

Light Measurement Report

Print date: 26-9-2025

Measurement date and time: 26-9-2025 12:10:51 – Measurement no. VFR-250926-3404-MS

Measurement tracking No. and Link: [VT250926-007974](#)

Operator:



Laboratory and Equipment

Laboratory Owner and Location
Goniospectrometer System and Type
Sensor Name, Calibr. Date and Serial No.
Spectrometer Manufacturer and Model

Viso Systems, Copenhagen V, Denmark
LabSpion – Type C, horizontal
LabSensor Model2 – 11-1-2024 – 3130191315
Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

Number of C-planes and Resolution
 γ (gamma)-Resolution
Test Distance
Input Power, Power and Displ. Factors
Input RMS Voltage and Current
Frequency of Input Power
Warm-up Time and Variation

36 planes – 10°
5°
2,89 m
76,7 W – PF 0,97 – DPF 0,97
230 V – 0,344 A
50 Hz
Lamp stabilized in 15 min 3 sec – 2,0%

Tested Light Source

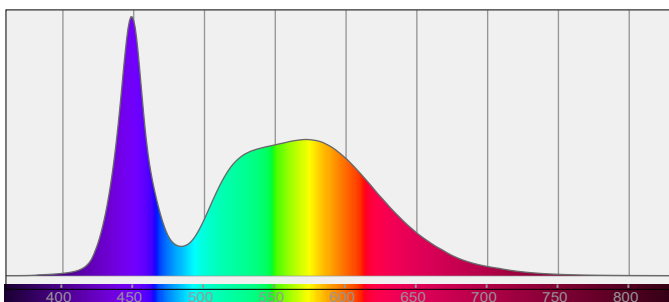
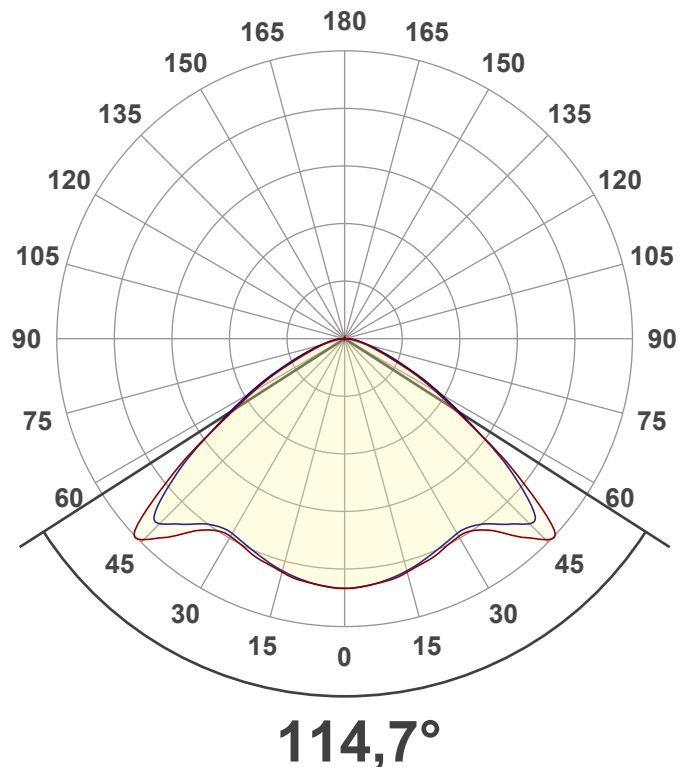
Product Name
Item No. and Manufacturer
Product Description (line 1)
SWITCH

812713-6000K-80W
812713-6000K-80W – Dutchfulfillment
LED HIGHBAY ARGOS | 0-10V | 100W/80W/60W | 60°/90°/120° | CCT

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)
Efficiency
Peak Intensity and Beam Angle
Correlated Color Temperature, Target/Measured
Color Rendering Index
Color Rendering TM30-18
Color Shift, CIE duv and MacAdam Steps
Flicker

10565 lm – 0,16% / 99,84%
138 lm/W
3758 cd – 114,7°
CCT = 6000 K / 5820 K
CRI 73,5
 R_f 73,9 – R_g 94,9
Duv 0,0012 – SDCM 2,8
SVM 0 – PstLM 0,1



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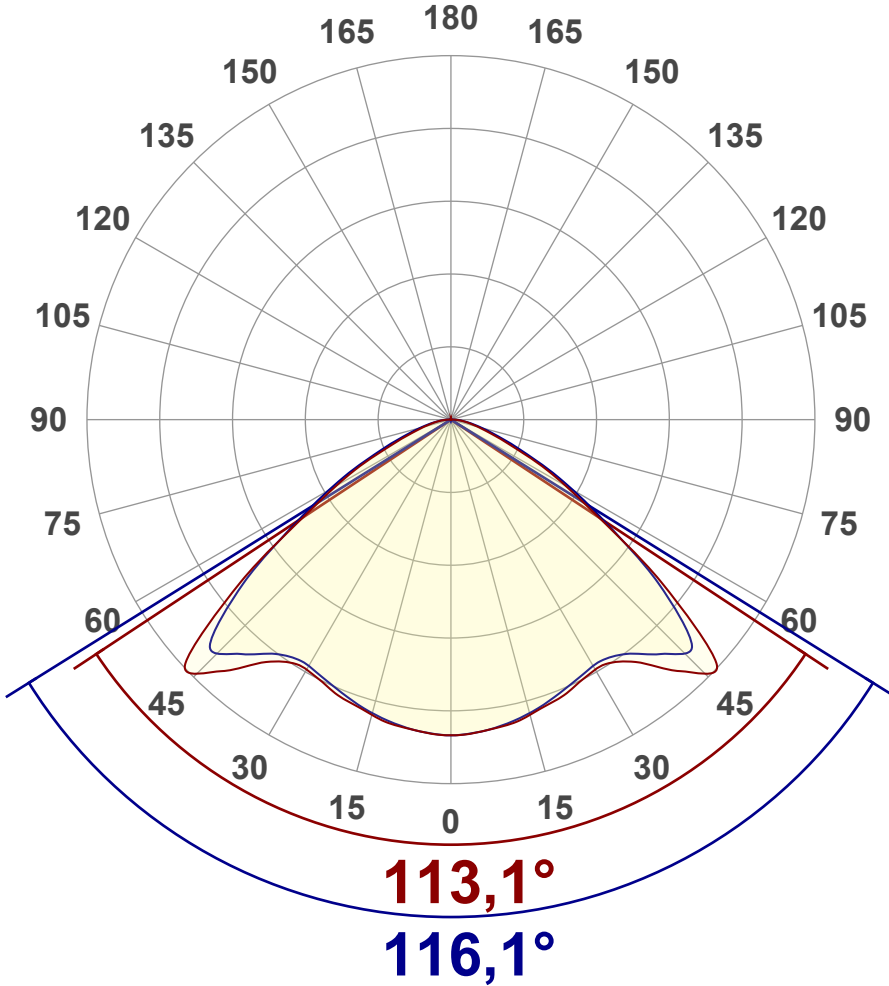
Measurement tracking No. and Link: [VT250926-007974](https://www.viso-systems.com/VT250926-007974)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	10565 lm
Lumen Up% / Down%	0,16% / 99,84%
Peak Intensity	3758 cd
Beam Angle (50%)	114,7°
Beam Angle (90%)	116,1°
Beam Angle (10%)	113,4°

Cut-off Angle

Average 2,5%	171,4°
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Field Angle

Average 10%	148,1°
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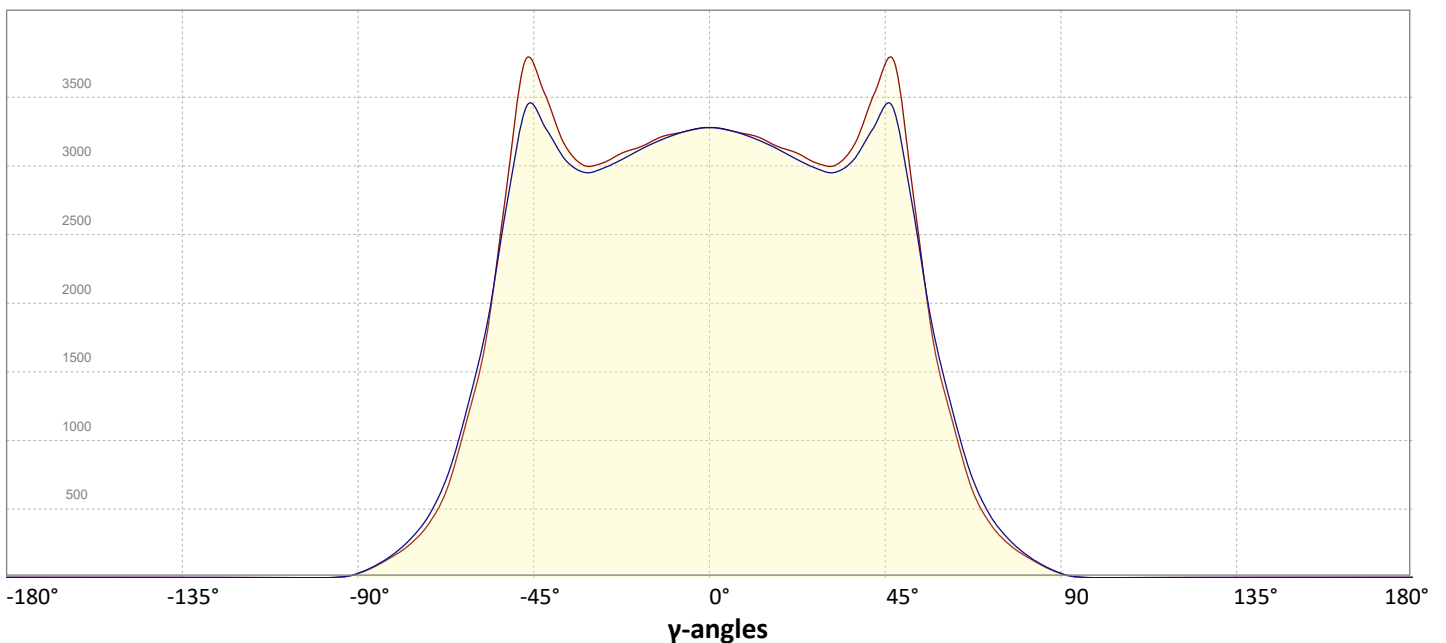
Intensity Ratio

In 120° cone	87,0%
In 90° cone	54,9%

C000-C180

C090-C270

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



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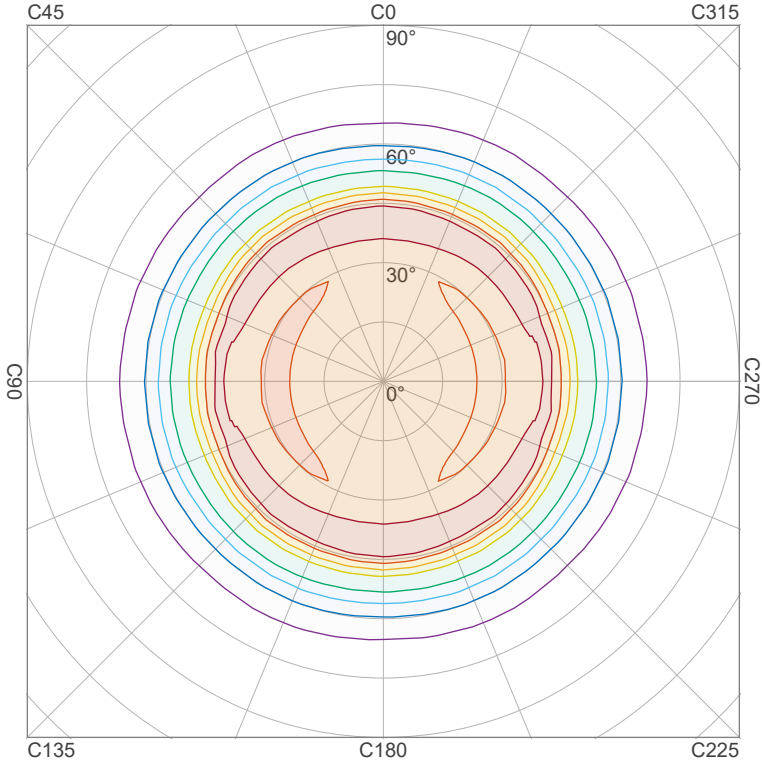
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Iso-intensity Diagram (Iso-candela)

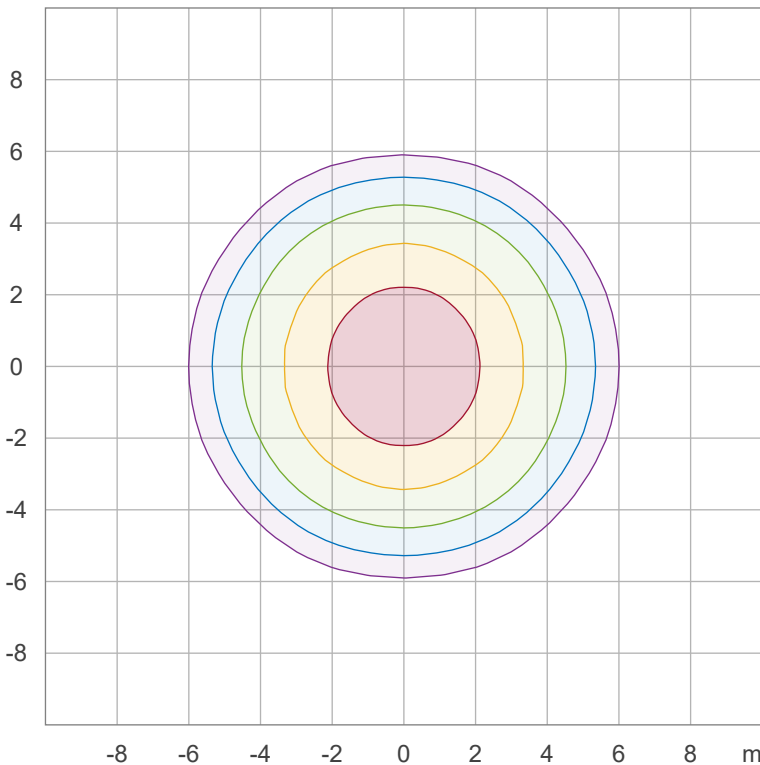


90 %	3369,7 cd
80 %	2995,3 cd
70 %	2620,9 cd
60 %	2246,5 cd
50 %	1872,1 cd
40 %	1497,6 cd
30 %	1123,2 cd
20 %	748,8 cd
10 %	374,4 cd

Peak intensity: 3744,1 cd

Number of c-planes: 36

Iso-illuminance Diagram (Iso-lux)



50,0 %	182,0 lx
30,0 %	109,2 lx
10,0 %	36,4 lx
5,0 %	18,2 lx
3,0 %	10,9 lx

Peak illuminance: 364,0 lx

Mounting height: 3,0 m

Number of c-planes: 36

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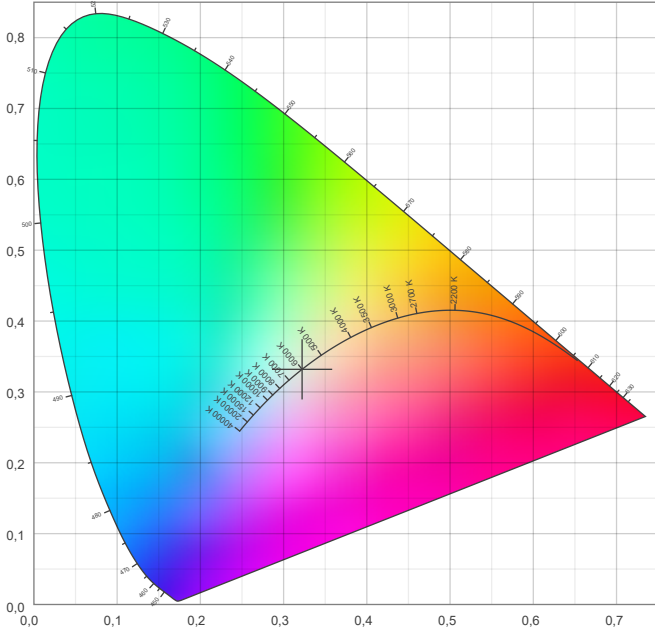


Color details

Correlated Color Temperature, Target CCT = 6000 K
 Correlated Color Temperature, Measured CCT = 5820 K
 Color Rendering Index CRI 73,5
 Color Rendering Index, R9 (red component) R9 = -28,5
 Color Rendering TM30-18 R_f 73,9 – R_g 94,9
 Color Quality Scale CQS = 70,9

MacAdam Steps
 Color coordinates CIE 1931 (x;y) = (0,322;0,332)
 Color coordinate CIEs 1960 (u;v) = (0,203;0,314)
 Color deviation from BBL Duv = 0,0012
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,203;0,471)

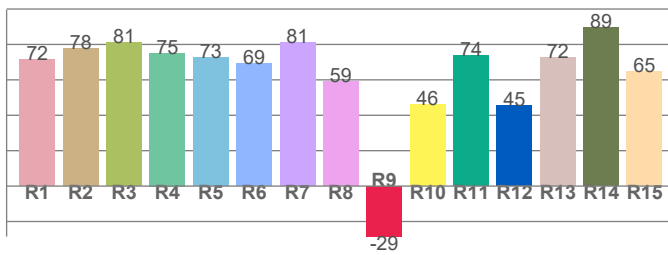
CIE 1931



CIE 1931 – zoomed on Planckian locus



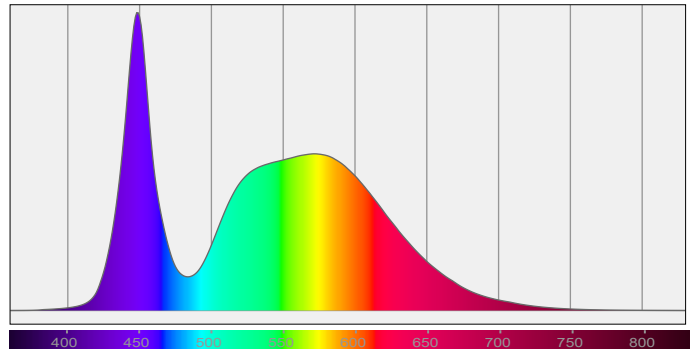
Color Rendering Index per reference color (CIE 1995)



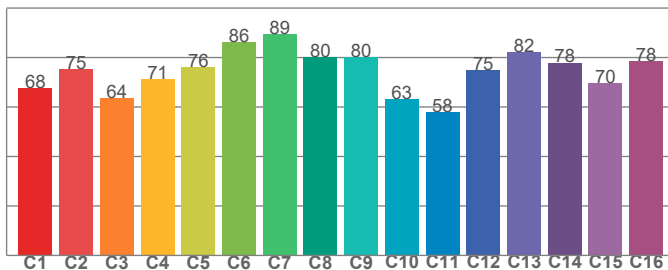
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
71,6	77,5	81,0	75,1	72,8	69,4	81,0	59,3	-28,5	46,0	73,5	45,3	72,4	89,4	64,9

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



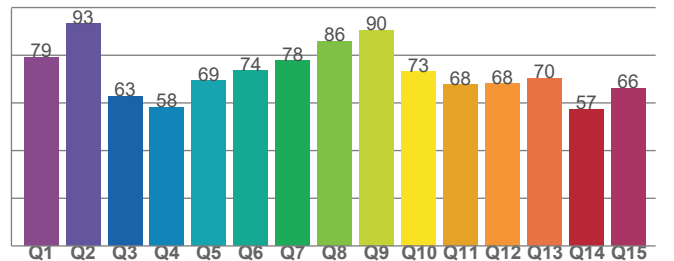
TM30-18 Rf-values per hue bin



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
67,7	75,2	63,5	71,2	76,1	86,3	89,3	80,1	80,1	63,1	58,0	74,9	82,1	77,8	69,7	78,4

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
79,1	93,3	62,8	58,2	69,3	73,6	77,7	85,8	90,4	73,0	67,5	68,0	70,3	57,3	66,1

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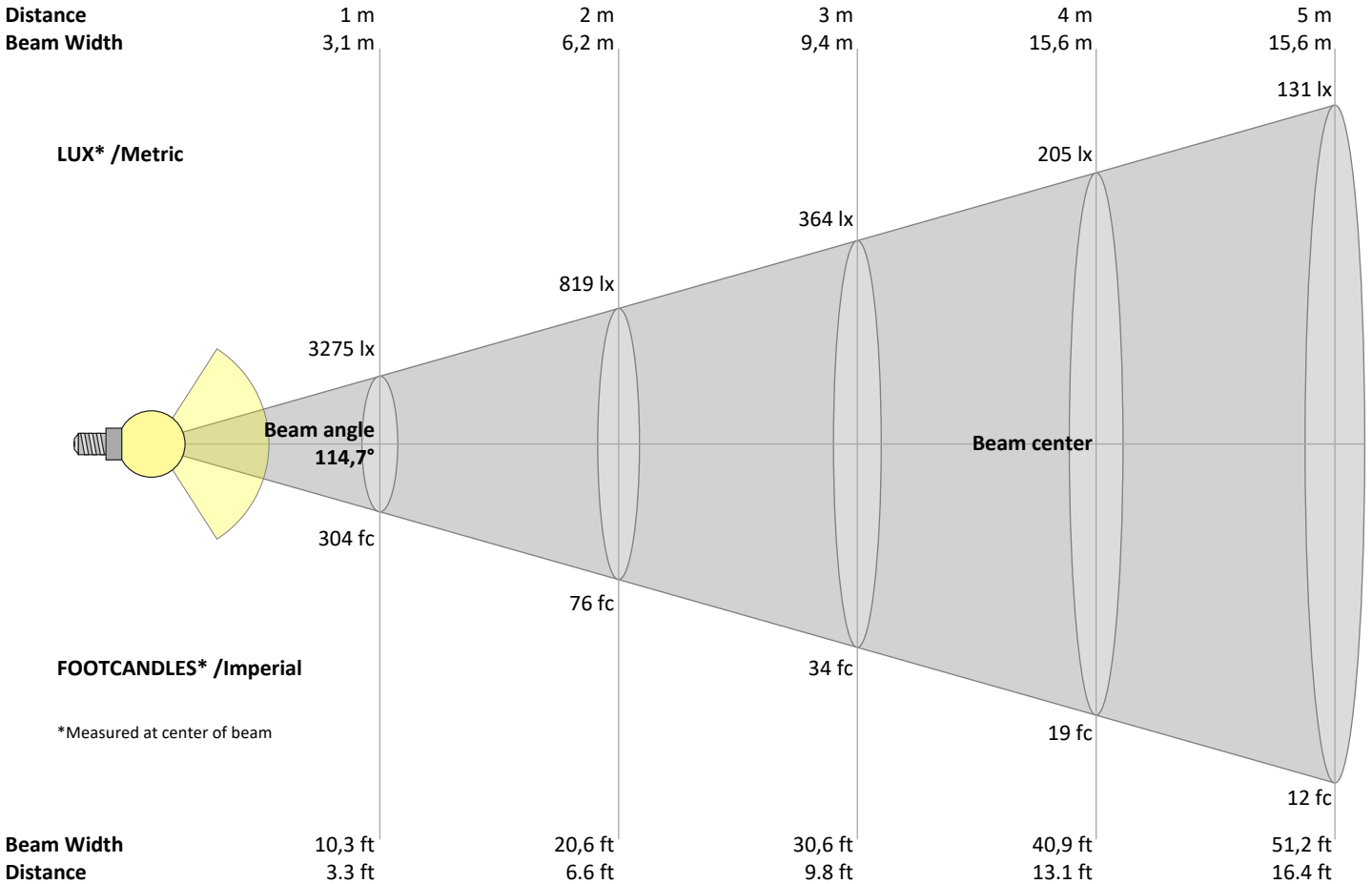
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Operator:



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
3275	819	364	205	131	91	67	51	40	33	27	23	19	17	15	13	11	10	9	8	lux
304,2	76,1	33,8	19	12,2	8,5	6,2	4,8	3,8	3	2,5	2,1	1,8	1,6	1,4	1,2	1,1	0,9	0,8	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
3275	3259	3227	3175	3117	3056	3013	3092	3363	3654	3223	2201	1402	865	497	297	179	94	34	6	cd
100%	100%	99%	97%	95%	93%	92%	94%	103%	112%	98%	67%	43%	26%	15%	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
3275	3257	3214	3155	3084	3013	2965	3008	3185	3376	2987	2181	1482	945	568	341	198	101	36	7	cd
100%	99%	98%	96%	94%	92%	91%	92%	97%	103%	91%	67%	45%	29%	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
3275	3259	3227	3175	3117	3056	3013	3092	3363	3654	3223	2201	1402	865	497	297	179	94	34	6	cd
100%	100%	99%	97%	95%	93%	92%	94%	103%	112%	98%	67%	43%	26%	15%	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
3275	3257	3214	3155	3084	3013	2965	3008	3185	3376	2987	2181	1482	945	568	341	198	101	36	7	cd
100%	99%	98%	96%	94%	92%	91%	92%	97%	103%	91%	67%	45%	29%	17%	10%	6%	3%	1%	0%	of 0°val

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Operator:



Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances		70	70	50	50	30	70	70	50	50	30
	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		Viewed Crosswise					Viewed Endwise				
H = mounting height above eye level		(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
X	Y										
2H	2H	31,1	32,3	31,3	32,6	32,8	31,0	32,2	31,2	32,5	32,7
	3H	31,4	32,6	31,8	32,9	33,1	31,4	32,6	31,8	32,9	33,1
	4H	31,5	32,7	31,9	33,0	33,2	31,6	32,7	32,0	33,0	33,3
	6H	31,7	32,7	32,0	32,9	33,3	31,7	32,7	32,0	33,0	33,4
	8H	31,7	32,6	32,0	33,0	33,4	31,7	32,7	32,1	33,0	33,4
	12H	31,7	32,6	32,0	33,0	33,4	31,7	32,7	32,1	33,0	33,5
4H	2H	31,3	32,5	31,7	32,7	33,0	31,2	32,4	31,6	32,6	32,9
	3H	31,9	32,8	32,2	33,2	33,6	31,9	32,8	32,3	33,2	33,6
	4H	32,0	32,8	32,4	33,3	33,8	32,0	32,9	32,5	33,3	33,9
	6H	32,1	32,9	32,6	33,3	33,7	32,2	33,0	32,7	33,4	33,7
	8H	32,2	32,9	32,7	33,3	33,7	32,2	33,0	32,8	33,4	33,7
	12H	32,2	32,8	32,7	33,2	33,7	32,3	32,9	32,8	33,3	33,8
8H	4H	32,0	32,8	32,5	33,1	33,5	32,1	32,8	32,6	33,2	33,6
	6H	32,2	32,8	32,8	33,3	33,8	32,3	32,9	32,8	33,3	33,9
	8H	32,4	32,9	32,9	33,4	34,0	32,5	32,9	33,0	33,5	34,1
	12H	32,5	32,9	33,0	33,4	34,0	32,5	33,0	33,1	33,5	34,1
12H	4H	32,0	32,6	32,5	33,0	33,5	32,0	32,7	32,5	33,1	33,6
	6H	32,3	32,8	32,8	33,3	33,9	32,3	32,8	32,9	33,4	34,0
	8H	32,4	32,8	33,0	33,3	33,9	32,5	32,9	33,1	33,4	34,0

Variations with the observer position for the luminaire spacings, S:

S = 1.0H	0,4 / -0,4	0,4 / -0,3
S = 1.5H	1,2 / -1,3	1,0 / -1,1
S = 2.0H	2,3 / -2,3	2,0 / -2,2

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	106	106	106	102	102	102	100	100	
1	110	105	101	98	107	103	100	96	99	96	93	95	93	90	91	89	88	86	86
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72	72
3	92	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61	61
4	84	72	64	57	81	71	63	57	68	61	56	66	60	55	64	59	54	52	52
5	77	64	55	49	75	63	55	49	61	54	48	59	52	47	57	51	47	45	45
6	71	57	49	42	69	57	48	42	55	47	42	53	46	41	51	46	41	39	39
7	65	52	43	37	64	51	43	37	49	42	37	48	41	36	47	41	36	34	34
8	61	47	38	33	59	46	38	32	45	38	32	44	37	32	42	36	32	30	30
9	56	43	35	29	55	42	34	29	41	34	29	40	33	29	39	33	28	27	27
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24	24

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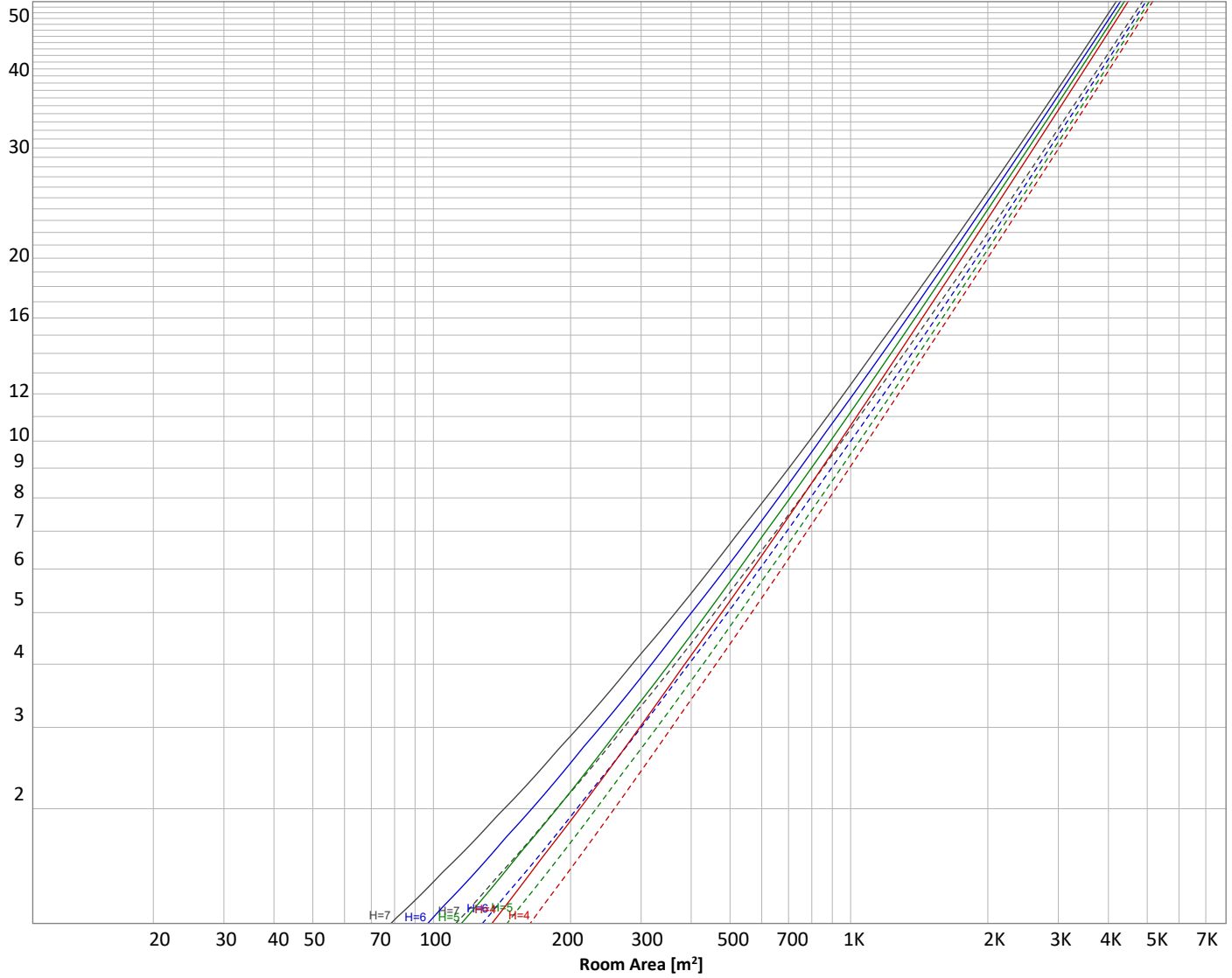
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 10565 lm				
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	ρ(%) 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°
310 lm	896 lm	1402 lm	1921 lm	2705 lm	1955 lm	908 lm	343 lm	109 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
6,63 lm	0,857 lm	1,59 lm	1,98 lm	1,99 lm	1,73 lm	1,32 lm	0,816 lm	0,280 lm

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Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	310 lm	2,9%
10-20°	896 lm	8,5%
20-30°	1402 lm	13,3%
30-40°	1921 lm	18,2%
40-50°	2705 lm	25,6%
50-60°	1955 lm	18,5%
60-70°	908 lm	8,6%
70-80°	343 lm	3,2%
80-90°	109 lm	1,0%
90-100°	7 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	10565 lm	100,0%

Intensity peaks

Max intensity	3758 cd
Intensity, 90°	34 cd
Intensity, 0°	3275 cd

Zonal Lumen summary

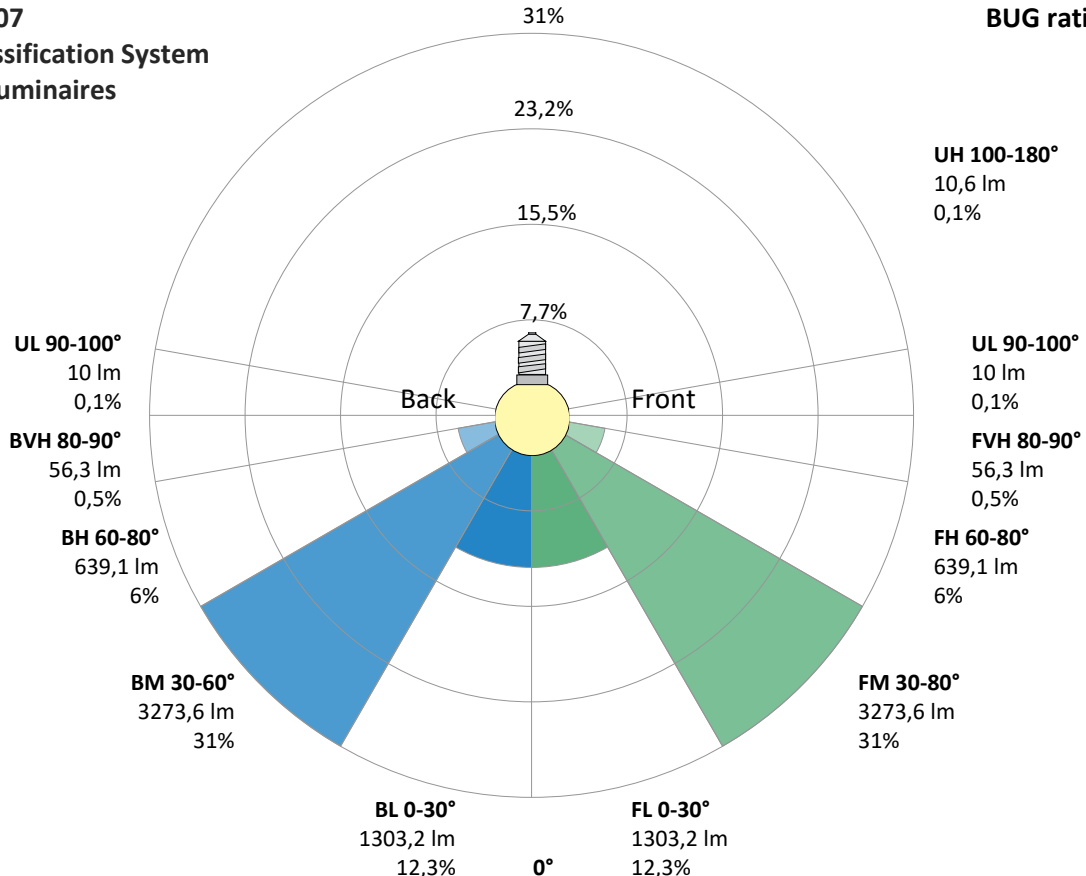
Zone (γ)	Lumen	% Total
0-30°	2608 lm	24,7%
0-40°	4528 lm	42,9%
0-60°	9188 lm	87,0%
60-90°	1360 lm	12,9%
70-100°	458 lm	4,3%
90-120°	9 lm	0,1%
0-90°	10548 lm	99,8%
90-180°	17 lm	0,2%
0-180°	10565 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1303 lm	12,3%
Medium(30-60°)	3274 lm	31,0%
High(60-80°)	639 lm	6,0%
Very high(80-90°)	56 lm	0,5%
Back light		
Low(0-30°)	1303 lm	12,3%
Medium(30-60°)	3274 lm	31,0%
High(60-80°)	639 lm	6,0%
Very high(80-90°)	56 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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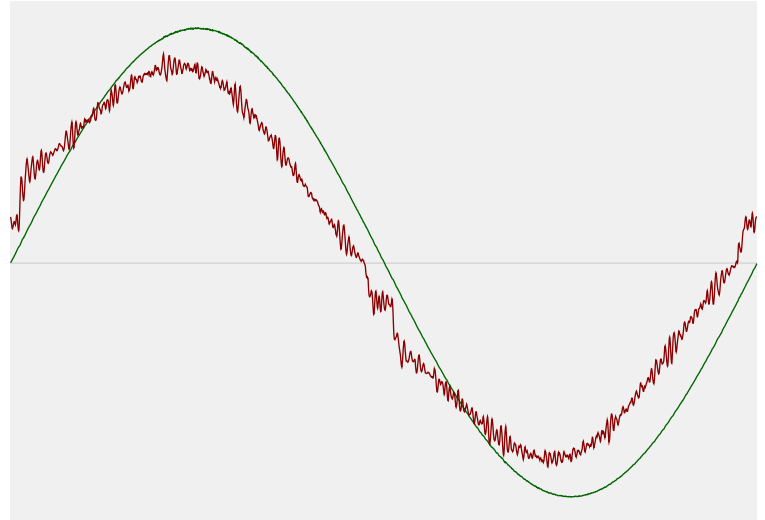


Power Details

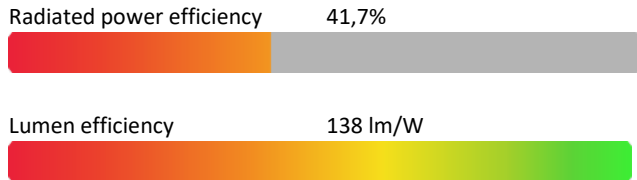
Input Power

Power feed to light source	76,7 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,344 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	79,05 VA
Displacement factor of AC power feed	0,97
Power factor of AC current feed	0,97
Total harmonic distortion of the current	4,24%
Total harmonic distortion of the voltage	0,06%

Input Power Curve



Efficiency



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	6001 K
CCT shift	-1 K
CCT end	6000 K

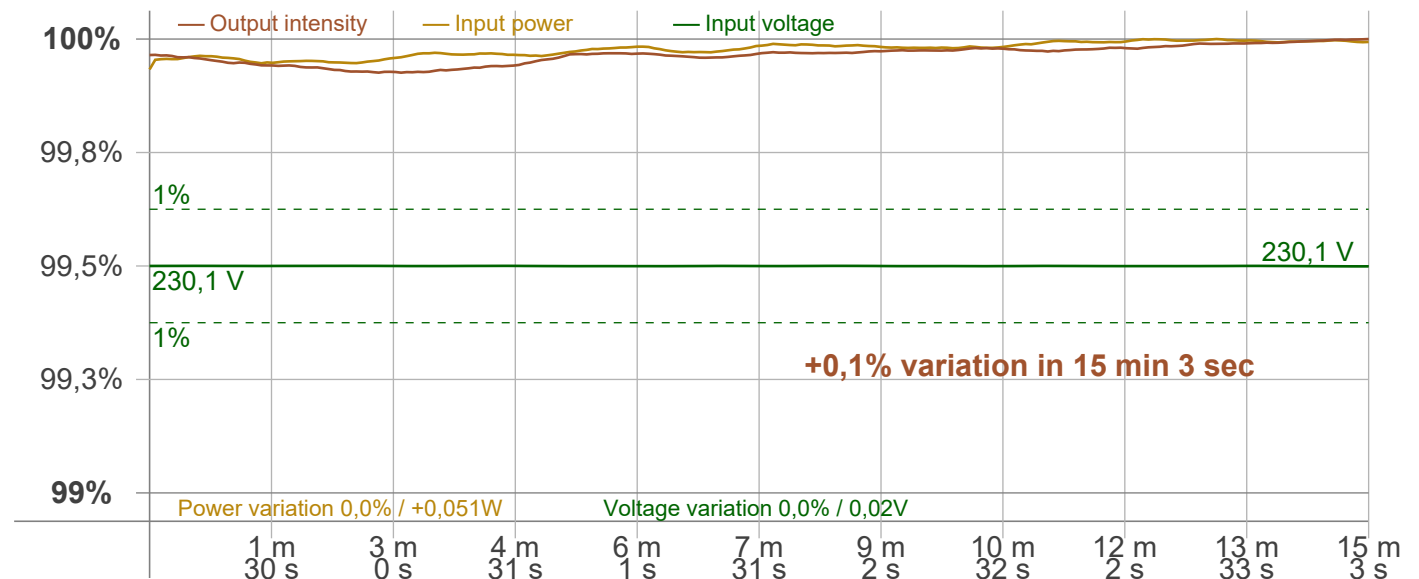
Warmup Result

Total warmup time	Lamp stabilized in 15 min 3 sec
Warmup variation	+0,1%

Output Change

Output start	10562 lm
Output change	+3 lm
Output end	10565 lm

Stabilization Curve



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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: 0,35 %
 Flicker index: 0

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

JA8/10 40 Hz: 0,21 %
 JA8/10 90 Hz: 0,21 %
 JA8/10 200 Hz: 0,25 %
 JA8/10 400 Hz: 0,25 %
 JA8/10 1000 Hz: 0,35 %

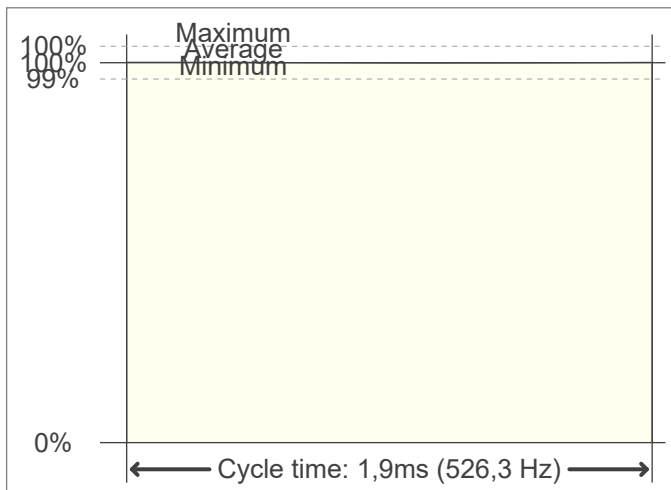
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz): 0,1
 SVM value (80 < F < 2000 Hz): 0

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

