

Light Measurement Report

Print date: 25-9-2025

Measurement date and time: 25-9-2025 16:42:54 – Measurement no. VFR-250925-3382-MS

Measurement tracking No. and Link: [VT250925-000612](https://www.viso-systems.com/VT250925-000612)

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

28 planes – 12,86°
5°
2,89 m
143,7 W – PF 0,99 – DPF 0,99
230 V – 0,632 A
50 Hz
Lamp stabilized in 15 min 0 sec – 2,0%

Tested Light Source

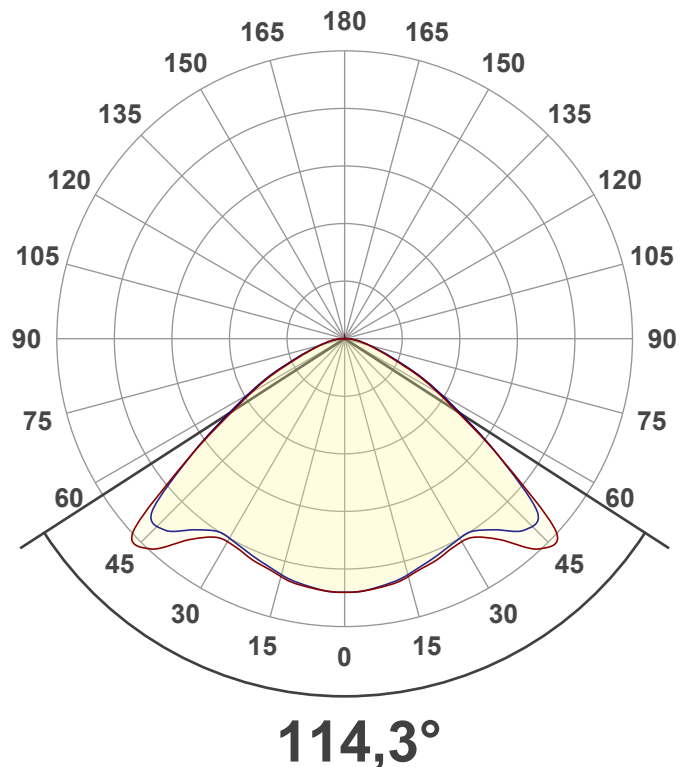
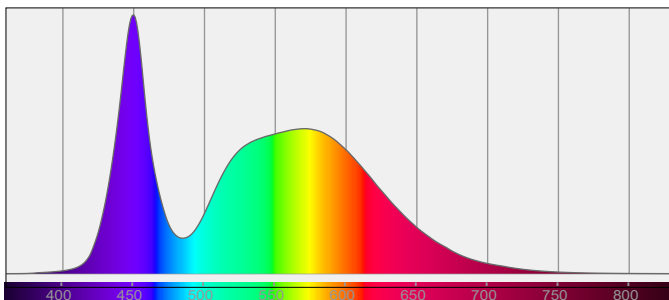
Product Name
Item No. and Manufacturer
Product Description (line 1)
SWITCH

812720-6000K-150W
812720-6000K-150W – Dutchfulfillment
LED HIGHBAY ARGOS | 0-10V | 150W/120W/100W | 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

17907 lm – 0,17% / 99,83%
125 lm/W
6317 cd – 114,3°
CCT = 6000 K / 5894 K
CRI 74,2
 R_f 74,6 – R_g 94,6
Duv 0,0007 – SDCM 1,6
SVM 0 – PstLM 0,07



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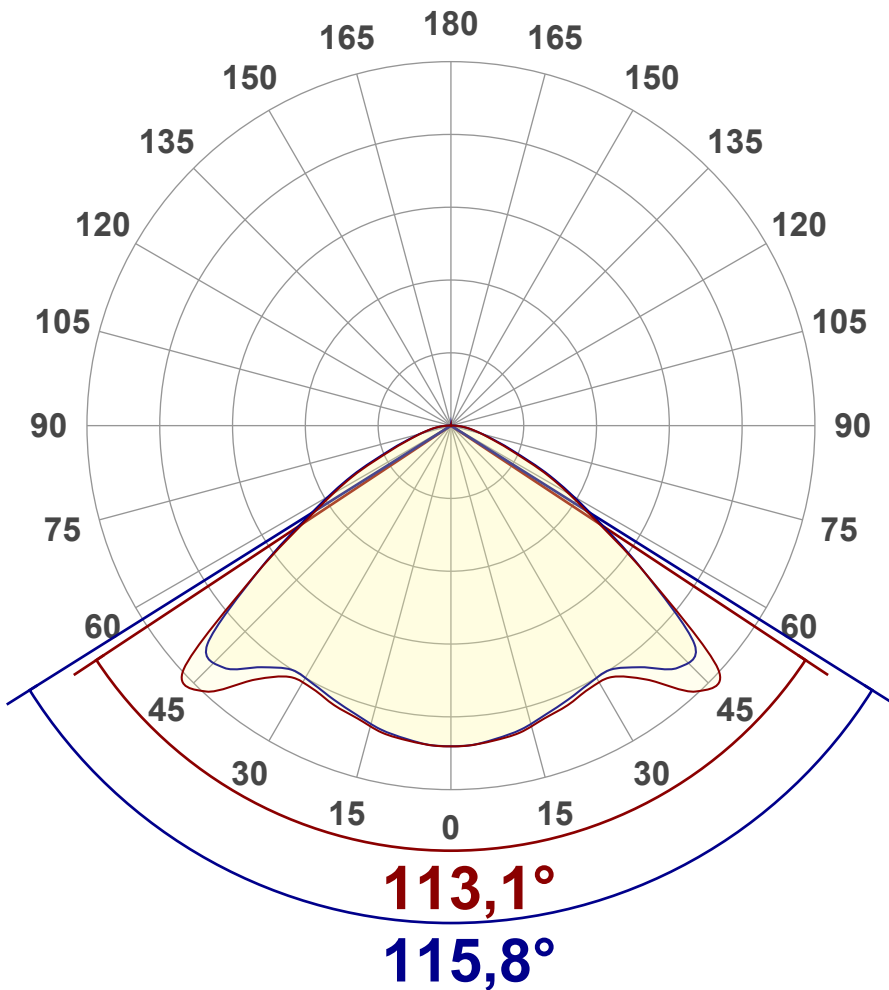
Measurement tracking No. and Link: [VT250925-000612](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	17907 lm
Lumen Up% / Down%	0,17% / 99,83%
Peak Intensity	6317 cd
Beam Angle (50%)	114,3°
Beam Angle (90%)	115,8°
Beam Angle (10%)	112,7°

Cut-off Angle

Average 2,5%	172,3°
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Field Angle

Average 10%	148,6°
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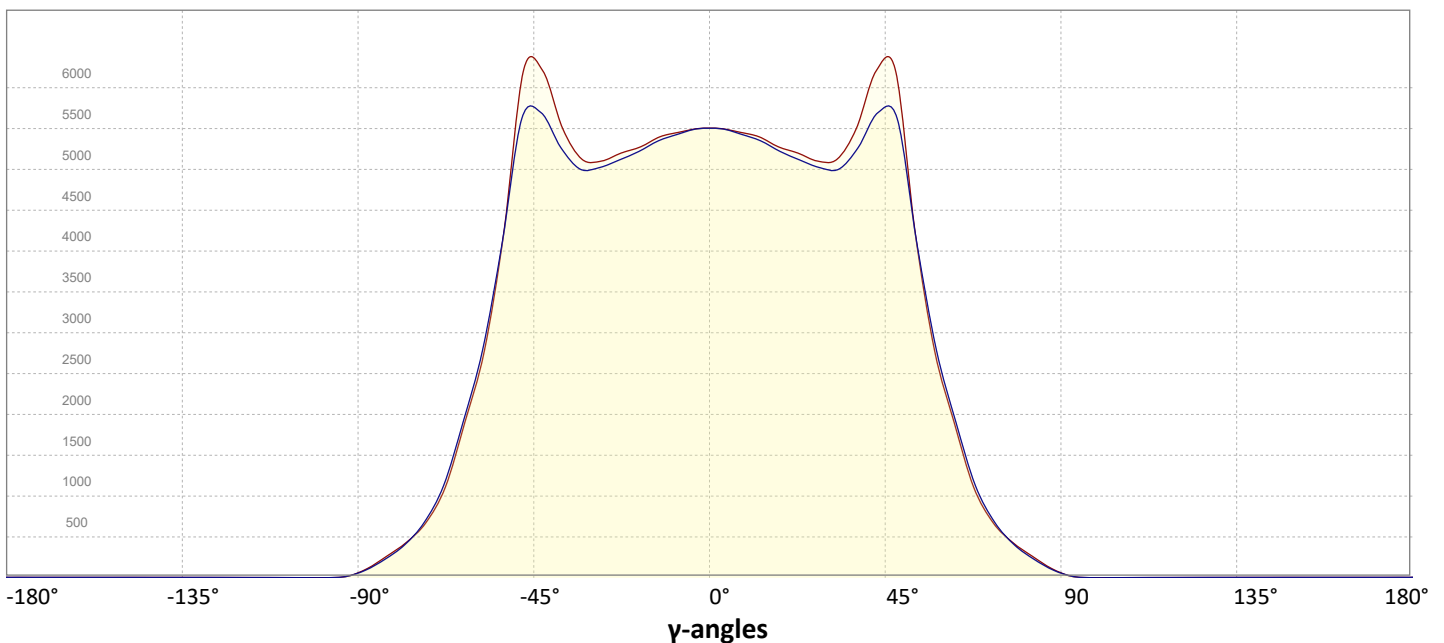
Intensity Ratio

In 120° cone	86,6%
In 90° cone	54,9%

C000-C180

C090-C270

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



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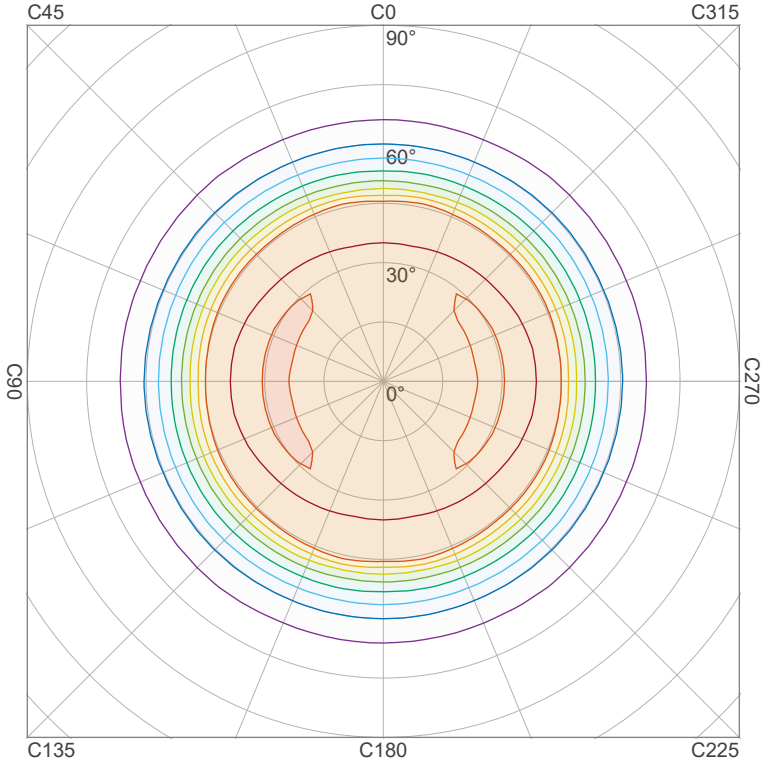
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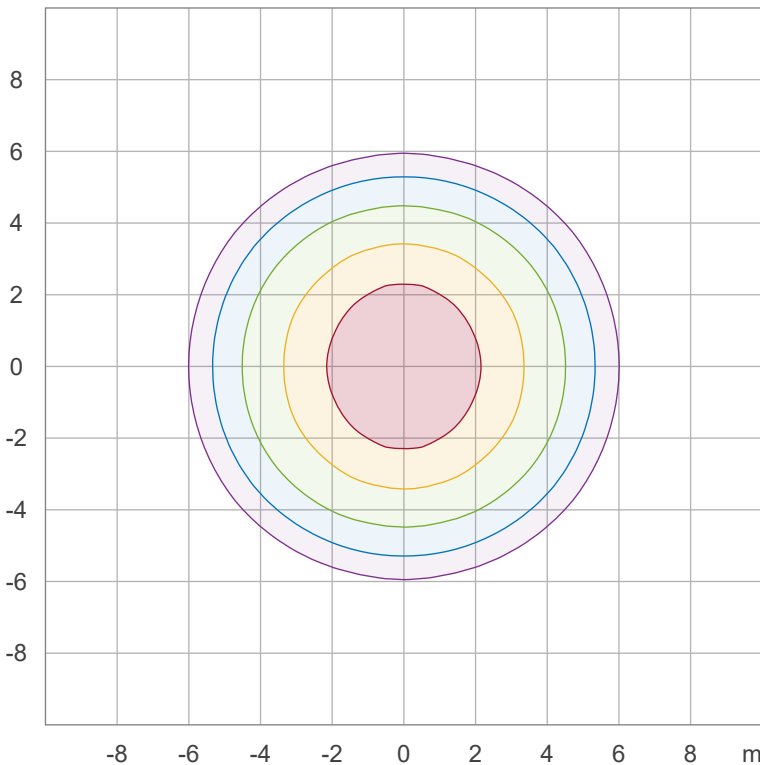
Iso-intensity Diagram (Iso-candela)



90 %	5683,4 cd
80 %	5051,9 cd
70 %	4420,4 cd
60 %	3788,9 cd
50 %	3157,4 cd
40 %	2526,0 cd
30 %	1894,5 cd
20 %	1263,0 cd
10 %	631,5 cd

Peak intensity: 6314,9 cd
Number of c-planes: 28

Iso-illuminance Diagram (Iso-lux)



50,0 %	306,1 lx
30,0 %	183,7 lx
10,0 %	61,2 lx
5,0 %	30,6 lx
3,0 %	18,4 lx

Peak illuminance: 612,2 lx
Mounting height: 3,0 m
Number of c-planes: 28

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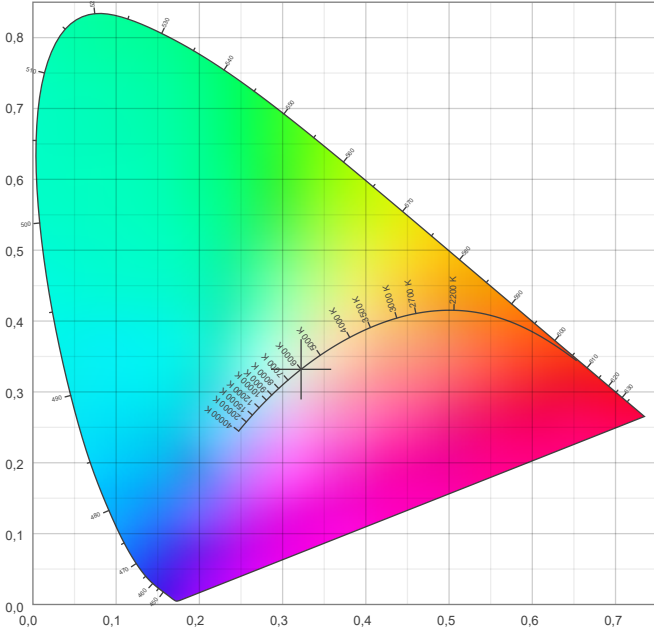


Color details

Correlated Color Temperature, Target CCT = 6000 K
 Correlated Color Temperature, Measured CCT = 5894 K
 Color Rendering Index CRI 74,2
 Color Rendering Index, R9 (red component) R9 = -25,2
 Color Rendering TM30-18 R_f 74,6 – R_g 94,6
 Color Quality Scale CQS = 71,2

MacAdam Steps SDCM = 1,6
 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 = 0,0007
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,203;0,471)

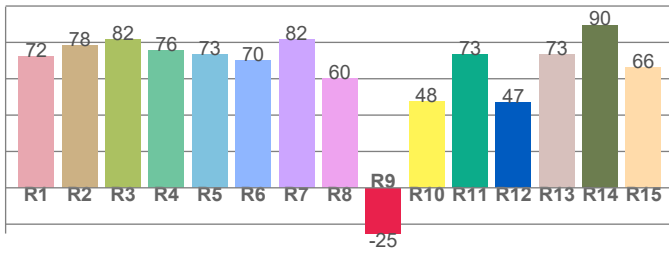
CIE 1931



CIE 1931 – zoomed on Planckian locus



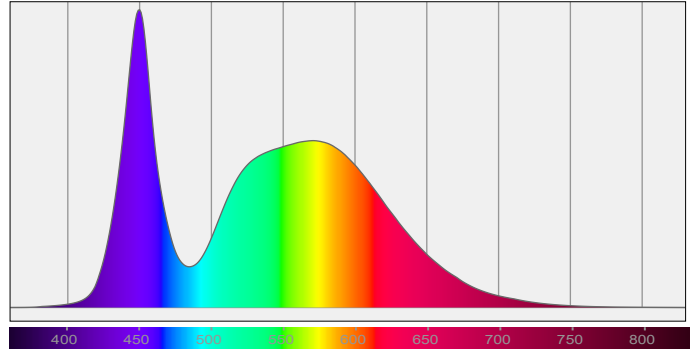
Color Rendering Index per reference color (CIE 1995)



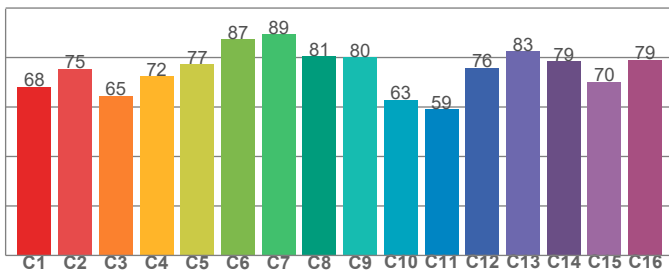
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
72,3	78,5	81,6	75,5	73,3	70,3	81,8	60,3	-25,2	47,7	73,3	46,8	73,3	89,7	66,2

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



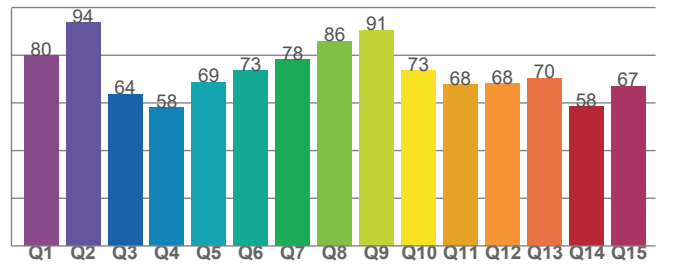
TM30-18 Rf-values per hue bin



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
68,2	75,4	64,5	72,3	77,2	87,4	89,5	80,6	80,0	62,9	59,0	75,8	82,6	78,6	70,2	79,1

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
79,9	93,7	63,5	57,9	68,8	73,5	78,1	85,9	90,5	73,5	67,6	68,1	70,4	58,3	67,0

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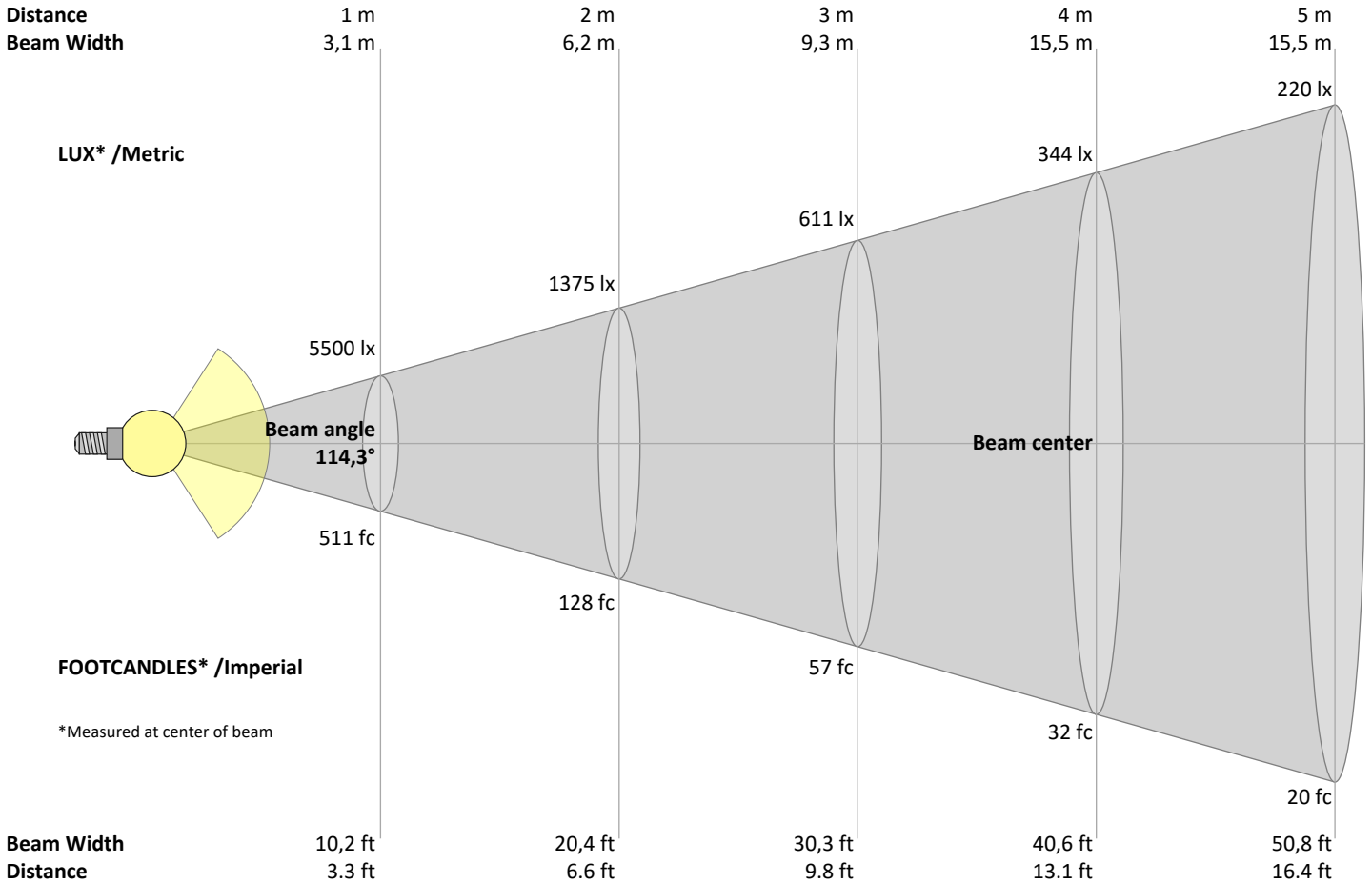
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Operator:



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
5500	1375	611	344	220	153	112	86	68	55	45	38	33	28	24	21	19	17	15	14	lux
510,9	127,7	56,8	31,9	20,4	14,2	10,4	8	6,3	5,1	4,2	3,5	3	2,6	2,3	2	1,8	1,6	1,4	1,3	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
5500	5480	5430	5341	5240	5153	5112	5302	5834	6204	5277	3549	2366	1528	903	559	353	192	68	10	cd
100%	100%	99%	97%	95%	94%	93%	96%	106%	113%	96%	65%	43%	28%	16%	10%	6%	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
5500	5471	5399	5300	5179	5080	5015	5103	5430	5663	5036	3598	2453	1609	955	570	335	175	63	10	cd
100%	99%	98%	96%	94%	92%	91%	93%	99%	103%	92%	65%	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
5500	5480	5430	5341	5240	5153	5112	5302	5834	6204	5277	3549	2366	1528	903	559	353	192	68	10	cd
100%	100%	99%	97%	95%	94%	93%	96%	106%	113%	96%	65%	43%	28%	16%	10%	6%	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
5500	5471	5399	5300	5179	5080	5015	5103	5430	5663	5036	3598	2453	1609	955	570	335	175	63	10	cd
100%	99%	98%	96%	94%	92%	91%	93%	99%	103%	92%	65%	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	32,8	34,0	33,1	34,3	34,6	32,8	34,0	33,1	34,3	34,5
	3H	33,2	34,4	33,6	34,7	34,9	33,2	34,5	33,7	34,7	35,0
	4H	33,3	34,5	33,7	34,7	35,0	33,4	34,6	33,8	34,8	35,1
	6H	33,5	34,5	33,8	34,8	35,1	33,6	34,6	33,9	34,8	35,2
	8H	33,5	34,5	33,8	34,8	35,2	33,6	34,5	33,9	34,9	35,3
	12H	33,5	34,5	33,9	34,8	35,2	33,6	34,5	33,9	34,9	35,3
4H	2H	33,1	34,2	33,5	34,5	34,8	33,1	34,2	33,5	34,5	34,7
	3H	33,7	34,6	34,0	34,9	35,4	33,7	34,7	34,1	35,0	35,5
	4H	33,8	34,6	34,2	35,1	35,6	33,9	34,7	34,3	35,2	35,7
	6H	34,0	34,8	34,5	35,1	35,5	34,0	34,9	34,5	35,2	35,6
	8H	34,0	34,8	34,5	35,1	35,5	34,1	34,9	34,6	35,2	35,6
	12H	34,1	34,7	34,6	35,1	35,6	34,1	34,8	34,6	35,2	35,7
8H	4H	33,8	34,6	34,3	35,0	35,3	33,9	34,7	34,4	35,0	35,4
	6H	34,1	34,7	34,6	35,1	35,7	34,2	34,7	34,7	35,2	35,8
	8H	34,3	34,8	34,8	35,3	35,9	34,3	34,8	34,8	35,3	36,0
	12H	34,4	34,8	35,0	35,3	35,9	34,4	34,8	35,0	35,3	36,0
12H	4H	33,8	34,4	34,3	34,9	35,3	33,9	34,5	34,4	34,9	35,4
	6H	34,1	34,6	34,7	35,2	35,8	34,2	34,7	34,7	35,2	35,9
	8H	34,3	34,7	34,9	35,2	35,8	34,4	34,8	34,9	35,3	35,9

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

S = 1.0H	0,5 / -0,4	0,4 / -0,3
S = 1.5H	1,3 / -1,2	1,1 / -1,0
S = 2.0H	2,4 / -2,2	2,1 / -2,1

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	101	98	107	103	99	96	99	96	93	95	92	90	91	89	88	86
2	100	92	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72
3	91	81	74	67	89	80	72	67	77	71	65	74	69	64	71	67	63	61
4	84	72	63	57	81	71	63	56	68	61	56	66	60	55	64	58	54	52
5	77	64	55	49	75	63	55	48	61	53	48	59	52	47	57	51	47	45
6	71	57	48	42	69	56	48	42	55	47	42	53	46	41	51	45	41	39
7	65	52	43	37	63	51	43	37	49	42	36	48	41	36	46	40	36	34
8	60	47	38	33	59	46	38	32	45	37	32	44	37	32	42	36	32	30
9	56	43	35	29	55	42	34	29	41	34	29	40	33	29	39	33	28	27
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

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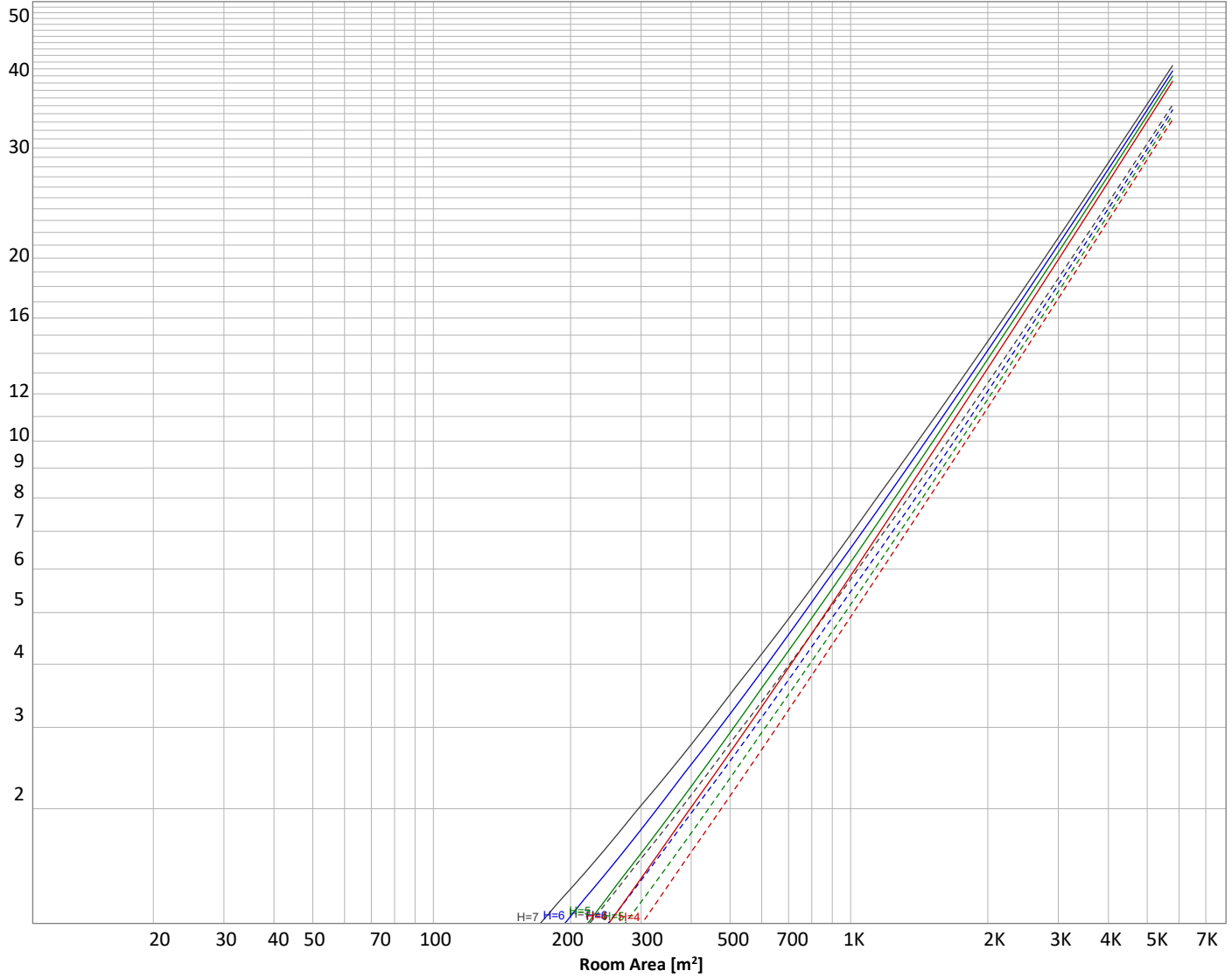
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 17907 lm			
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	ρ(%)
H _{work} = Work area height from floor =	0.00 m	-----	70	Wall reflectance
E _{work} = Average lux on work area =	100 lx	_____	50	30
				Floor reflectance
				20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
521 lm	1505 lm	2362 lm	3268 lm	4595 lm	3263 lm	1555 lm	603 lm	202 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
13,4 lm	1,50 lm	2,74 lm	3,30 lm	3,33 lm	2,89 lm	2,18 lm	1,37 lm	0,470 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	521 lm	2,9%
10-20°	1505 lm	8,4%
20-30°	2362 lm	13,2%
30-40°	3268 lm	18,3%
40-50°	4595 lm	25,7%
50-60°	3263 lm	18,2%
60-70°	1555 lm	8,7%
70-80°	603 lm	3,4%
80-90°	202 lm	1,1%
90-100°	13 lm	0,1%
100-110°	2 lm	0,0%
110-120°	3 lm	0,0%
120-130°	3 lm	0,0%
130-140°	3 lm	0,0%
140-150°	3 lm	0,0%
150-160°	2 lm	0,0%
160-170°	1 lm	0,0%
170-180°	0 lm	0,0%
Total	17907 lm	100,0%

Intensity peaks

Max intensity	6317 cd
Intensity, 90°	68 cd
Intensity, 0°	5500 cd

Zonal Lumen summary

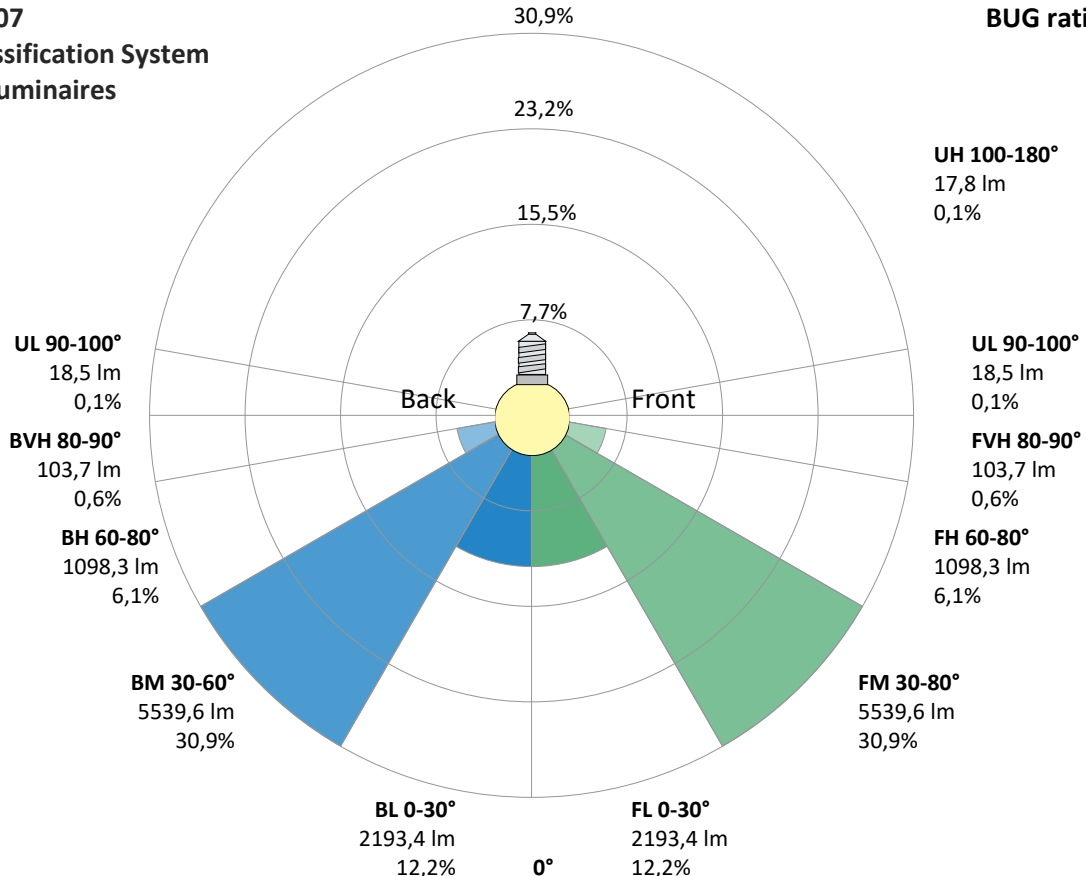
Zone (γ)	Lumen	% Total
0-30°	4388 lm	24,5%
0-40°	7656 lm	42,8%
0-60°	15515 lm	86,6%
60-90°	2361 lm	13,2%
70-100°	819 lm	4,6%
90-120°	18 lm	0,1%
0-90°	17876 lm	99,8%
90-180°	31 lm	0,2%
0-180°	17907 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	2193 lm	12,2%
Medium(30-60°)	5540 lm	30,9%
High(60-80°)	1098 lm	6,1%
Very high(80-90°)	104 lm	0,6%
Back light		
Low(0-30°)	2193 lm	12,2%
Medium(30-60°)	5540 lm	30,9%
High(60-80°)	1098 lm	6,1%
Very high(80-90°)	104 lm	0,6%
Uplight		
Low(90-100°)	19 lm	0,1%
High(100-180°)	18 lm	0,1%

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

BUG rating B4 U2 G2



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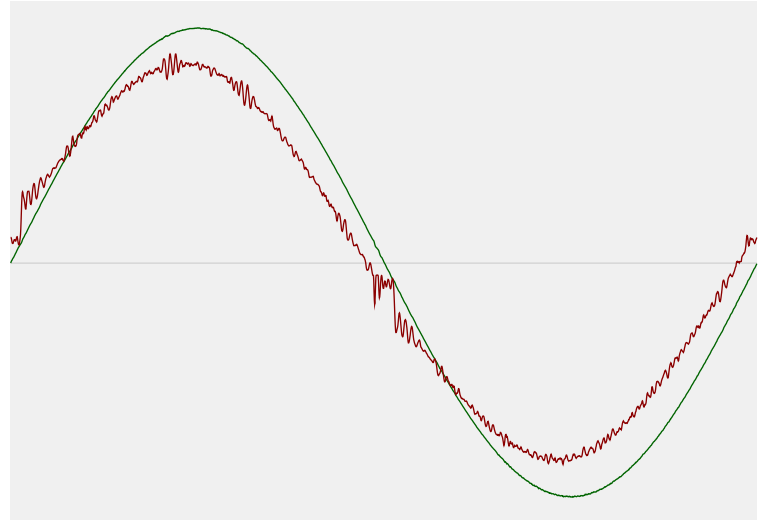


Power Details

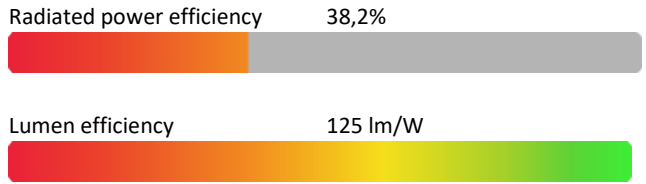
Input Power

Power feed to light source	143,7 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,632 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	145,31 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,99
Total harmonic distortion of the current	2,61%
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	5960 K
CCT shift	+40 K
CCT end	6000 K

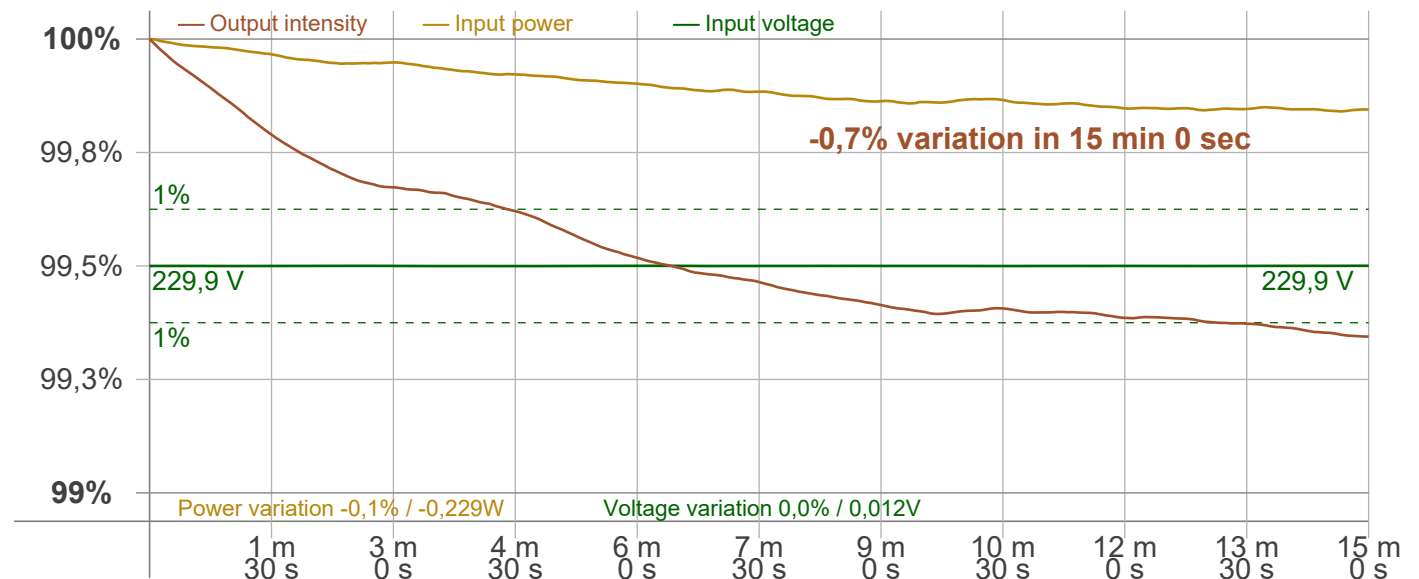
Warmup Result

Total warmup time	Lamp stabilized in 15 min 0 sec
Warmup variation	-0,7%

Output Change

Output start	18030 lm
Output change	-123 lm
Output end	17907 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 540,54 Hz
 Percent Flicker 0,35 %
 Flicker index 0

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

JA8/10 40 Hz 0,15 %
 JA8/10 90 Hz 0,17 %
 JA8/10 200 Hz 0,19 %
 JA8/10 400 Hz 0,21 %
 JA8/10 1000 Hz 0,31 %

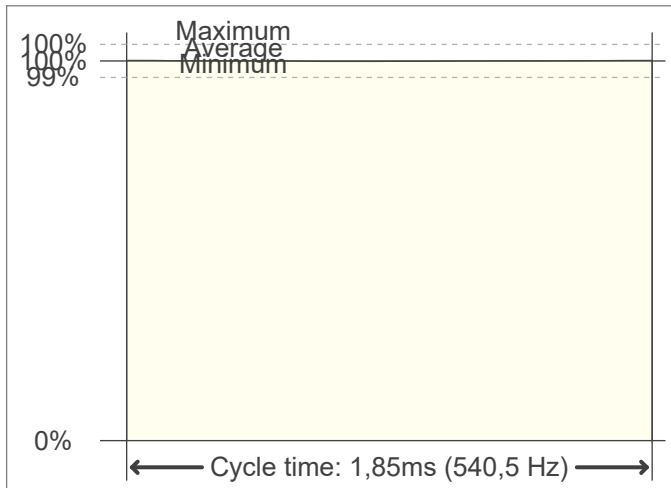
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

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

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

