Light Measurement Report

Print date: 8-10-2025
Measurement date and time: 8-10-2025 12:08:32 – Measurement no. VFR-251008-3600-MS
Measurement tracking No. and Link: VT251008-008572
Operator:

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 – 11-1-2024 – 3130191315
Spectrometer Manufacturer and Model	Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

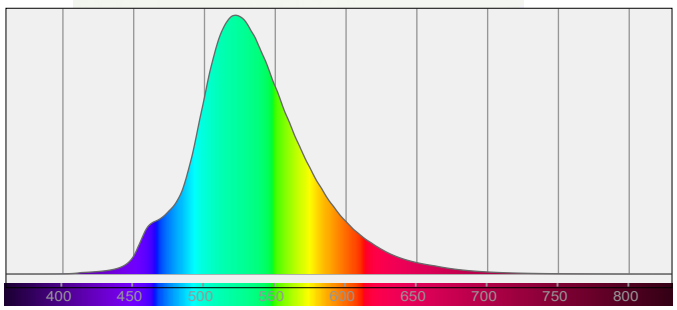
Number of C-planes and Resolution	72 planes – 5°
γ (gamma)-Resolution	5°
Test Distance	2,29 m
Input Power, Power and Displ. Factors	100,9 W – PF 1,0 – DPF 1,0
Input RMS Voltage and Current	230 V – 0,440 A
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Lamp stabilized in 21 min 44 sec – 2,0%

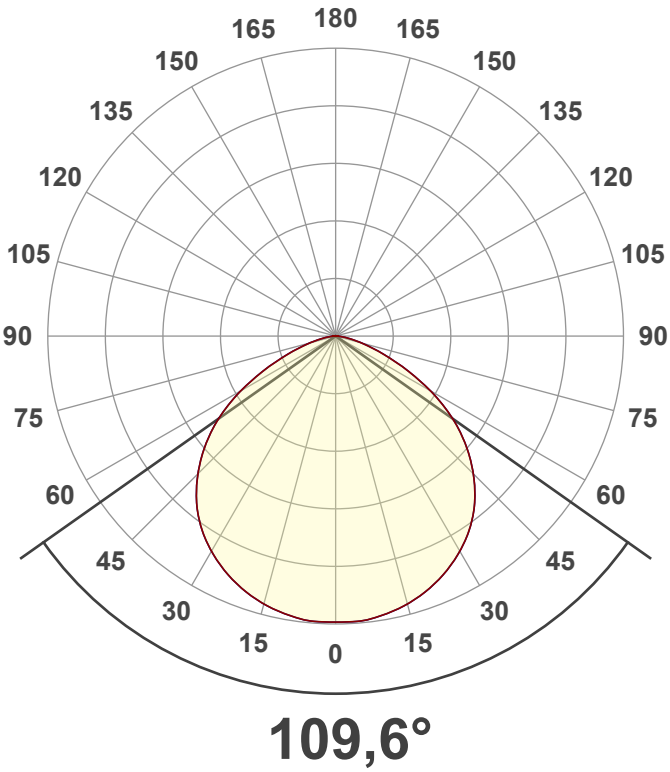
Tested Light Source

Product Name	812881-GROEN
Item No. and Manufacturer	812881-GROEN – Dutchfulfillment
Product Description (line 1)	LED FLOODLIGHT ISTOS | 100W | GROEN

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	9808 lm – 0,08% / 99,92%
Efficiency	97 lm/W
Peak Intensity and Beam Angle	3693 cd – 109,6°
Correlated Color Temperature, Target/Measured	CCT = 0 K / 0 K
Color Rendering Index	CRI 0,0
Color Rendering TM30-18	R_f 0,0 – R_g 0,0
Color Shift, CIE duv and MacAdam Steps	Duv n/a – SDCM n/a
Flicker	SVM 3,7 – PstLM 0,07





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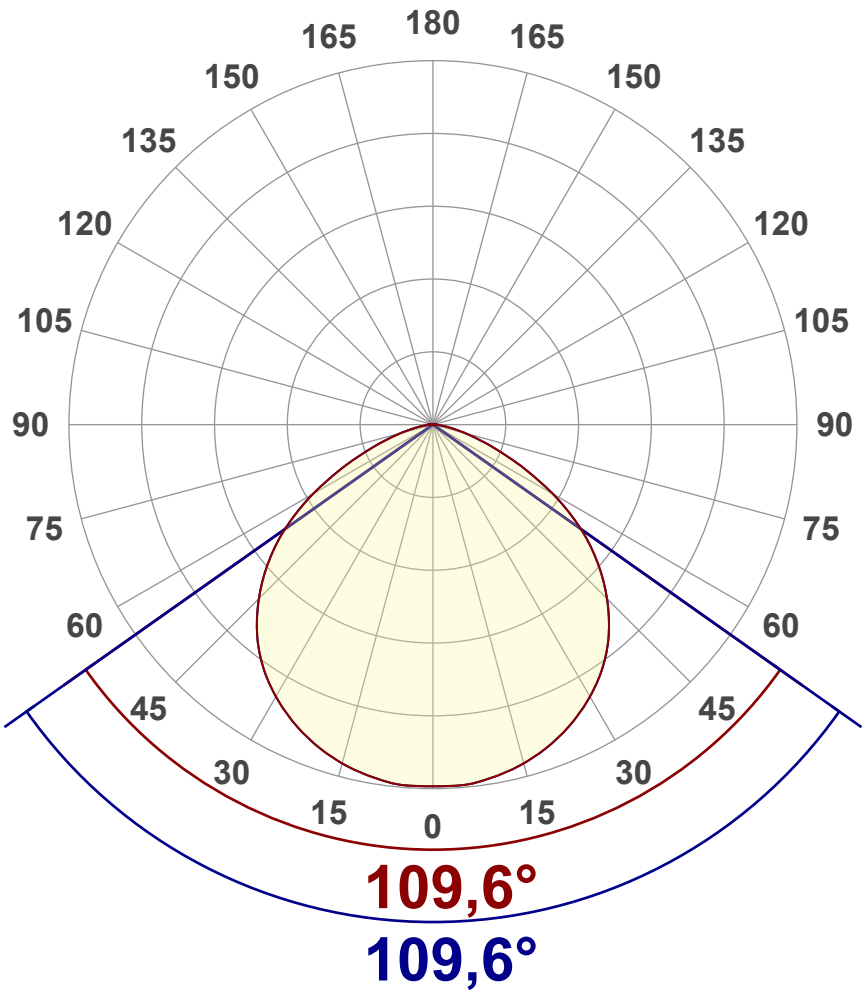
Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	9808 lm
Lumen Up% / Down%	0,08% / 99,92%
Peak Intensity	3693 cd
Beam Angle (50%)	109,6°
Beam Angle (90%)	109,6°
Beam Angle (10%)	109,6°

Cut-off Angle

Average 2,5%	167,1°

Field Angle

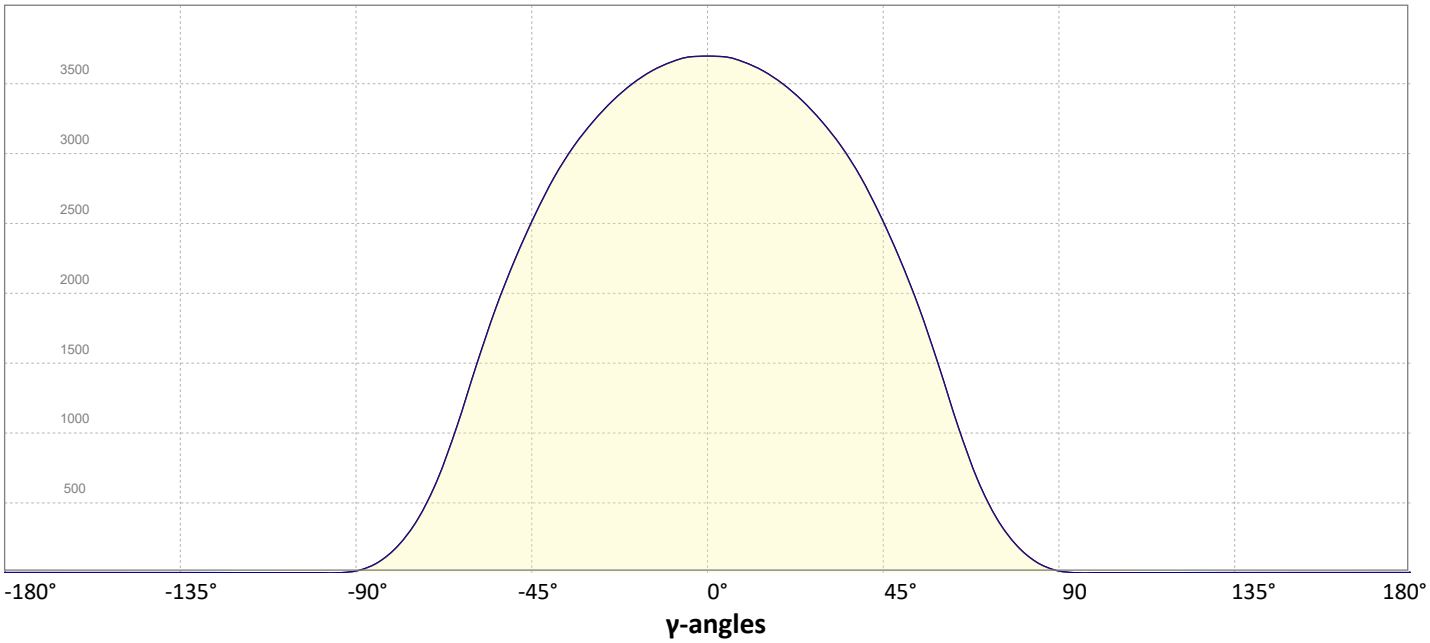
Average 10%	149,1°

Intensity Ratio

In 120° cone	85,1%
In 90° cone	58,9%

C000-C180
C090-C270

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



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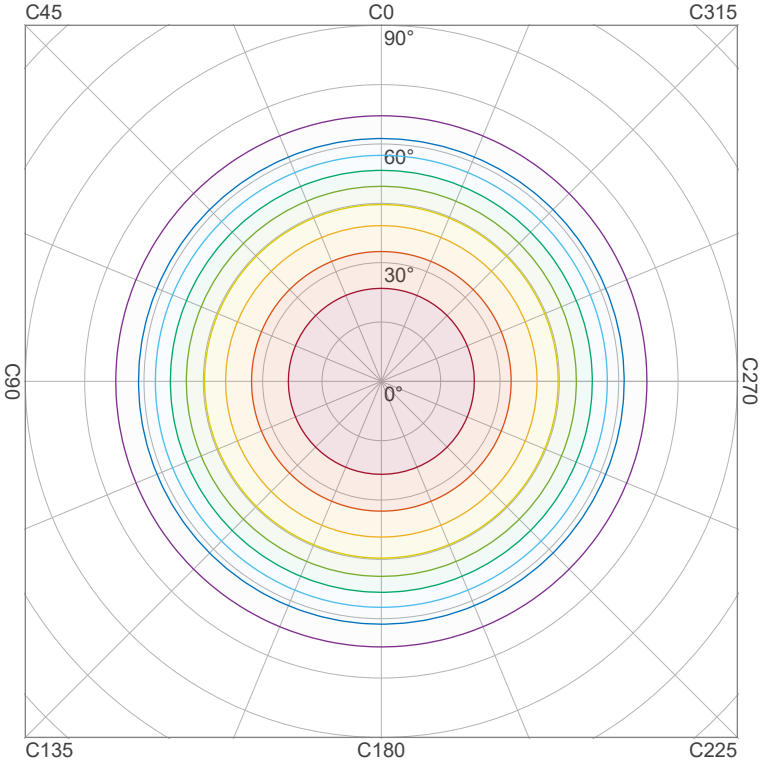
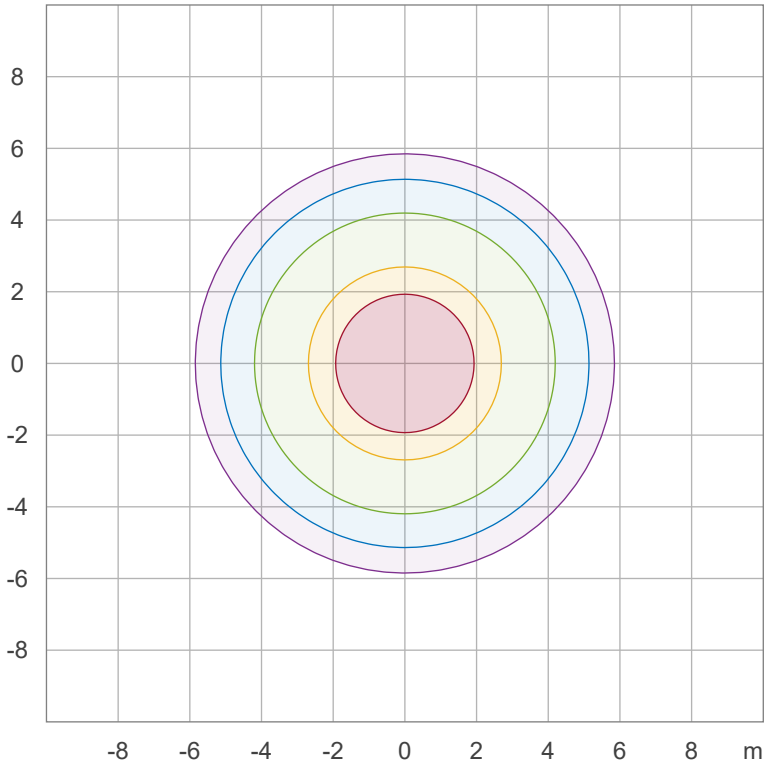
Iso-intensity Diagram (Iso-candela)



	90 %	3323,3 cd
	80 %	2954,0 cd
	70 %	2584,8 cd
	60 %	2215,5 cd
	50 %	1846,3 cd
	40 %	1477,0 cd
	30 %	1107,8 cd
	20 %	738,5 cd
	10 %	369,3 cd

Peak intensity: 3692,5 cd
Number of c-planes: 72

Iso-illuminance Diagram (Iso-lux)



	50,0 %	205,1 lx
	30,0 %	123,1 lx
	10,0 %	41,0 lx
	5,0 %	20,5 lx
	3,0 %	12,3 lx

Peak illuminance: 410,3 lx
Mounting height: 3,0 m
Number of c-planes: 72

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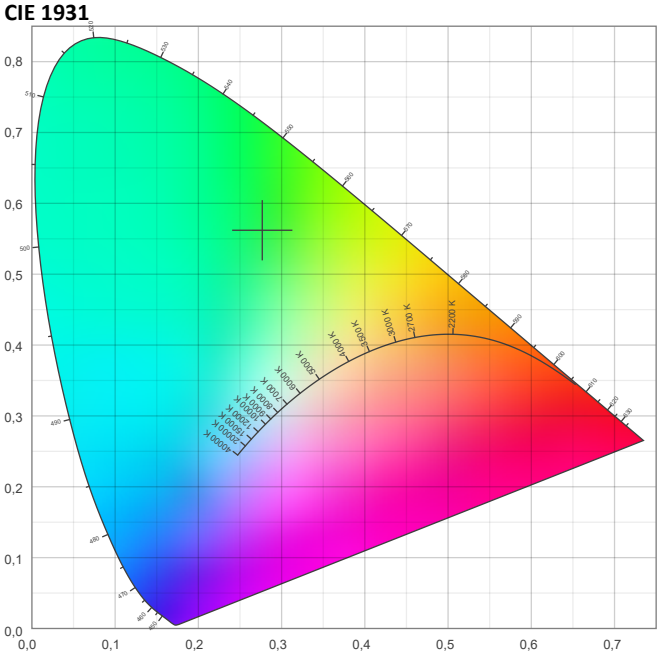
Color details

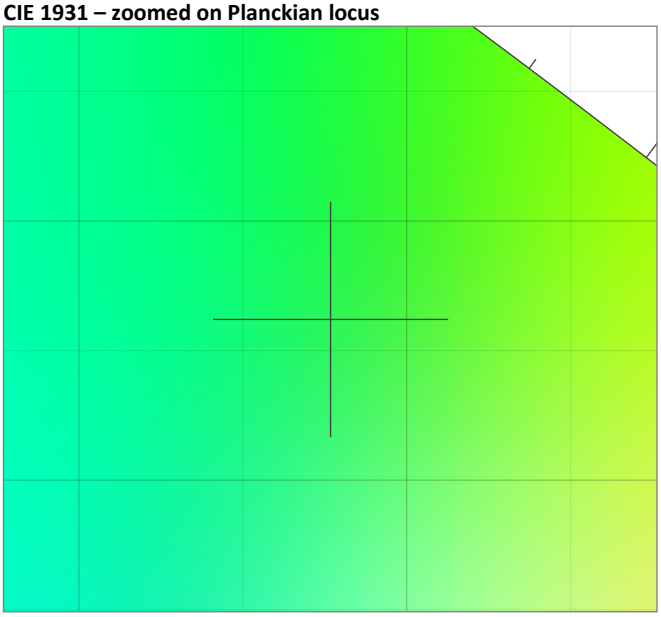
Correlated Color Temperature, Target	CCT = 0 K
Correlated Color Temperature, Measured	CCT = 0 K
Color Rendering Index	CRI 0,0
Color Rendering Index, R9 (red component)	R9 = 0,0
Color Rendering TM30-18	R_f 0,0 – R_g 0,0
Color Quality Scale	CQS = 0,0

MacAdam Steps	SDCM = n/a
Color coordinates CIE 1931	(x;y) = (0,277;0,562)
Color coordinate CIEs 1960	(u;v) = (0,120;0,367)
Color deviation from BBL	Duv = n/a
Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0,120;0,550)

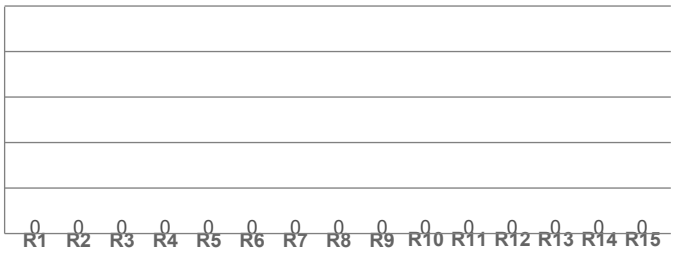
CIE 1931



CIE 1931 – zoomed on Planckian locus



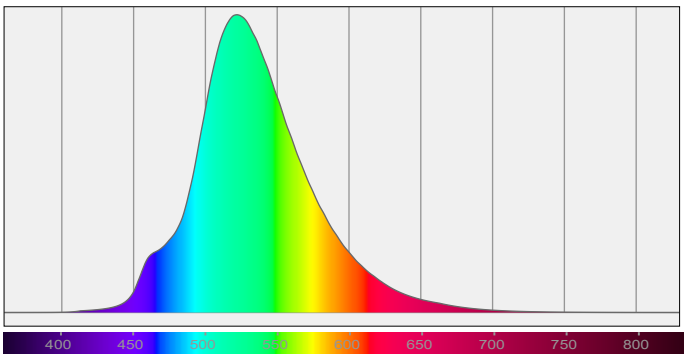
Color Rendering Index per reference color (CIE 1995)



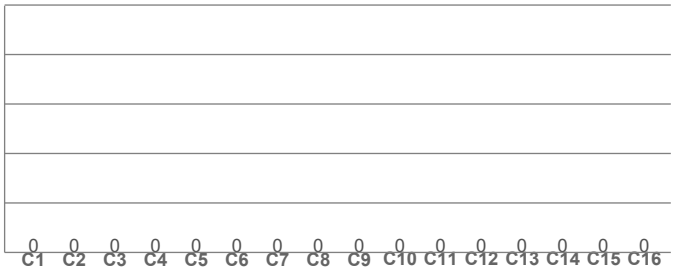
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

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
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Color Quality Scale by reference color

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

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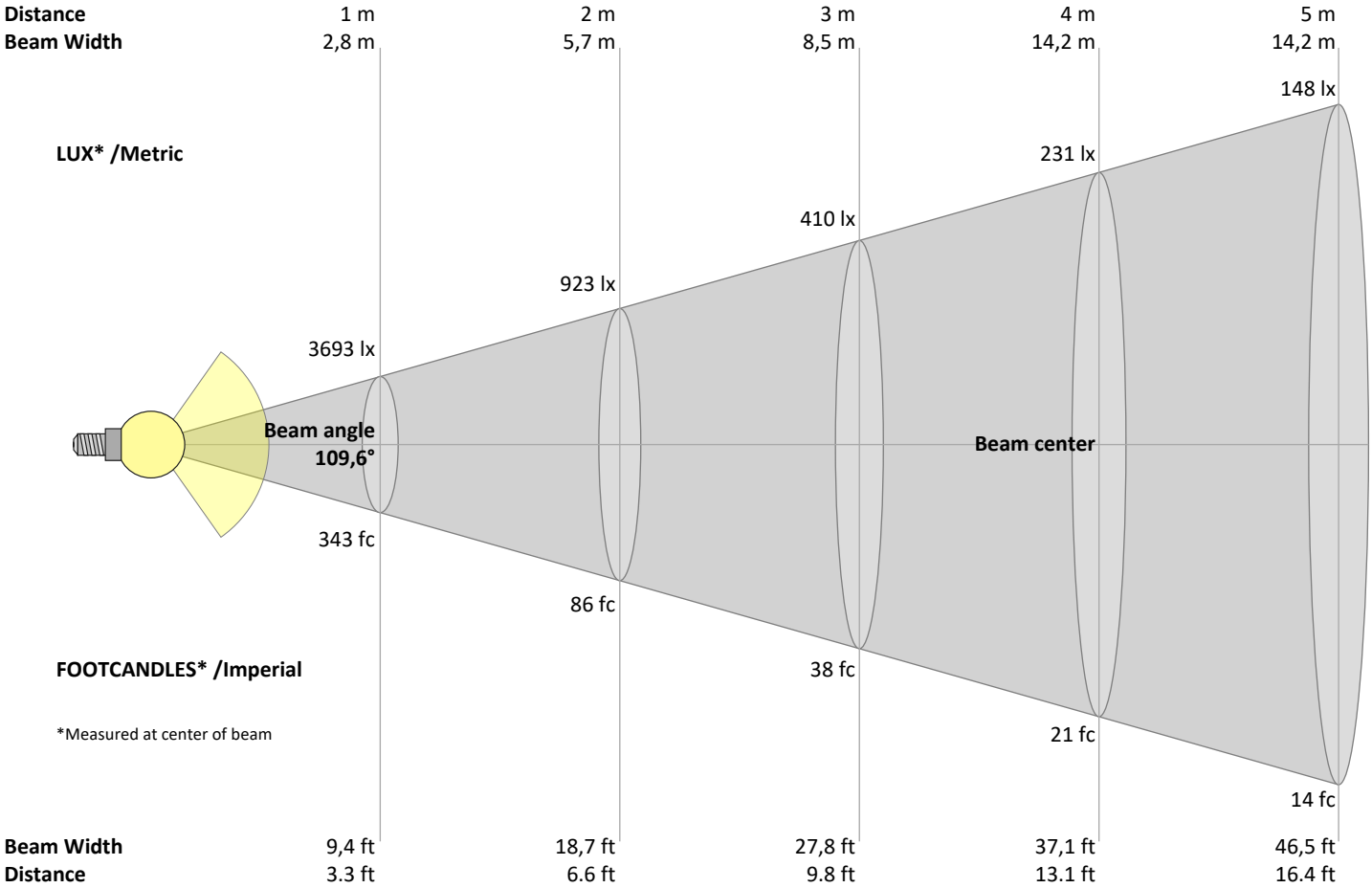
Beam Details



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
3693	923	410	231	148	103	75	58	46	37	31	26	22	19	16	14	13	11	10	9	lux
343	85,8	38,1	21,4	13,7	9,5	7	5,4	4,2	3,4	2,8	2,4	2	1,8	1,5	1,3	1,2	1,1	1	0,9	fc

Intensities in 0° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
3693	3687	3646	3578	3481	3356	3203	3019	2789	2510	2192	1828	1413	983	618	353	176	68	15	0	cd
100%	100%	99%	97%	94%	91%	87%	82%	76%	68%	59%	50%	38%	27%	17%	10%	5%	2%	0%	0%	of 0°val

Intensities in 90° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
3693	3687	3646	3578	3481	3356	3203	3019	2789	2510	2192	1828	1413	983	618	353	176	68	15	0	cd
100%	100%	99%	97%	94%	91%	87%	82%	76%	68%	59%	50%	38%	27%	17%	10%	5%	2%	0%	0%	of 0°val

Intensities in 180° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
3693	3687	3646	3578	3481	3356	3203	3019	2789	2510	2192	1828	1413	983	618	353	176	68	15	0	cd
100%	100%	99%	97%	94%	91%	87%	82%	76%	68%	59%	50%	38%	27%	17%	10%	5%	2%	0%	0%	of 0°val

Intensities in 270° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
3693	3687	3646	3578	3481	3356	3203	3019	2789	2510	2192	1828	1413	983	618	353	176	68	15	0	cd
100%	100%	99%	97%	94%	91%	87%	82%	76%	68%	59%	50%	38%	27%	17%	10%	5%	2%	0%	0%	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		**Viewed Crosswise** (Viewing direction orthogonal to lamp length axis)					**Viewed Endwise** (Viewing direction parallel to lamp length axis)				
X	**Y**										
2H	2H	29,6	30,8	29,9	31,1	31,3	29,5	30,6	29,7	30,9	31,2
	3H	30,3	31,5	30,8	31,8	32,0	30,2	31,4	30,6	31,6	31,8
	4H	30,6	31,7	31,0	32,0	32,2	30,4	31,5	30,8	31,8	32,0
	6H	30,7	31,7	31,0	32,0	32,4	30,5	31,5	30,8	31,8	32,1
	8H	30,7	31,7	31,1	32,0	32,4	30,5	31,5	30,8	31,8	32,2
	12H	30,7	31,6	31,1	32,0	32,4	30,5	31,4	30,8	31,7	32,2
4H	2H	30,0	31,1	30,4	31,4	31,6	29,9	31,0	30,3	31,3	31,5
	3H	30,9	31,9	31,3	32,2	32,7	30,8	31,7	31,2	32,1	32,5
	4H	31,1	32,0	31,6	32,4	32,9	31,0	31,8	31,4	32,2	32,8
	6H	31,3	32,1	31,8	32,5	32,8	31,1	31,9	31,6	32,3	32,6
	8H	31,3	32,1	31,8	32,4	32,8	31,1	31,9	31,6	32,2	32,6
	12H	31,3	31,9	31,8	32,3	32,8	31,1	31,7	31,6	32,1	32,6
8H	4H	31,2	31,9	31,7	32,3	32,7	31,0	31,8	31,5	32,1	32,5
	6H	31,4	32,0	31,9	32,4	33,0	31,2	31,8	31,7	32,2	32,8
	8H	31,5	32,0	32,0	32,5	33,1	31,3	31,8	31,8	32,3	32,9
	12H	31,5	31,9	32,1	32,4	33,0	31,3	31,7	31,9	32,2	32,8
12H	4H	31,2	31,8	31,7	32,2	32,7	31,0	31,6	31,5	32,0	32,5
	6H	31,4	31,9	31,9	32,4	33,1	31,2	31,7	31,8	32,2	32,9
	8H	31,5	31,9	32,1	32,4	33,0	31,3	31,7	31,9	32,2	32,8

Variations with the observer position for the luminaire spacings, S:		
S = 1.0H	0,1 / -0,2	0,2 / -0,2
S = 1.5H	0,5 / -0,7	0,5 / -0,7
S = 2.0H	1,2 / -1,8	1,2 / -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	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86
2	101	93	87	81	98	91	85	80	88	83	78	84	80	77	81	78	75	73
3	92	82	74	68	90	81	73	68	78	72	66	75	70	65	72	68	64	62
4	84	73	65	58	82	72	64	58	69	62	57	67	61	56	65	60	56	53
5	78	65	57	50	76	64	56	50	62	55	50	60	54	49	58	53	49	46
6	72	59	50	44	70	58	50	44	56	49	44	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	38	48	43	38	36
8	62	49	41	35	61	48	40	35	47	40	34	46	39	34	44	39	34	32
9	58	45	37	31	57	44	37	31	43	36	31	42	36	31	41	35	31	29
10	54	41	34	28	53	41	33	28	40	33	28	39	33	28	38	32	28	26

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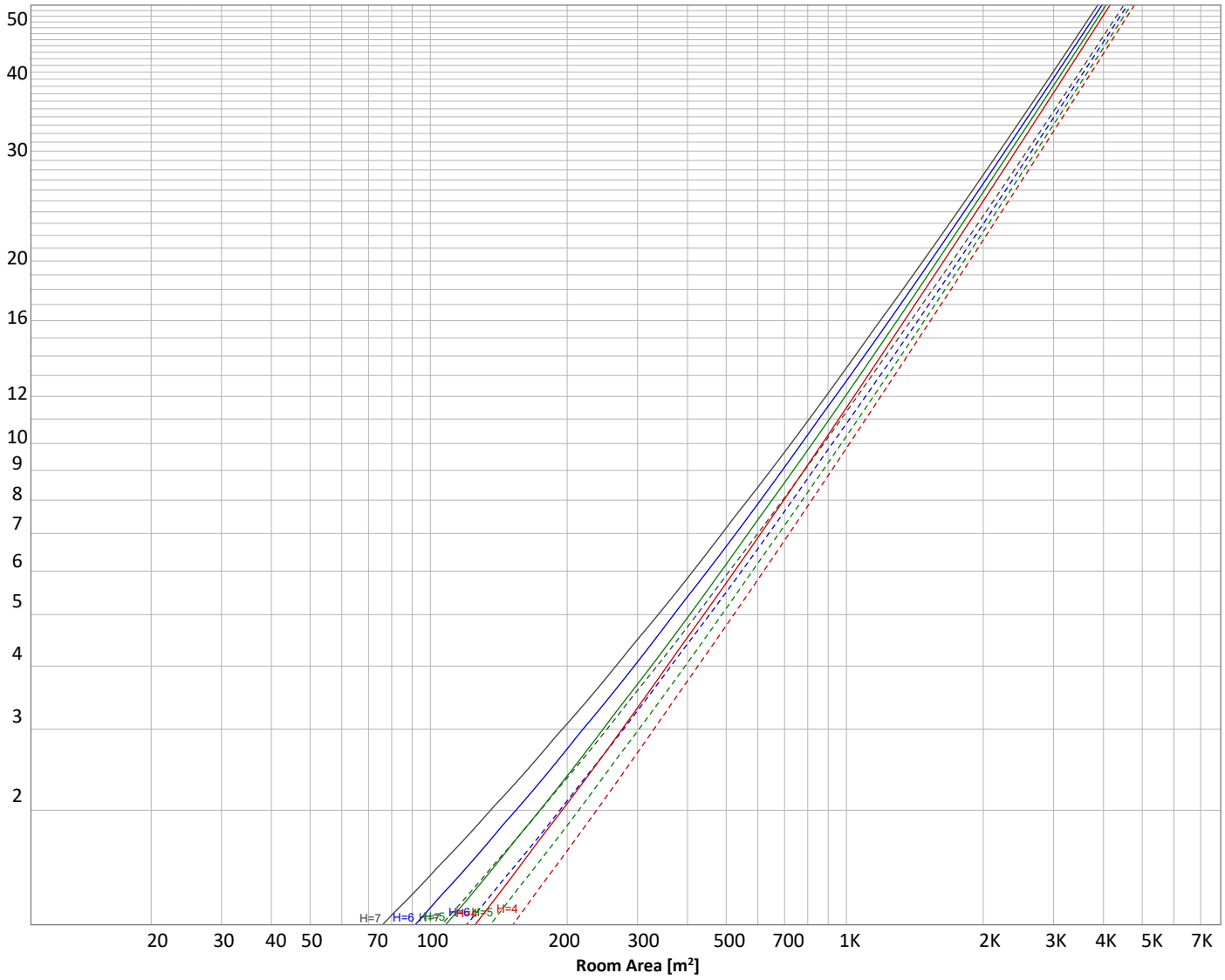
Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 9808 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°
351 lm	1010 lm	1547 lm	1886 lm	1932 lm	1624 lm	980 lm	388 lm	84,2 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
3,40 lm	0,135 lm	0,540 lm	0,900 lm	1,02 lm	0,894 lm	0,709 lm	0,446 lm	0,156 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	351 lm	3,6%
10-20°	1010 lm	10,3%
20-30°	1547 lm	15,8%
30-40°	1886 lm	19,2%
40-50°	1932 lm	19,7%
50-60°	1624 lm	16,6%
60-70°	980 lm	10,0%
70-80°	388 lm	4,0%
80-90°	84 lm	0,9%
90-100°	3 lm	0,0%
100-110°	0 lm	0,0%
110-120°	1 lm	0,0%
120-130°	1 lm	0,0%
130-140°	1 lm	0,0%
140-150°	1 lm	0,0%
150-160°	1 lm	0,0%
160-170°	0 lm	0,0%
170-180°	0 lm	0,0%
Total	9808 lm	100,0%

Intensity peaks

Max intensity	3693 cd
Intensity, 90°	15 cd
Intensity, 0°	3693 cd

Zonal Lumen summary

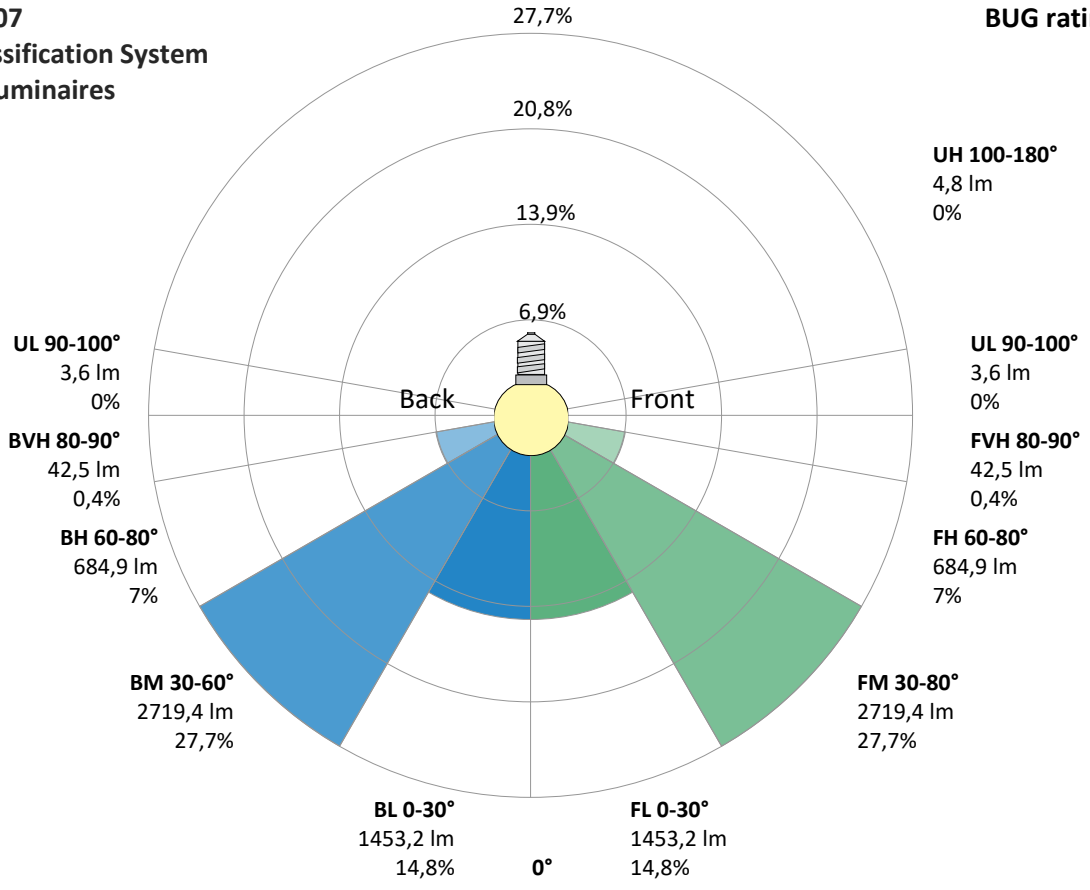
Zone (γ)	Lumen	% Total
0-30°	2908 lm	29,6%
0-40°	4793 lm	48,9%
0-60°	8349 lm	85,1%
60-90°	1451 lm	14,8%
70-100°	475 lm	4,8%
90-120°	4 lm	0,0%
0-90°	9800 lm	99,9%
90-180°	8 lm	0,1%
0-180°	9808 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1453 lm	14,8%
Medium(30-60°)	2719 lm	27,7%
High(60-80°)	685 lm	7,0%
Very high(80-90°)	43 lm	0,4%
Back light		
Low(0-30°)	1453 lm	14,8%
Medium(30-60°)	2719 lm	27,7%
High(60-80°)	685 lm	7,0%
Very high(80-90°)	43 lm	0,4%
Uplight		
Low(90-100°)	4 lm	0,0%
High(100-180°)	5 lm	0,0%

IESNA TM-15-07
Luminaire Classification System
For Outdoor Luminaires

BUG rating B3 U1 G1



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Power Details

Input Power

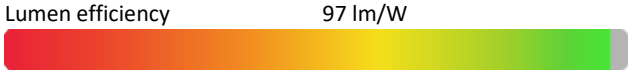
Power feed to light source	100,9 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,440 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	101,29 VA
Displacement factor of AC power feed	1,0
Power factor of AC current feed	1,0
Total harmonic distortion of the current	8,56%
Total harmonic distortion of the voltage	0,08%

Input Power Curve

Efficiency

Radiated power efficiency 21,8%

Lumen efficiency 97 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	0 K
CCT shift	0 K
CCT end	0 K

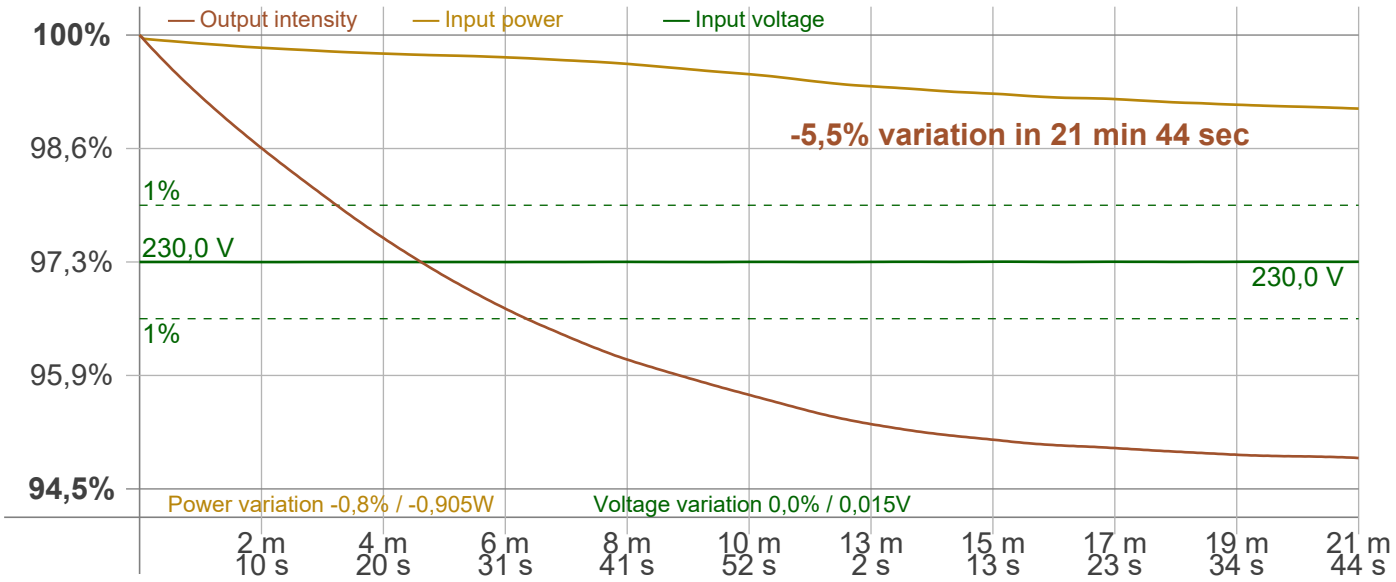
Warmup Result

Total warmup time	Lamp stabilized in 21 min 44 sec
Warmup variation	-5,5%

Output Change

Output start	10360 lm
Output change	-552 lm
Output end	9808 lm

Stabilization Curve



Light Measurement Report

Print date: 8-10-2025
Measurement date and time: 8-10-2025 12:08:32 – Measurement no. VFR-251008-3600-MS
Measurement tracking No. and Link: VT251008-008572
Operator:

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	99,91 %
Flicker index	0,31

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

JA8/10 40 Hz	0,17 %
JA8/10 90 Hz	0,72 %
JA8/10 200 Hz	101,07 %
JA8/10 400 Hz	102,09 %
JA8/10 1000 Hz	102,05 %

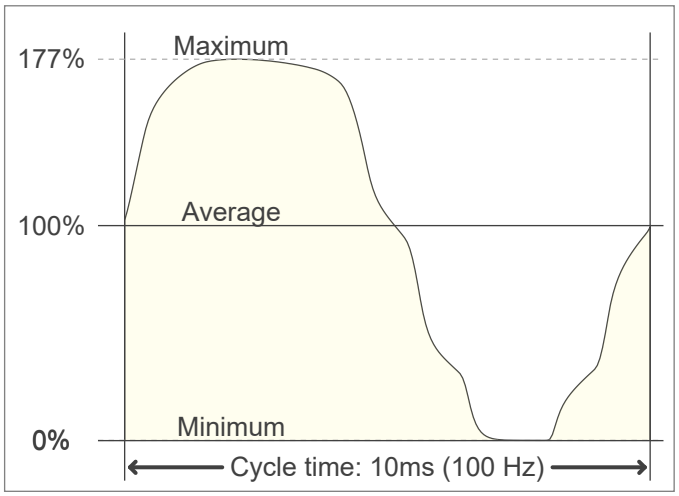
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz)	0,07
SVM value (80 < F < 2000 Hz)	3,7

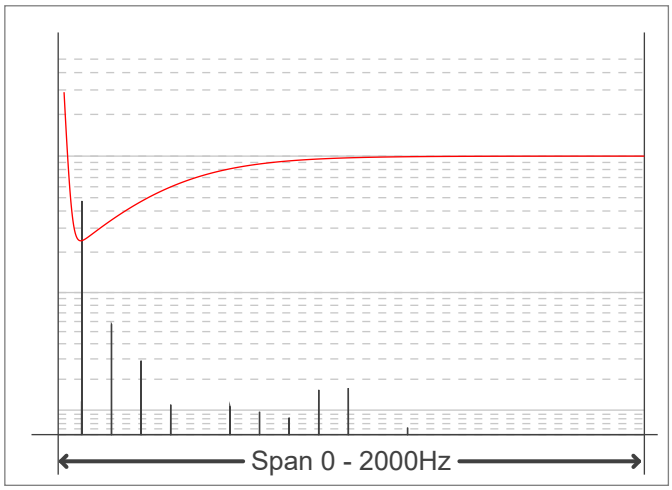
Flicker indices according to Lighting Research Center (2015)

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