Light Measurement Report

Print date: 26-9-2025
Measurement date and time: 26-9-2025 11:26:08 – Measurement no. VFR-250926-3400-MS
Measurement tracking No. and Link: VT250926-000924
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

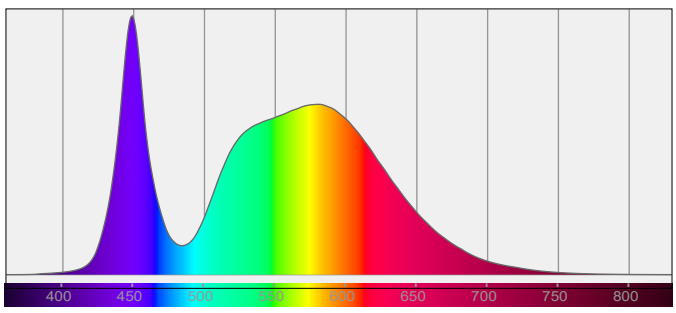
Number of C-planes and Resolution	48 planes – 7,5°
γ (gamma)-Resolution	5°
Test Distance	2,89 m
Input Power, Power and Displ. Factors	73,9 W – PF 0,97 – DPF 0,97
Input RMS Voltage and Current	230 V – 0,332 A
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Lamp stabilized in 15 min 3 sec – 2,0%

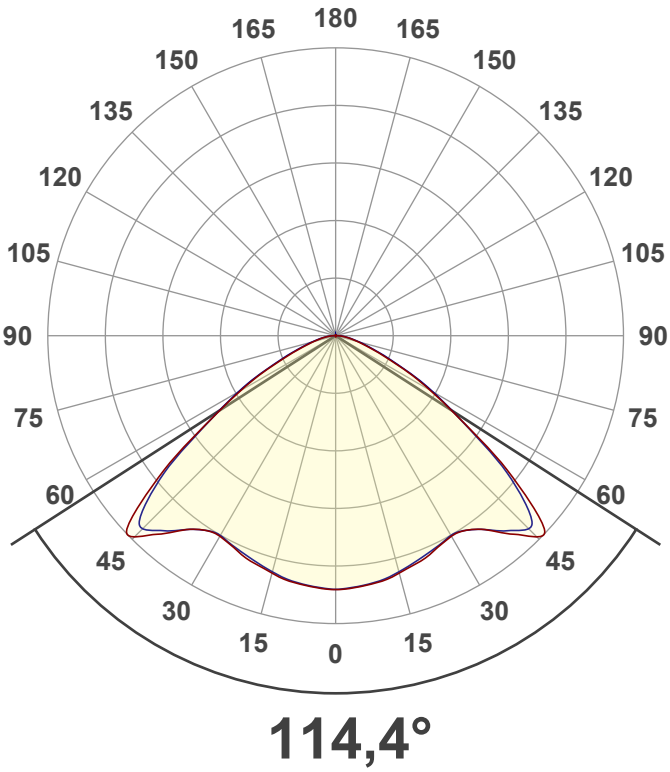
Tested Light Source

Product Name	812713-5000K-80W
Item No. and Manufacturer	812713-5000K-80W – Dutchfulfillment
Product Description (line 1)	LED HIGHBAY ARGOS | 0-10V | 100W/80W/60W | 60°/90°/120° | CCT
SWITCH	

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	11613 lm – 0,16% / 99,84%
Efficiency	157 lm/W
Peak Intensity and Beam Angle	4061 cd – 114,4°
Correlated Color Temperature, Target/Measured	CCT = 5000 K / 4835 K
Color Rendering Index	CRI 73,1
Color Rendering TM30-18	R_f 74,0 – R_g 95,0
Color Shift, CIE duv and MacAdam Steps	Duv 0,0020 – SDCM 3,3
Flicker	SVM 0 – PstLM 0,11





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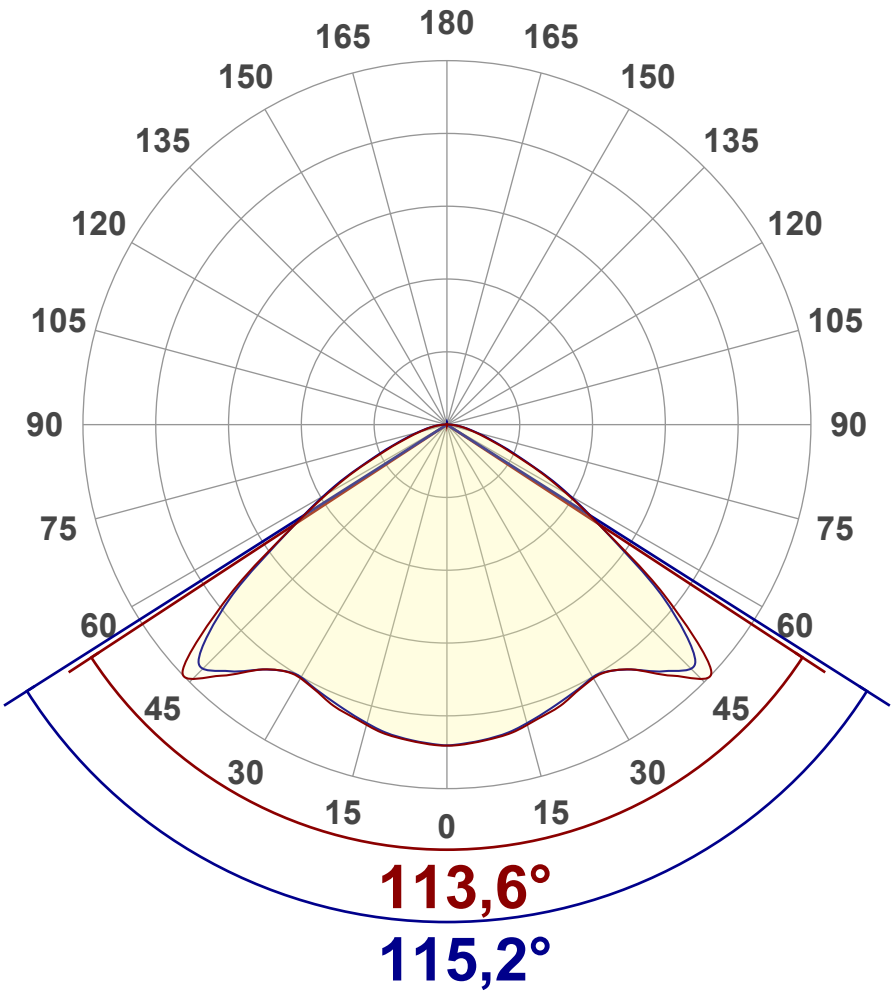
Luminous Intensity diagram Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	11613 lm
Lumen Up% / Down%	0,16% / 99,84%
Peak Intensity	4061 cd
Beam Angle (50%)	114,4°
Beam Angle (90%)	115,2°
Beam Angle (10%)	114,3°

Cut-off Angle

Average 2,5%	170,7°

Field Angle

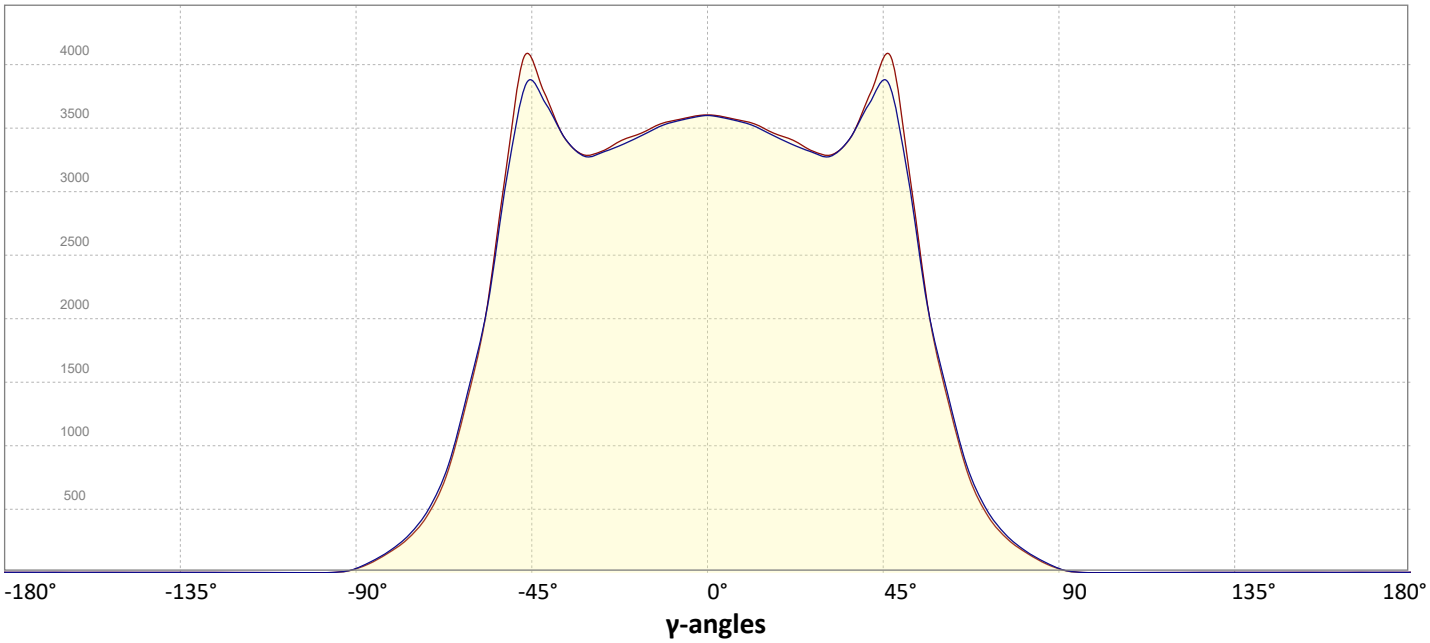
Average 10%	147,5°

Intensity Ratio

In 120° cone	87,1%
In 90° cone	55,3%

C000-C180
C090-C270

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



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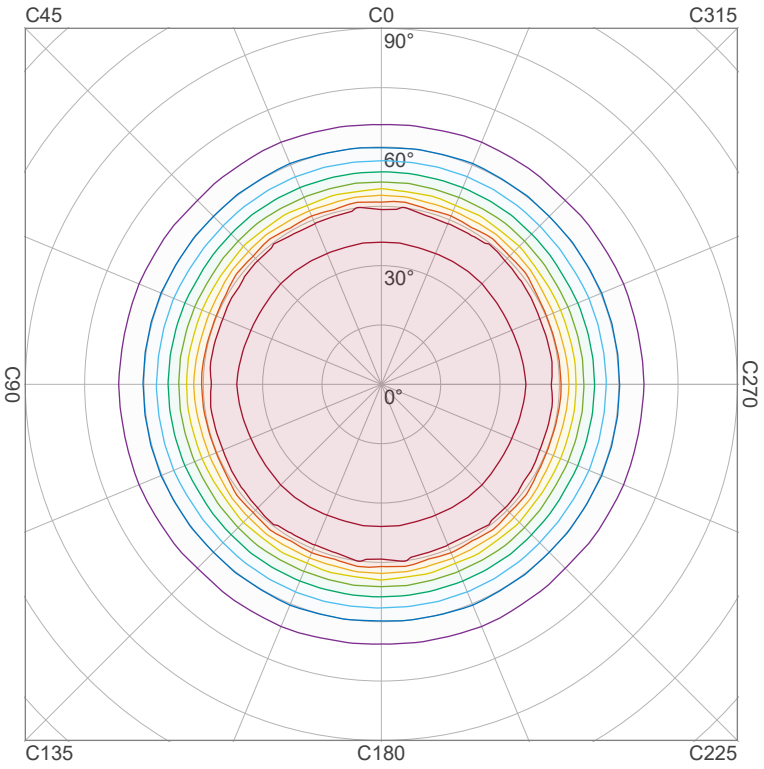
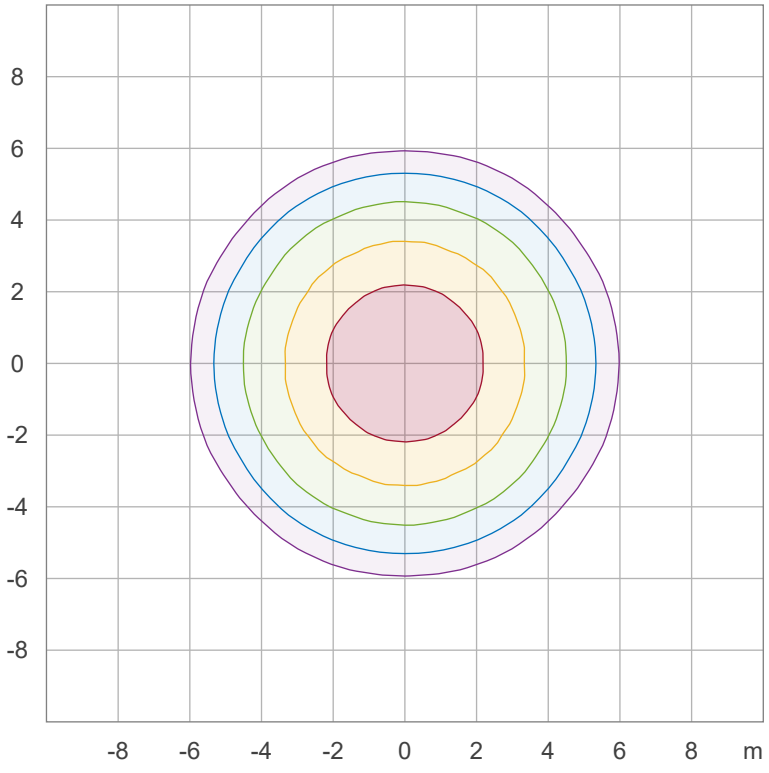
Iso-intensity Diagram (Iso-candela)



90 %	3647,7 cd
80 %	3242,4 cd
70 %	2837,1 cd
60 %	2431,8 cd
50 %	2026,5 cd
40 %	1621,2 cd
30 %	1215,9 cd
20 %	810,6 cd
10 %	405,3 cd

Peak intensity: 4053,0 cd
Number of c-planes: 48

Iso-illuminance Diagram (Iso-lux)



50,0 %	200,1 lx
30,0 %	120,1 lx
10,0 %	40,0 lx
5,0 %	20,0 lx
3,0 %	12,0 lx

Peak illuminance: 400,2 lx
Mounting height: 3,0 m
Number of c-planes: 48

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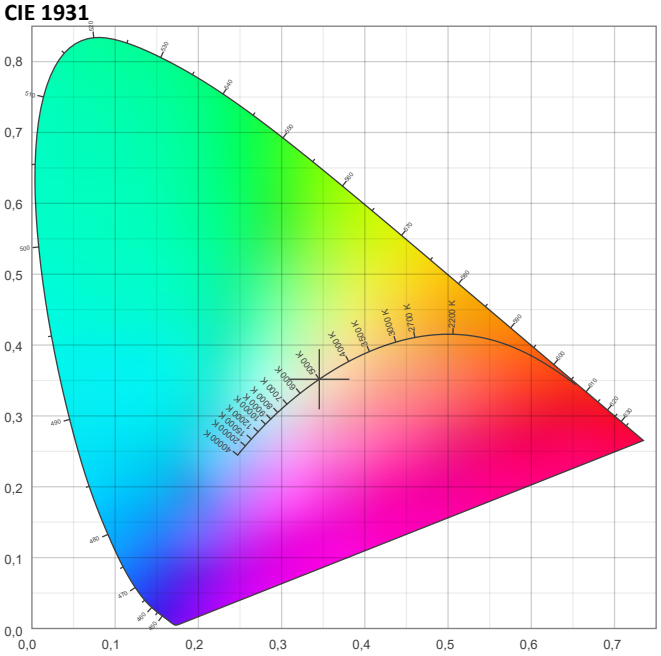
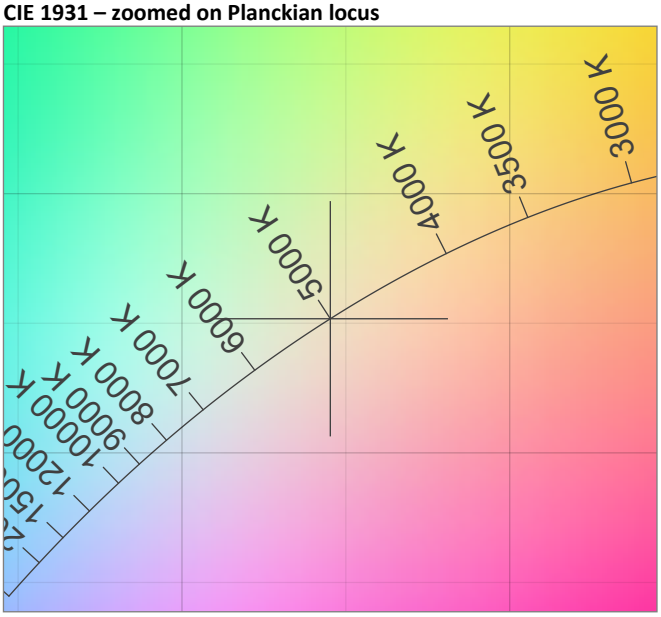
Color details

Correlated Color Temperature, Target	CCT = 5000 K
Correlated Color Temperature, Measured	CCT = 4835 K
Color Rendering Index	CRI 73,1
Color Rendering Index, R9 (red component)	R9 = -27,7
Color Rendering TM30-18	R_f 74,0 – R_g 95,0
Color Quality Scale	CQS = 72,2
MacAdam Steps	SDCM = 3,3
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 = 0,0020
Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0,211;0,485)

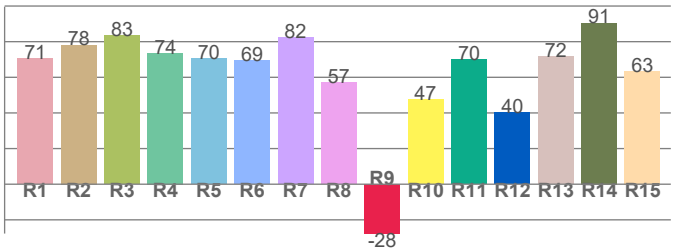
CIE 1931



CIE 1931 – zoomed on Planckian locus



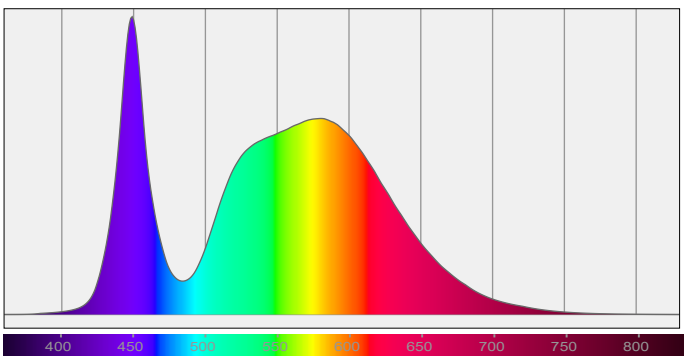
Color Rendering Index per reference color (CIE 1995)



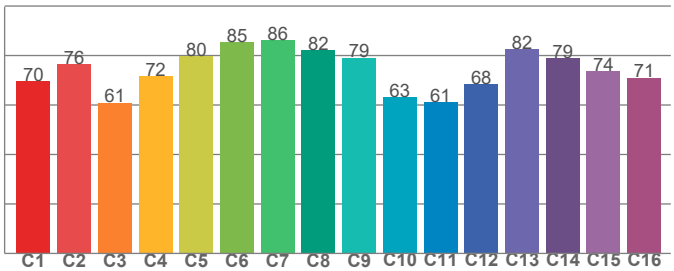
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
70,5	78,2	83,3	73,5	70,4	69,3	82,3	57,0	-27,7	47,5	70,1	40,3	71,8	90,6	63,5

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



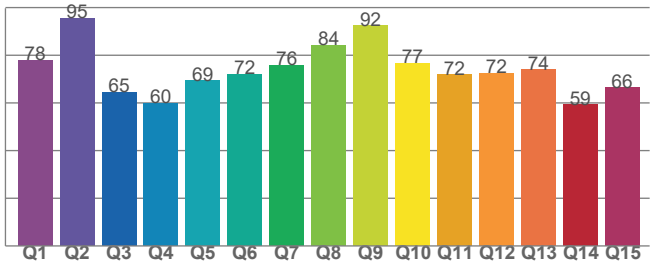
TM30-18 Rf-values per hue bin



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
69,7	76,4	60,9	71,7	79,6	85,3	86,1	82,2	79,0	63,2	61,0	68,4	82,5	79,0	73,5	71,0

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
77,9	95,5	64,6	59,8	69,2	72,2	75,9	84,2	92,4	76,5	71,9	72,5	73,8	59,3	66,4

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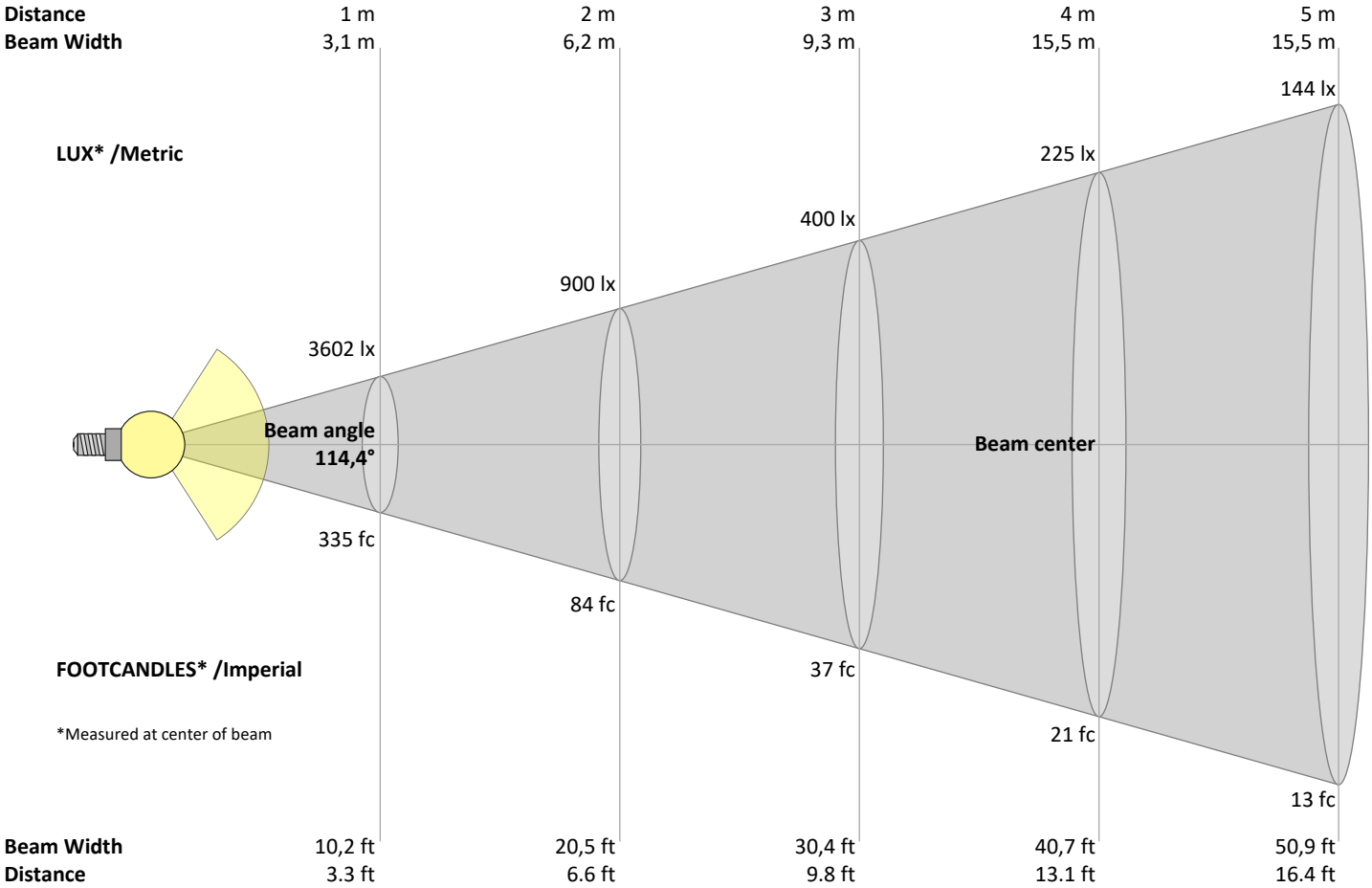
Beam Details



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
3602	900	400	225	144	100	74	56	44	36	30	25	21	18	16	14	12	11	10	9	lux
334,6	83,7	37,2	20,9	13,4	9,3	6,8	5,2	4,1	3,3	2,8	2,3	2	1,7	1,5	1,3	1,2	1	0,9	0,8	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
3602	3582	3548	3489	3426	3352	3303	3382	3653	3955	3470	2422	1577	971	563	331	194	100	35	6	cd
100%	99%	99%	97%	95%	93%	92%	94%	101%	110%	96%	67%	44%	27%	16%	9%	5%	3%	1%	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
3602	3574	3535	3469	3396	3332	3287	3376	3614	3810	3315	2370	1608	1004	597	356	208	109	37	7	cd
100%	99%	98%	96%	94%	93%	91%	94%	100%	106%	92%	66%	45%	28%	17%	10%	6%	3%	1%	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
3602	3582	3548	3489	3426	3352	3303	3382	3653	3955	3470	2422	1577	971	563	331	194	100	35	6	cd
100%	99%	99%	97%	95%	93%	92%	94%	101%	110%	96%	67%	44%	27%	16%	9%	5%	3%	1%	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
3602	3574	3535	3469	3396	3332	3287	3376	3614	3810	3315	2370	1608	1004	597	356	208	109	37	7	cd
100%	99%	98%	96%	94%	93%	91%	94%	100%	106%	92%	66%	45%	28%	17%	10%	6%	3%	1%	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	31,4	32,6	31,7	32,9	33,1	31,3	32,5	31,5	32,8	33,0
	3H	31,7	33,0	32,2	33,2	33,4	31,7	32,9	32,1	33,2	33,4
	4H	31,8	33,0	32,3	33,3	33,5	31,8	33,0	32,2	33,3	33,5
	6H	32,0	33,0	32,3	33,3	33,6	32,0	33,0	32,3	33,3	33,6
	8H	32,0	32,9	32,3	33,3	33,7	32,0	33,0	32,3	33,3	33,7
	12H	32,0	32,9	32,3	33,3	33,7	32,0	32,9	32,4	33,3	33,7
4H	2H	31,6	32,8	32,0	33,0	33,3	31,5	32,7	31,9	32,9	33,2
	3H	32,2	33,1	32,5	33,5	33,9	32,1	33,1	32,5	33,4	33,9
	4H	32,3	33,1	32,7	33,6	34,1	32,3	33,1	32,7	33,5	34,1
	6H	32,4	33,2	32,9	33,6	34,0	32,4	33,2	32,9	33,6	34,0
	8H	32,4	33,2	33,0	33,6	33,9	32,5	33,2	33,0	33,6	34,0
	12H	32,5	33,1	33,0	33,5	34,0	32,5	33,1	33,0	33,6	34,0
8H	4H	32,3	33,1	32,8	33,4	33,8	32,3	33,0	32,8	33,4	33,8
	6H	32,5	33,1	33,0	33,5	34,1	32,5	33,1	33,0	33,6	34,1
	8H	32,6	33,1	33,1	33,6	34,3	32,7	33,1	33,2	33,7	34,3
	12H	32,7	33,1	33,3	33,6	34,2	32,8	33,2	33,3	33,7	34,3
12H	4H	32,3	32,9	32,8	33,3	33,8	32,3	32,9	32,8	33,3	33,8
	6H	32,5	33,0	33,1	33,5	34,2	32,6	33,0	33,1	33,6	34,2
	8H	32,6	33,1	33,2	33,6	34,2	32,7	33,1	33,3	33,6	34,2

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

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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	110	105	102	98	107	103	100	96	99	96	93	95	93	90	91	90	88	86
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	78	75	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	63	61
4	84	72	64	57	82	71	63	57	68	61	56	66	60	55	64	59	54	52
5	77	64	55	49	75	63	55	49	61	54	48	59	53	48	57	52	47	45
6	71	58	49	42	69	57	48	42	55	47	42	53	46	41	51	46	41	39
7	65	52	43	37	64	51	43	37	49	42	37	48	41	36	47	41	36	34
8	61	47	39	33	59	46	38	33	45	38	32	44	37	32	43	36	32	30
9	56	43	35	29	55	42	34	29	41	34	29	40	33	29	39	33	29	27
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

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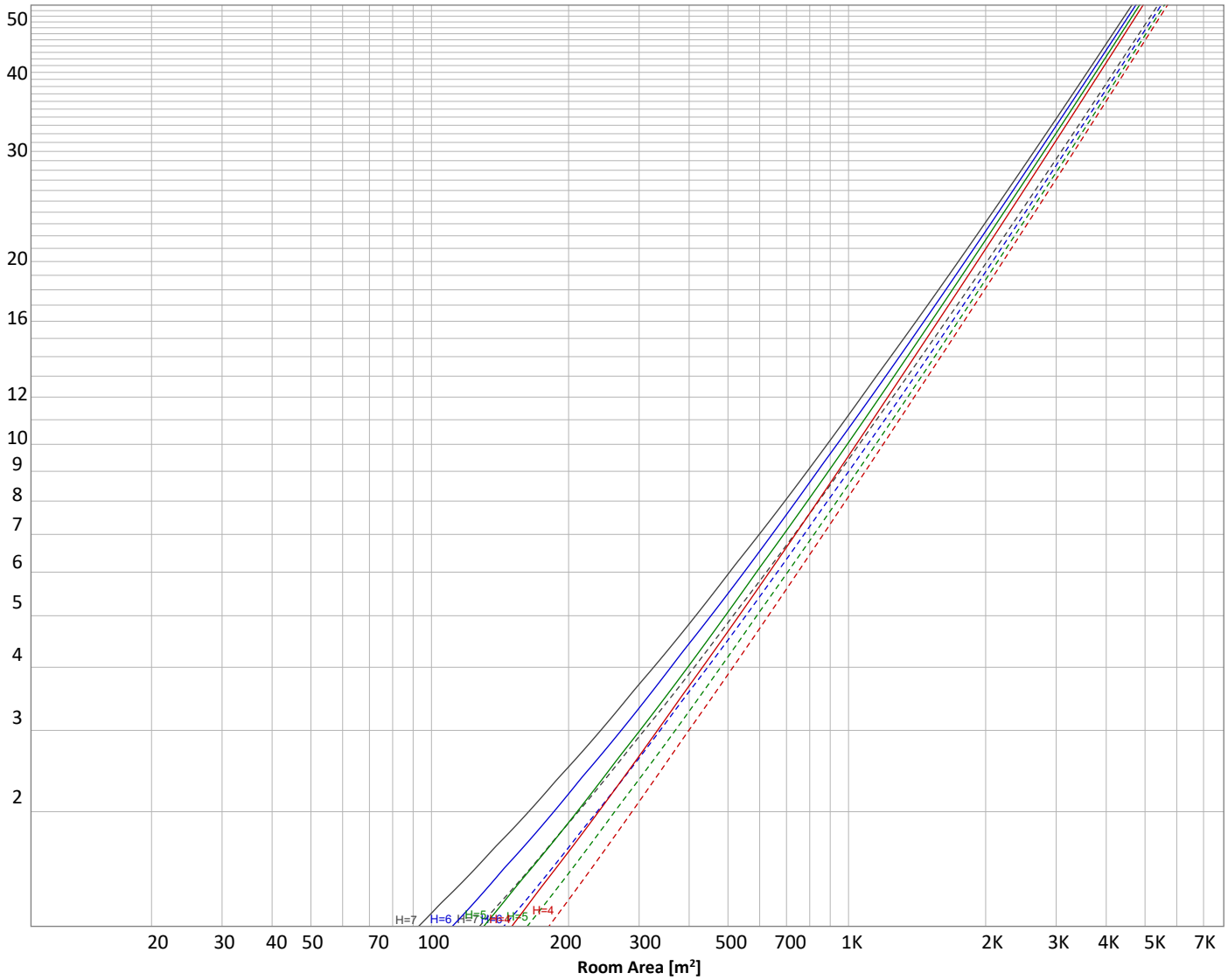
Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 11613 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°
341 lm	985 lm	1546 lm	2136 lm	2970 lm	2134 lm	998 lm	371 lm	116 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
7,57 lm	0,793 lm	1,56 lm	2,00 lm	2,02 lm	1,80 lm	1,34 lm	0,832 lm	0,290 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	341 lm	2,9%
10-20°	985 lm	8,5%
20-30°	1546 lm	13,3%
30-40°	2136 lm	18,4%
40-50°	2970 lm	25,6%
50-60°	2134 lm	18,4%
60-70°	998 lm	8,6%
70-80°	371 lm	3,2%
80-90°	116 lm	1,0%
90-100°	8 lm	0,1%
100-110°	1 lm	0,0%
110-120°	2 lm	0,0%
120-130°	2 lm	0,0%
130-140°	2 lm	0,0%
140-150°	2 lm	0,0%
150-160°	1 lm	0,0%
160-170°	1 lm	0,0%
170-180°	0 lm	0,0%
Total	11613 lm	100,0%

Intensity peaks

Max intensity	4061 cd
Intensity, 90°	35 cd
Intensity, 0°	3602 cd

Zonal Lumen summary

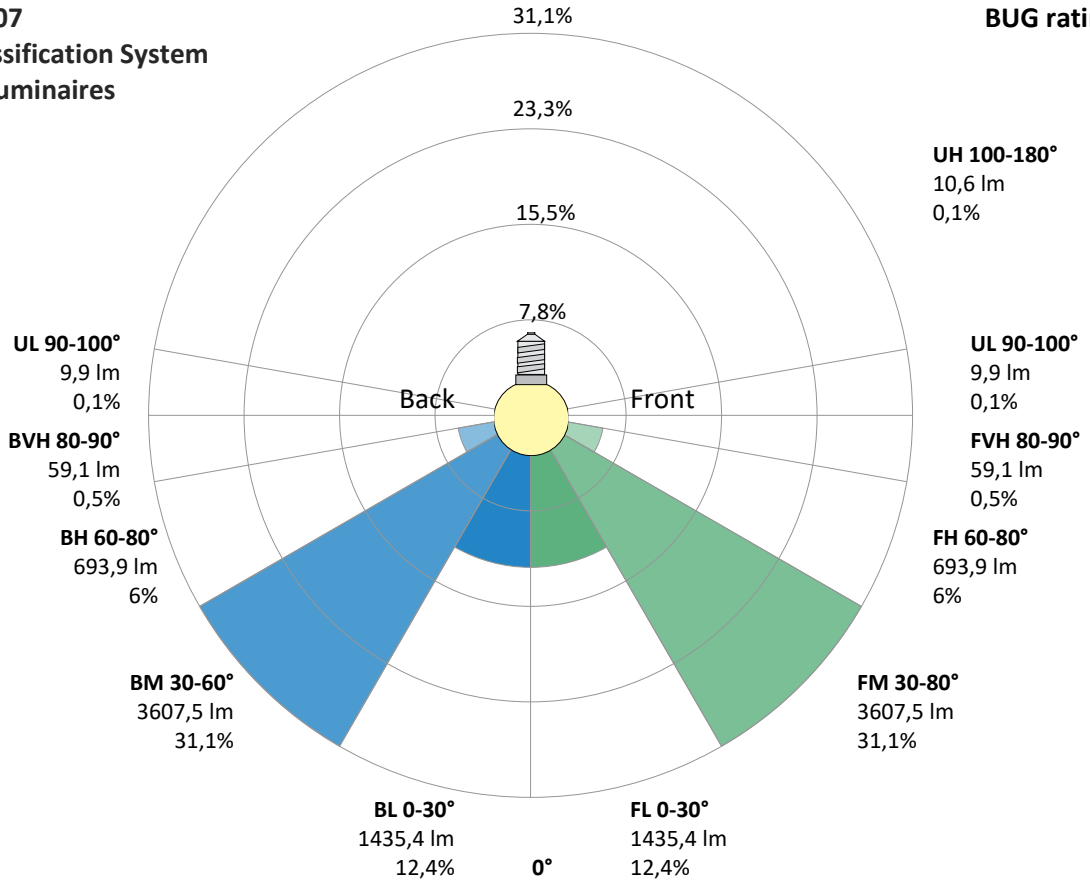
Zone (γ)	Lumen	% Total
0-30°	2872 lm	24,7%
0-40°	5007 lm	43,1%
0-60°	10111 lm	87,1%
60-90°	1484 lm	12,8%
70-100°	494 lm	4,3%
90-120°	10 lm	0,1%
0-90°	11595 lm	99,8%
90-180°	18 lm	0,2%
0-180°	11613 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1435 lm	12,4%
Medium(30-60°)	3608 lm	31,1%
High(60-80°)	694 lm	6,0%
Very high(80-90°)	59 lm	0,5%
Back light		
Low(0-30°)	1435 lm	12,4%
Medium(30-60°)	3608 lm	31,1%
High(60-80°)	694 lm	6,0%
Very high(80-90°)	59 lm	0,5%
Uplight		
Low(90-100°)	10 lm	0,1%
High(100-180°)	11 lm	0,1%

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

BUG rating B3 U2 G1



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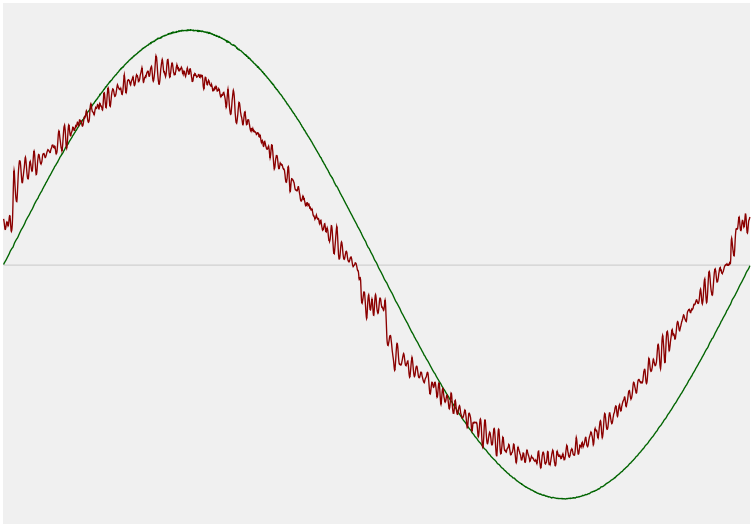
Power Details

Input Power

Power feed to light source	73,9 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,332 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	76,33 VA
Displacement factor of AC power feed	0,97
Power factor of AC current feed	0,97
Total harmonic distortion of the current	4,26%
Total harmonic distortion of the voltage	0,13%

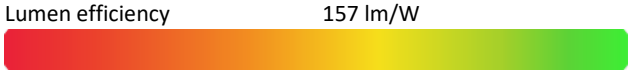
Input Power Curve



Efficiency

Radiated power efficiency 46,0%

Lumen efficiency 157 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	4996 K
CCT shift	+4 K
CCT end	5000 K

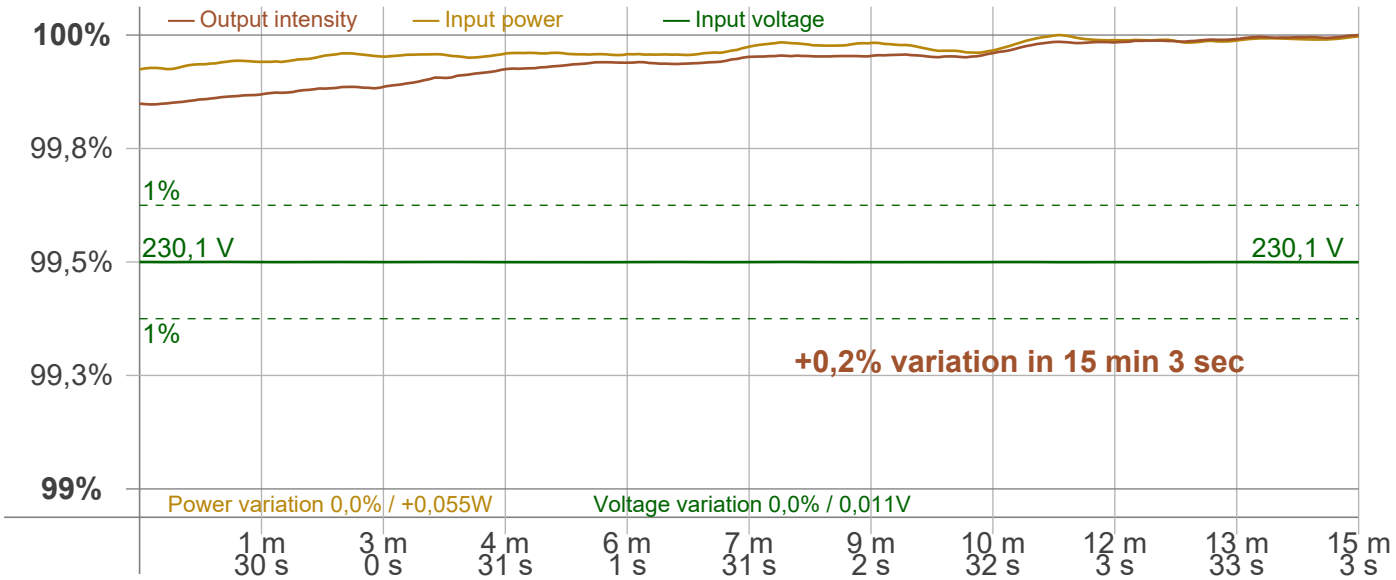
Warmup Result

Total warmup time	Lamp stabilized in 15 min 3 sec
Warmup variation	+0,2%

Output Change

Output start	11596 lm
Output change	+17 lm
Output end	11613 lm

Stabilization Curve



Light Measurement Report

Print date: 26-9-2025
Measurement date and time: 26-9-2025 11:26:08 – Measurement no. VFR-250926-3400-MS
Measurement tracking No. and Link: VT250926-000924
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	526,32 Hz
Percent Flicker	0,42 %
Flicker index	0

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

PstLM value (F < 80 Hz)	0,11
SVM value (80 < F < 2000 Hz)	0

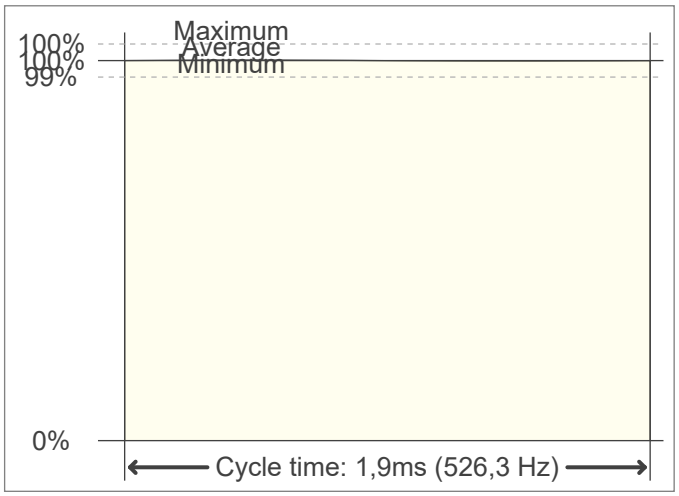
Flicker indices according to California Energy Commission (CEC) 2016b

JA8/10 40 Hz	0,22 %
JA8/10 90 Hz	0,22 %
JA8/10 200 Hz	0,25 %
JA8/10 400 Hz	0,26 %
JA8/10 1000 Hz	0,42 %

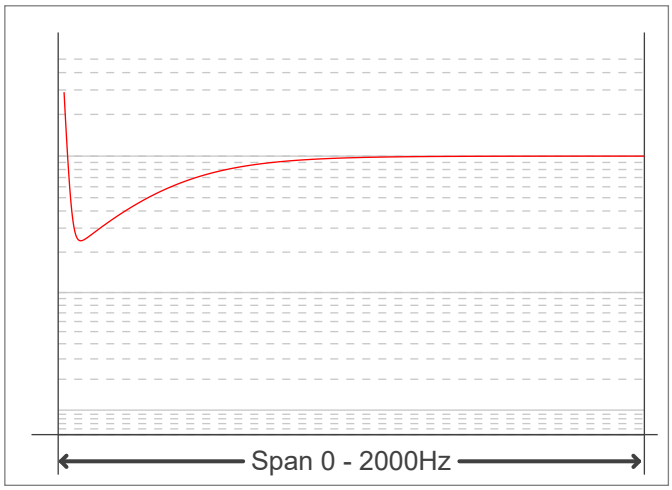
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp	0,04

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot