

Light Measurement Report

Print date: 15-9-2025

Measurement date and time: 15-9-2025 13:56:55 – Measurement no. VFR-250915-3198-MS

Measurement tracking No. and Link: [VT250915-007355](#)

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

12 planes – 30°

5°

9,59 m

37,7 W – PF 0,98 – DPF 0,99

230 V – 0,166 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)

813659-4000K-40W

813659-4000K-40W – Dutchfulfillment

LED BATTEN | CLIFF | 25-45W | 120CM | PHILIPS DRIVER | 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

4952 lm – 8,36% / 91,64%

132 lm/W

1352 cd – 121,3°

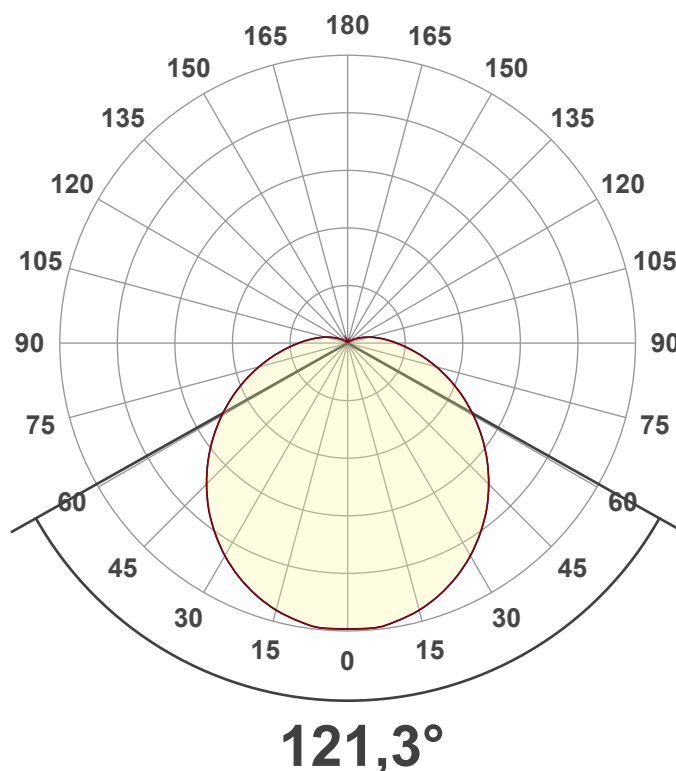
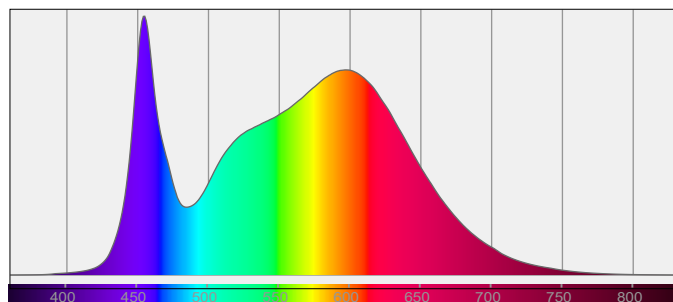
CCT = 4000 K / 4090 K

CRI 85,5

R_f 84,1 – R_g 95,0

Duv -0,0026 – SDCM 3,0

SVM 0,02 – PstLM 0,01



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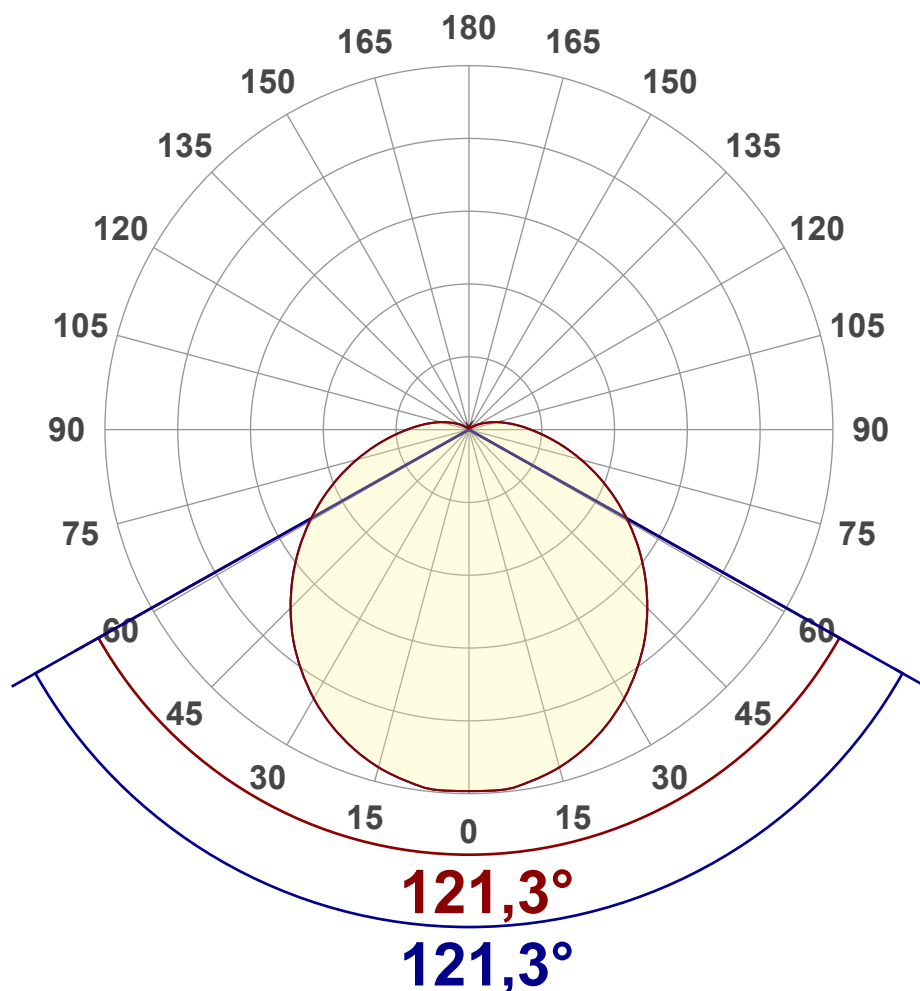
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	4952 lm
Lumen Up% / Down%	8,36% / 91,64%
Peak Intensity	1352 cd
Beam Angle (50%)	121,3°
Beam Angle (90%)	121,3°
Beam Angle (10%)	121,3°

Cut-off Angle

Average 2,5%	241,8°
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Field Angle

Average 10%	202,1°
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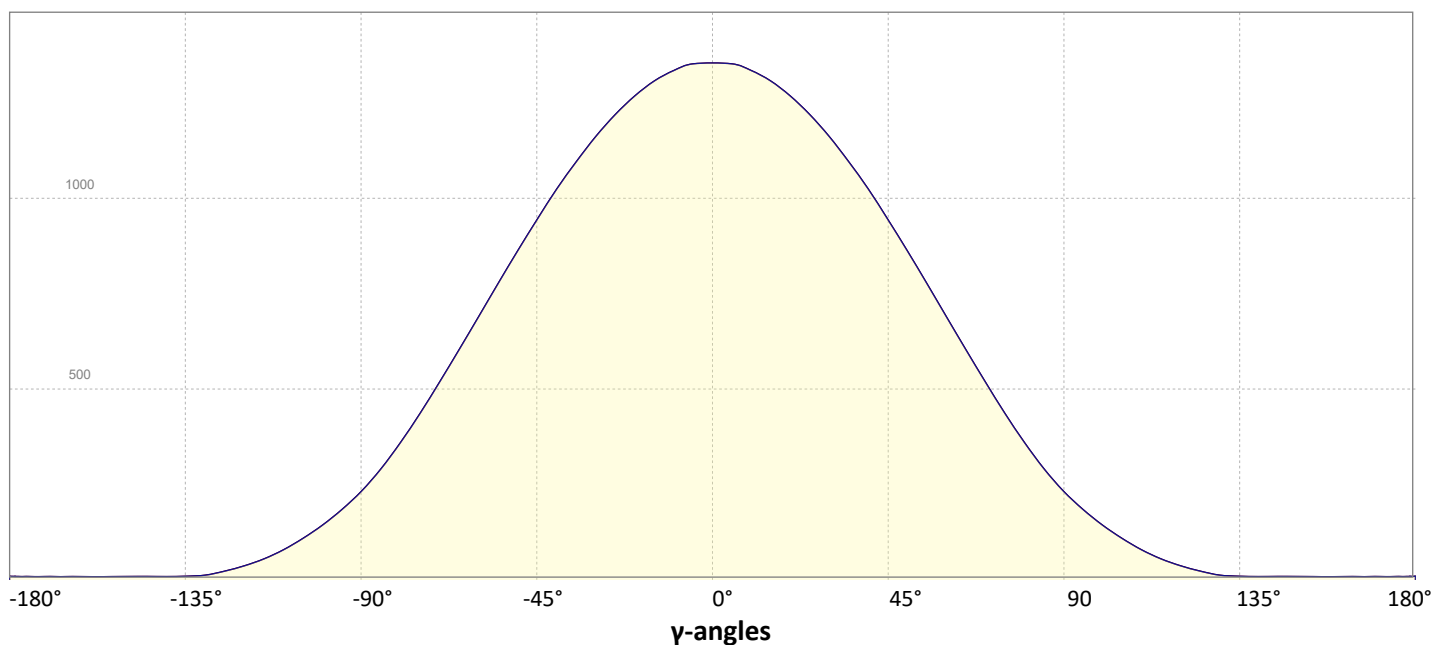
Intensity Ratio

In 120° cone	63,9%
In 90° cone	42,5%

C000-C180

C090-C270

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

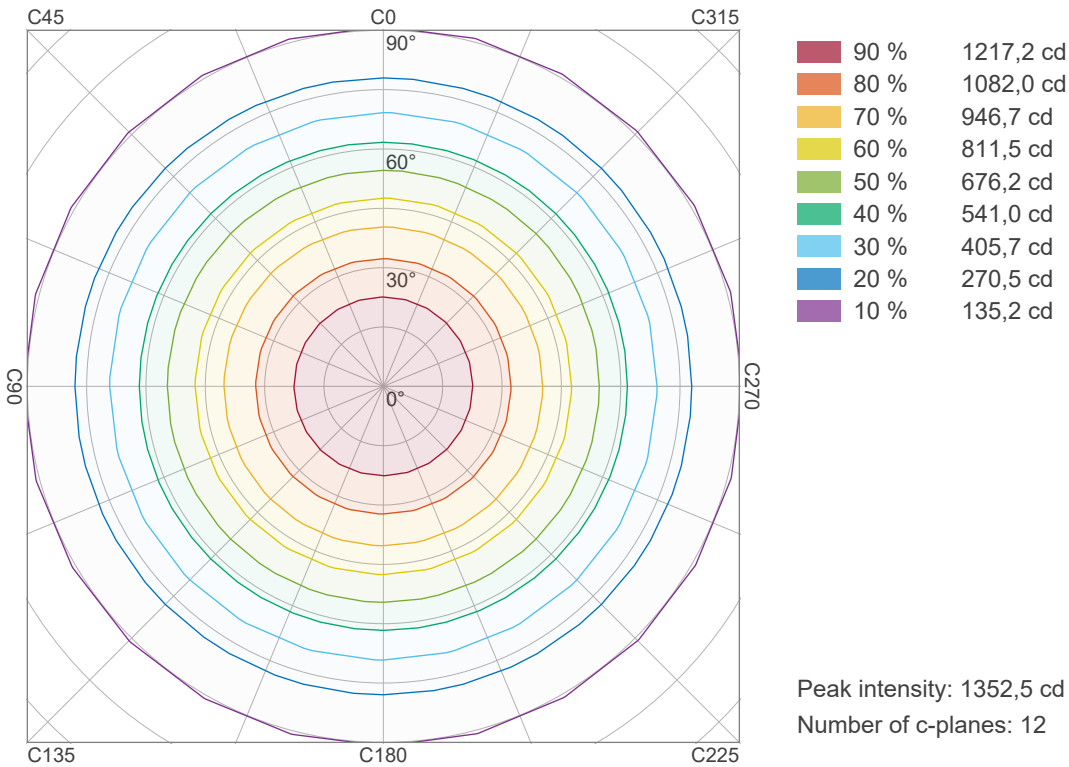


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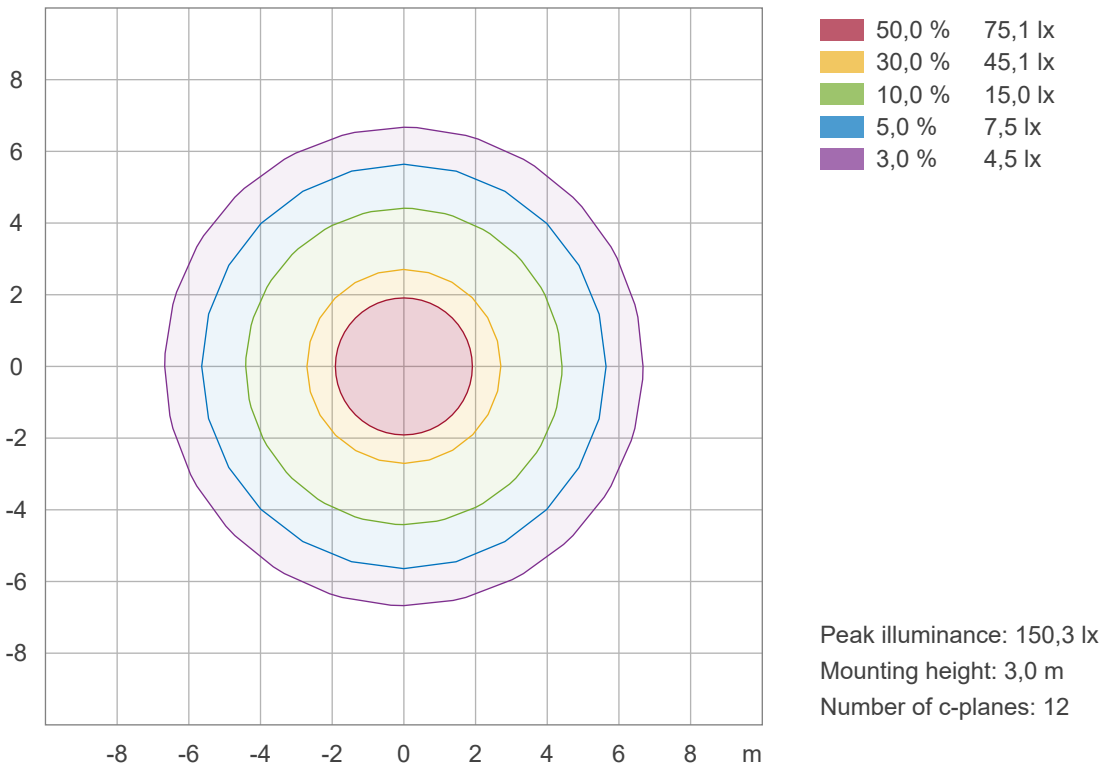
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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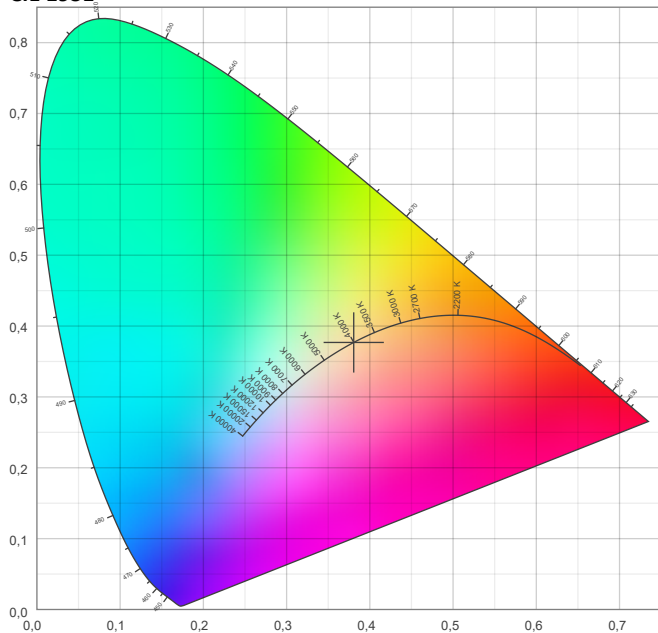


Color details

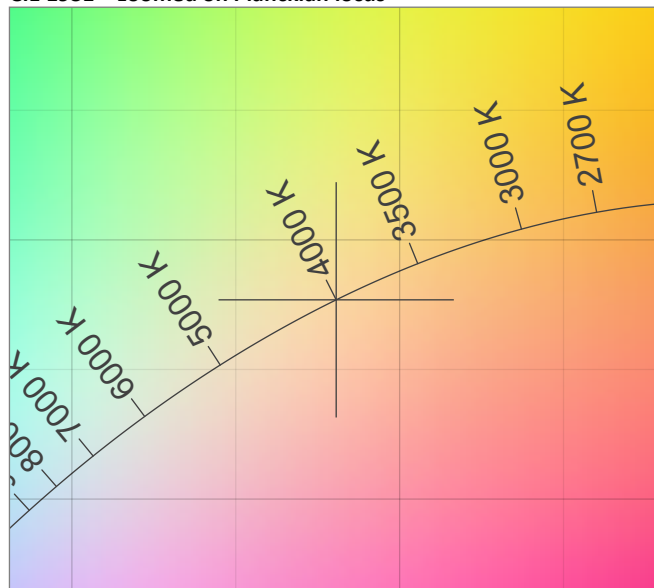
Correlated Color Temperature, Target CCT = 4000 K
Correlated Color Temperature, Measured CCT = 4090 K
Color Rendering Index CRI 85,5
Color Rendering Index, R9 (red component) R9 = 20,5
Color Rendering TM30-18 R_f 84,1 – R_g 95,0
Color Quality Scale CQS = 83,0

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0,381;0,377)
Color coordinate CIEs 1960 (u;v) = (0,225;0,334)
Color deviation from BBL Duv = -0,0026
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,225;0,502)

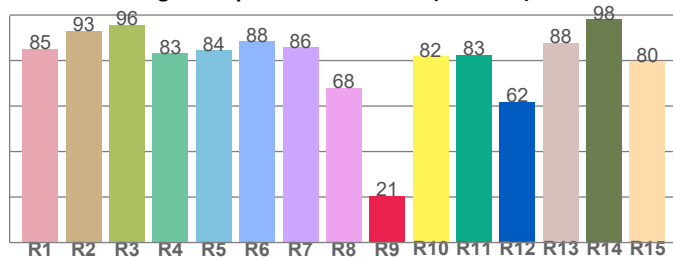
CIE 1931



CIE 1931 – zoomed on Planckian locus



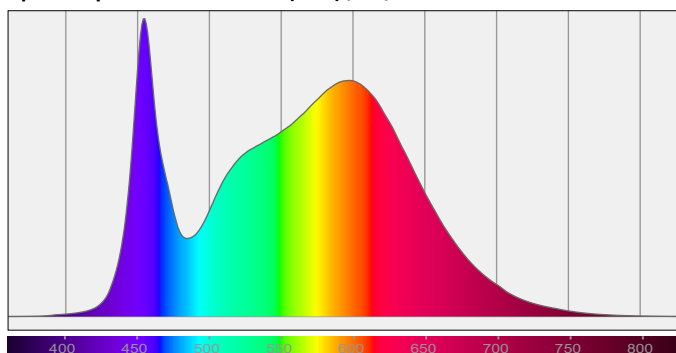
Color Rendering Index per reference color (CIE 1995)



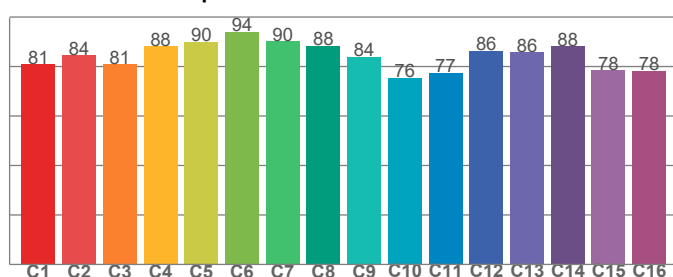
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
85,3	93,0	95,7	83,3	84,4	88,4	85,9	68,0	20,5	81,8	82,6	61,9	87,9	98,3	79,7

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



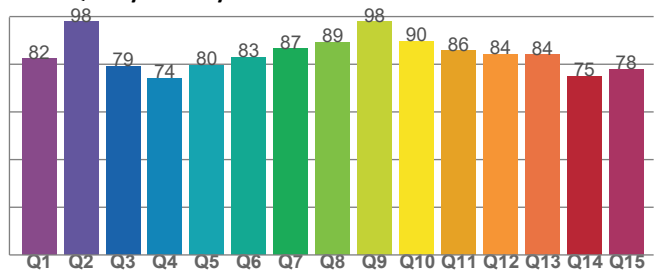
TM30-18 R_f-values per hue bin



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
80,8	84,5	81,0	88,1	90,0	94,1	90,3	88,4	83,9	75,5	77,4	86,3	85,8	88,3	78,4	78,3

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
82,4	97,8	79,1	74,1	79,6	83,0	86,6	89,2	97,9	89,7	85,7	84,1	83,9	75,1	77,9

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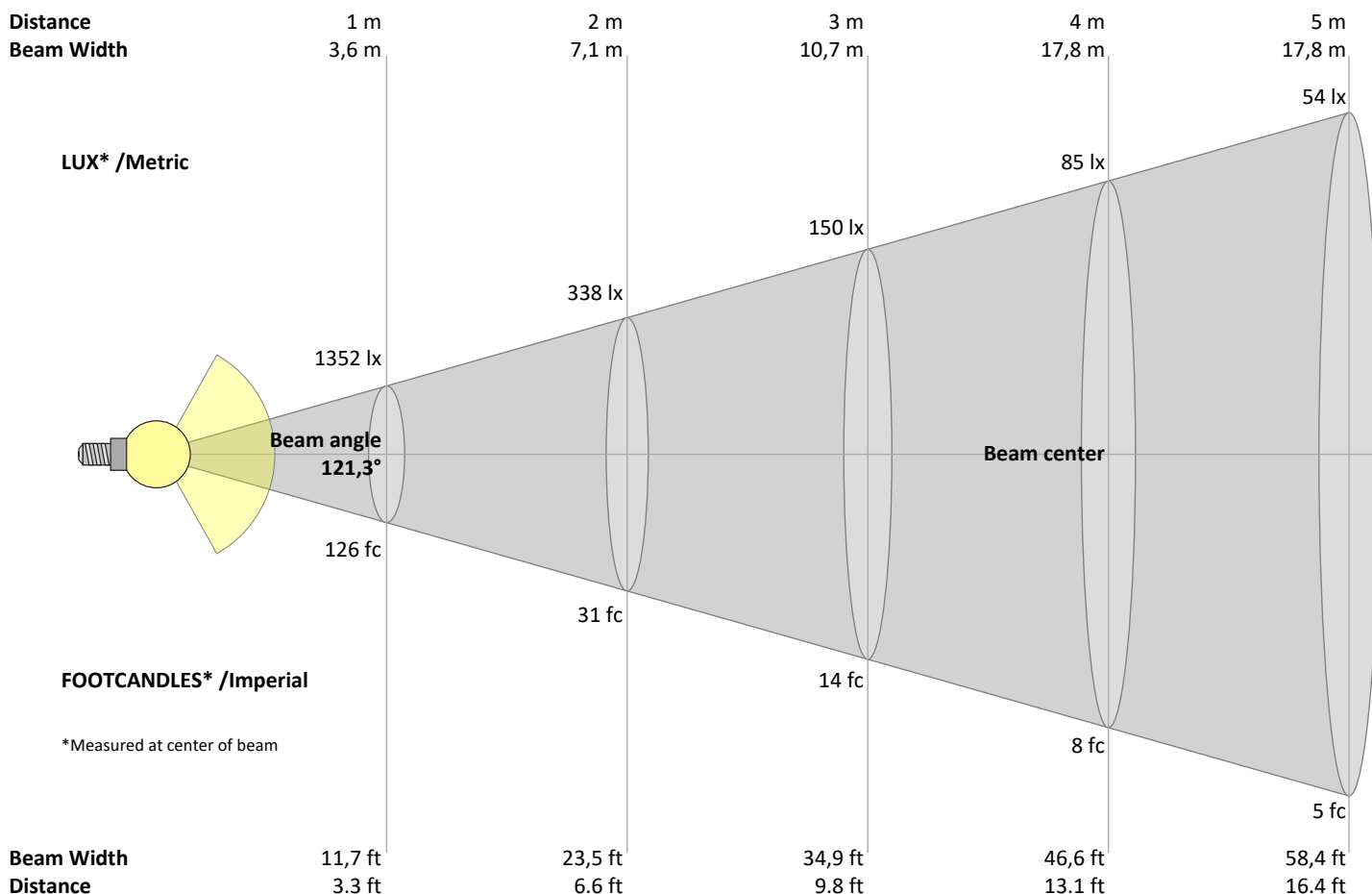
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Beam Details



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
1352	338	150	85	54	38	28	21	17	14	11	9	8	7	6	5	5	4	4	3	lux
125,7	31,4	14	7,9	5	3,5	2,6	2	1,6	1,3	1	0,9	0,7	0,6	0,6	0,5	0,4	0,4	0,3	0,3	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
1352	1338	1283	1195	1080	943	792	636	484	345	231	150	90	47	20	9	9	8	8	8	cd
100%	99%	95%	88%	80%	70%	59%	47%	36%	25%	17%	11%	7%	3%	2%	1%	1%	1%	1%	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
1352	1338	1283	1195	1080	943	792	636	484	345	231	150	90	47	20	9	9	8	8	8	cd
100%	99%	95%	88%	80%	70%	59%	47%	36%	25%	17%	11%	7%	3%	2%	1%	1%	1%	1%	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
1352	1338	1283	1195	1080	943	792	636	484	345	231	150	90	47	20	9	9	8	8	8	cd
100%	99%	95%	88%	80%	70%	59%	47%	36%	25%	17%	11%	7%	3%	2%	1%	1%	1%	1%	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
1352	1338	1283	1195	1080	943	792	636	484	345	231	150	90	47	20	9	9	8	8	8	cd
100%	99%	95%	88%	80%	70%	59%	47%	36%	25%	17%	11%	7%	3%	2%	1%	1%	1%	1%	1%	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					Viewed Endwise				
		(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
2H	2H	21,1	22,4	21,5	22,8	23,2	21,5	22,8	21,9	23,2	23,6
	3H	22,9	24,2	23,5	24,6	25,0	23,5	24,8	24,0	25,2	25,6
	4H	23,9	25,1	24,4	25,5	25,9	24,6	25,8	25,1	26,2	26,6
	6H	24,8	25,9	25,3	26,3	26,8	25,7	26,8	26,2	27,2	27,7
	8H	25,2	26,3	25,7	26,7	27,3	26,3	27,4	26,8	27,8	28,3
	12H	25,6	26,7	26,1	27,1	27,7	26,9	28,0	27,4	28,4	29,0
4H	2H	21,9	23,1	22,4	23,5	23,9	22,2	23,3	22,7	23,8	24,2
	3H	24,0	25,0	24,5	25,5	26,1	24,5	25,5	24,9	25,9	26,5
	4H	25,0	26,0	25,5	26,5	27,2	25,6	26,6	26,1	27,1	27,8
	6H	26,0	26,9	26,6	27,4	28,0	26,9	27,8	27,5	28,2	28,8
	8H	26,5	27,4	27,2	27,9	28,4	27,5	28,3	28,1	28,9	29,4
	12H	27,1	27,7	27,6	28,3	28,9	28,3	29,0	28,9	29,5	30,1
8H	4H	25,5	26,3	26,1	26,8	27,3	26,0	26,8	26,6	27,3	27,8
	6H	26,8	27,4	27,4	28,0	28,7	27,5	28,1	28,1	28,7	29,4
	8H	27,4	28,0	28,1	28,6	29,4	28,3	28,9	28,9	29,5	30,3
	12H	28,1	28,6	28,8	29,2	29,9	29,2	29,7	29,9	30,4	31,1
12H	4H	25,6	26,3	26,2	26,8	27,4	26,0	26,7	26,6	27,3	27,9
	6H	27,0	27,5	27,6	28,2	28,9	27,6	28,2	28,3	28,8	29,6
	8H	27,7	28,2	28,4	28,8	29,5	28,5	29,0	29,2	29,6	30,4
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H		0,1 / -0,1					0,1 / -0,1				
S = 1.5H		0,1 / -0,1					0,1 / -0,1				
S = 2.0H		0,2 / -0,2					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	117	117	117	117	113	113	113	113	106	106	106	100	100	100	94	94	94	92
1	104	99	94	89	101	96	91	87	90	86	82	84	81	78	79	77	74	72
2	94	85	77	71	91	82	75	69	77	71	66	73	68	63	68	64	61	58
3	85	74	65	58	82	72	63	57	67	60	55	63	58	53	60	55	51	48
4	78	65	56	48	75	63	54	48	59	52	46	56	50	45	53	48	43	40
5	71	58	48	41	69	56	47	41	53	45	40	50	44	38	47	42	37	35
6	66	52	43	36	63	51	42	35	48	40	34	45	39	33	43	37	32	30
7	61	47	38	32	59	46	37	31	43	36	30	41	34	29	39	33	29	27
8	57	43	34	28	55	42	33	28	40	32	27	38	31	26	36	30	26	24
9	53	39	31	25	51	38	30	25	36	29	24	35	28	24	33	27	23	21
10	50	36	28	23	48	35	28	22	34	27	22	32	26	21	31	25	21	19

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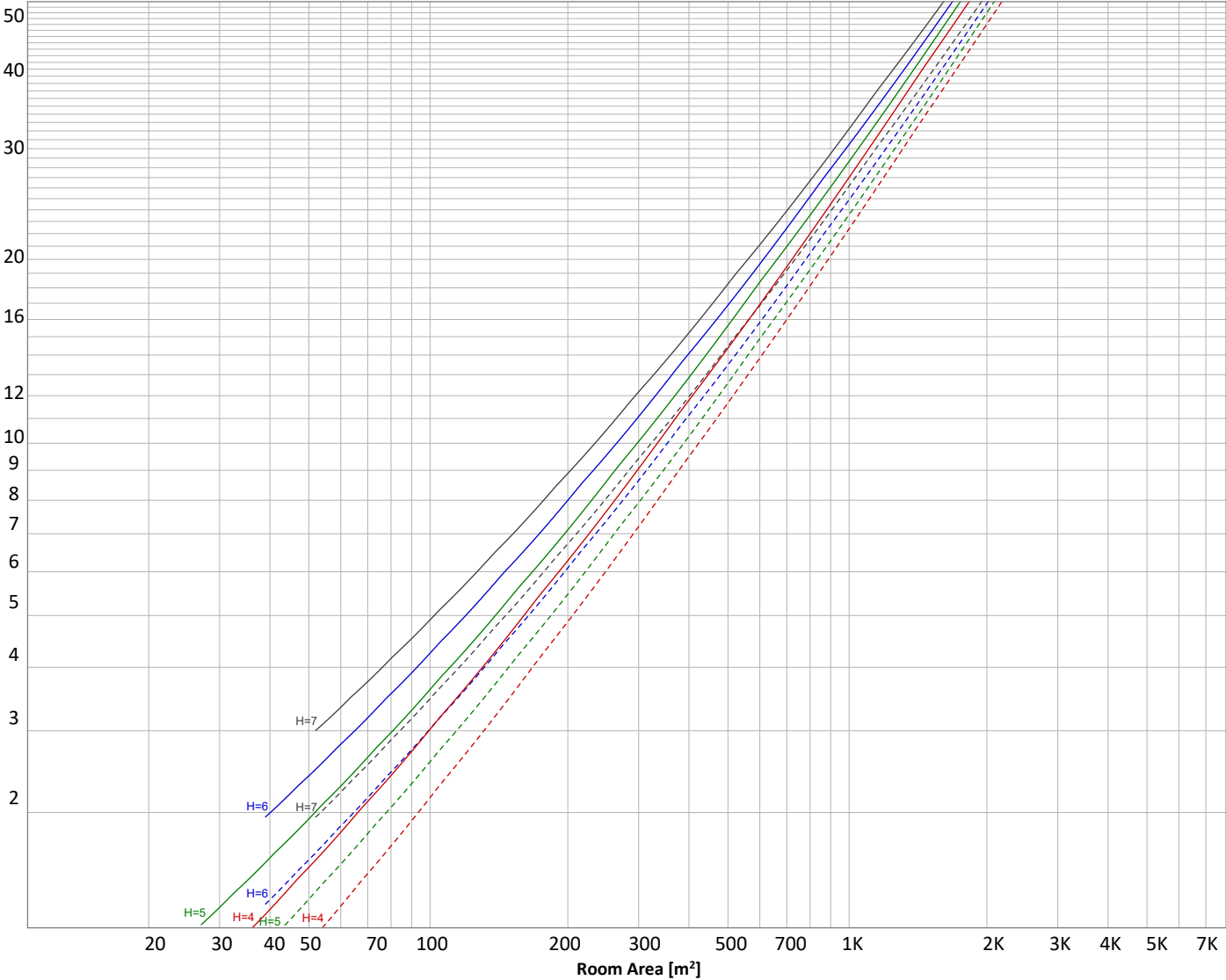
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 4952 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°
128 lm	368 lm	561 lm	685 lm	728 lm	693 lm	596 lm	460 lm	318 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
202 lm	115 lm	55,5 lm	21,1 lm	7,57 lm	5,42 lm	3,84 lm	2,38 lm	0,806 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	128 lm	2,6%
10-20°	368 lm	7,4%
20-30°	561 lm	11,3%
30-40°	685 lm	13,8%
40-50°	728 lm	14,7%
50-60°	693 lm	14,0%
60-70°	596 lm	12,0%
70-80°	460 lm	9,3%
80-90°	318 lm	6,4%
90-100°	202 lm	4,1%
100-110°	115 lm	2,3%
110-120°	55 lm	1,1%
120-130°	21 lm	0,4%
130-140°	8 lm	0,2%
140-150°	5 lm	0,1%
150-160°	4 lm	0,1%
160-170°	2 lm	0,0%
170-180°	1 lm	0,0%
Total	4952 lm	100,0%

Intensity peaks

Max intensity	1352 cd
Intensity, 90°	231 cd
Intensity, 0°	1352 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	1058 lm	21,4%
0-40°	1743 lm	35,2%
0-60°	3163 lm	63,9%
60-90°	1375 lm	27,8%
70-100°	981 lm	19,8%
90-120°	373 lm	7,5%
0-90°	4538 lm	91,6%
90-180°	414 lm	8,4%
0-180°	4952 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	529 lm	10,7%
Medium(30-60°)	1053 lm	21,3%
High(60-80°)	528 lm	10,7%
Very high(80-90°)	159 lm	3,2%
Back light		
Low(0-30°)	529 lm	10,7%
Medium(30-60°)	1053 lm	21,3%
High(60-80°)	528 lm	10,7%
Very high(80-90°)	159 lm	3,2%

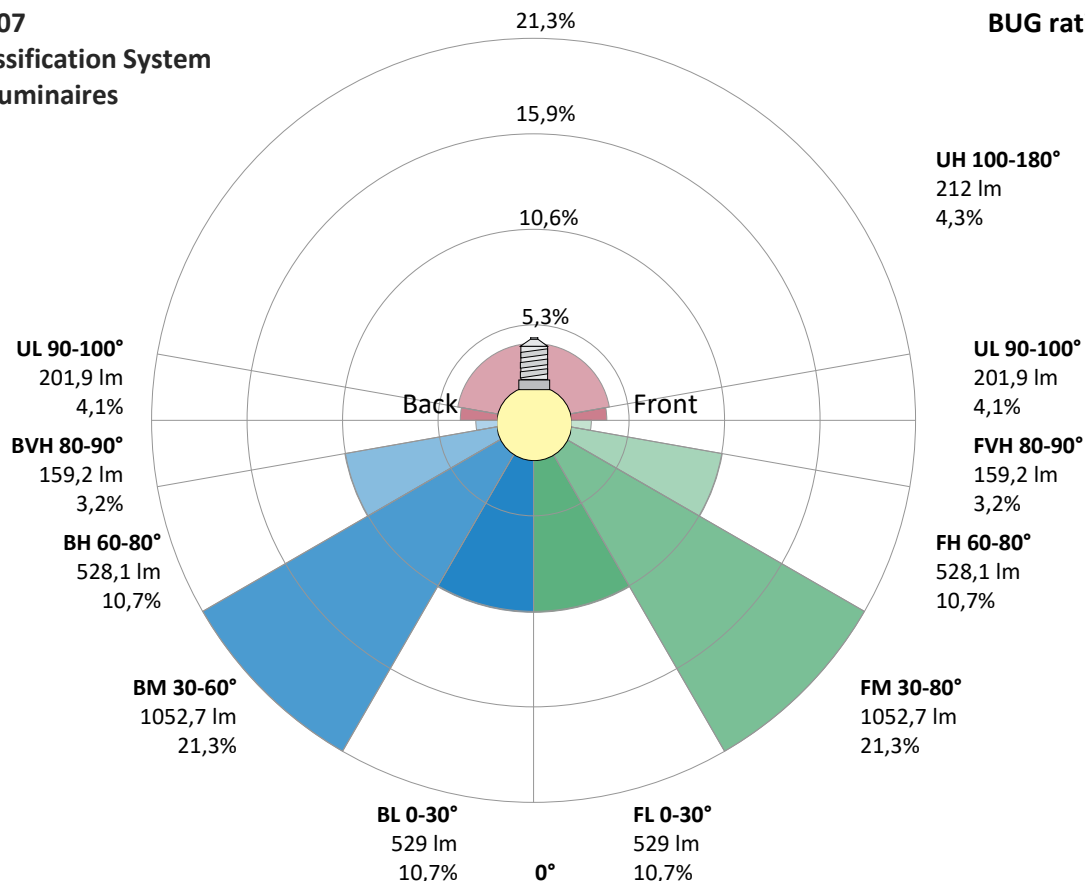
Uplight

Low(90-100°)	202 lm	4,1%
High(100-180°)	212 lm	4,3%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B2 U3 G2



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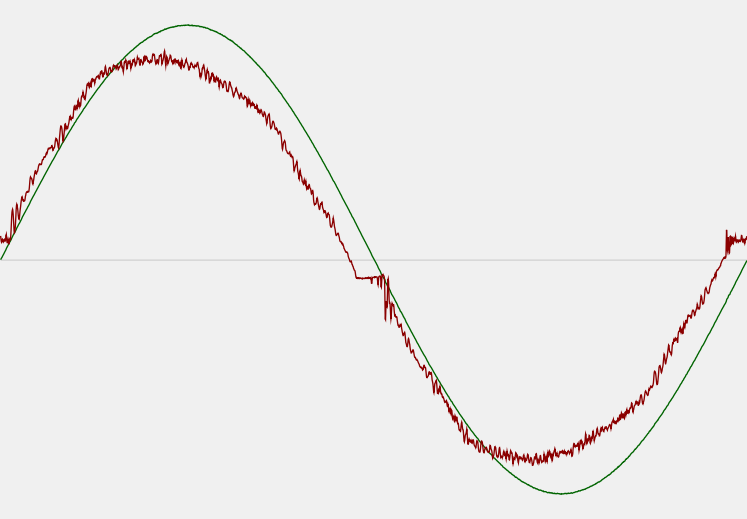


Power Details

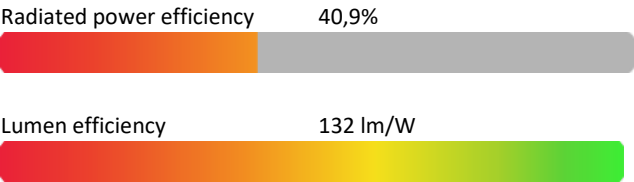
Input Power

Power feed to light source	37,7 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,166 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	38,26 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,98
Total harmonic distortion of the current	5,15%
Total harmonic distortion of the voltage	0,05%

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	4001 K
CCT shift	-1 K
CCT end	4000 K

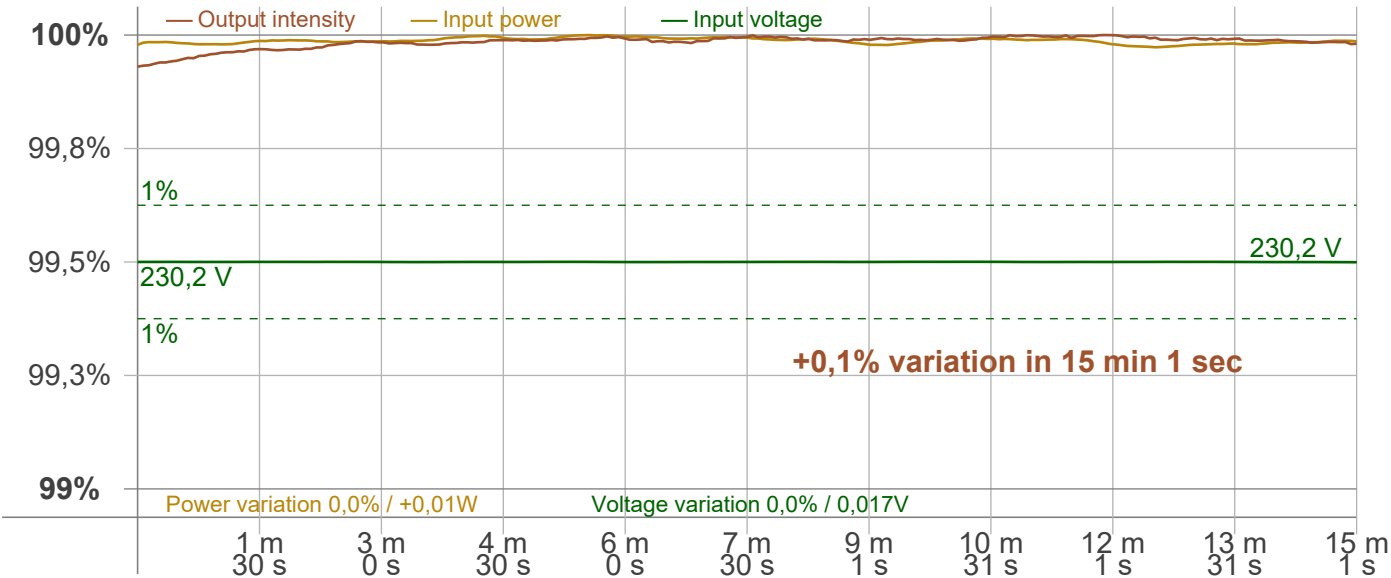
Warmup Result

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

Output Change

Output start	4949 lm
Output change	+3 lm
Output end	4952 lm

Stabilization Curve



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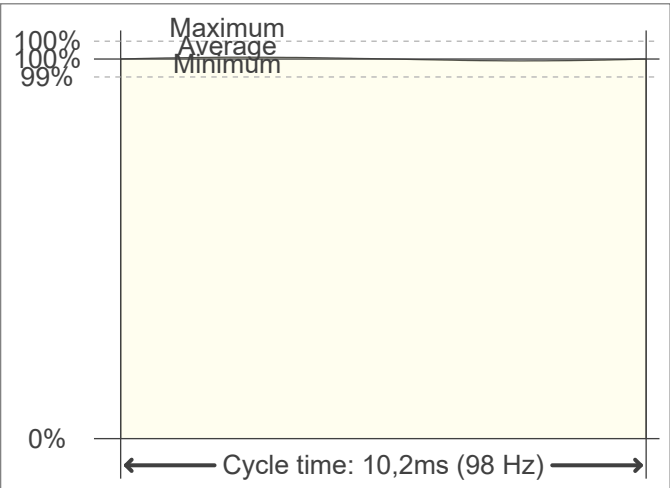
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Flicker /TLA details

Flicker Meter Type	Viso Systems LabFlicker	Measurement time	
Frequency of input power	50 Hz	PstLM	180 sec
Flicker/TLA sample rate	20000 samples/s	All other indices	1,2 sec
Flicker indices according to Illuminating Engineering Society (IES)		Flicker indices according to California Energy Commission (CEC) 2016b	
Flicker frequency	98,04 Hz	JA8/10 40 Hz	0,01 %
Percent Flicker	0,5 %	JA8/10 90 Hz	0,05 %
Flicker index	0	JA8/10 200 Hz	0,49 %
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)		JA8/10 400 Hz	0,49 %
PstLM value (F < 80 Hz)	0,01	JA8/10 1000 Hz	0,5 %
SVM value (80 < F < 2000 Hz)	0,02	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

