Light Measurement Report

Print date: 1-7-2025
Measurement date and time: 1-7-2025 08:35:49 – Measurement no. VFR-250701-1822-MS
Measurement tracking No. and Link: VT250701-000989
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

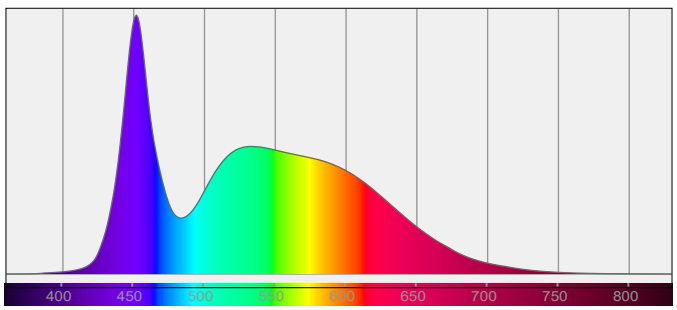
Number of C-planes and Resolution	16 planes – 22,5°
γ (gamma)-Resolution	5°
Test Distance	1,99 m
Input Power, Power and Displ. Factors	30,6 W – PF 0,99 – DPF 1,0
Input RMS Voltage and Current	230 V – 0,134 A
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Lamp stabilized in 21 min 15 sec – 2,0%

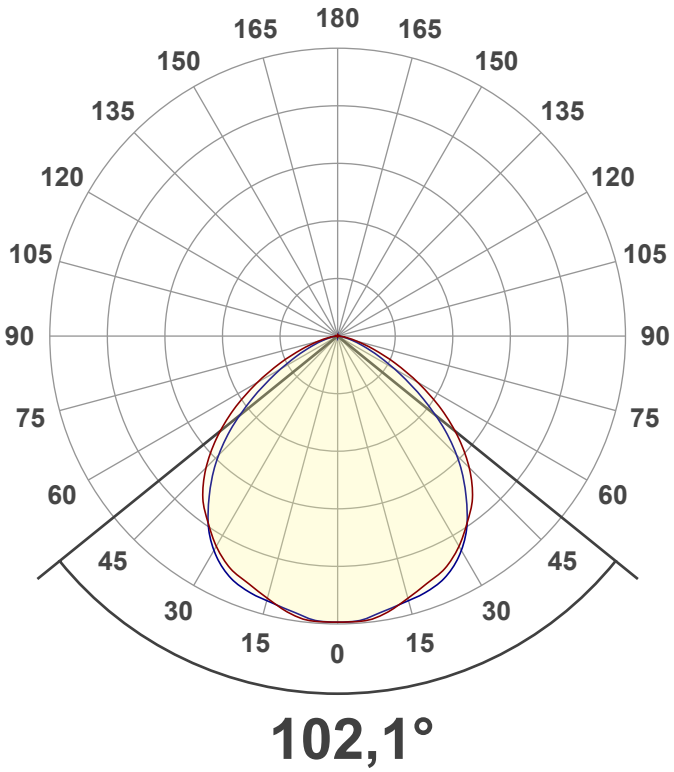
Tested Light Source

Product Name	811501-6000K
Item No. and Manufacturer	811501-6000K – Dutchfulfillment
Product Description (line 1)	LED FLOODLIGHT ISTOS | 30W | CCT-SWITCH

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	2792 lm – 0,06% / 99,94%
Efficiency	91 lm/W
Peak Intensity and Beam Angle	1170 cd – 102,1°
Correlated Color Temperature, Target/Measured	CCT = 6000 K / 6805 K
Color Rendering Index	CRI 82,4
Color Rendering TM30-18	R_f 82,8 – R_g 95,2
Color Shift, CIE duv and MacAdam Steps	Duv 0,0064 – SDCM 13,8
Flicker	SVM 3,75 – PstLM 0,07





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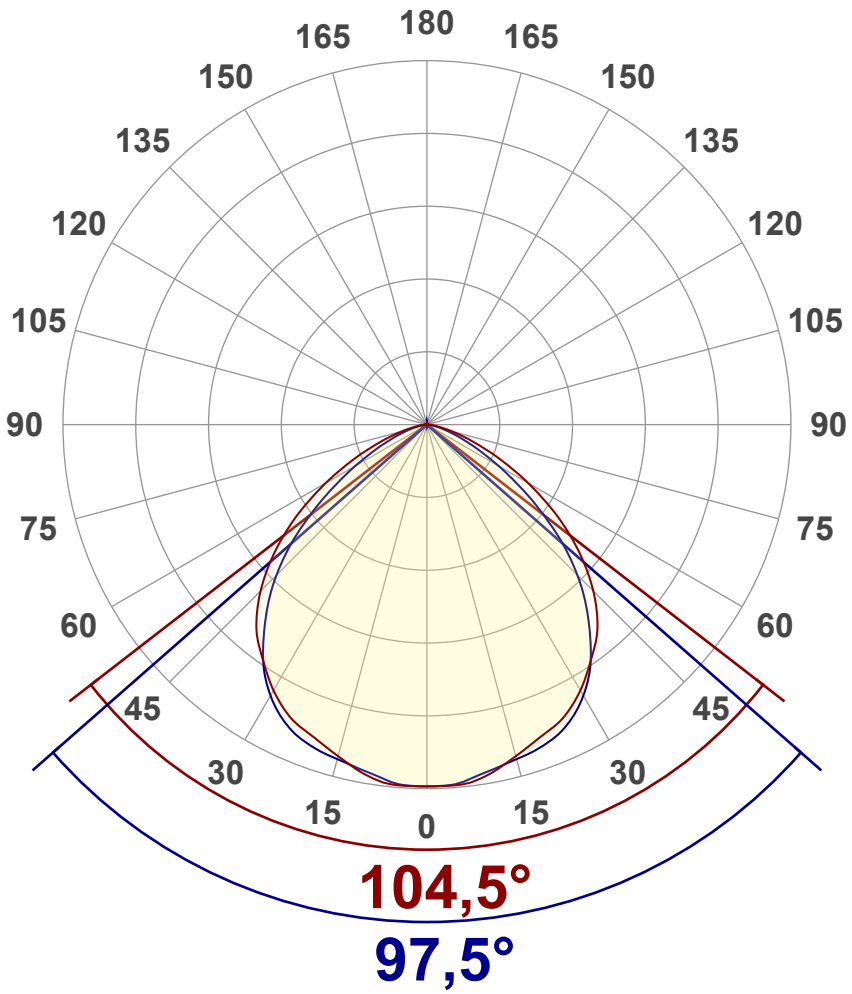
Luminous Intensity diagram Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2792 lm
Lumen Up% / Down%	0,06% / 99,94%
Peak Intensity	1170 cd
Beam Angle (50%)	102,1°
Beam Angle (90%)	97,5°
Beam Angle (10%)	104,5°

Cut-off Angle

Average 2,5%	160,6°

Field Angle

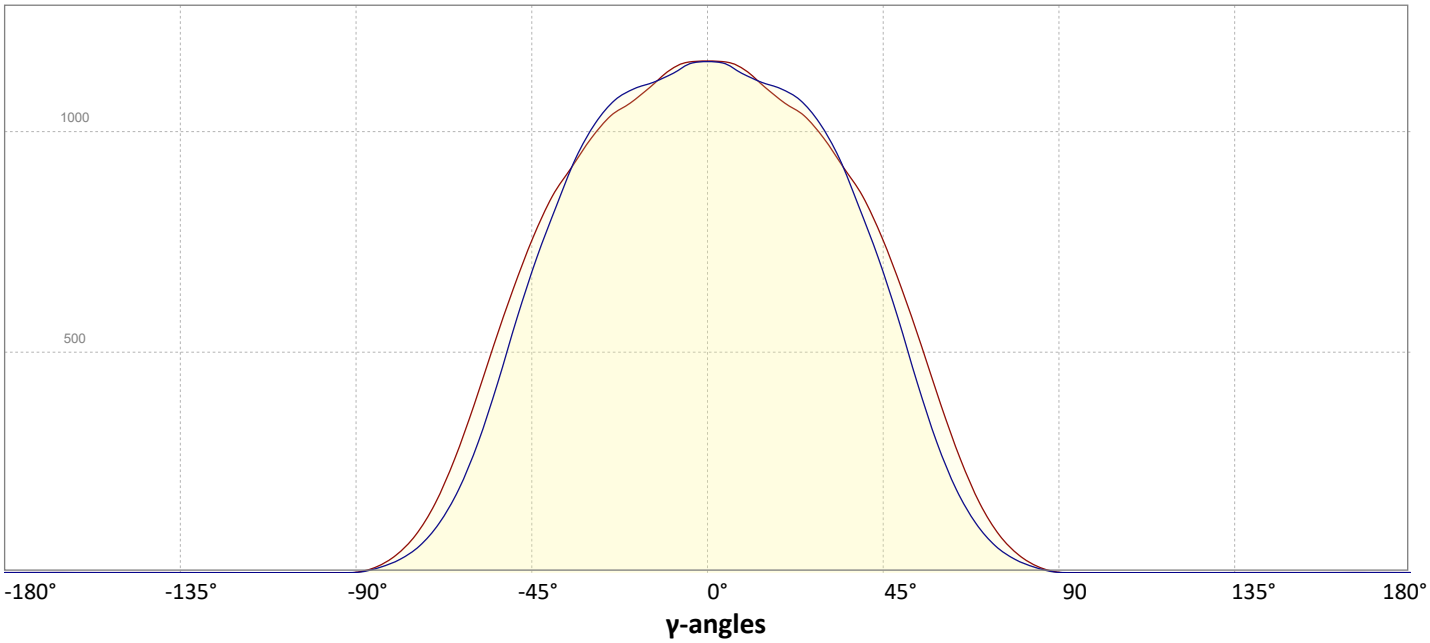
Average 10%	140,9°

Intensity Ratio

In 120° cone	89,2%
In 90° cone	64,6%

C000-C180
C090-C270

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



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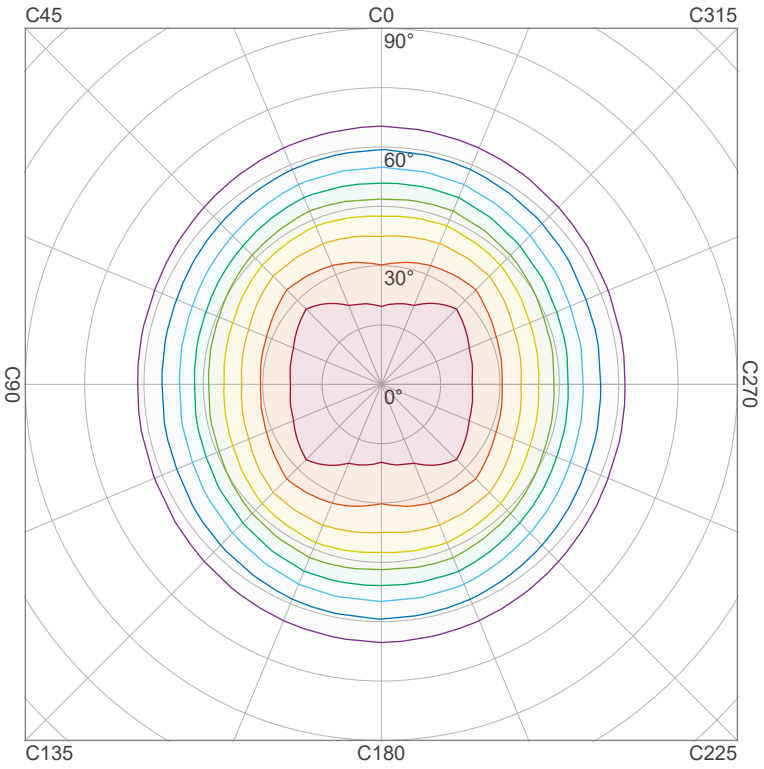
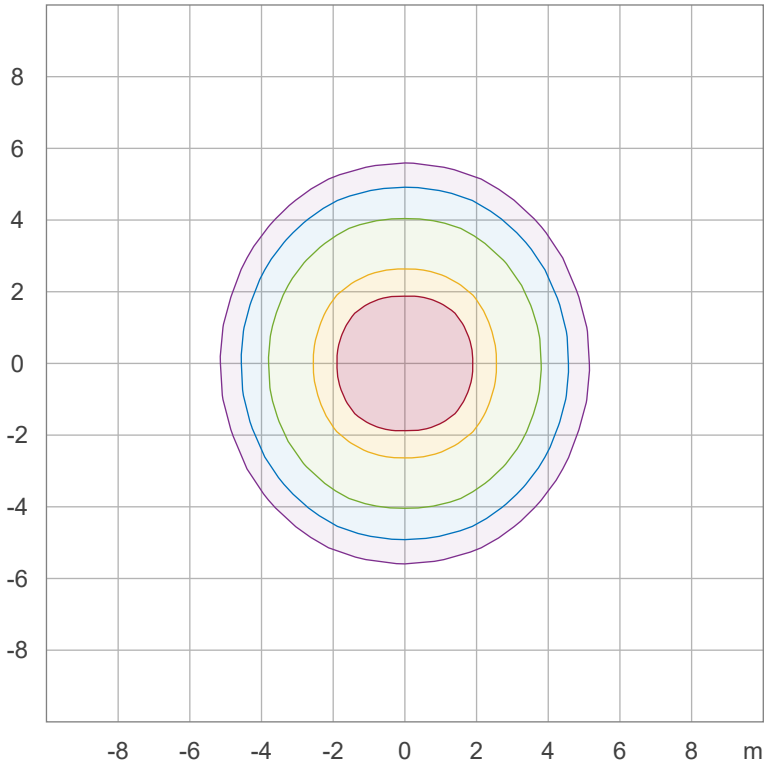
Iso-intensity Diagram (Iso-candela)



	90 %	1052,6 cd
	80 %	935,6 cd
	70 %	818,7 cd
	60 %	701,7 cd
	50 %	584,8 cd
	40 %	467,8 cd
	30 %	350,9 cd
	20 %	233,9 cd
	10 %	117,0 cd

Peak intensity: 1169,5 cd
Number of c-planes: 16

Iso-illuminance Diagram (Iso-lux)



	50,0 %	64,7 lx
	30,0 %	38,8 lx
	10,0 %	12,9 lx
	5,0 %	6,5 lx
	3,0 %	3,9 lx

Peak illuminance: 129,4 lx
Mounting height: 3,0 m
Number of c-planes: 16

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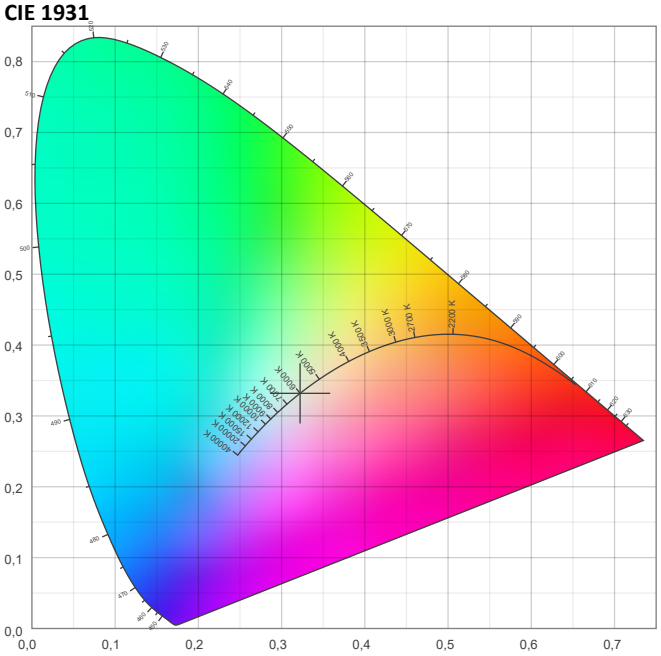
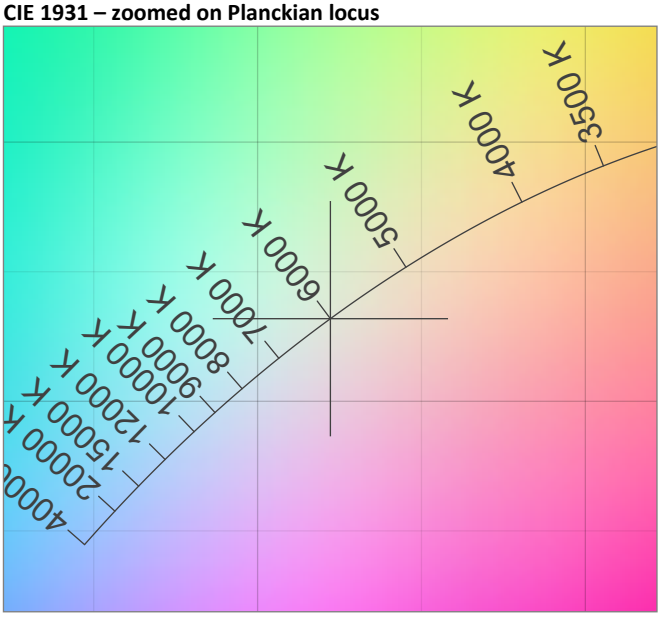
Color details

Correlated Color Temperature, Target	CCT = 6000 K	MacAdam Steps	SDCM = 13,8
Correlated Color Temperature, Measured	CCT = 6805 K	Color coordinates CIE 1931	(x;y) = (0,322;0,332)
Color Rendering Index	CRI 82,4	Color coordinate CIEs 1960	(u;v) = (0,203;0,314)
Color Rendering Index, R9 (red component)	R9 = 7,6	Color deviation from BBL	Duv = 0,0064
Color Rendering TM30-18	R_f 82,8 – R_g 95,2	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0,203;0,471)
Color Quality Scale	CQS = 81,1		

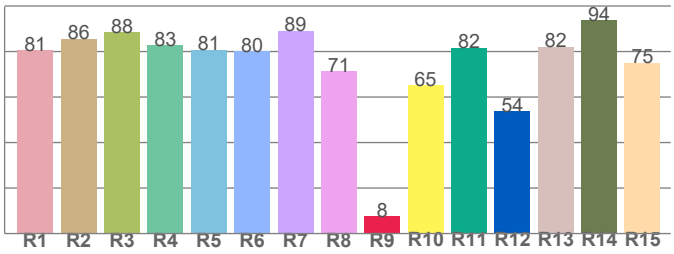
CIE 1931



CIE 1931 – zoomed on Planckian locus



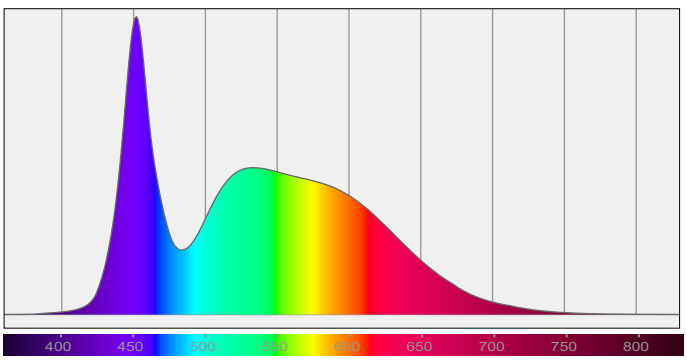
Color Rendering Index per reference color (CIE 1995)



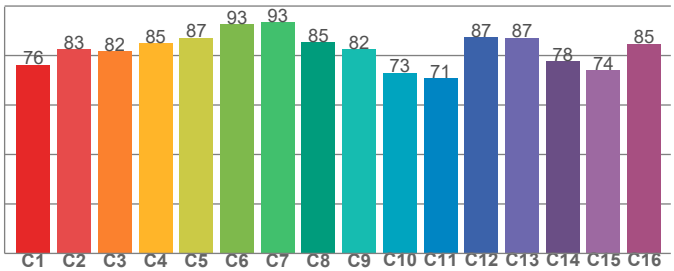
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
80,5	85,7	88,5	82,8	80,8	80,2	89,1	71,4	7,6	65,3	81,6	53,8	82,0	93,9	75,1

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



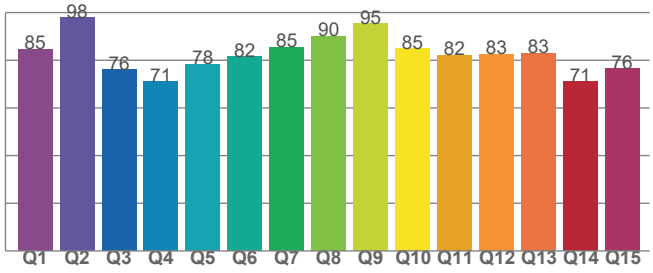
TM30-18 Rf-values per hue bin



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
76,3	82,5	81,6	85,1	87,1	92,7	93,3	85,5	82,5	73,1	70,7	87,5	87,2	77,6	74,0	84,7

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
84,7	97,9	76,0	71,1	78,3	81,5	85,4	90,0	95,3	84,9	82,1	82,5	83,0	70,9	76,4

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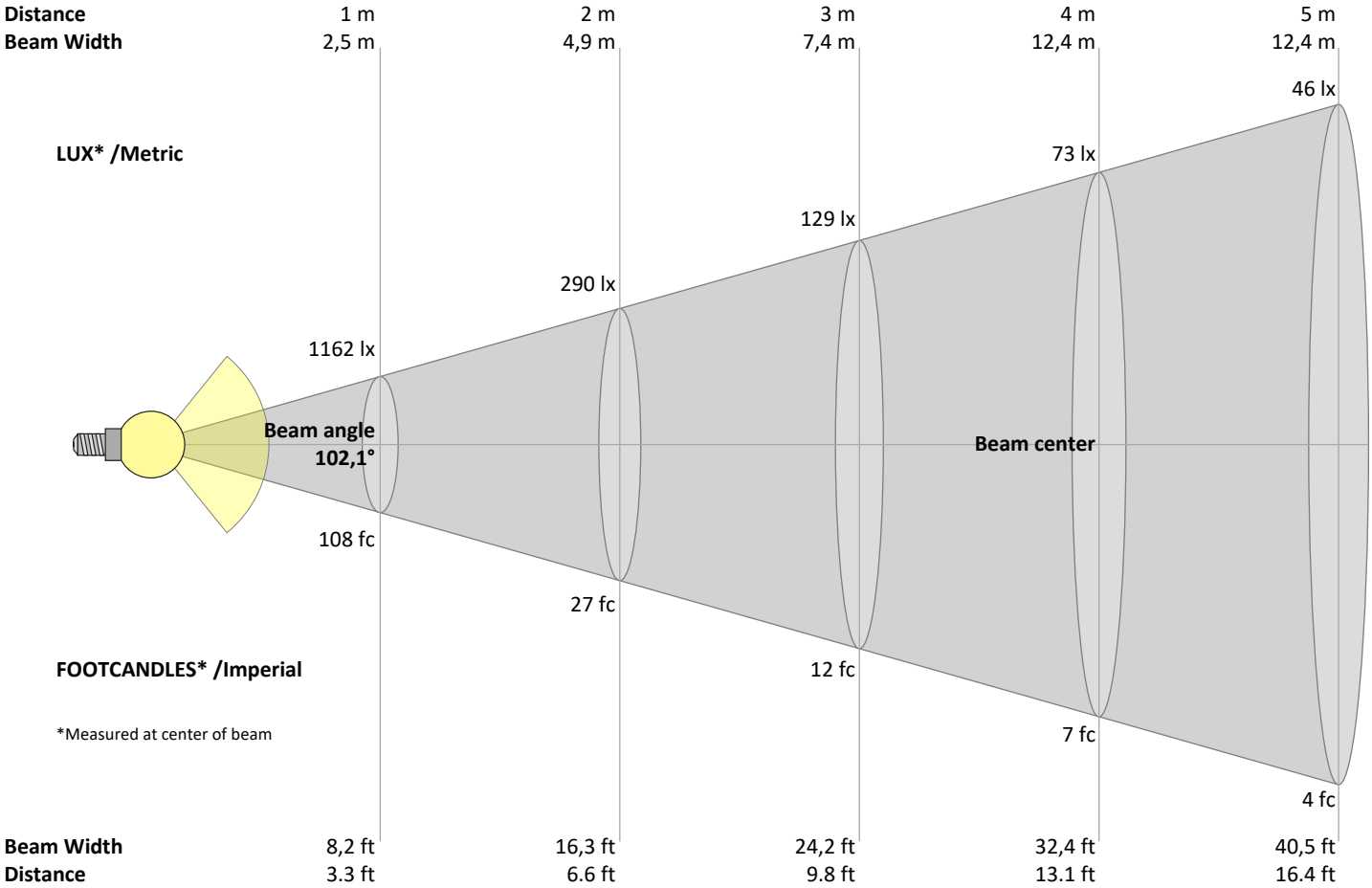
Beam Details



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
1162	290	129	73	46	32	24	18	14	12	10	8	7	6	5	5	4	4	3	3	lux
107,9	27	12	6,7	4,3	3	2,2	1,7	1,3	1,1	0,9	0,7	0,6	0,6	0,5	0,4	0,4	0,3	0,3	0,3	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
1162	1157	1137	1098	1063	1033	982	916	848	753	637	508	375	253	153	83	39	13	1	0	cd
100%	100%	98%	95%	92%	89%	85%	79%	73%	65%	55%	44%	32%	22%	13%	7%	3%	1%	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
1162	1150	1127	1108	1091	1058	999	912	801	679	541	396	268	169	99	53	26	10	1	0	cd
100%	99%	97%	95%	94%	91%	86%	79%	69%	58%	47%	34%	23%	15%	9%	5%	2%	1%	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
1162	1157	1137	1098	1063	1033	982	916	848	753	637	508	375	253	153	83	39	13	1	0	cd
100%	100%	98%	95%	92%	89%	85%	79%	73%	65%	55%	44%	32%	22%	13%	7%	3%	1%	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
1162	1150	1127	1108	1091	1058	999	912	801	679	541	396	268	169	99	53	26	10	1	0	cd
100%	99%	97%	95%	94%	91%	86%	79%	69%	58%	47%	34%	23%	15%	9%	5%	2%	1%	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	28,5	29,5	28,7	29,8	30,1	27,2	28,3	27,4	28,6	28,8
	3H	29,0	30,1	29,4	30,4	30,6	27,5	28,6	27,9	28,9	29,1
	4H	29,1	30,2	29,5	30,4	30,7	27,5	28,6	27,9	28,9	29,1
	6H	29,2	30,1	29,5	30,4	30,8	27,6	28,5	27,9	28,8	29,2
	8H	29,2	30,1	29,5	30,4	30,8	27,6	28,5	27,9	28,8	29,2
	12H	29,2	30,0	29,5	30,4	30,8	27,5	28,4	27,9	28,7	29,2
4H	2H	28,6	29,6	29,0	29,9	30,2	27,5	28,6	27,9	28,9	29,1
	3H	29,3	30,2	29,7	30,5	31,0	28,0	28,9	28,4	29,2	29,7
	4H	29,4	30,2	29,9	30,7	31,2	28,0	28,8	28,5	29,2	29,8
	6H	29,5	30,3	30,0	30,7	31,0	28,0	28,8	28,5	29,2	29,5
	8H	29,5	30,2	30,0	30,6	31,0	28,0	28,7	28,5	29,1	29,5
	12H	29,5	30,1	30,0	30,5	31,0	28,0	28,6	28,5	29,0	29,5
8H	4H	29,4	30,1	29,9	30,5	30,9	28,0	28,7	28,6	29,1	29,5
	6H	29,6	30,1	30,1	30,5	31,1	28,1	28,6	28,6	29,1	29,6
	8H	29,6	30,0	30,1	30,6	31,2	28,2	28,6	28,7	29,1	29,7
	12H	29,6	30,0	30,2	30,5	31,1	28,1	28,5	28,7	29,0	29,6
12H	4H	29,4	30,0	29,9	30,4	30,8	28,0	28,6	28,5	29,0	29,5
	6H	29,6	30,0	30,1	30,5	31,1	28,1	28,6	28,6	29,1	29,7
	8H	29,6	29,9	30,2	30,4	31,1	28,1	28,5	28,7	29,0	29,6

Variations with the observer position for the luminaire spacings, S:		
S = 1.0H	0,2 / -0,3	0,4 / -0,6
S = 1.5H	0,8 / -1,2	0,9 / -1,8
S = 2.0H	1,8 / -2,6	2,0 / -3,3

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	111	107	103	100	108	104	101	98	100	97	95	96	94	92	93	91	89	87
2	102	95	89	84	99	93	87	83	89	85	81	86	82	79	83	80	77	75
3	94	84	77	71	91	83	76	71	80	74	69	77	72	68	75	71	67	65
4	86	75	67	61	84	74	67	61	72	65	60	69	64	59	67	63	59	57
5	80	68	60	53	78	67	59	53	65	58	53	63	57	52	61	56	52	50
6	74	61	53	47	72	61	53	47	59	52	47	57	51	46	56	50	46	44
7	69	56	48	42	67	55	47	42	54	47	41	52	46	41	51	45	41	39
8	64	51	43	38	62	50	43	37	49	42	37	48	42	37	47	41	37	35
9	60	47	39	34	58	46	39	34	45	38	34	44	38	33	43	38	33	32
10	56	43	36	31	55	43	36	31	42	35	31	41	35	30	40	34	30	29

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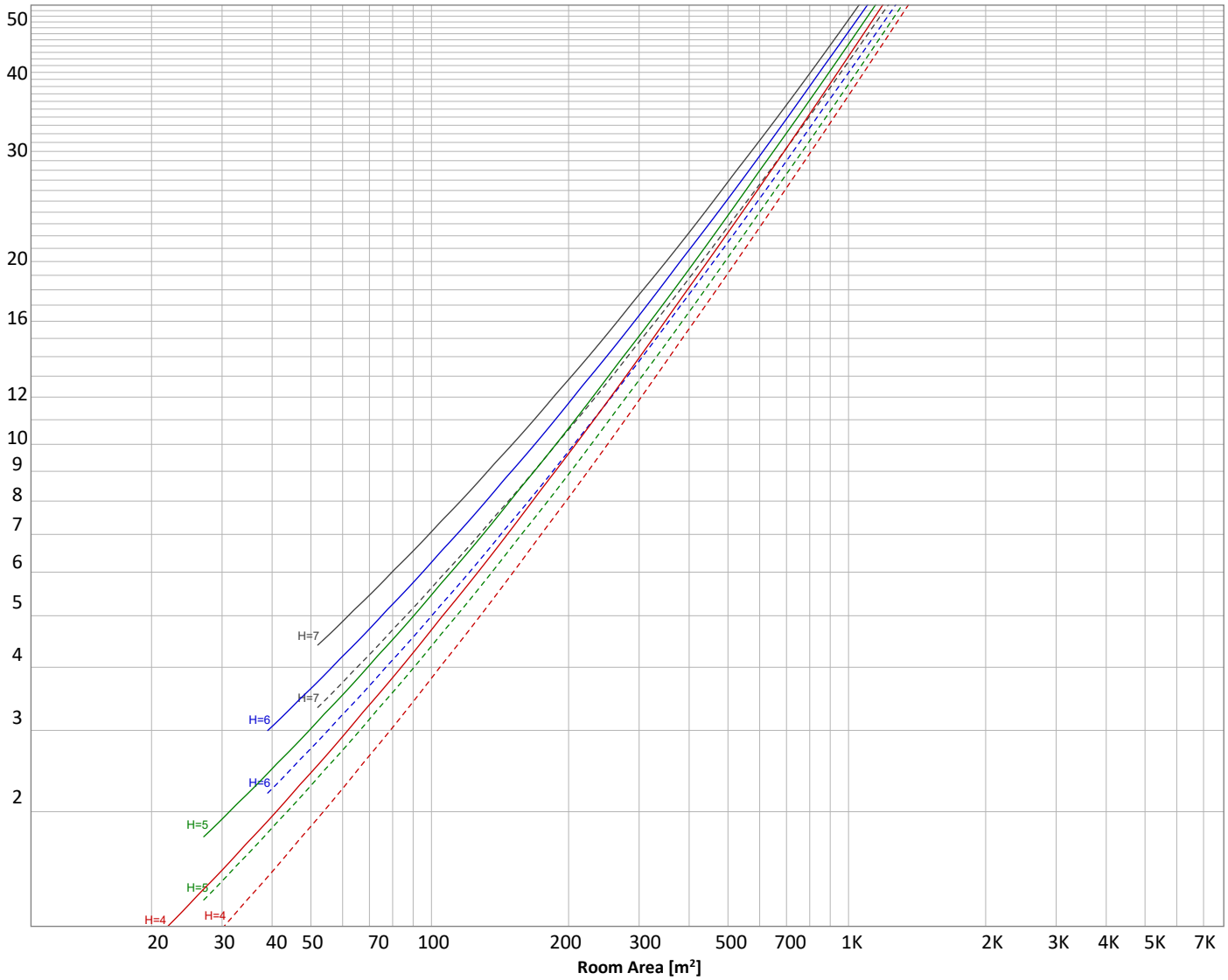
Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2792 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°
110 lm	318 lm	490 lm	589 lm	568 lm	415 lm	212 lm	73,9 lm	14,1 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,298 lm	0,193 lm	0,217 lm	0,255 lm	0,271 lm	0,239 lm	0,182 lm	0,111 lm	0,037 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	110 lm	3,9%
10-20°	318 lm	11,4%
20-30°	490 lm	17,6%
30-40°	589 lm	21,1%
40-50°	568 lm	20,3%
50-60°	415 lm	14,9%
60-70°	212 lm	7,6%
70-80°	74 lm	2,6%
80-90°	14 lm	0,5%
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	2792 lm	100,0%

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	919 lm	32,9%
0-40°	1508 lm	54,0%
0-60°	2490 lm	89,2%
60-90°	300 lm	10,8%
70-100°	88 lm	3,2%
90-120°	1 lm	0,0%
0-90°	2791 lm	99,9%
90-180°	2 lm	0,1%
0-180°	2792 lm	100,0%

Intensity peaks

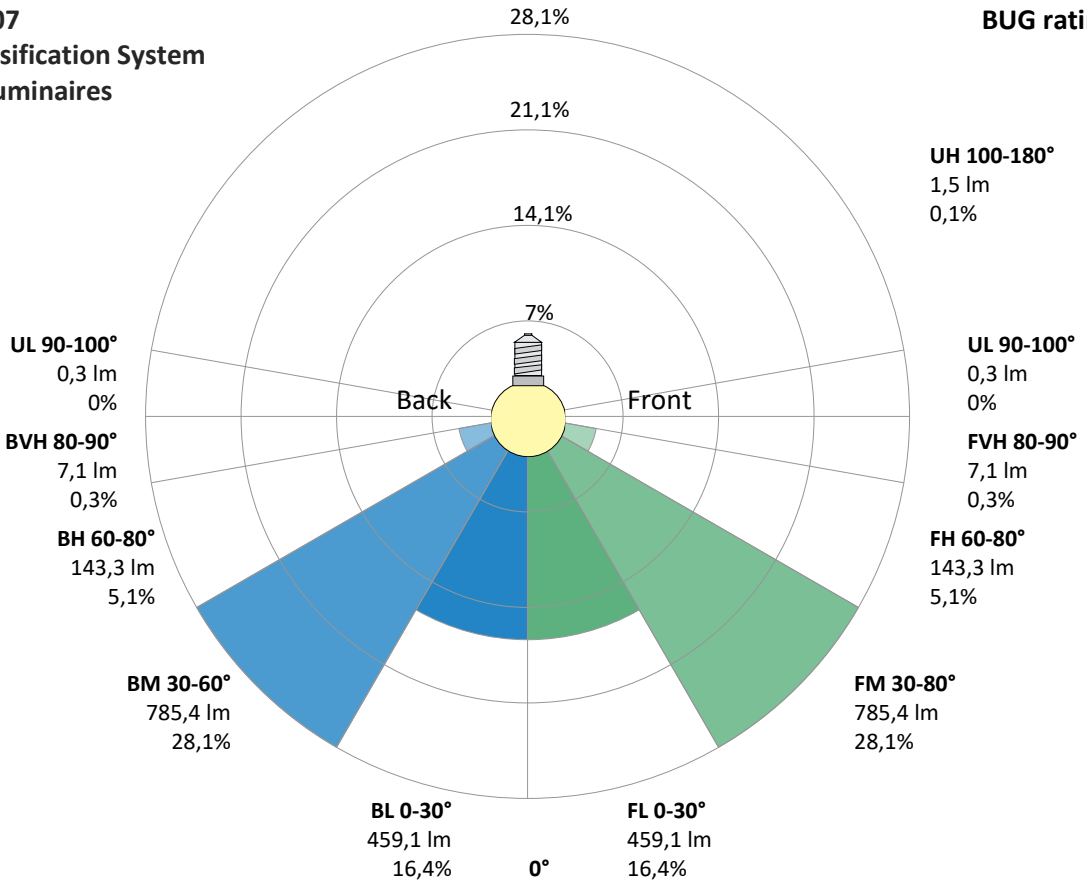
Max intensity	1170 cd
Intensity, 90°	1 cd
Intensity, 0°	1162 cd

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	459 lm	16,4%
Medium(30-60°)	785 lm	28,1%
High(60-80°)	143 lm	5,1%
Very high(80-90°)	7 lm	0,3%
Back light		
Low(0-30°)	459 lm	16,4%
Medium(30-60°)	785 lm	28,1%
High(60-80°)	143 lm	5,1%
Very high(80-90°)	7 lm	0,3%
Uplight		
Low(90-100°)	0 lm	0,0%
High(100-180°)	2 lm	0,1%

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

BUG rating B1 U1 G0



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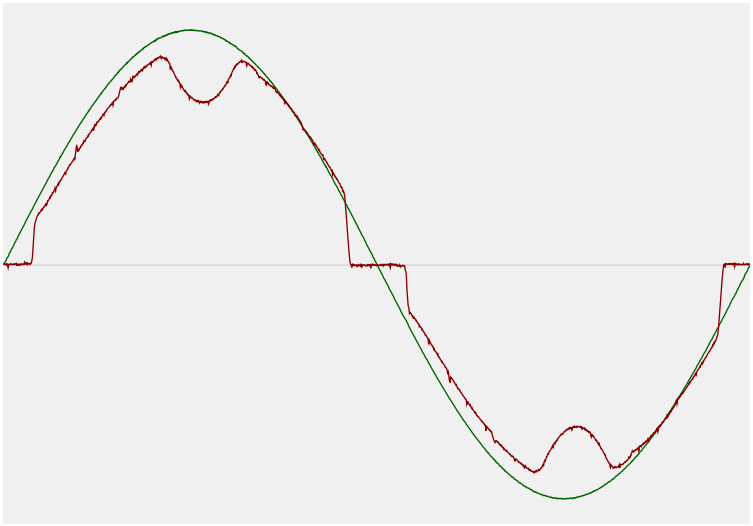
Power Details

Input Power

Power feed to light source	30,6 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,134 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	30,86 VA
Displacement factor of AC power feed	1,0
Power factor of AC current feed	0,99
Total harmonic distortion of the current	13,03%
Total harmonic distortion of the voltage	0,07%

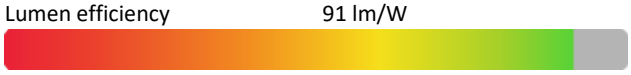
Input Power Curve



Efficiency

Radiated power efficiency 29,4%

Lumen efficiency 91 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	5896 K
CCT shift	+104 K
CCT end	6000 K

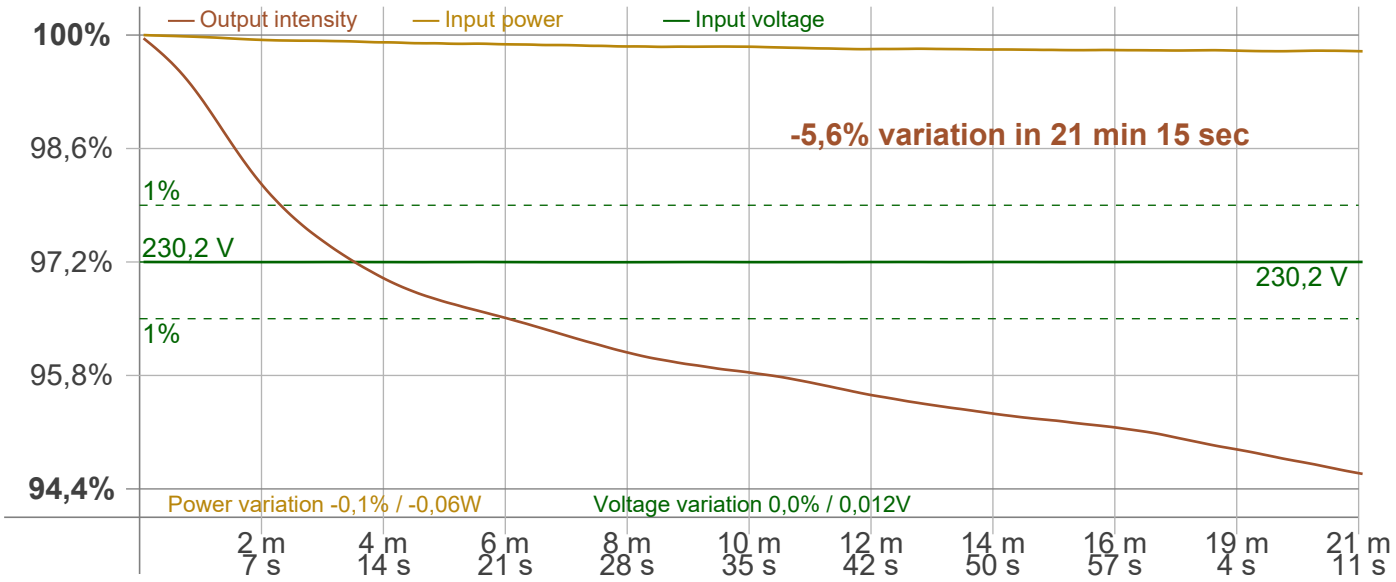
Warmup Result

Total warmup time	Lamp stabilized in 21 min 15 sec
Warmup variation	-5,6%

Output Change

Output start	2954 lm
Output change	-161 lm
Output end	2792 lm

Stabilization Curve



Light Measurement Report

Print date: 1-7-2025
Measurement date and time: 1-7-2025 08:35:49 – Measurement no. VFR-250701-1822-MS
Measurement tracking No. and Link: VT250701-000989
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	0,32

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

JA8/10 40 Hz	0,19 %
JA8/10 90 Hz	0,83 %
JA8/10 200 Hz	105,43 %
JA8/10 400 Hz	100,65 %
JA8/10 1000 Hz	102,3 %

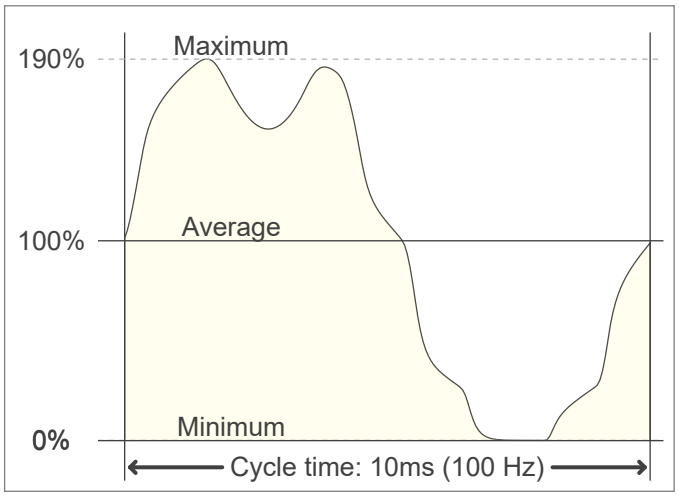
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz)	0,07
SVM value (80 < F < 2000 Hz)	3,75

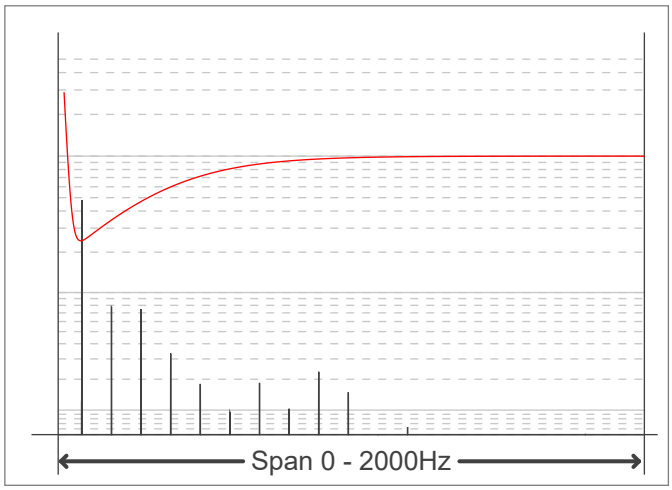
Flicker indices according to Lighting Research Center (2015)

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