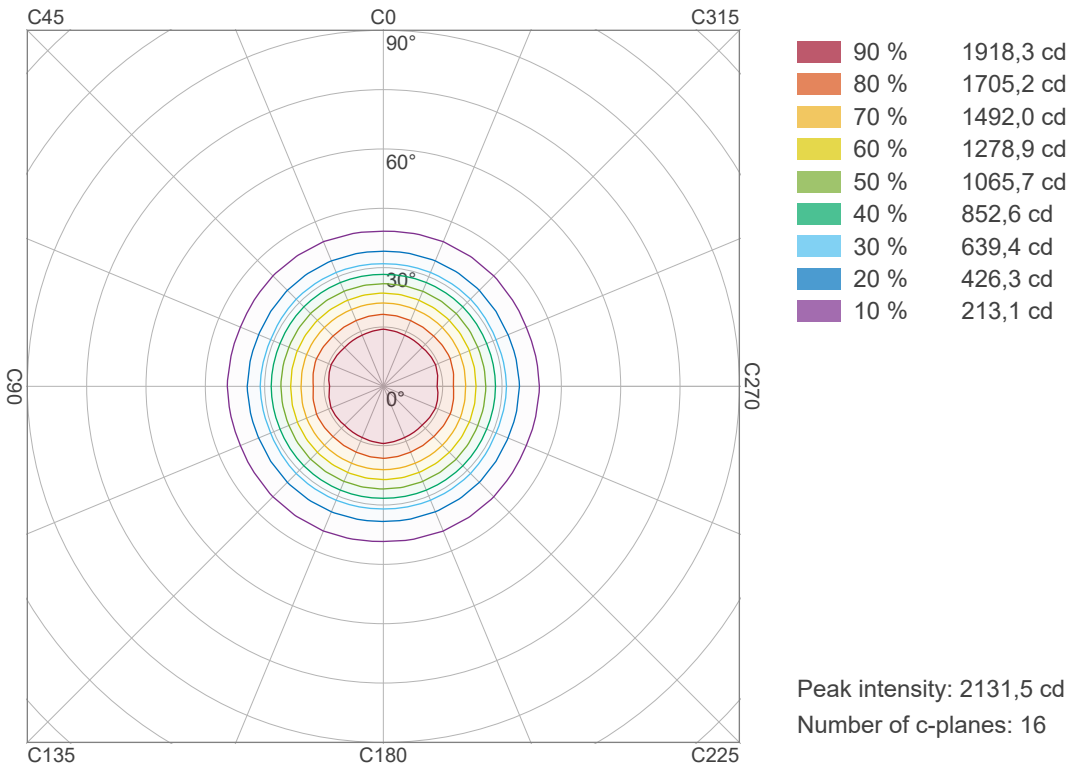


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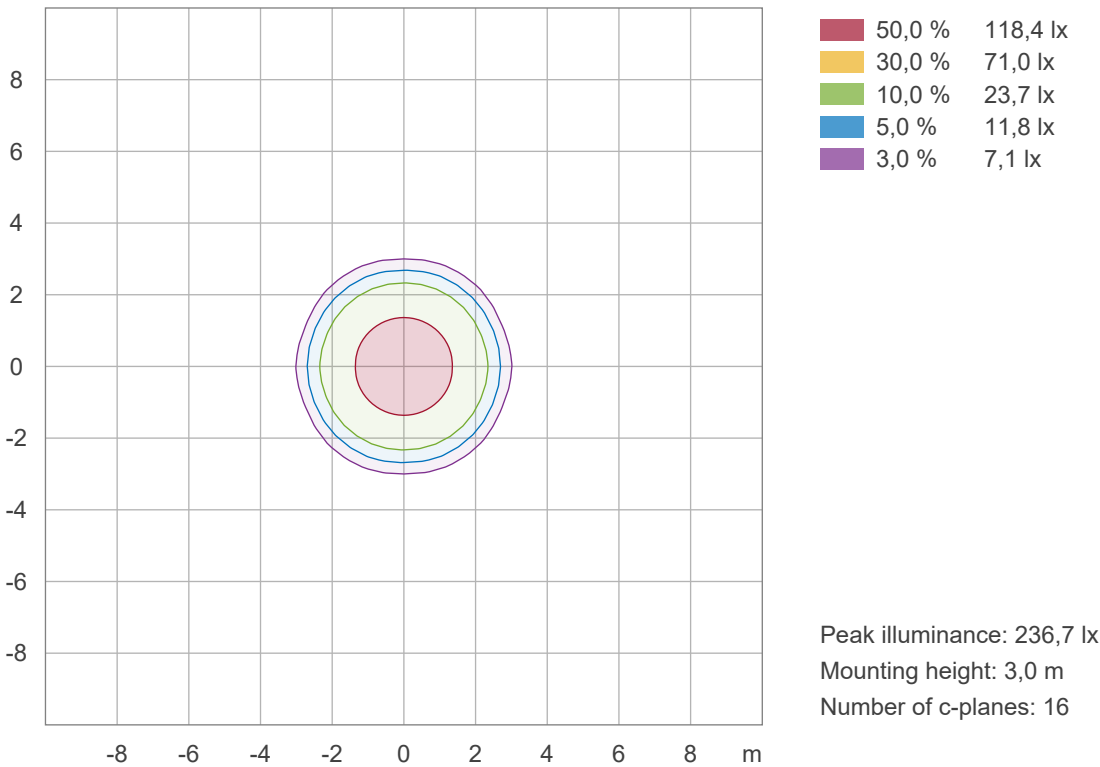
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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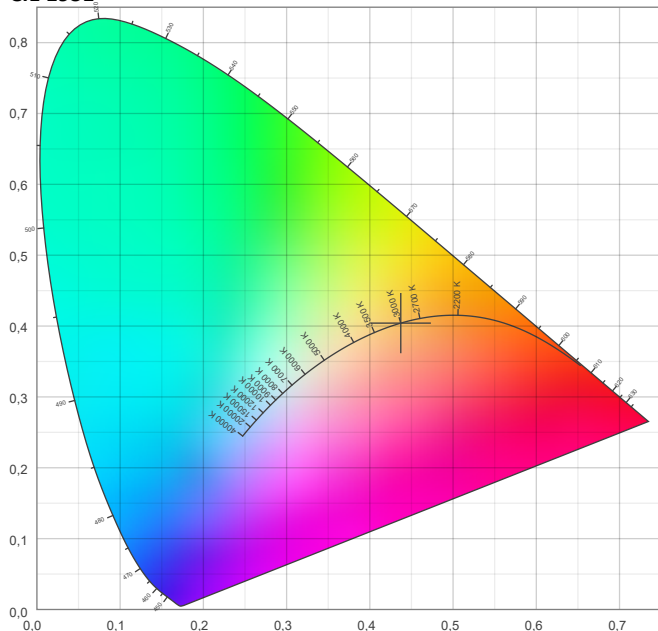


Color details

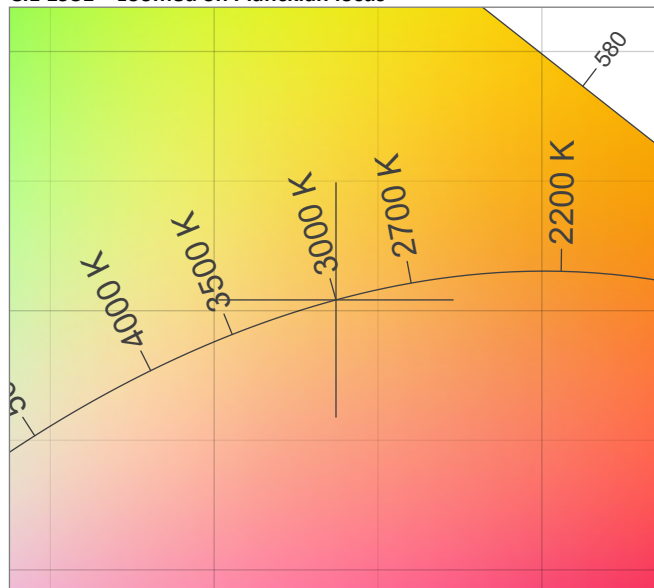
Correlated Color Temperature, Target CCT = 3000 K
Correlated Color Temperature, Measured CCT = 2992 K
Color Rendering Index CRI 93,2
Color Rendering Index, R9 (red component) R9 = 56,4
Color Rendering TM30-18 R_f 91,7 – R_g 98,0
Color Quality Scale CQS = 91,3

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 = -0,0004
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,251;0,521)

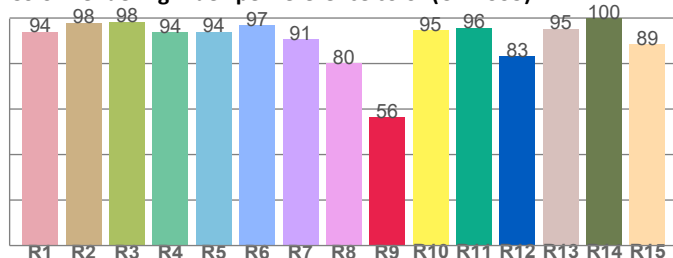
CIE 1931



CIE 1931 – zoomed on Planckian locus



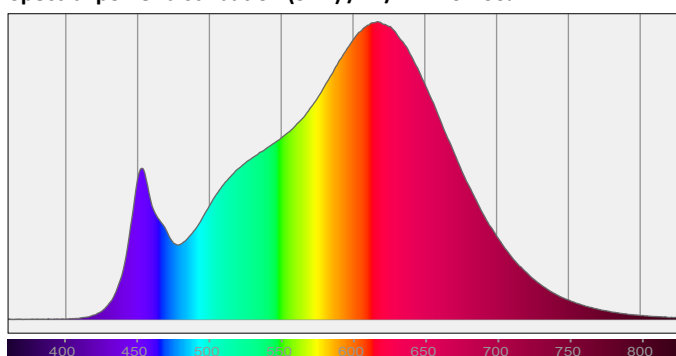
Color Rendering Index per reference color (CIE 1995)



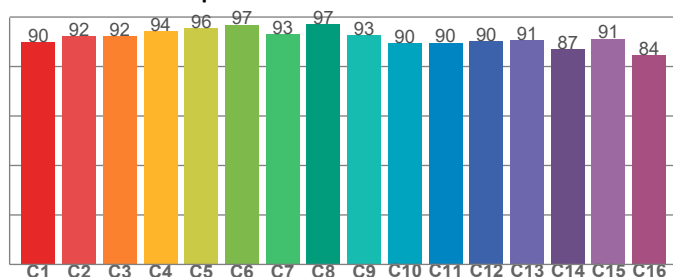
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
93,9	98,0	98,3	93,6	94,0	96,8	90,6	80,1	56,4	94,5	95,6	83,2	95,4	99,8	88,6

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



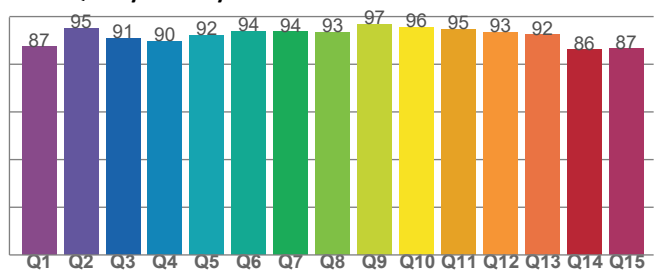
TM30-18 R_f-values per hue bin



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
89,9	92,3	92,2	94,2	95,5	96,9	93,0	97,0	92,8	89,5	89,7	90,2	90,7	87,0	91,3	84,5

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
87,4	95,1	90,8	89,7	92,2	93,8	93,6	93,4	96,8	95,7	94,7	93,4	92,5	86,1	86,6

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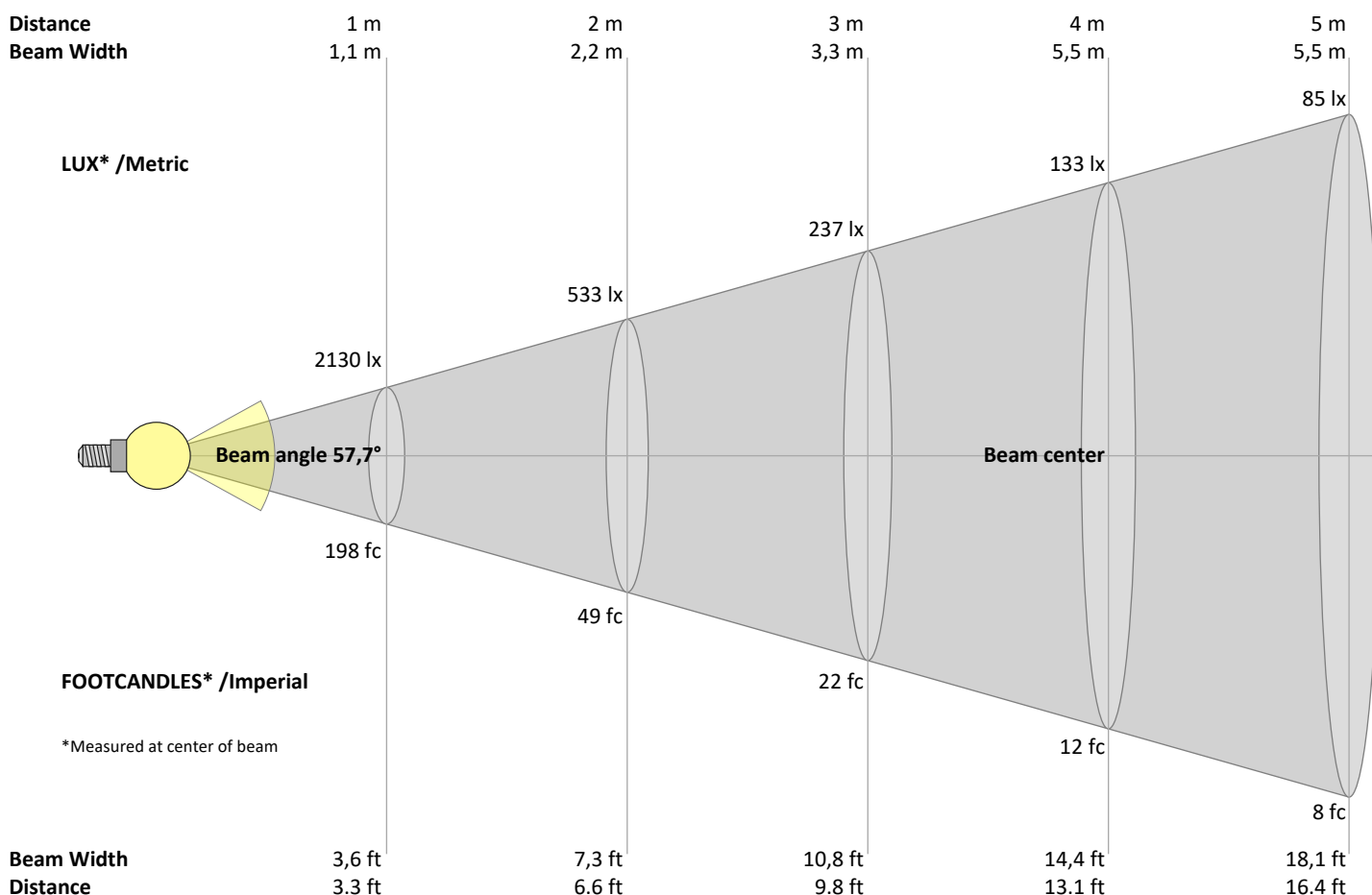
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Beam Details



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
2130	533	237	133	85	59	43	33	26	21	18	15	13	11	9	8	7	7	6	5	lux
197,9	49,5	22	12,4	7,9	5,5	4	3,1	2,4	2	1,6	1,4	1,2	1	0,9	0,8	0,7	0,6	0,5	0,5	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
2130	2129	2120	2112	2092	2067	2037	1978	1920	1828	1717	1600	1447	1293	1133	969	809	670	531	424	cd
100%	100%	100%	99%	98%	97%	96%	93%	90%	86%	81%	75%	68%	61%	53%	46%	38%	31%	25%	20%	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
2130	2124	2117	2110	2086	2056	2018	1954	1889	1795	1688	1573	1427	1281	1127	969	816	680	544	438	cd
100%	100%	99%	99%	98%	97%	95%	92%	89%	84%	79%	74%	67%	60%	53%	45%	38%	32%	26%	21%	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
2130	2129	2120	2112	2092	2067	2037	1978	1920	1828	1717	1600	1447	1293	1133	969	809	670	531	424	cd
100%	100%	100%	99%	98%	97%	96%	93%	90%	86%	81%	75%	68%	61%	53%	46%	38%	31%	25%	20%	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
2130	2124	2117	2110	2086	2056	2018	1954	1889	1795	1688	1573	1427	1281	1127	969	816	680	544	438	cd
100%	100%	99%	99%	98%	97%	95%	92%	89%	84%	79%	74%	67%	60%	53%	45%	38%	32%	26%	21%	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	25,0	25,7	25,1	26,0	26,2	24,8	25,5	24,9	25,8	26,0
	3H	25,4	26,2	25,8	26,5	26,6	25,2	26,1	25,6	26,3	26,5
	4H	25,6	26,5	26,0	26,7	26,9	25,5	26,3	25,9	26,5	26,8
	6H	25,9	26,6	26,2	26,8	27,2	25,7	26,4	26,0	26,7	27,0
	8H	25,9	26,6	26,2	26,9	27,3	25,7	26,4	26,0	26,7	27,1
	12H	25,9	26,5	26,2	26,9	27,3	25,7	26,4	26,1	26,7	27,1
4H	2H	25,0	25,8	25,4	26,0	26,3	24,8	25,6	25,2	25,9	26,1
	3H	25,8	26,4	26,1	26,8	27,2	25,6	26,3	26,0	26,6	27,0
	4H	26,0	26,6	26,5	27,1	27,6	25,9	26,5	26,3	26,9	27,4
	6H	26,3	26,9	26,8	27,2	27,6	26,1	26,8	26,6	27,1	27,4
	8H	26,3	26,9	26,9	27,3	27,6	26,2	26,8	26,7	27,1	27,5
	12H	26,4	26,8	26,9	27,2	27,7	26,2	26,6	26,7	27,1	27,5
8H	4H	26,1	26,7	26,6	27,0	27,4	26,0	26,6	26,5	26,9	27,3
	6H	26,5	26,9	27,0	27,3	27,9	26,3	26,7	26,8	27,2	27,7
	8H	26,6	27,0	27,1	27,5	28,1	26,5	26,8	27,0	27,3	27,9
	12H	26,7	26,9	27,3	27,5	28,1	26,5	26,8	27,1	27,3	27,9
12H	4H	26,1	26,6	26,6	27,0	27,4	26,0	26,4	26,5	26,8	27,3
	6H	26,5	26,8	27,0	27,4	28,0	26,4	26,7	26,9	27,2	27,8
	8H	26,6	26,9	27,2	27,4	28,0	26,5	26,7	27,1	27,2	27,8
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H				2,0 / -1,3				2,1 / -1,3			
S = 1.5H				3,9 / -1,6				4,0 / -1,6			
S = 2.0H				5,5 / -1,9				5,6 / -1,8			

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	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92
2	106	101	96	93	104	99	95	92	96	93	90	93	90	88	90	88	86	84
3	100	93	88	84	98	92	87	83	89	85	81	87	83	80	84	81	79	77
4	95	87	81	76	93	86	80	76	83	79	75	81	77	74	79	76	73	71
5	90	81	75	70	88	80	74	70	78	73	69	76	72	68	75	71	68	66
6	85	76	69	65	84	75	69	64	73	68	64	72	67	63	70	66	63	61
7	81	71	64	60	79	70	64	60	69	63	59	68	63	59	66	62	59	57
8	77	67	60	56	75	66	60	56	65	59	56	64	59	55	63	58	55	54
9	73	63	57	52	72	62	56	52	61	56	52	60	55	52	60	55	52	50
10	69	59	53	49	68	59	53	49	58	53	49	57	52	49	56	52	49	47

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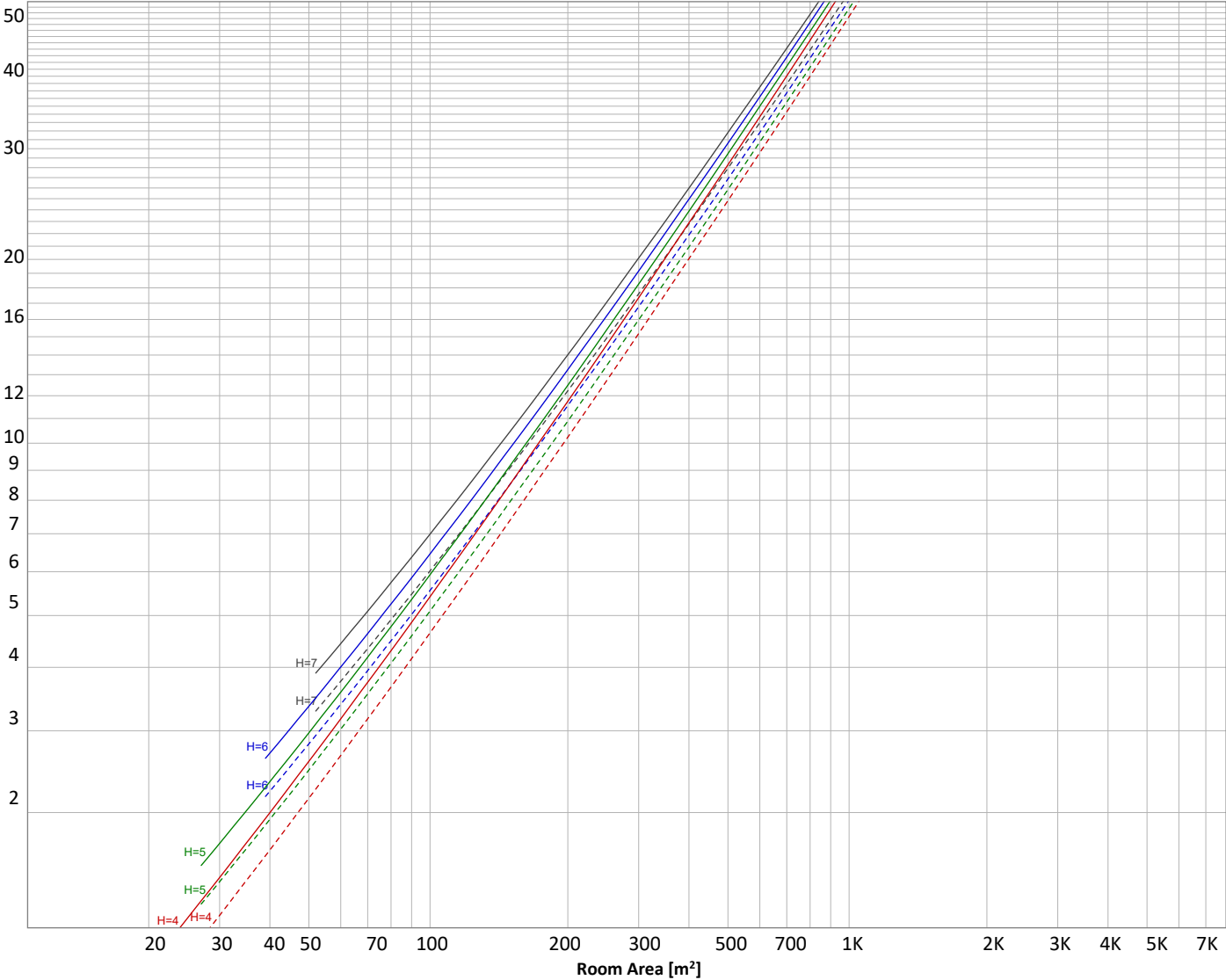
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2060 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°
201 lm	543 lm	621 lm	378 lm	145 lm	74,0 lm	55,7 lm	32,5 lm	8,28 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,214 lm	0,005 lm	0,009 lm	0,022 lm	0,070 lm	0,176 lm	0,224 lm	0,179 lm	0,061 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	201 lm	9,8%
10-20°	543 lm	26,3%
20-30°	621 lm	30,2%
30-40°	378 lm	18,4%
40-50°	145 lm	7,0%
50-60°	74 lm	3,6%
60-70°	56 lm	2,7%
70-80°	32 lm	1,6%
80-90°	8 lm	0,4%
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	2060 lm	100,0%

Intensity peaks

Max intensity	2134 cd
Intensity, 90°	2 cd
Intensity, 0°	2130 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	1365 lm	66,3%
0-40°	1743 lm	84,6%
0-60°	1962 lm	95,3%
60-90°	96 lm	4,7%
70-100°	41 lm	2,0%
90-120°	0 lm	0,0%
0-90°	2059 lm	100,0%
90-180°	1 lm	0,0%
0-180°	2060 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	678 lm	32,9%
Medium(30-60°)	303 lm	14,7%
High(60-80°)	44 lm	2,1%
Very high(80-90°)	4 lm	0,2%
Back light		
Low(0-30°)	678 lm	32,9%
Medium(30-60°)	303 lm	14,7%
High(60-80°)	44 lm	2,1%
Very high(80-90°)	4 lm	0,2%

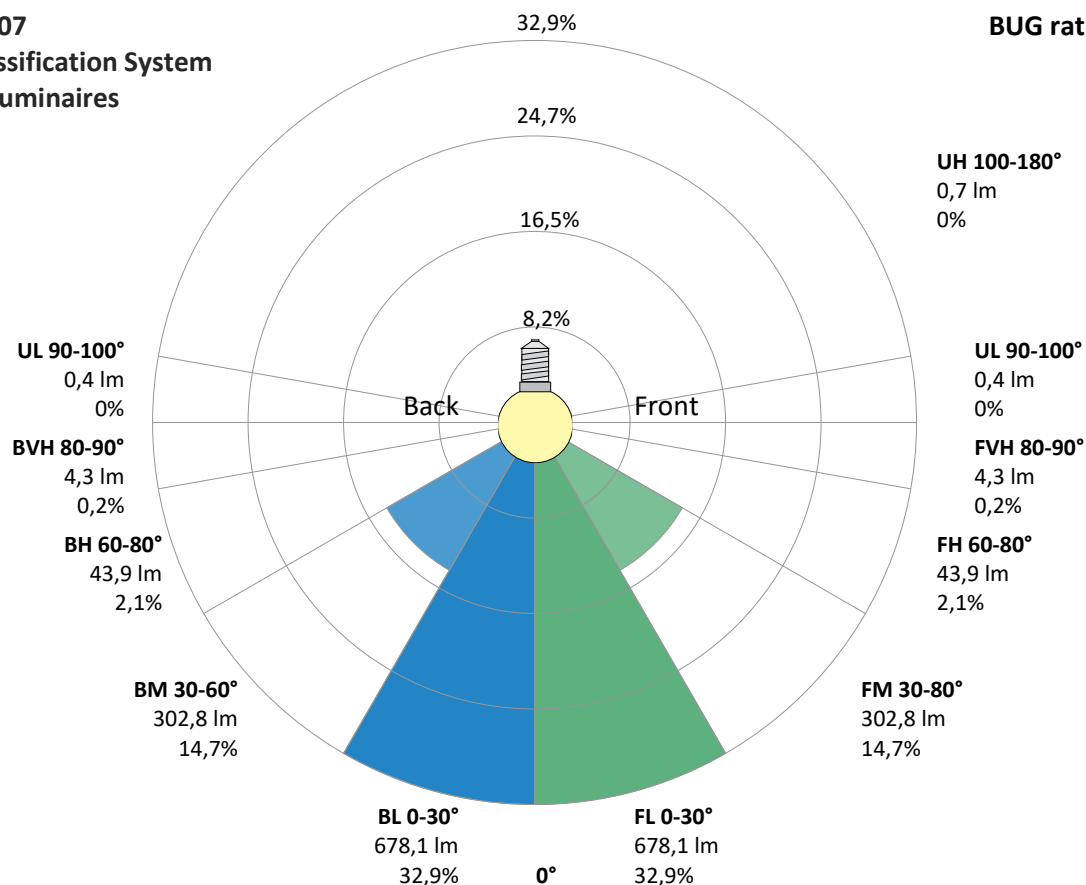
Uplight

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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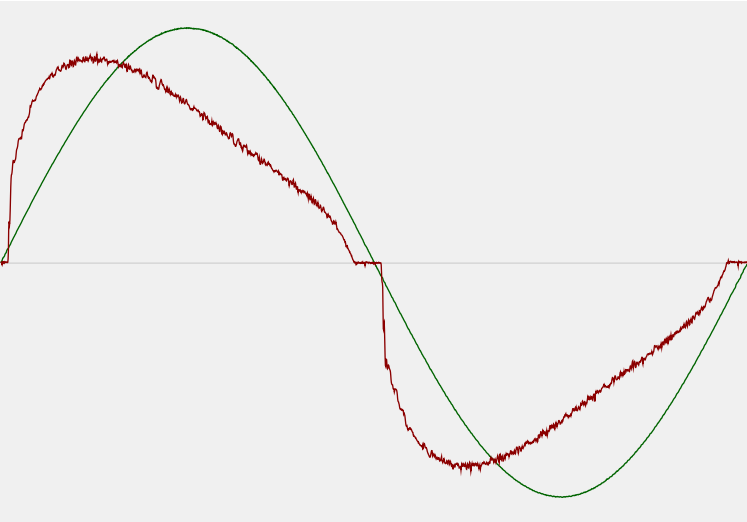


Power Details

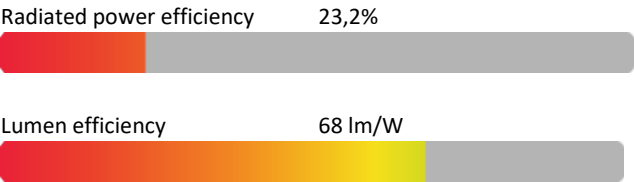
Input Power

Power feed to light source	30,2 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,143 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	32,99 VA
Displacement factor of AC power feed	0,94
Power factor of AC current feed	0,91
Total harmonic distortion of the current	22,43%
Total harmonic distortion of the voltage	0,12%

Input Power Curve



Efficiency



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	2997 K
CCT shift	+3 K
CCT end	3000 K

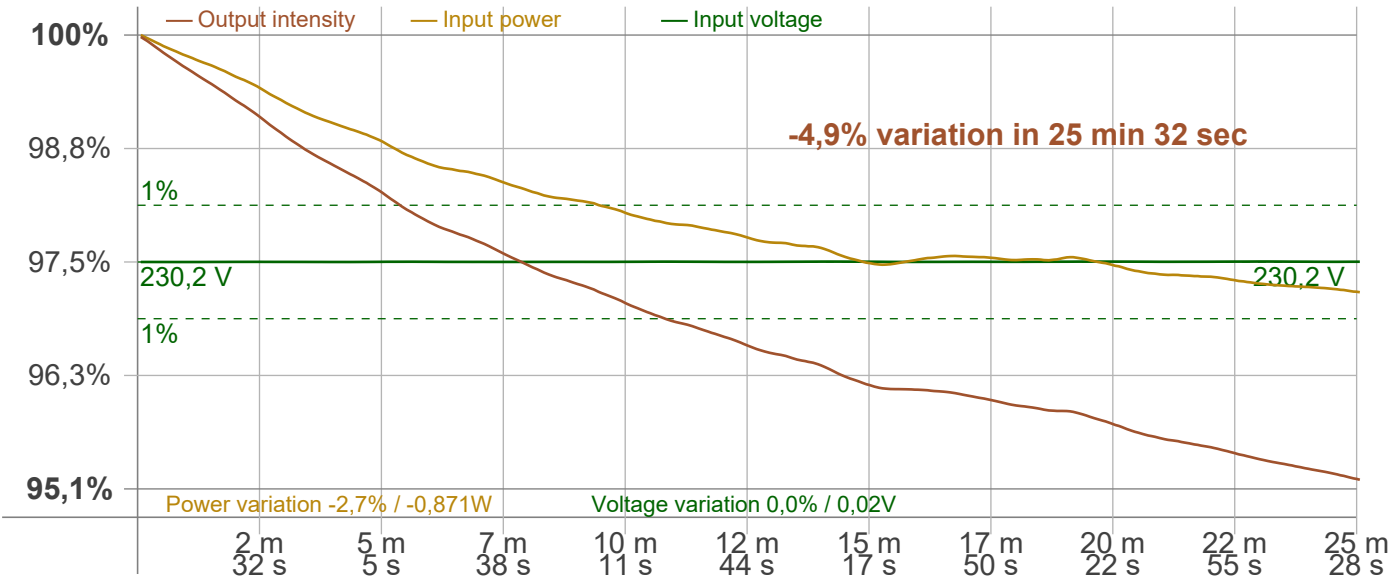
Warmup Result

Total warmup time	Lamp stabilized in 25 min 32 sec
Warmup variation	-4,9%

Output Change

Output start	2166 lm
Output change	-106 lm
Output end	2060 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 28,63 %
Flicker index 0,09

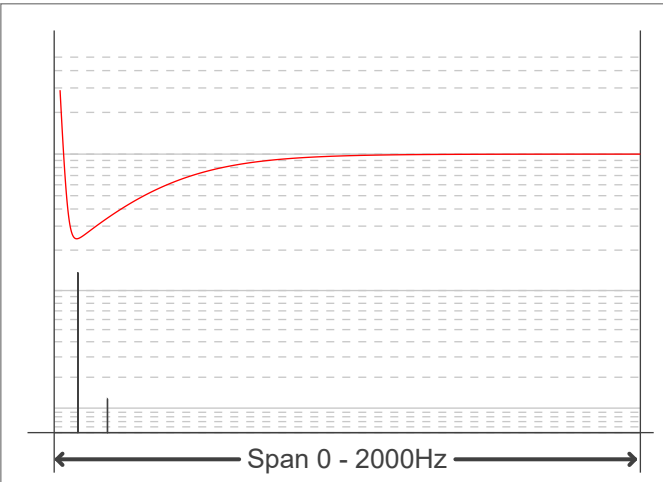
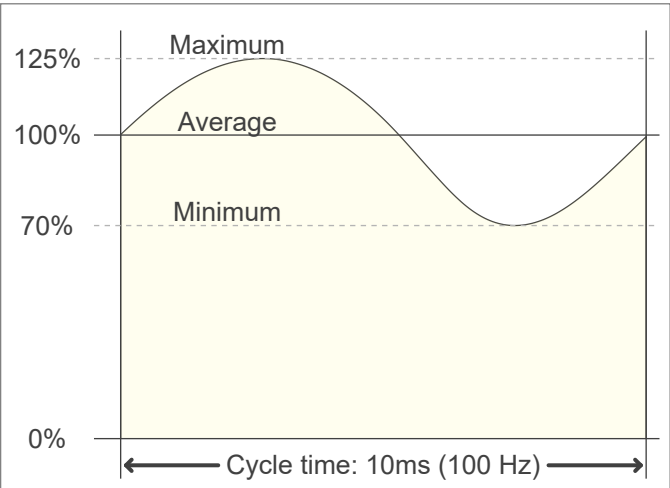
Flicker indices according to California Energy Commission (CEC) 2016b
JA8/10 40 Hz 0,53 %
JA8/10 90 Hz 0,62 %
JA8/10 200 Hz 28,25 %
JA8/10 400 Hz 28,69 %
JA8/10 1000 Hz 28,63 %

TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)
PstLM value (F < 80 Hz) 0,37
SVM value (80 < F < 2000 Hz) 1,07

Flicker indices according to Lighting Research Center (2015)
Perception metric, Assist Mp 0,35

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

Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

