Light Measurement Report

Print date: 20-8-2025
Measurement date and time: 19-8-2025 16:52:28 – Measurement no. VFR-250819-2619-MS
Measurement tracking No. and Link: VT250819-003820
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

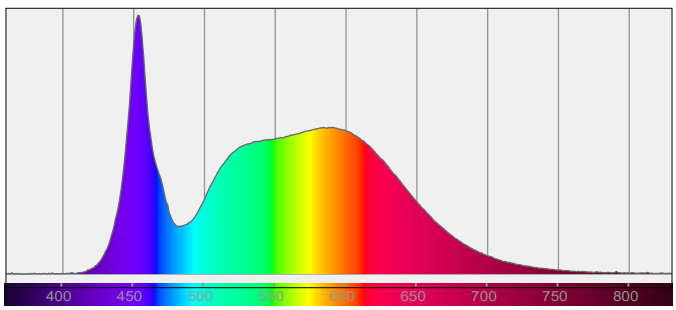
Number of C-planes and Resolution	12 planes – 30°
γ (gamma)-Resolution	5°
Test Distance	12,09 m
Input Power, Power and Displ. Factors	72,3 W – PF 0,97 – DPF 0,97
Input RMS Voltage and Current	230 V – 0,325 A
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Lamp stabilized in 15 min 1 sec – 2,0%

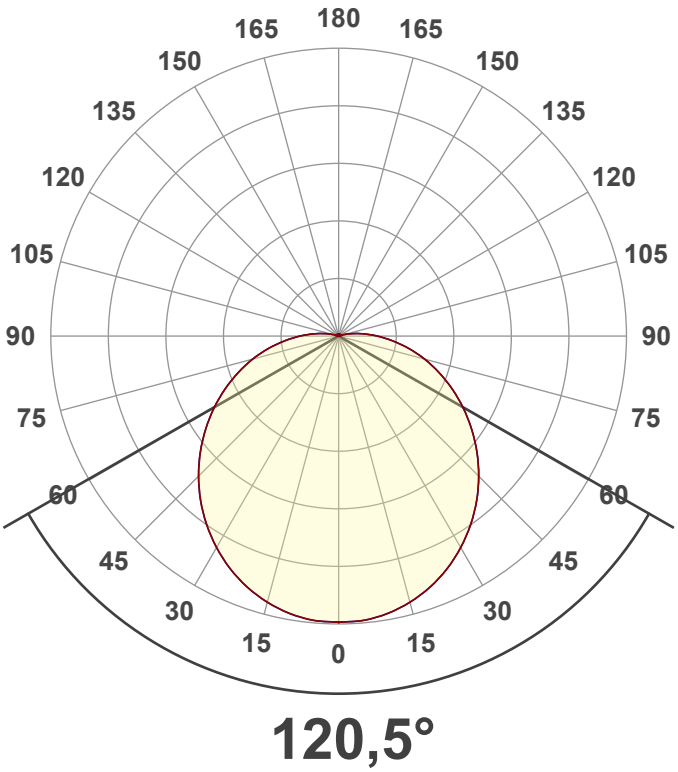
Tested Light Source

Product Name	810351-5000K
Item No. and Manufacturer	810351-5000K – Dutchfulfillment
Product Description (line 1)	LICHTLIJN MODULE | JUPITER | 29-75W | 120° | CCT-SWITCH

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	11132 lm – 4,23% / 95,77%
Efficiency	154 lm/W
Peak Intensity and Beam Angle	3237 cd – 120,5°
Correlated Color Temperature, Target/Measured	CCT = 5000 K / 4812 K
Color Rendering Index	CRI 83,2
Color Rendering TM30-18	R_f 83,0 – R_g 96,0
Color Shift, CIE duv and MacAdam Steps	Duv 0,0018 – SDCM 3,6
Flicker	SVM 0,04 – PstLM 0,02





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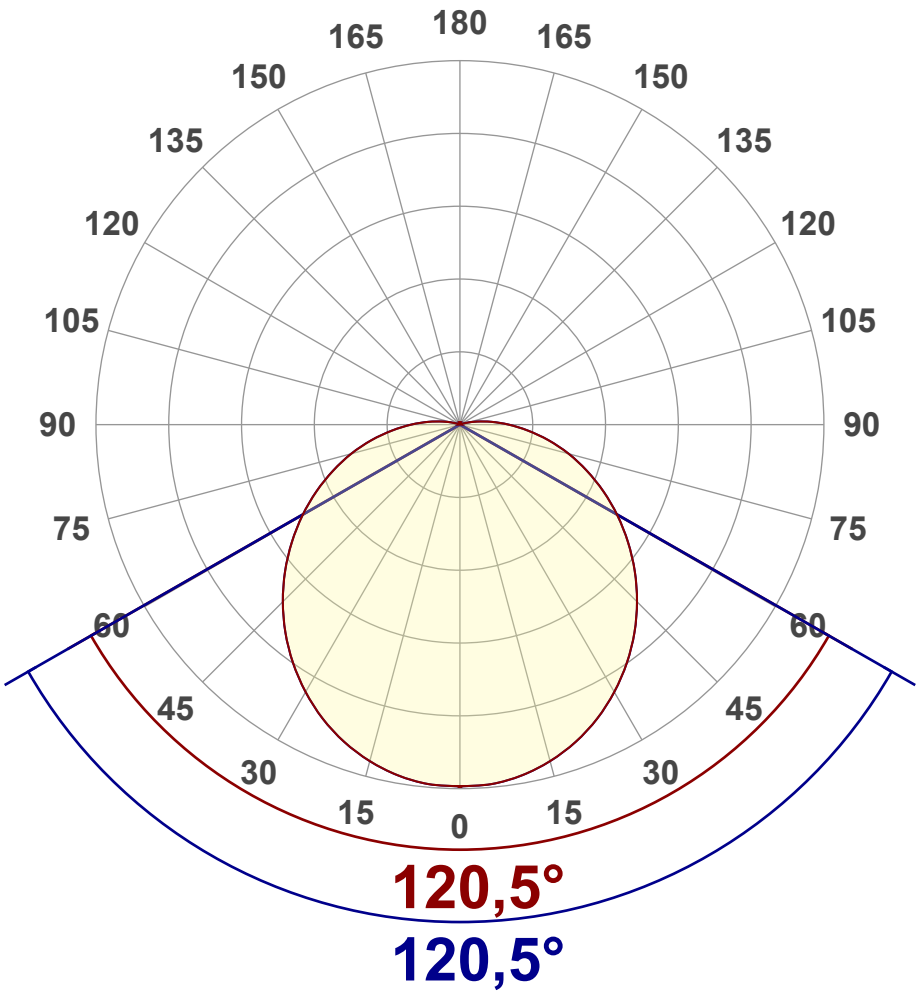
Luminous Intensity diagram Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	11132 lm
Lumen Up% / Down%	4,23% / 95,77%
Peak Intensity	3237 cd
Beam Angle (50%)	120,5°
Beam Angle (90%)	120,5°
Beam Angle (10%)	120,5°

Cut-off Angle

Average 2,5%	208,5°

Field Angle

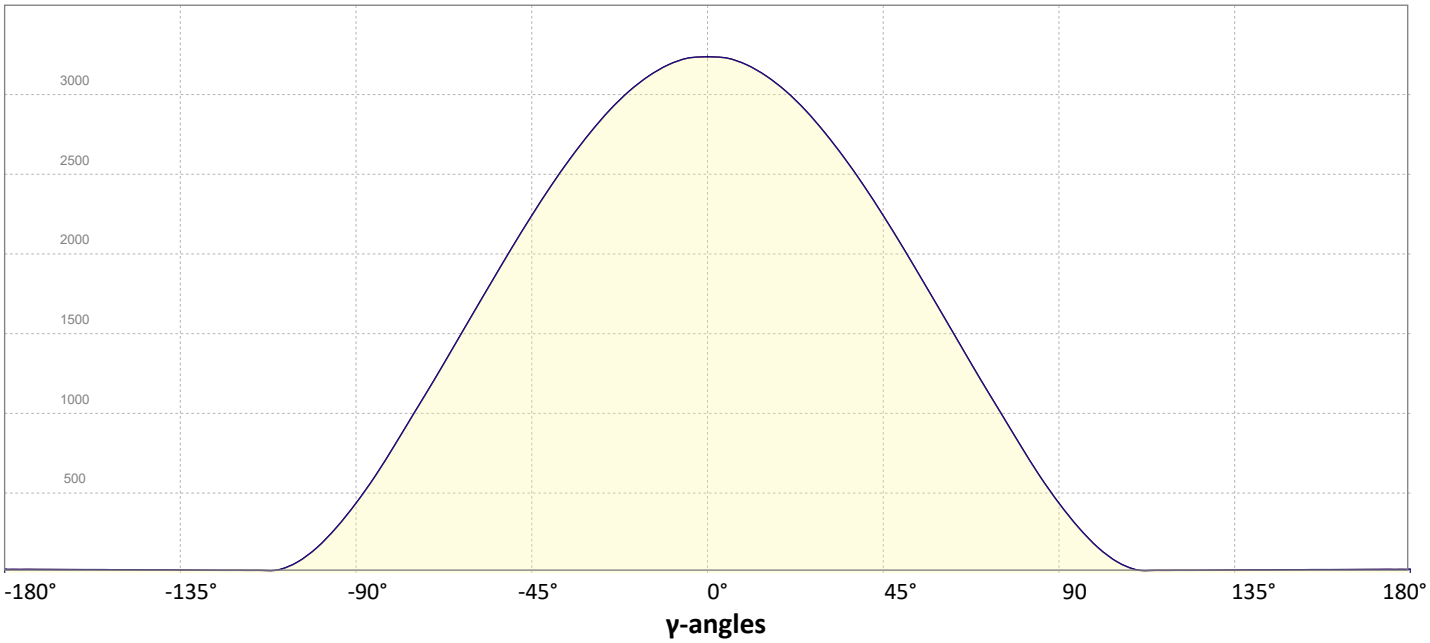
Average 10%	187,4°

Intensity Ratio

In 120° cone	67,6%
In 90° cone	45,0%

C000-C180
C090-C270

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



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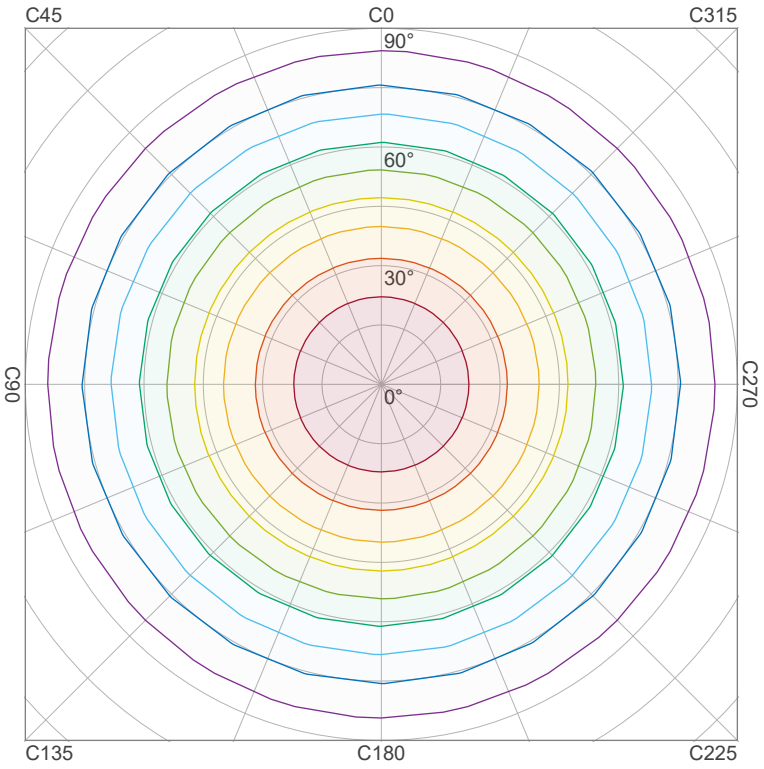
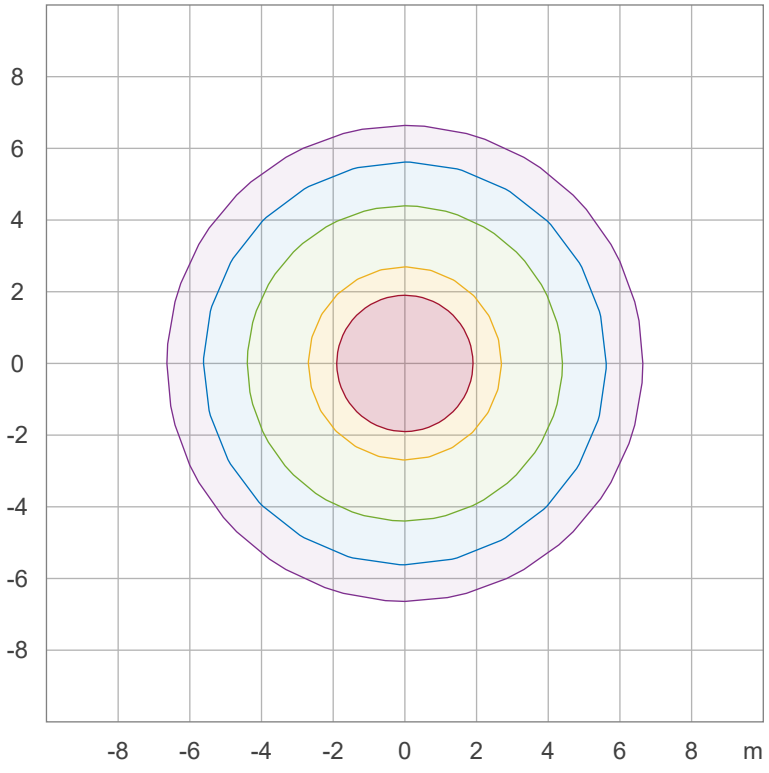
Iso-intensity Diagram (Iso-candela)



	90 %	2913,1 cd
	80 %	2589,4 cd
	70 %	2265,8 cd
	60 %	1942,1 cd
	50 %	1618,4 cd
	40 %	1294,7 cd
	30 %	971,0 cd
	20 %	647,4 cd
	10 %	323,7 cd

Peak intensity: 3236,8 cd
Number of c-planes: 12

Iso-illuminance Diagram (Iso-lux)



	50,0 %	179,8 lx
	30,0 %	107,9 lx
	10,0 %	36,0 lx
	5,0 %	18,0 lx
	3,0 %	10,8 lx

Peak illuminance: 359,6 lx
Mounting height: 3,0 m
Number of c-planes: 12

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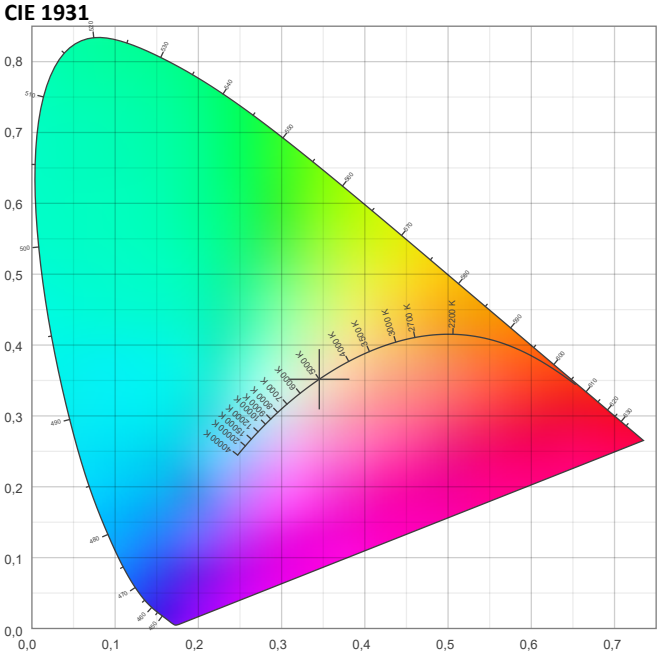
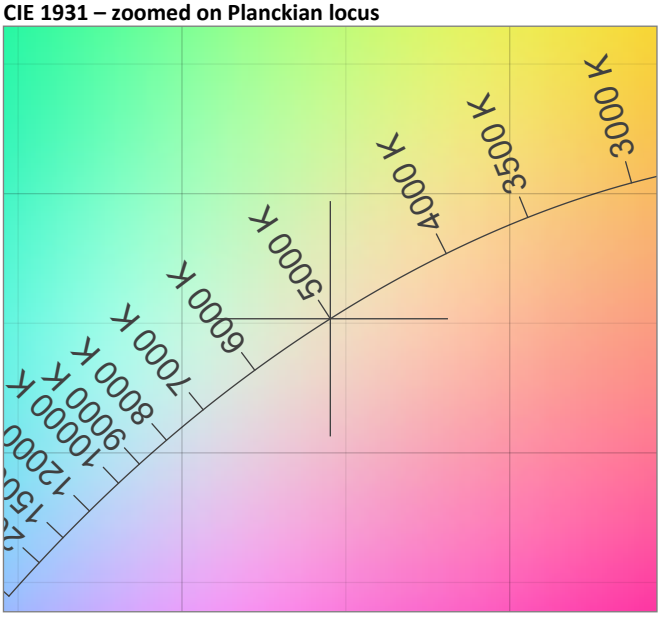
Color details

Correlated Color Temperature, Target	CCT = 5000 K
Correlated Color Temperature, Measured	CCT = 4812 K
Color Rendering Index	CRI 83,2
Color Rendering Index, R9 (red component)	R9 = 13,6
Color Rendering TM30-18	R_f 83,0 – R_g 96,0
Color Quality Scale	CQS = 81,5
MacAdam Steps	SDCM = 3,6
Color coordinates CIE 1931	(x;y) = (0,345;0,352)
Color coordinate CIEs 1960	(u;v) = (0,211;0,323)
Color deviation from BBL	Duv = 0,0018
Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0,211;0,485)

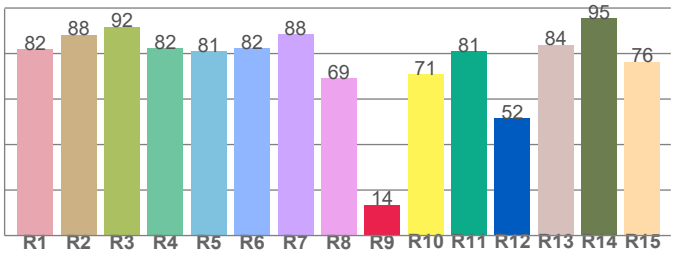
CIE 1931



CIE 1931 – zoomed on Planckian locus



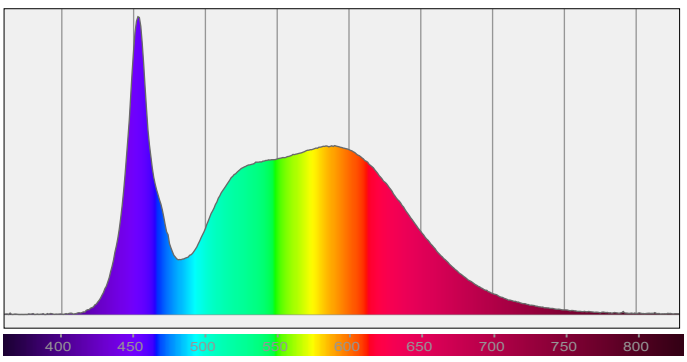
Color Rendering Index per reference color (CIE 1995)



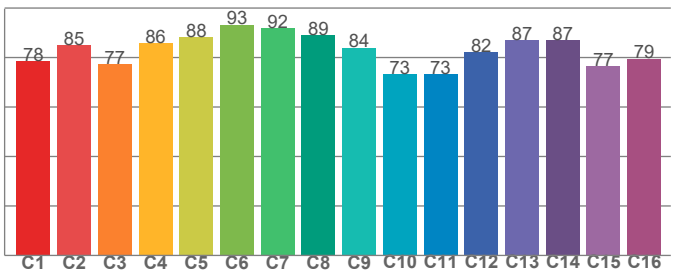
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
82,0	88,3	91,8	82,4	80,9	82,4	88,5	69,2	13,6	70,8	80,9	51,6	83,9	95,5	76,3

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



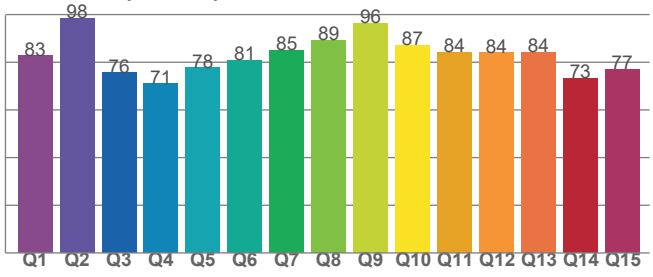
TM30-18 Rf-values per hue bin



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
78,5	85,0	77,2	85,7	88,3	93,2	91,7	89,1	84,0	73,2	73,1	82,2	86,9	87,0	76,5	79,5

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
82,8	98,5	75,7	70,9	77,7	80,9	85,0	89,2	96,4	87,2	84,1	84,0	84,2	73,3	77,1

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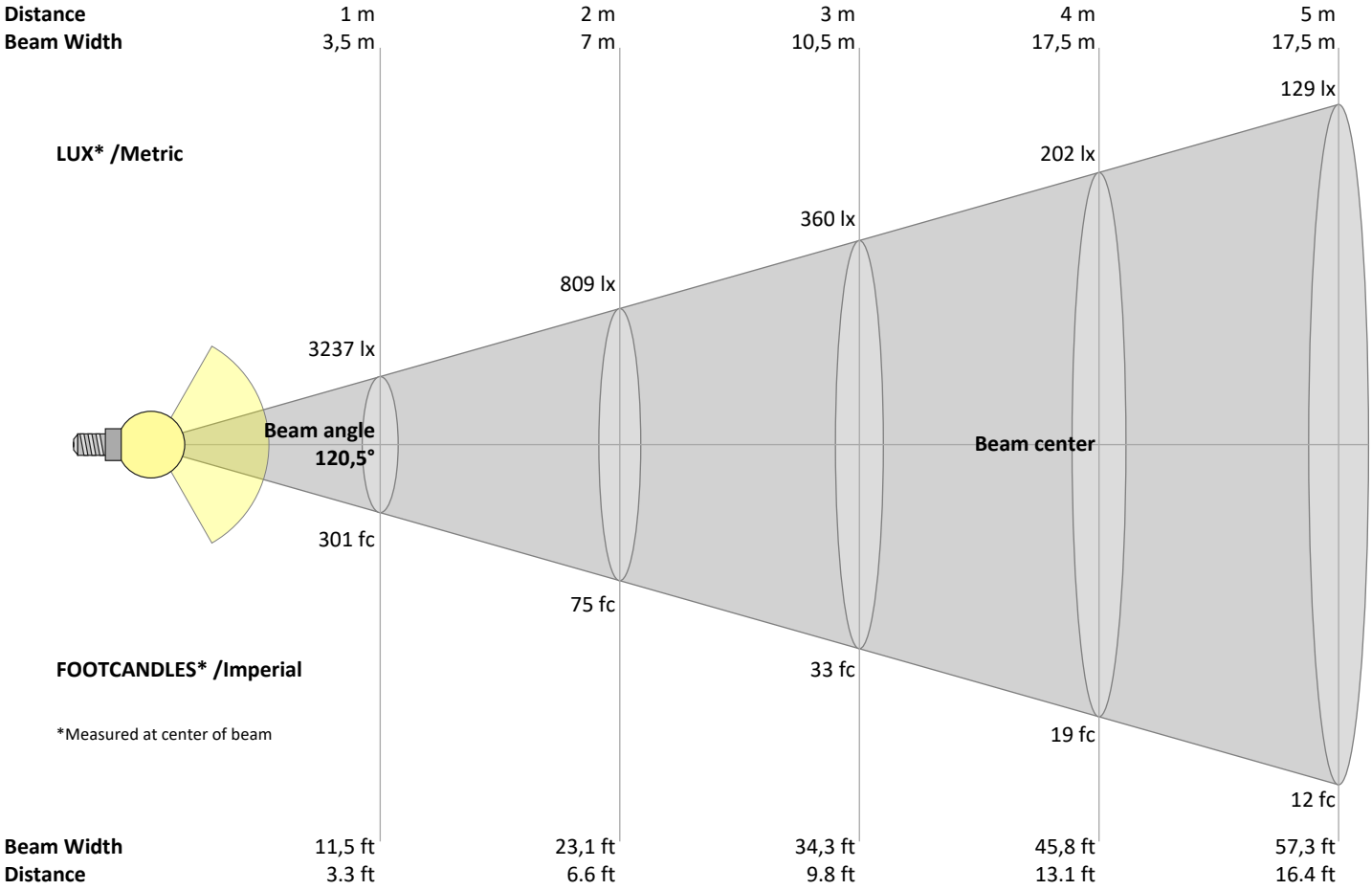
Beam Details



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
3237	809	360	202	129	90	66	51	40	32	27	22	19	17	14	13	11	10	9	8	lux
300,7	75,2	33,4	18,8	12	8,4	6,1	4,7	3,7	3	2,5	2,1	1,8	1,5	1,3	1,2	1	0,9	0,8	0,8	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
3237	3195	3060	2847	2569	2241	1878	1502	1128	766	437	183	38	15	15	17	18	20	20	21	cd
100%	99%	95%	88%	79%	69%	58%	46%	35%	24%	13%	6%	1%	0%	0%	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
3237	3195	3060	2847	2569	2241	1878	1502	1128	766	437	183	38	15	15	17	18	20	20	21	cd
100%	99%	95%	88%	79%	69%	58%	46%	35%	24%	13%	6%	1%	0%	0%	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
3237	3195	3060	2847	2569	2241	1878	1502	1128	766	437	183	38	15	15	17	18	20	20	21	cd
100%	99%	95%	88%	79%	69%	58%	46%	35%	24%	13%	6%	1%	0%	0%	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
3237	3195	3060	2847	2569	2241	1878	1502	1128	766	437	183	38	15	15	17	18	20	20	21	cd
100%	99%	95%	88%	79%	69%	58%	46%	35%	24%	13%	6%	1%	0%	0%	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		**Viewed Crosswise** (Viewing direction orthogonal to lamp length axis)					**Viewed Endwise** (Viewing direction parallel to lamp length axis)				
X	**Y**										
2H	2H	25,4	26,6	25,7	27,0	27,3	26,1	27,3	26,4	27,7	28,0
	3H	27,0	28,3	27,5	28,7	29,0	28,0	29,3	28,5	29,7	30,0
	4H	27,8	29,1	28,3	29,4	29,8	29,1	30,3	29,5	30,7	31,0
	6H	28,6	29,7	29,0	30,1	30,6	30,2	31,3	30,6	31,6	32,1
	8H	28,9	30,0	29,3	30,4	30,9	30,7	31,8	31,1	32,2	32,6
	12H	29,2	30,3	29,6	30,7	31,2	31,2	32,3	31,7	32,7	33,2
4H	2H	26,1	27,3	26,6	27,7	28,0	26,6	27,9	27,1	28,2	28,6
	3H	28,1	29,1	28,5	29,5	30,1	28,9	30,0	29,3	30,4	30,9
	4H	28,9	30,0	29,5	30,4	31,0	30,0	31,0	30,5	31,5	32,1
	6H	29,8	30,8	30,4	31,2	31,6	31,2	32,1	31,7	32,6	33,0
	8H	30,2	31,1	30,8	31,5	32,0	31,8	32,6	32,4	33,1	33,6
	12H	30,6	31,3	31,1	31,8	32,3	32,4	33,2	33,0	33,7	34,2
8H	4H	29,4	30,3	30,0	30,7	31,2	30,3	31,2	30,9	31,6	32,1
	6H	30,5	31,2	31,1	31,7	32,3	31,7	32,4	32,3	32,9	33,5
	8H	31,0	31,6	31,6	32,2	32,9	32,5	33,1	33,0	33,6	34,3
	12H	31,5	32,0	32,2	32,6	33,3	33,3	33,8	33,9	34,3	35,0
12H	4H	29,5	30,2	30,0	30,7	31,3	30,3	31,1	30,9	31,6	32,1
	6H	30,7	31,3	31,3	31,9	32,6	31,8	32,4	32,4	33,0	33,7
	8H	31,3	31,8	31,9	32,3	33,0	32,6	33,1	33,2	33,7	34,4

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

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	118	118	118	118	115	115	115	115	109	109	109	103	103	103	98	98	98	96
1	106	100	95	90	102	97	92	88	92	88	85	87	84	81	83	80	78	76
2	95	86	78	72	92	84	76	70	79	73	68	75	70	66	71	67	64	61
3	86	75	66	59	83	73	65	58	69	62	56	66	60	55	63	58	53	51
4	79	66	56	49	76	64	55	49	61	53	47	58	52	46	55	50	45	43
5	72	59	49	42	70	57	48	42	55	47	41	52	45	40	50	44	39	37
6	67	53	43	36	64	51	43	36	49	41	35	47	40	35	45	39	34	32
7	62	48	38	32	60	47	38	32	45	37	31	43	36	31	41	35	30	28
8	57	43	35	28	56	42	34	28	41	33	28	39	32	27	38	32	27	25
9	54	40	31	26	52	39	31	25	37	30	25	36	29	25	35	29	24	22
10	50	37	29	23	49	36	28	23	35	28	23	33	27	22	32	26	22	20

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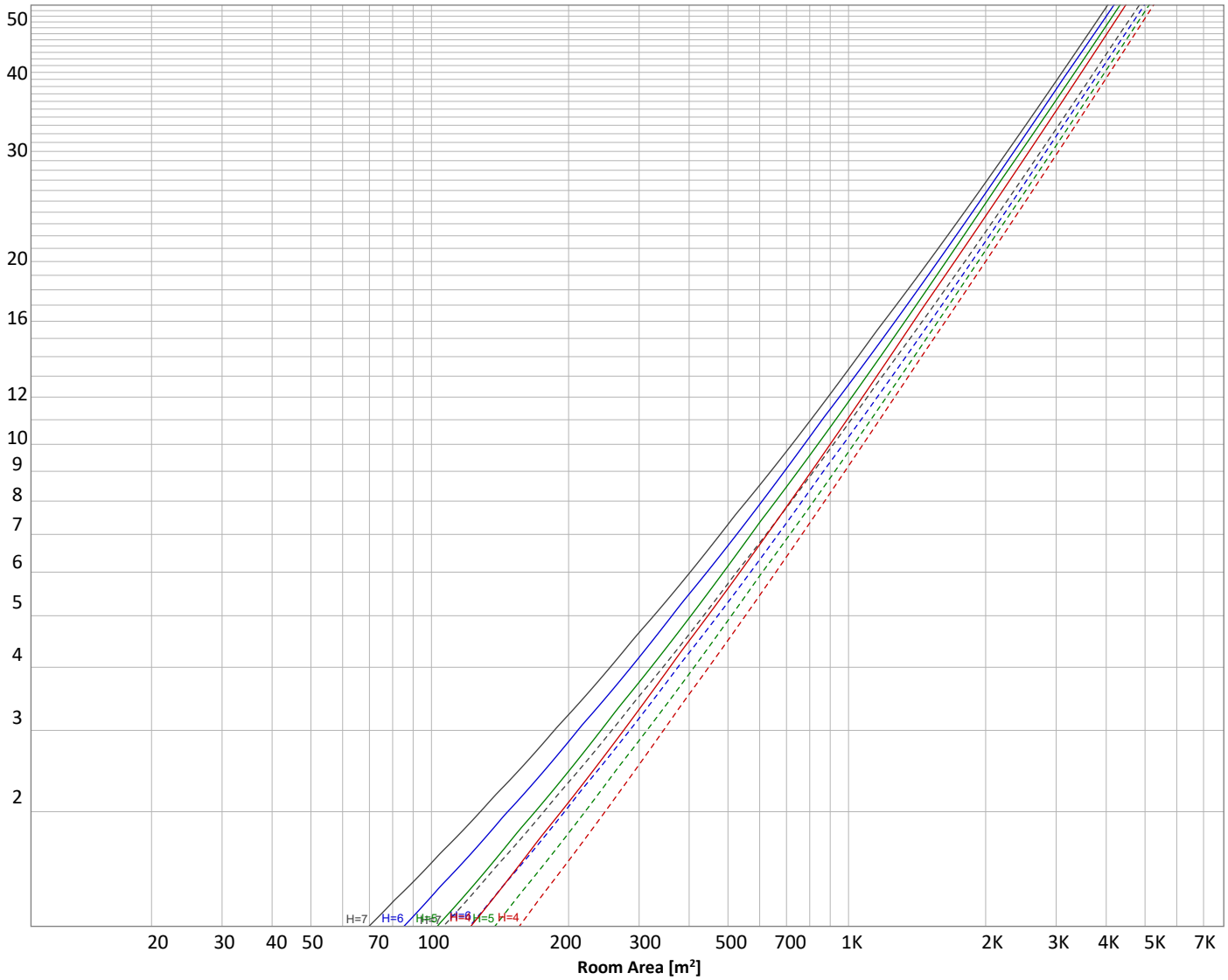
Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 11132 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°
306 lm	879 lm	1337 lm	1628 lm	1729 lm	1643 lm	1405 lm	1064 lm	671 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
318 lm	82,7 lm	15,7 lm	13,9 lm	13,0 lm	11,4 lm	9,07 lm	5,76 lm	2,01 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	306 lm	2,8%
10-20°	879 lm	7,9%
20-30°	1337 lm	12,0%
30-40°	1628 lm	14,6%
40-50°	1729 lm	15,5%
50-60°	1643 lm	14,8%
60-70°	1405 lm	12,6%
70-80°	1064 lm	9,6%
80-90°	671 lm	6,0%
90-100°	318 lm	2,9%
100-110°	83 lm	0,7%
110-120°	16 lm	0,1%
120-130°	14 lm	0,1%
130-140°	13 lm	0,1%
140-150°	11 lm	0,1%
150-160°	9 lm	0,1%
160-170°	6 lm	0,1%
170-180°	2 lm	0,0%
Total	11132 lm	100,0%

Intensity peaks

Max intensity	3237 cd
Intensity, 90°	437 cd
Intensity, 0°	3237 cd

Zonal Lumen summary

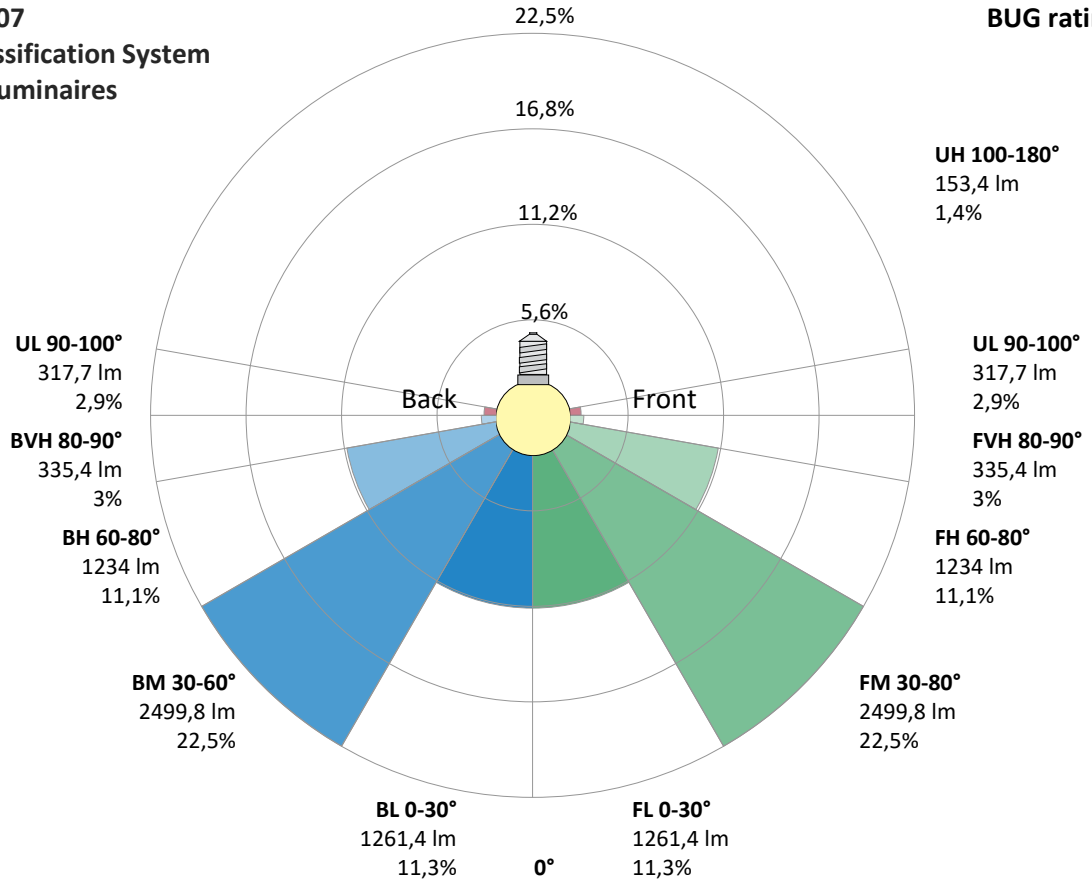
Zone (γ)	Lumen	% Total
0-30°	2523 lm	22,7%
0-40°	4151 lm	37,3%
0-60°	7522 lm	67,6%
60-90°	3139 lm	28,2%
70-100°	2052 lm	18,4%
90-120°	416 lm	3,7%
0-90°	10661 lm	95,8%
90-180°	471 lm	4,2%
0-180°	11132 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1261 lm	11,3%
Medium(30-60°)	2500 lm	22,5%
High(60-80°)	1234 lm	11,1%
Very high(80-90°)	335 lm	3,0%
Back light		
Low(0-30°)	1261 lm	11,3%
Medium(30-60°)	2500 lm	22,5%
High(60-80°)	1234 lm	11,1%
Very high(80-90°)	335 lm	3,0%
Uplight		
Low(90-100°)	318 lm	2,9%
High(100-180°)	153 lm	1,4%

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

BUG rating B3 U3 G3



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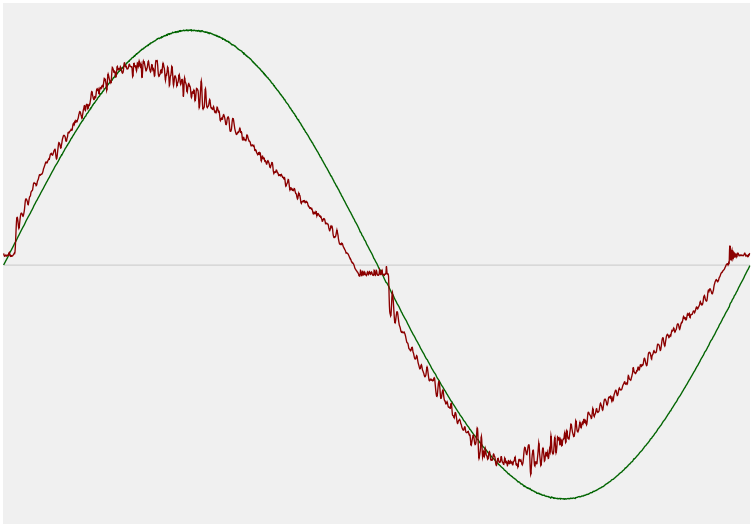
Power Details

Input Power

Power feed to light source	72,3 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,325 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	74,87 VA
Displacement factor of AC power feed	0,97
Power factor of AC current feed	0,97
Total harmonic distortion of the current	11,17%
Total harmonic distortion of the voltage	0,09%

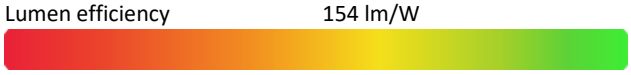
Input Power Curve



Efficiency

Radiated power efficiency 47,4%

Lumen efficiency 154 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	5000 K
CCT shift	0 K
CCT end	5000 K

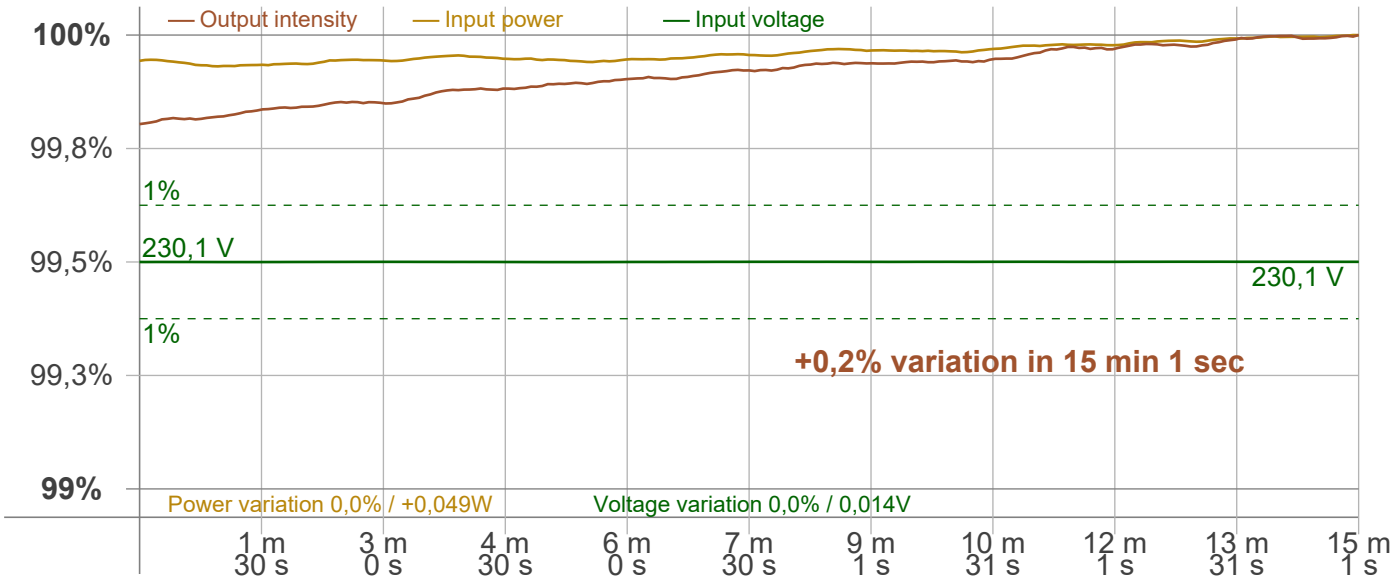
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	+0,2%

Output Change

Output start	11109 lm
Output change	+23 lm
Output end	11132 lm

Stabilization Curve



Light Measurement Report

Print date: 20-8-2025
Measurement date and time: 19-8-2025 16:52:28 – Measurement no. VFR-250819-2619-MS
Measurement tracking No. and Link: VT250819-003820
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	1,02 %
Flicker index	0

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

JA8/10 40 Hz	0,02 %
JA8/10 90 Hz	0,03 %
JA8/10 200 Hz	0,97 %
JA8/10 400 Hz	0,99 %
JA8/10 1000 Hz	1,01 %

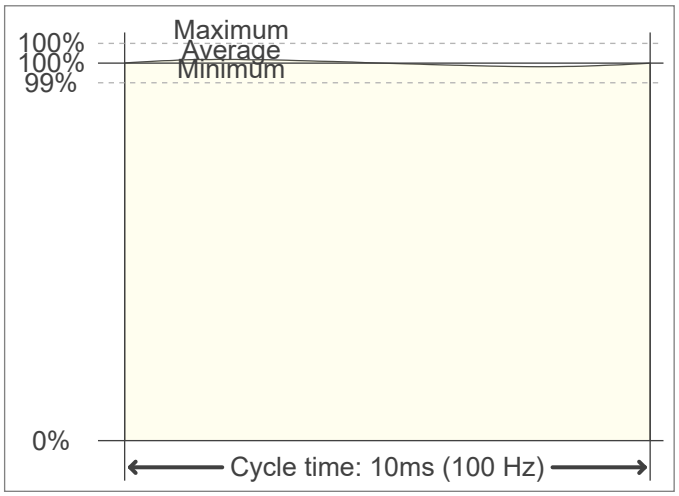
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz)	0,02
SVM value (80 < F < 2000 Hz)	0,04

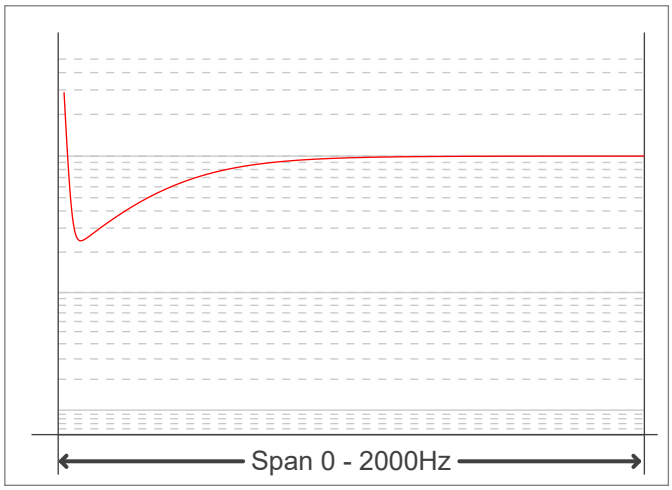
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp	0,01

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot