Light Measurement Report

Print date: 21/05/2026
Measurement date and time: 21/05/2026 11:39:29 – Measurement no. VFR-260521-1548-MS
Measurement tracking No. and Link: VT260521-008481
Operator: LC

Laboratory and Equipment

Laboratory Owner and Location	Viso Systems, Copenhagen V, Denmark
Goniospectrometer System and Type	LabSpion – Type C, horizontal
Sensor Name, Calibr. Date and Serial No.	LabSensor Model2 – 11/12/2024 – 3532797498
Spectrometer Manufacturer and Model	Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

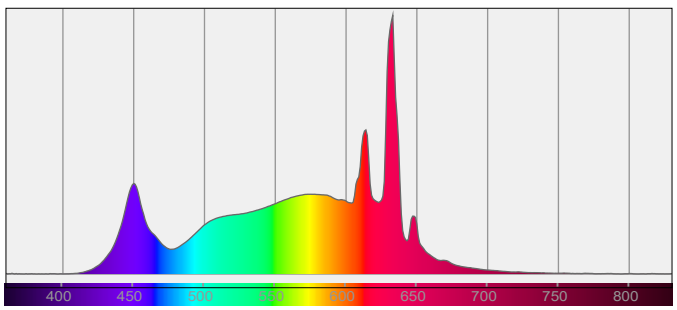
Number of C-planes and Resolution	12 planes – 30°
γ (gamma)-Resolution	1,5°
Test Distance	1,10 m
Input Power, Power and Displ. Factors	28,0 W – PF 0,97 – DPF 0,98
Input RMS Voltage and Current	241 V – 0,120 A
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Lamp stabilized in 15 min 1 sec – 2,0%

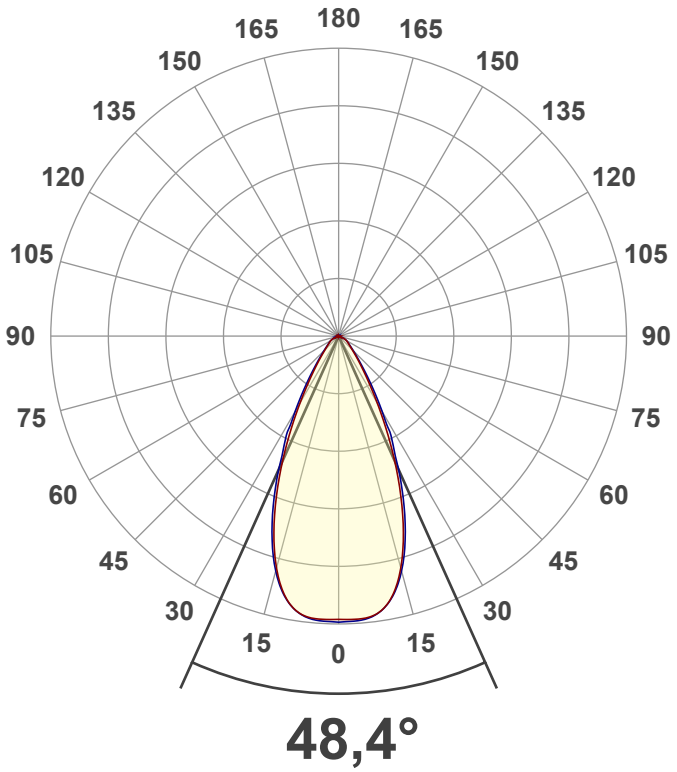
Tested Light Source

Product Name	ORION 30 3500K 45D WHITE
Item No. and Manufacturer	02230100354503 – ELECTRUM
Product Description (line 1)	700mA

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	3996 lm – 0,04% / 99,96%
Efficiency	143 lm/W
Peak Intensity and Beam Angle	5249 cd – 48,4°
Correlated Color Temperature, Target/Measured	CCT = 3500 K / 3440 K
Color Rendering Index	CRI 96,1
Color Rendering TM30-18	R_f 91,7 – R_g 103,2
Color Shift, CIE duv and MacAdam Steps	Duv -0,0052 – SDCM 4,3
Flicker	SVM 0,01 – PstLM 0,04

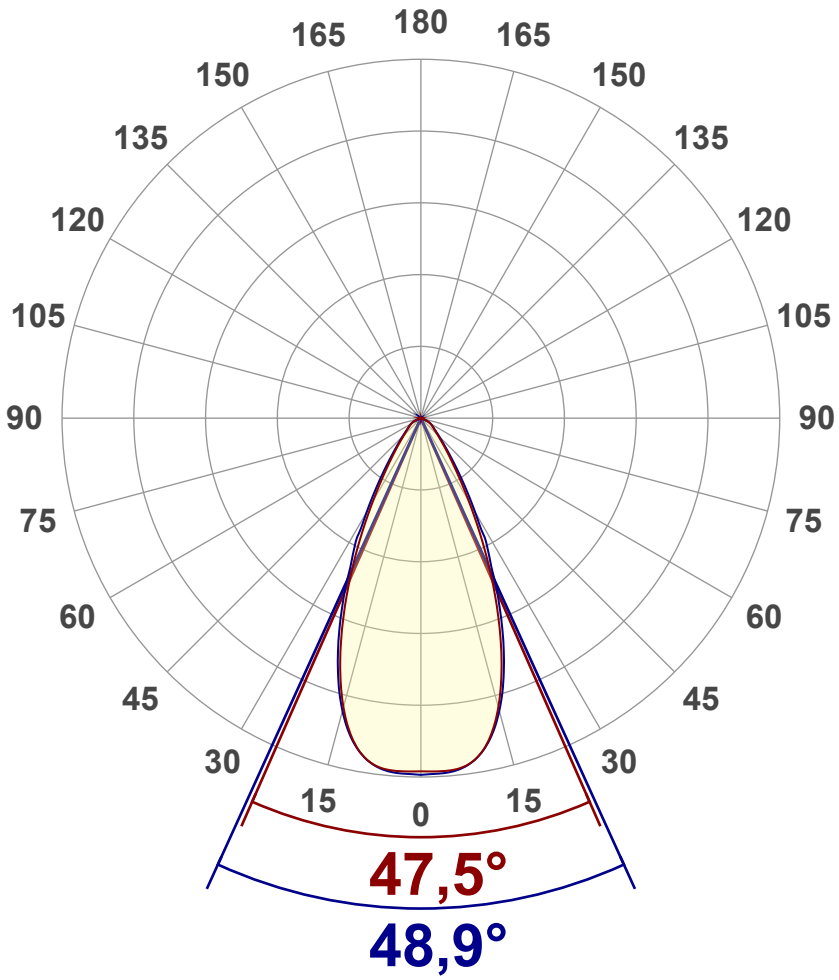




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Luminous Intensity diagram Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	3996 lm
Lumen Up% / Down%	0,04% / 99,96%
Peak Intensity	5249 cd
Beam Angle (50%-FWHM)	48,37°

Cut-off Angle

Average 2,5%	126,6°

Field Angle

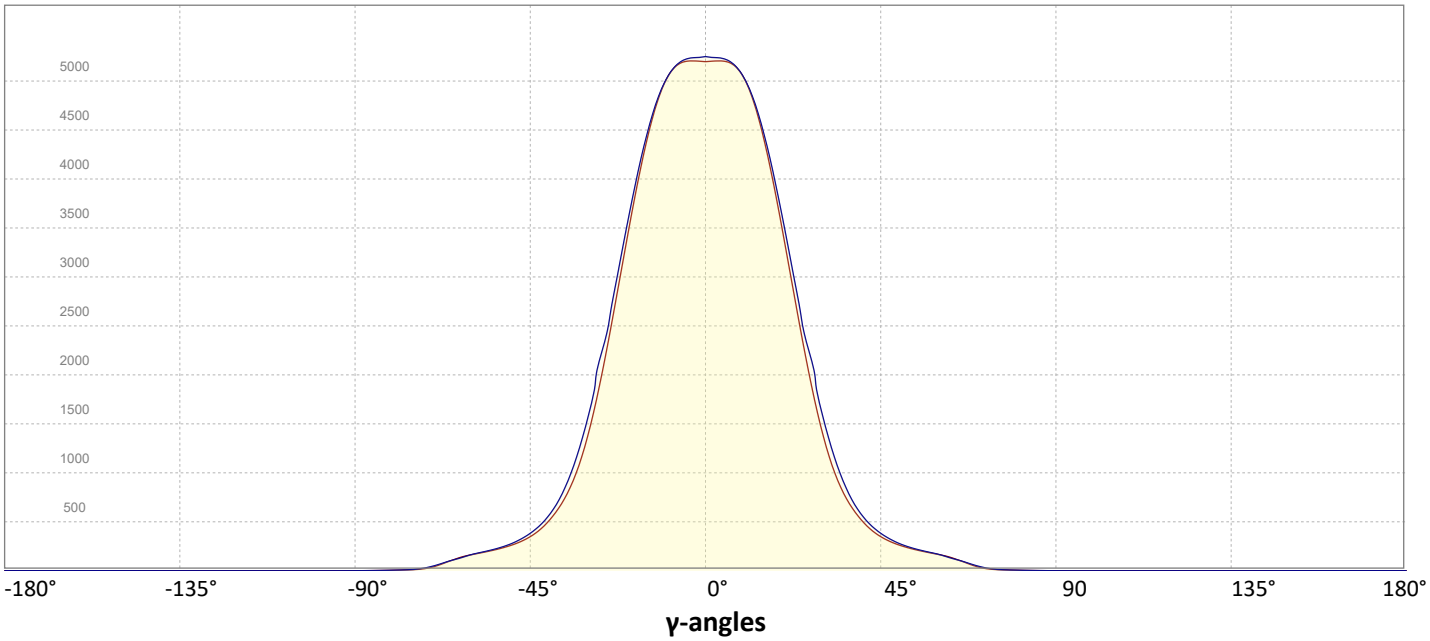
Average 10%	81°

Intensity Ratio

In 120° cone	96,8%
In 90° cone	89,0%

C000-C180
C090-C270

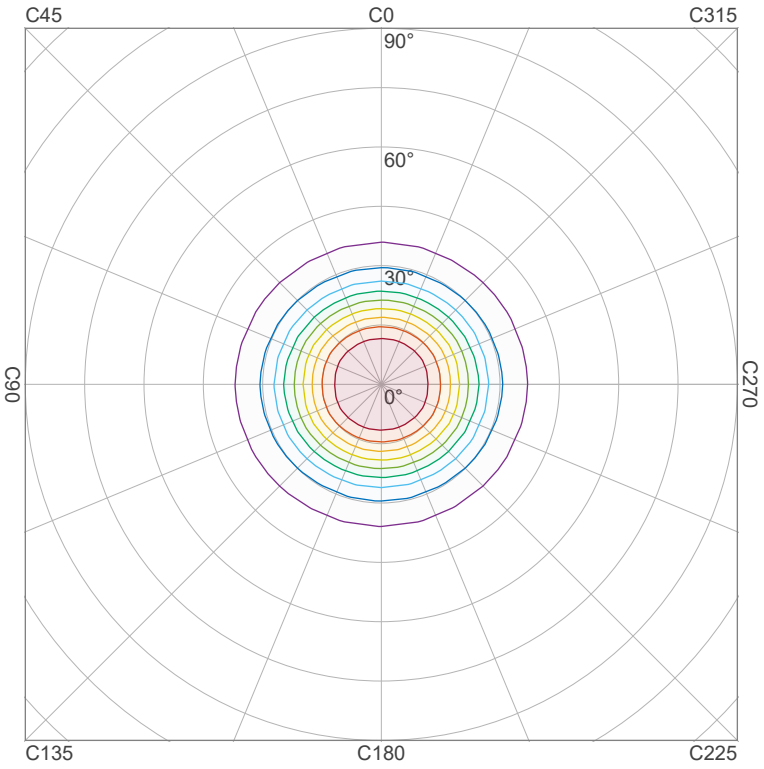
Linear distribution diagram - Intensity (candela) vs γ-angle



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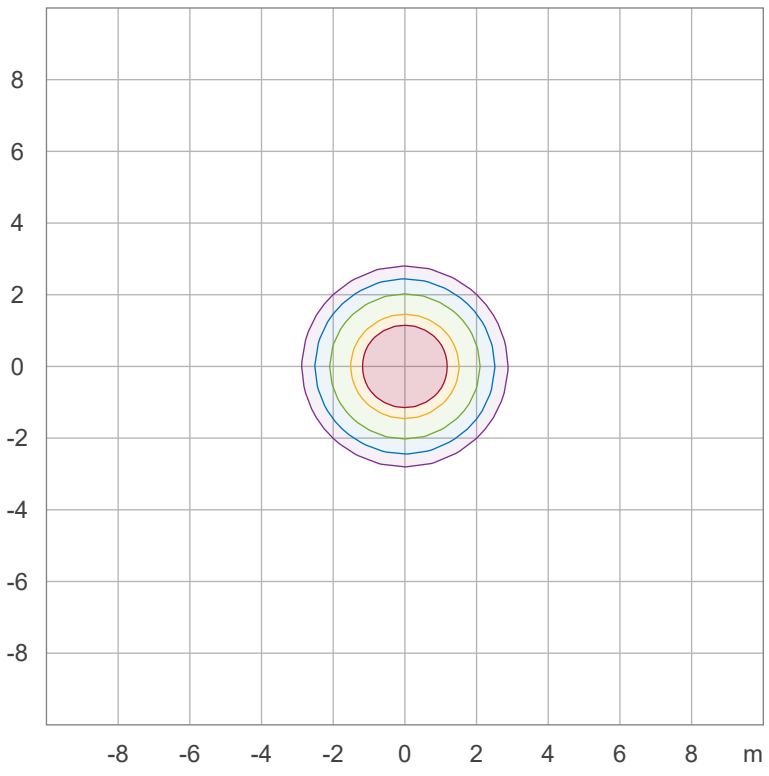
Iso-intensity Diagram (Iso-candela)



90 %	4719,8 cd
80 %	4195,4 cd
70 %	3671,0 cd
60 %	3146,6 cd
50 %	2622,1 cd
40 %	2097,7 cd
30 %	1573,3 cd
20 %	1048,9 cd
10 %	524,4 cd

Peak intensity: 5244,3 cd
Number of c-planes: 12

Iso-illuminance Diagram (Iso-lux)



50,0 %	291,2 lx
30,0 %	174,7 lx
10,0 %	58,2 lx
5,0 %	29,1 lx
3,0 %	17,5 lx

Peak illuminance: 582,4 lx
Mounting height: 3,0 m
Number of c-planes: 12

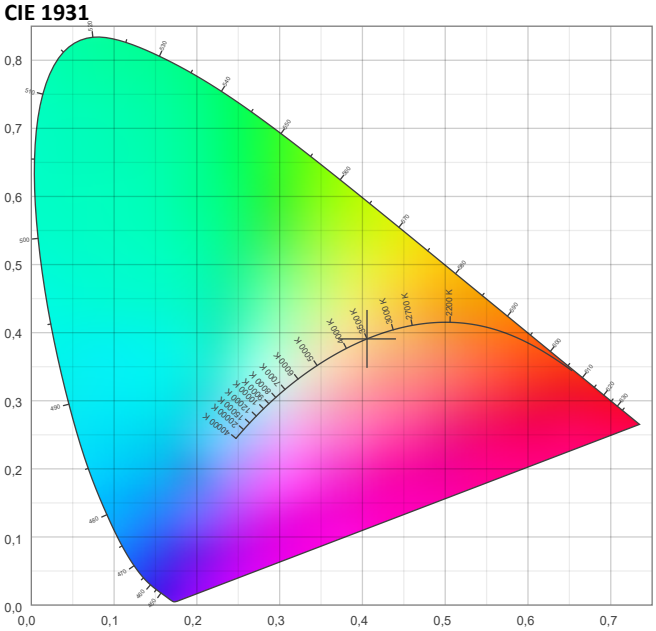
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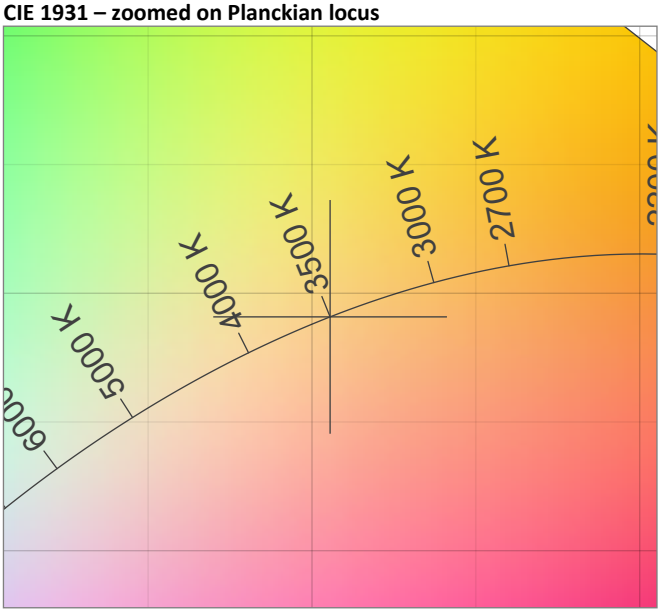
Color details

Correlated Color Temperature, Target	CCT = 3500 K
Correlated Color Temperature, Measured	CCT = 3440 K
Color Rendering Index	CRI 96,1
Color Rendering Index, R9 (red component)	R9 = 83,0
Color Rendering TM30-18	R_f 91,7 – R_g 103,2
Color Quality Scale	CQS = 92,8
MacAdam Steps	SDCM = 4,3
Color coordinates CIE 1931	(x;y) = (0,406;0,391)
Color coordinate CIEs 1960	(u;v) = (0,236;0,341)
Color deviation from BBL	Duv = -0,0052
Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0,236;0,511)

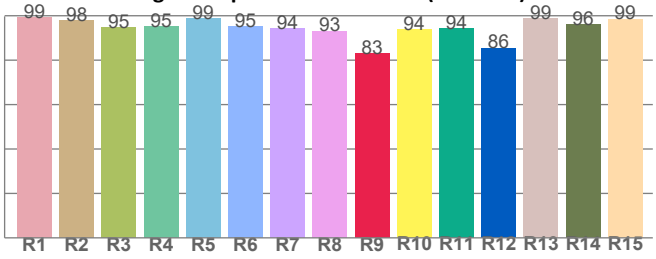
CIE 1931



CIE 1931 – zoomed on Planckian locus



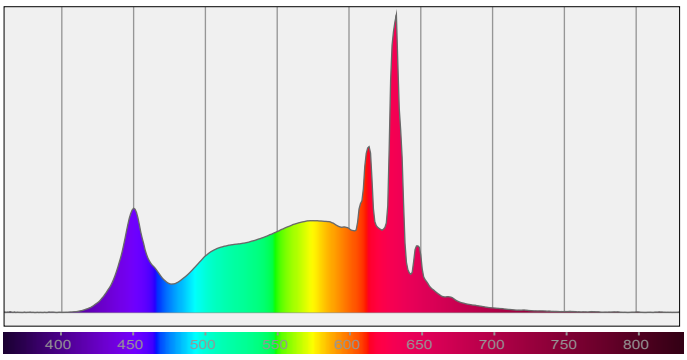
Color Rendering Index per reference color (CIE 1995)



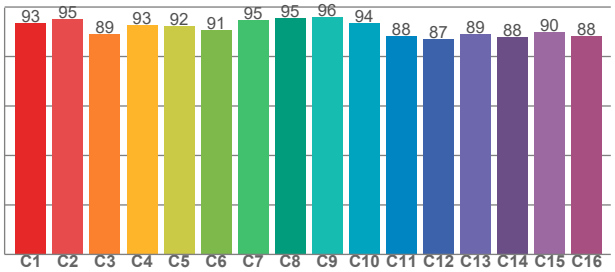
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
99,2	98,0	94,9	95,2	98,8	95,2	94,4	93,2	83,0	94,0	94,1	85,5	98,7	95,9	98,6

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



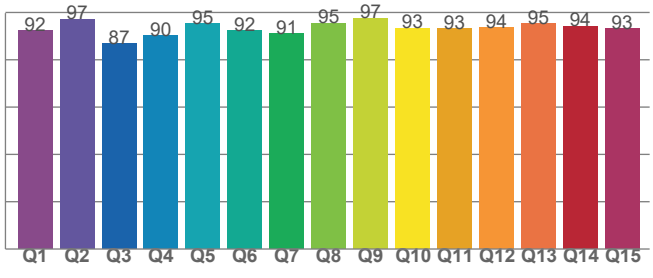
TM30-18 Rf-values per hue bin



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
93,5	95,2	89,0	92,7	92,2	90,8	94,7	95,5	96,0	93,6	88,3	87,0	89,1	87,7	89,9	88,4

Color Quality Scale by reference color



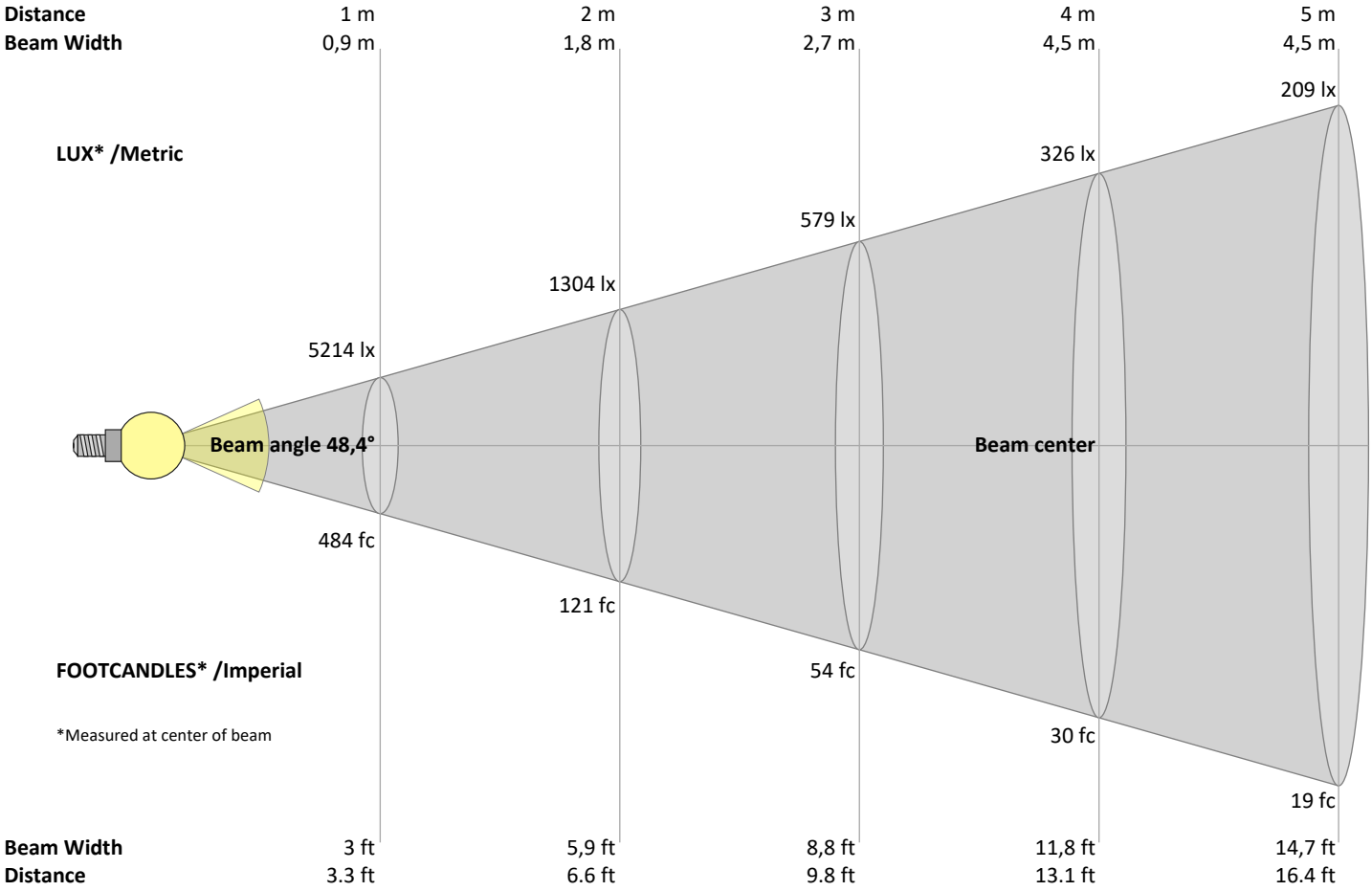
CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
92,3	97,2	86,8	90,2	95,2	92,4	91,0	95,4	97,5	93,4	93,1	93,6	95,2	94,3	93,1

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
5214	1304	579	326	209	145	106	81	64	52	43	36	31	27	23	20	18	16	14	13	lux
484,4	121,1	53,8	30,3	19,4	13,5	9,9	7,6	6	4,8	4	3,4	2,9	2,5	2,2	1,9	1,7	1,5	1,3	1,2	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
5214	5203	5204	5189	5134	5016	4828	4561	4226	3842	3420	2983	2546	2129	1749	1414	1138	922	752	623	cd
100%	100%	100%	100%	98%	96%	93%	87%	81%	74%	66%	57%	49%	41%	34%	27%	22%	18%	14%	12%	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
5214	5240	5232	5206	5137	5020	4847	4602	4300	3947	3556	3143	2727	2327	2000	1595	1305	1058	856	699	cd
100%	100%	100%	100%	99%	96%	93%	88%	82%	76%	68%	60%	52%	45%	38%	31%	25%	20%	16%	13%	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
5214	5203	5204	5189	5134	5016	4828	4561	4226	3842	3420	2983	2546	2129	1749	1414	1138	922	752	623	cd
100%	100%	100%	100%	98%	96%	93%	87%	81%	74%	66%	57%	49%	41%	34%	27%	22%	18%	14%	12%	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
5214	5240	5232	5206	5137	5020	4847	4602	4300	3947	3556	3143	2727	2327	2000	1595	1305	1058	856	699	cd
100%	100%	100%	100%	99%	96%	93%	88%	82%	76%	68%	60%	52%	45%	38%	31%	25%	20%	16%	13%	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			**Viewed Crosswise** (Viewing direction orthogonal to lamp length axis)					**Viewed Endwise** (Viewing direction parallel to lamp length axis)				
X	**Y**											
2H	2H	2H	25,4	26,1	25,5	26,3	26,5	25,7	26,4	25,8	26,6	26,8
		3H	25,5	26,3	25,9	26,5	26,7	25,8	26,7	26,2	26,9	27,0
		4H	25,5	26,3	25,9	26,5	26,7	25,8	26,6	26,2	26,8	27,1
		6H	25,5	26,1	25,8	26,4	26,8	25,8	26,5	26,1	26,8	27,1
		8H	25,5	26,1	25,8	26,4	26,8	25,8	26,4	26,1	26,7	27,1
		12H	25,4	26,0	25,7	26,3	26,8	25,7	26,3	26,1	26,7	27,1
4H	4H	2H	25,5	26,3	25,9	26,5	26,7	25,8	26,5	26,2	26,8	27,0
		3H	25,9	26,5	26,2	26,8	27,2	26,1	26,7	26,5	27,1	27,5
		4H	25,7	26,3	26,2	26,7	27,2	26,0	26,6	26,5	27,0	27,5
		6H	25,7	26,3	26,2	26,6	27,0	26,0	26,6	26,5	26,9	27,3
		8H	25,6	26,2	26,2	26,5	26,9	25,9	26,5	26,5	26,8	27,2
		12H	25,6	26,0	26,1	26,4	26,9	25,9	26,3	26,4	26,7	27,2
8H	8H	4H	25,6	26,2	26,2	26,5	26,9	25,9	26,5	26,5	26,8	27,2
		6H	25,6	26,0	26,1	26,4	27,0	25,9	26,3	26,4	26,7	27,3
		8H	25,6	25,9	26,1	26,4	27,0	25,9	26,2	26,4	26,7	27,3
		12H	25,6	25,8	26,1	26,3	26,9	25,8	26,1	26,4	26,6	27,2
12H	12H	4H	25,6	26,0	26,1	26,4	26,9	25,9	26,3	26,4	26,7	27,2
		6H	25,6	25,9	26,1	26,4	27,0	25,9	26,2	26,4	26,7	27,3
		8H	25,6	25,8	26,1	26,3	26,9	25,8	26,1	26,4	26,6	27,2

Variations with the observer position for the luminaire spacings, S:		
S = 1.0H	1,8 / -1,3	2,0 / -1,4
S = 1.5H	3,4 / -1,7	3,7 / -2,1
S = 2.0H	4,8 / -5,1	5,2 / -4,8

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	108	105	111	108	106	104	104	102	100	100	99	97	97	96	95	93
2	107	102	98	94	105	100	97	93	97	94	91	94	92	89	91	89	87	86
3	102	95	90	86	100	93	89	85	91	87	83	88	85	82	86	83	81	79
4	96	88	83	78	94	87	82	78	85	81	77	83	79	76	81	78	75	74
5	91	83	77	72	90	82	76	72	80	75	71	78	74	71	77	73	70	69
6	87	78	72	67	85	77	71	67	75	70	66	74	69	66	73	69	66	64
7	83	73	67	63	81	73	67	63	71	66	62	70	65	62	69	65	62	60
8	79	69	63	59	78	69	63	59	67	62	59	66	62	58	65	61	58	57
9	75	65	60	56	74	65	59	55	64	59	55	63	58	55	62	58	55	53
10	72	62	56	52	71	62	56	52	61	56	52	60	55	52	59	55	52	51

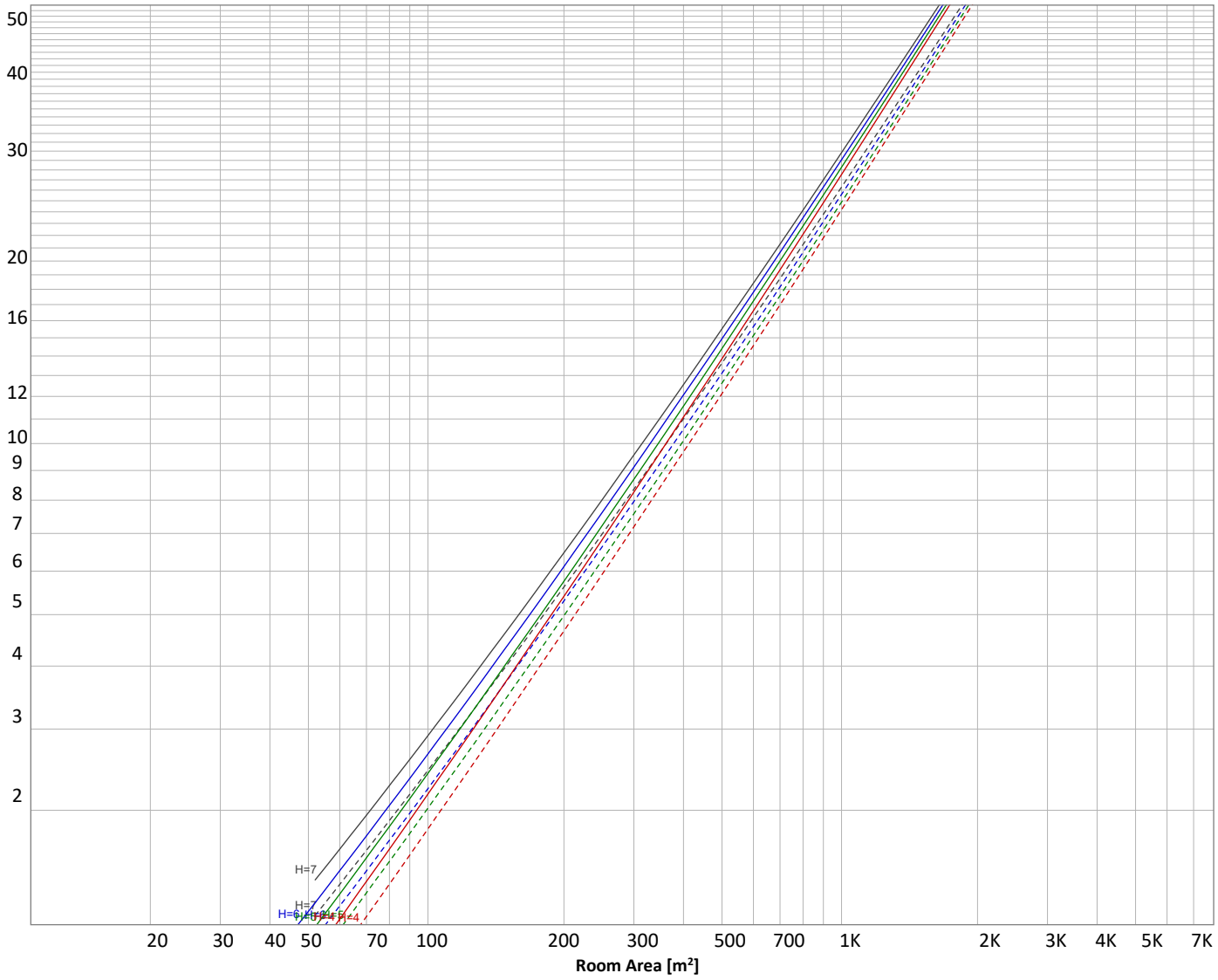
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 3996 lm		ρ(%)		
H_{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	Wall reflectance	Floor reflectance
H_{work} = Work area height from floor =	0.00 m	----------	70	50	30
E_{work} = Average lux on work area =	100 lx	————	50	30	20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
493 lm	1221 lm	1109 lm	571 lm	288 lm	188 lm	105 lm	16,6 lm	2,85 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,045 lm	0,031 lm	0,040 lm	0,070 lm	0,226 lm	0,357 lm	0,391 lm	0,275 lm	0,070 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	493 lm	12,3%
10-20°	1221 lm	30,6%
20-30°	1109 lm	27,7%
30-40°	571 lm	14,3%
40-50°	288 lm	7,2%
50-60°	188 lm	4,7%
60-70°	105 lm	2,6%
70-80°	17 lm	0,4%
80-90°	3 lm	0,1%
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	3996 lm	100,0%

Intensity peaks

Max intensity	5249 cd
Intensity, 90°	0 cd
Intensity, 0°	5214 cd

Zonal Lumen summary

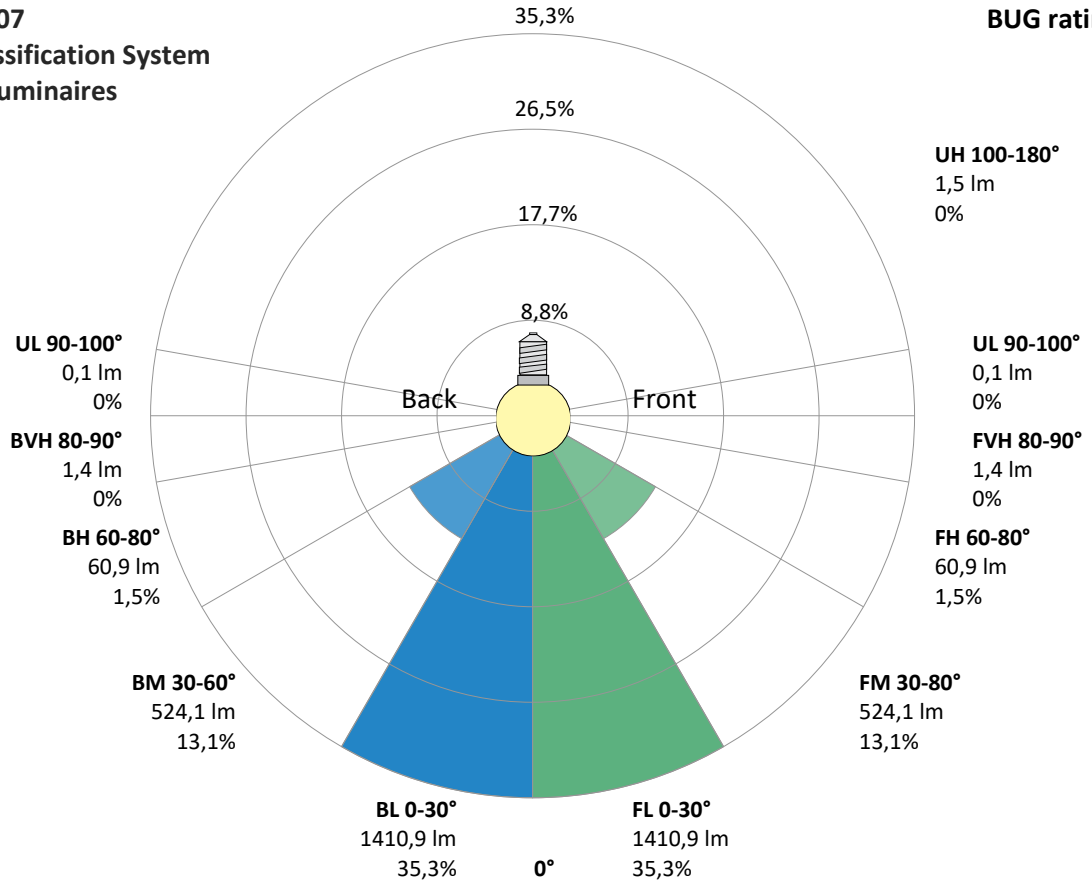
Zone (γ)	Lumen	% Total
0-30°	2822 lm	70,6%
0-40°	3394 lm	84,9%
0-60°	3870 lm	96,8%
60-90°	125 lm	3,1%
70-100°	20 lm	0,5%
90-120°	0 lm	0,0%
0-90°	3995 lm	100,0%
90-180°	2 lm	0,0%
0-180°	3996 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1411 lm	35,3%
Medium(30-60°)	524 lm	13,1%
High(60-80°)	61 lm	1,5%
Very high(80-90°)	1 lm	0,0%
Back light		
Low(0-30°)	1411 lm	35,3%
Medium(30-60°)	524 lm	13,1%
High(60-80°)	61 lm	1,5%
Very high(80-90°)	1 lm	0,0%
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 B3 U1 G0



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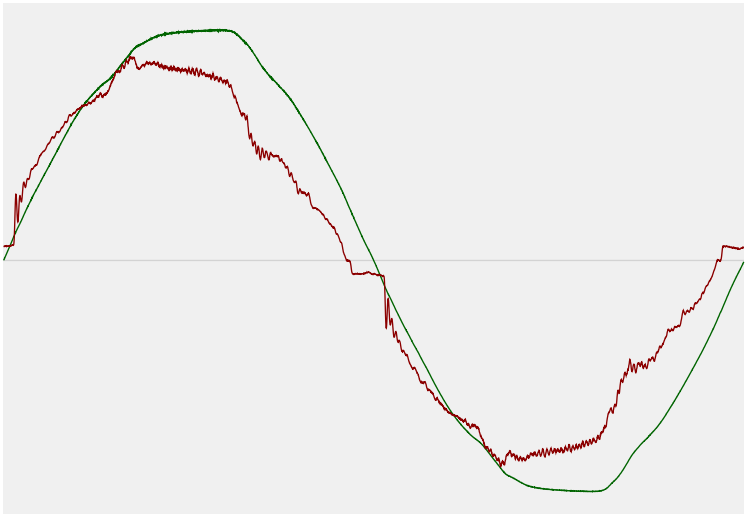
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Power Details

Input Power

Power feed to light source	28,0 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	241 V
RMS Input current feed, I_{RMS}	0,120 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	28,83 VA
Displacement factor of AC power feed	0,98
Power factor of AC current feed	0,97
Total harmonic distortion of the current	7,54%
Total harmonic distortion of the voltage	3,16%

Input Power Curve

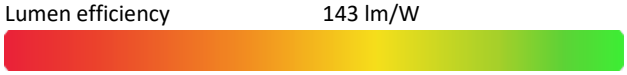


Efficiency

Radiated power efficiency 43,1%



Lumen efficiency 143 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	3501 K
CCT shift	-1 K
CCT end	3500 K

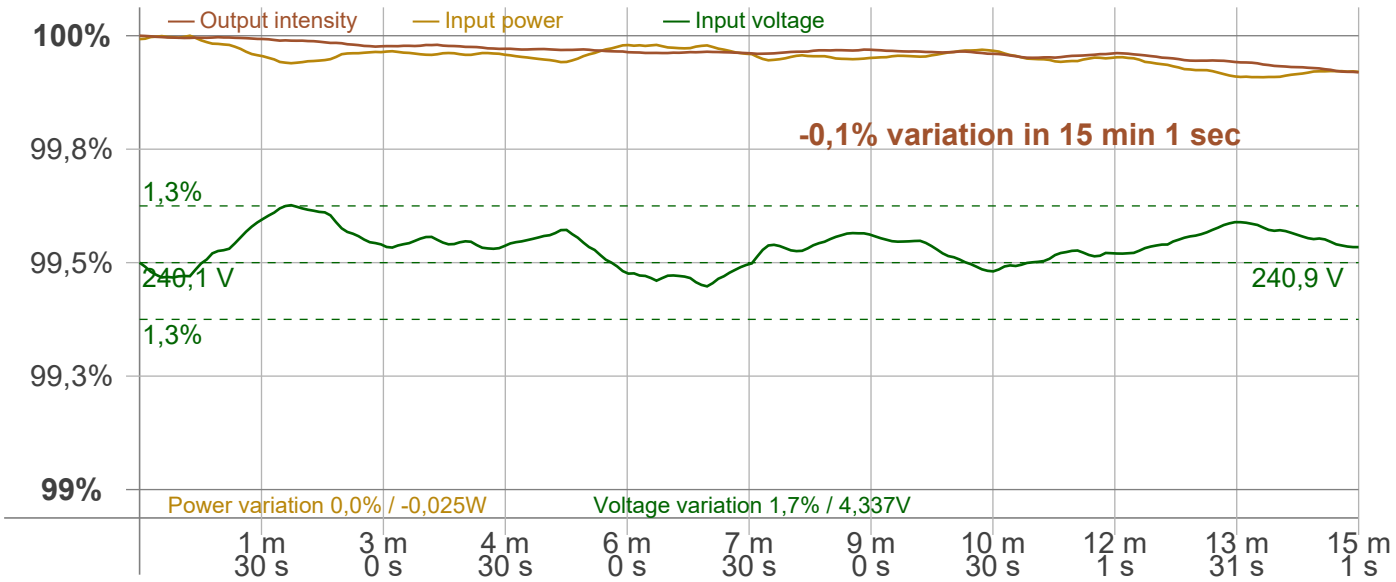
Warmup Result

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

Output Change

Output start	3999 lm
Output change	-3 lm
Output end	3996 lm

Stabilization Curve



Light Measurement Report

Print date: 21/05/2026
Measurement date and time: 21/05/2026 11:39:29 – Measurement no. VFR-260521-1548-MS
Measurement tracking No. and Link: VT260521-008481
Operator: LC

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	98,04 Hz
Percent Flicker	0,41 %
Flicker index	0

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

JA8/10 40 Hz	0,06 %
JA8/10 90 Hz	0,09 %
JA8/10 200 Hz	0,39 %
JA8/10 400 Hz	0,39 %
JA8/10 1000 Hz	0,4 %

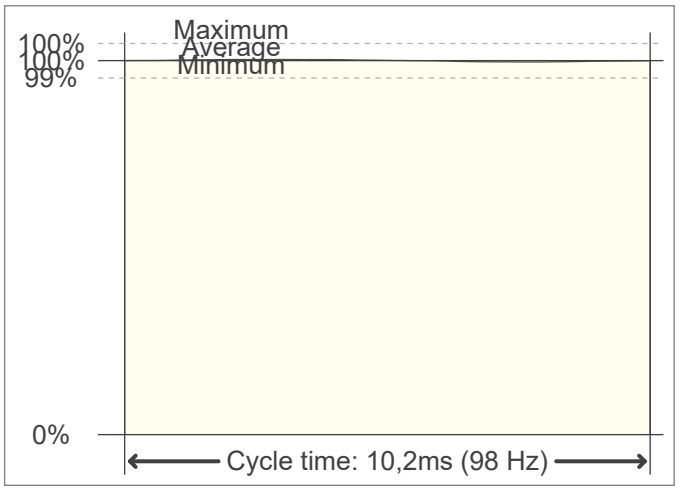
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz)	0,04
SVM value (80 < F < 2000 Hz)	0,01

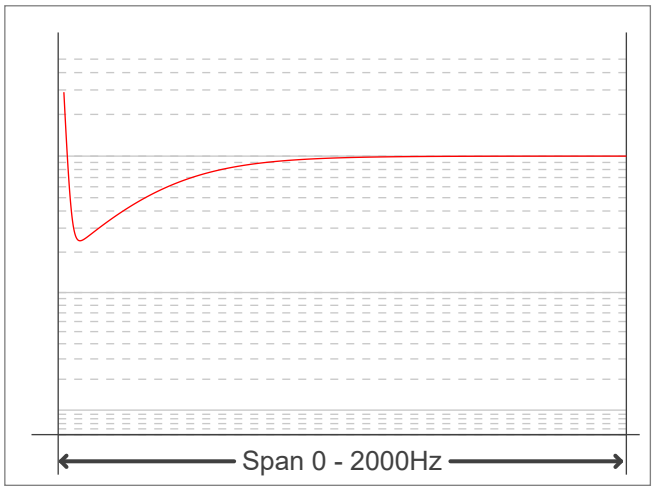
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp	0,03

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

