

Light Measurement Report

Print date: 29-9-2025

Measurement date and time: 29-9-2025 09:37:20 – Measurement no. VFR-250929-3415-MS

Measurement tracking No. and Link: [VT250929-003760](#)

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
97,7 W – PF 0,98 – DPF 0,99
230 V – 0,431 A
50 Hz
Lamp stabilized in 15 min 3 sec – 2,0%

Tested Light Source

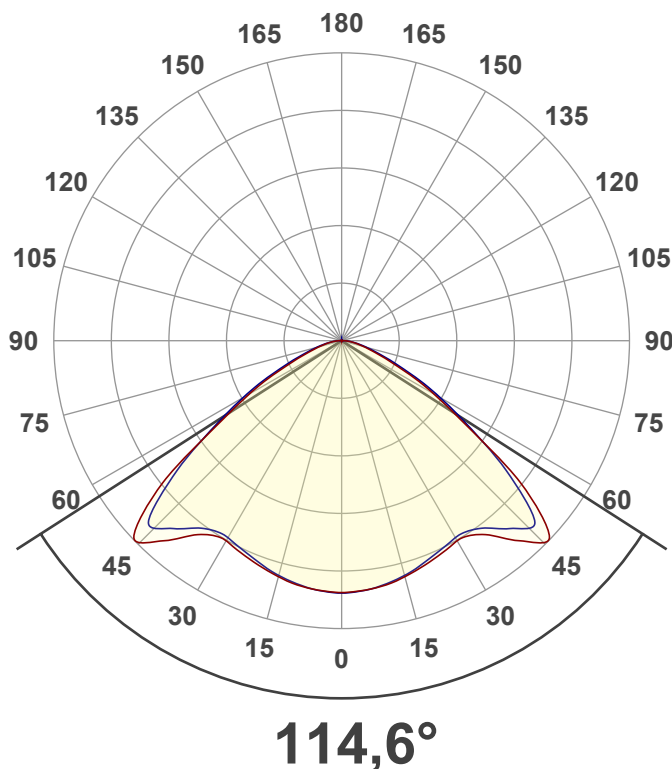
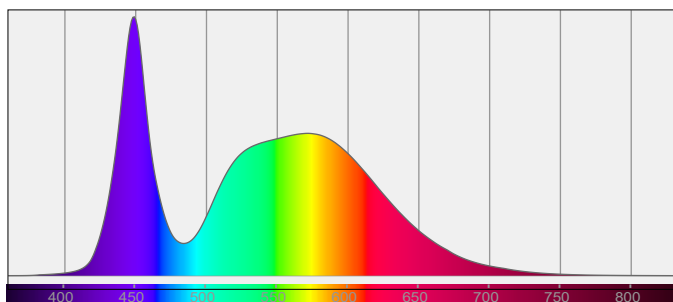
Product Name
Item No. and Manufacturer
Product Description (line 1)
SWITCH

812713-6000K-100W
812713-6000K-100W – 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

12545 lm – 0,16% / 99,84%
128 lm/W
4415 cd – 114,6°
CCT = 6000 K / 5864 K
CRI 73,7
 R_f 74,0 – R_g 94,9
Duv 0,0007 – SDCM 2,0
SVM 0 – PstLM 0,08



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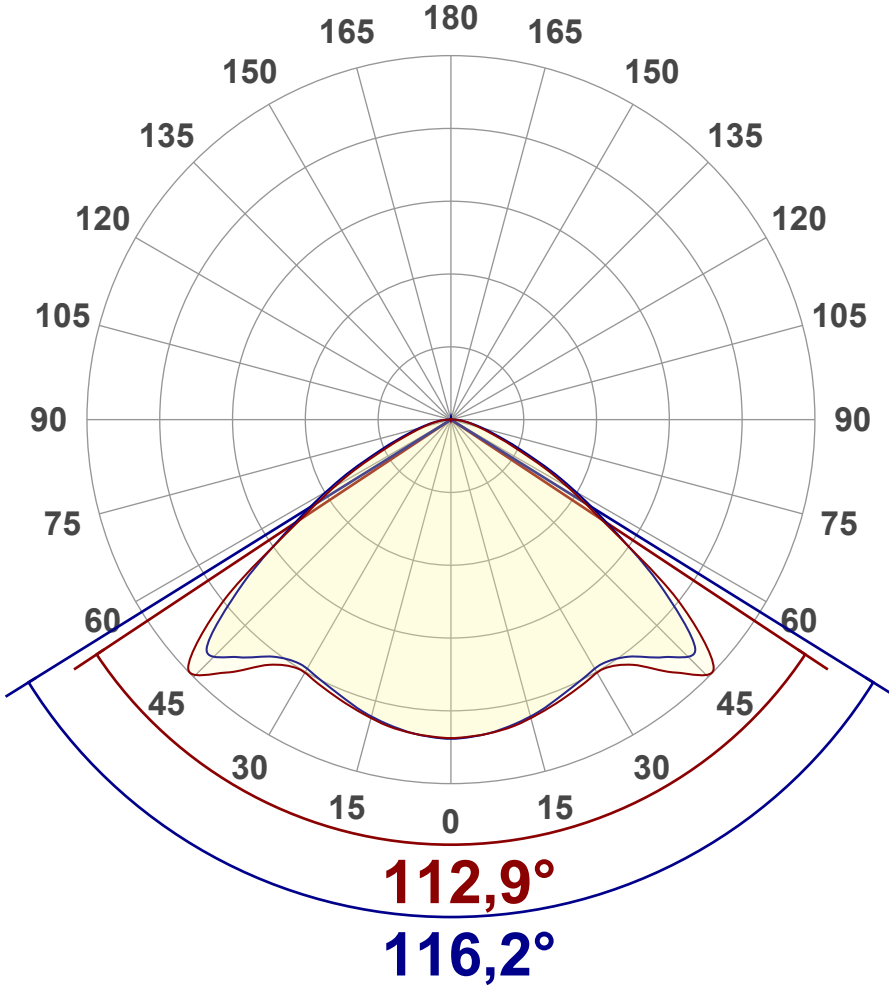
Measurement tracking No. and Link: [VT250929-003760](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	12545 lm
Lumen Up% / Down%	0,16% / 99,84%
Peak Intensity	4415 cd
Beam Angle (50%)	114,6°
Beam Angle (90%)	116,2°
Beam Angle (10%)	113,3°

Cut-off Angle

Average 2,5%	171,7°
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Field Angle

Average 10%	148,3°
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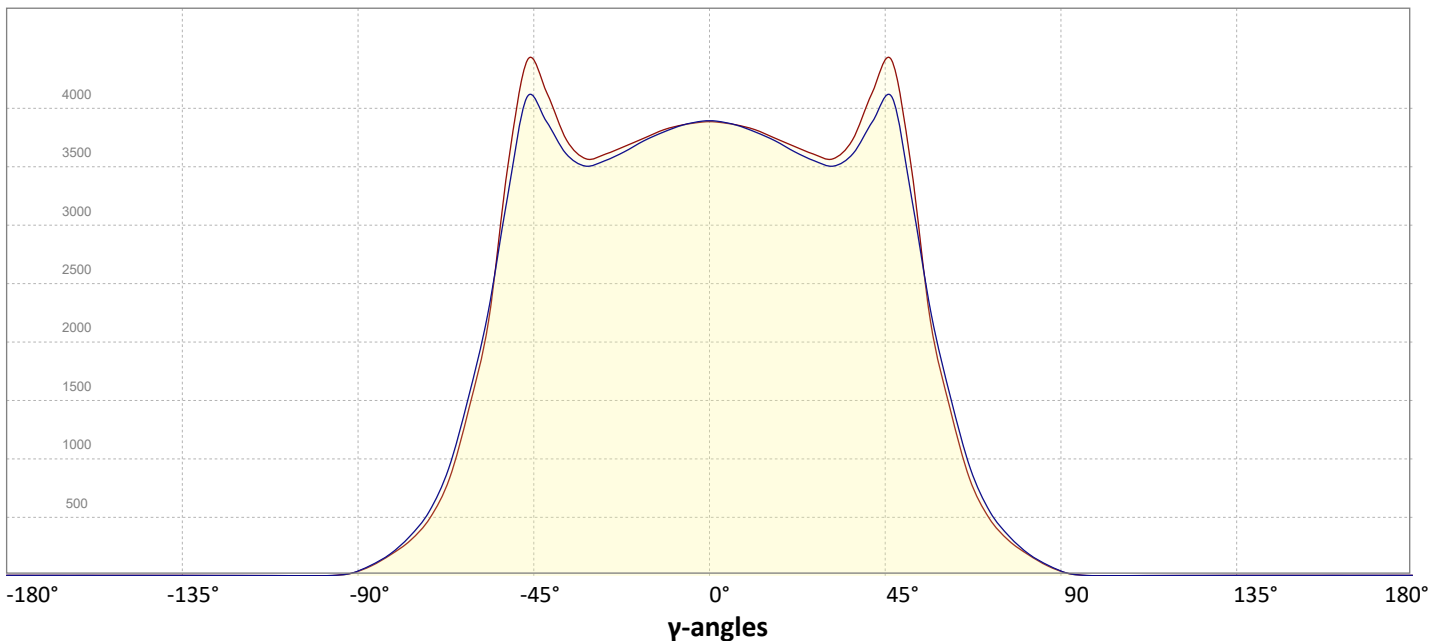
Intensity Ratio

In 120° cone	86,9%
In 90° cone	55,0%

C000-C180

C090-C270

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



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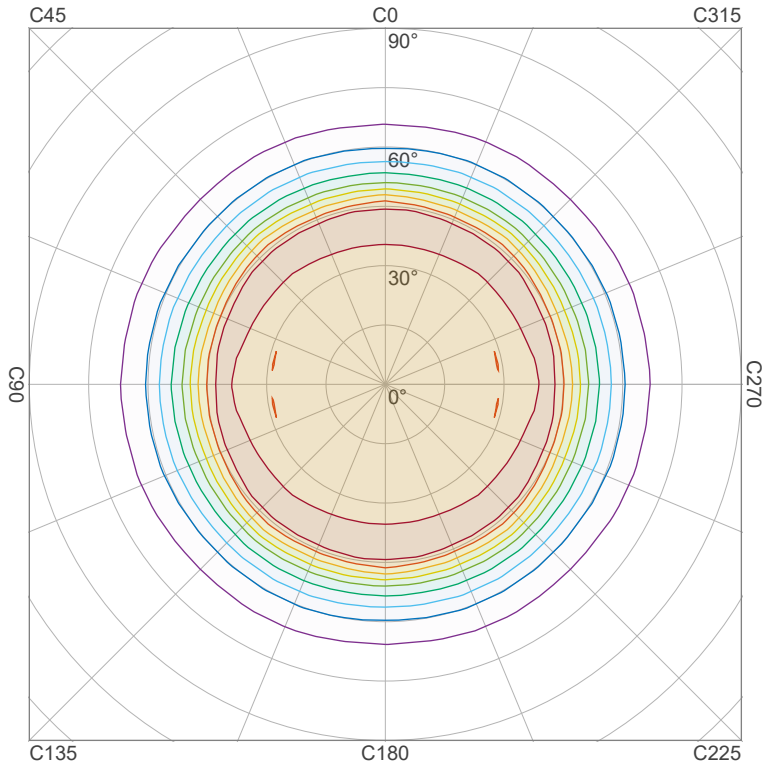
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Iso-intensity Diagram (Iso-candela)

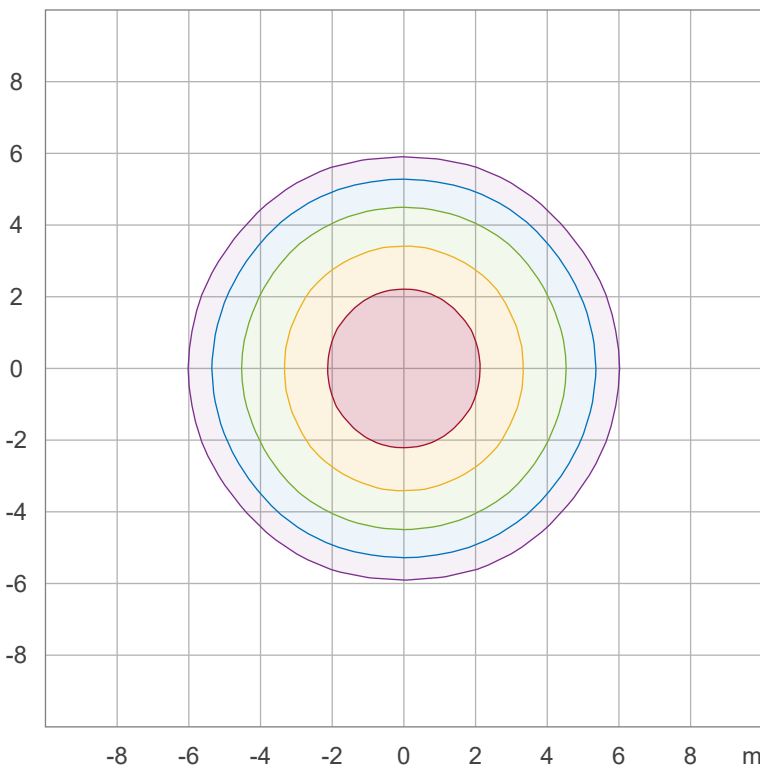


90 %	3943,2 cd
80 %	3505,1 cd
70 %	3066,9 cd
60 %	2628,8 cd
50 %	2190,7 cd
40 %	1752,5 cd
30 %	1314,4 cd
20 %	876,3 cd
10 %	438,1 cd

Peak intensity: 4381,4 cd

Number of c-planes: 36

Iso-illuminance Diagram (Iso-lux)



50,0 %	216,1 lx
30,0 %	129,6 lx
10,0 %	43,2 lx
5,0 %	21,6 lx
3,0 %	13,0 lx

Peak illuminance: 432,2 lx

Mounting height: 3,0 m

Number of c-planes: 36

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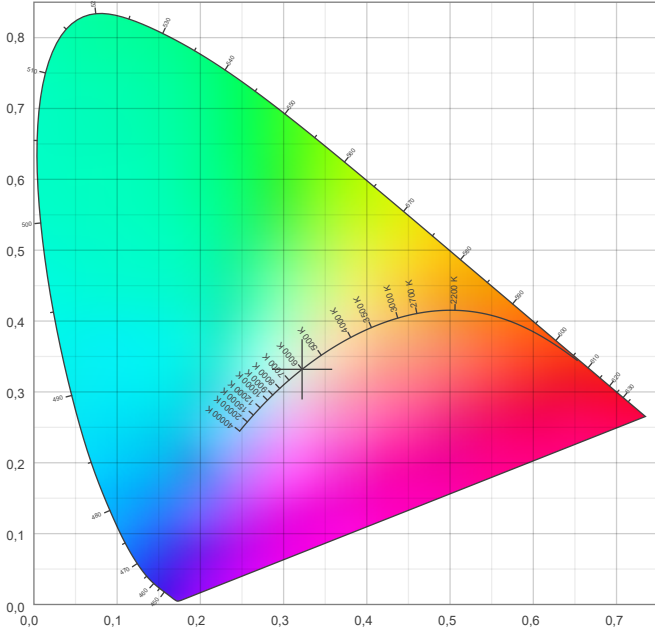


Color details

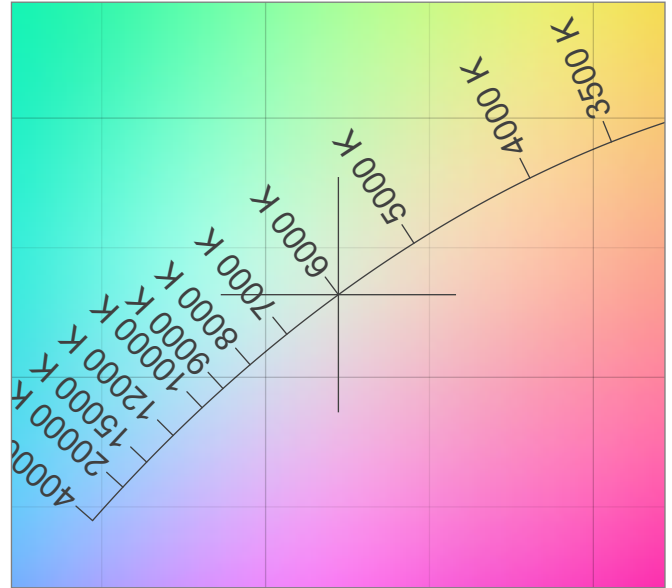
Correlated Color Temperature, Target CCT = 6000 K
 Correlated Color Temperature, Measured CCT = 5864 K
 Color Rendering Index CRI 73,7
 Color Rendering Index, R9 (red component) R9 = -26,9
 Color Rendering TM30-18 R_f 74,0 – R_g 94,9
 Color Quality Scale CQS = 70,9

MacAdam Steps SDCM = 2,0
 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)

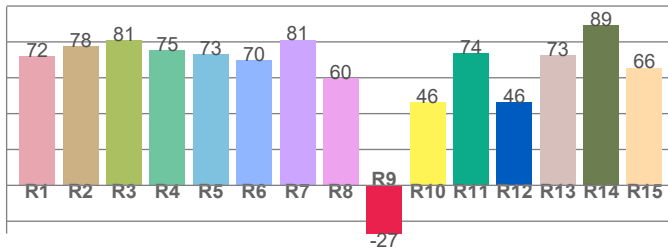
CIE 1931



CIE 1931 – zoomed on Planckian locus



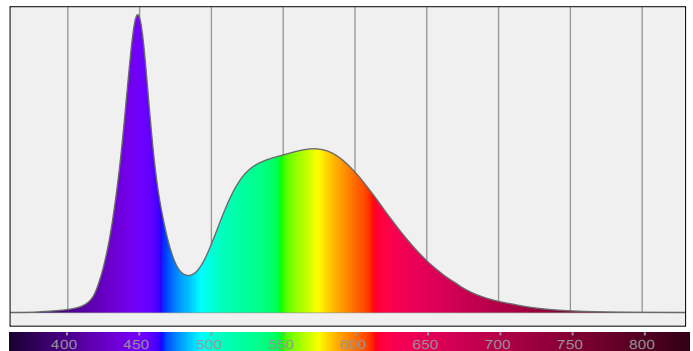
Color Rendering Index per reference color (CIE 1995)



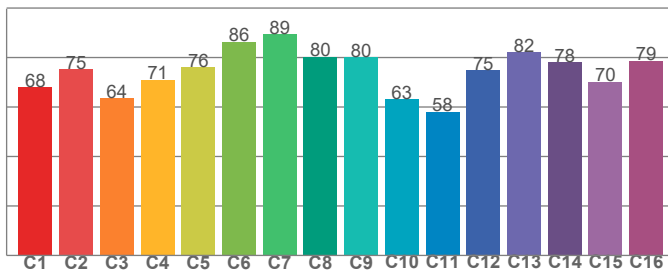
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
72,0	77,7	80,9	75,4	73,1	69,6	81,1	59,8	-26,9	46,3	73,7	46,2	72,7	89,3	65,5

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



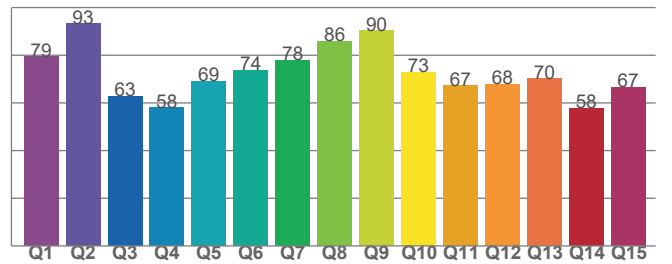
TM30-18 R_f-values per hue bin



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
68,0	75,2	63,5	71,0	76,0	86,3	89,4	80,2	80,2	63,1	58,1	74,8	82,1	78,1	70,2	78,7

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
79,4	93,2	62,9	58,0	69,2	73,7	77,9	86,0	90,2	72,9	67,3	67,8	70,2	57,7	66,5

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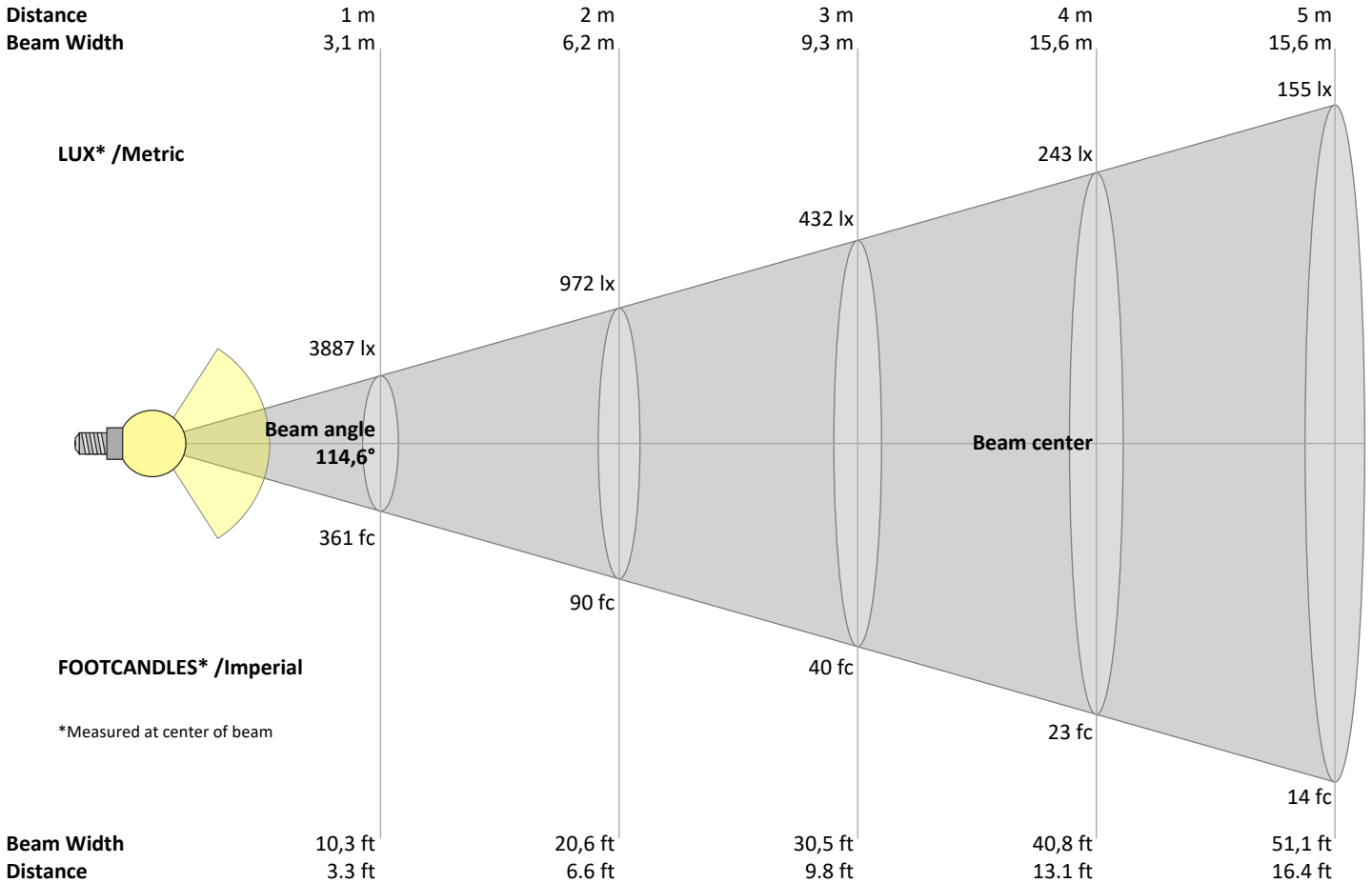
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Beam Details



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
3887	972	432	243	155	108	79	61	48	39	32	27	23	20	17	15	13	12	11	10	lux
361,1	90,3	40,1	22,6	14,4	10	7,4	5,6	4,5	3,6	3	2,5	2,1	1,8	1,6	1,4	1,2	1,1	1	0,9	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
3887	3867	3831	3769	3699	3630	3580	3676	4000	4324	3802	2601	1669	1022	601	363	220	115	42	8	cd
100%	99%	99%	97%	95%	93%	92%	95%	103%	111%	98%	67%	43%	26%	15%	9%	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
3887	3869	3818	3748	3662	3579	3522	3575	3790	4018	3537	2591	1775	1132	681	412	239	123	45	9	cd
100%	100%	98%	96%	94%	92%	91%	92%	97%	103%	91%	67%	46%	29%	18%	11%	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
3887	3867	3831	3769	3699	3630	3580	3676	4000	4324	3802	2601	1669	1022	601	363	220	115	42	8	cd
100%	99%	99%	97%	95%	93%	92%	95%	103%	111%	98%	67%	43%	26%	15%	9%	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
3887	3869	3818	3748	3662	3579	3522	3575	3790	4018	3537	2591	1775	1132	681	412	239	123	45	9	cd
100%	100%	98%	96%	94%	92%	91%	92%	97%	103%	91%	67%	46%	29%	18%	11%	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	31,7	32,9	31,9	33,2	33,4	31,6	32,8	31,8	33,1	33,3
	3H	32,0	33,2	32,4	33,5	33,7	32,0	33,2	32,4	33,5	33,7
	4H	32,1	33,3	32,5	33,6	33,8	32,2	33,3	32,6	33,6	33,8
	6H	32,3	33,3	32,6	33,5	33,9	32,3	33,3	32,6	33,6	34,0
	8H	32,3	33,2	32,6	33,6	34,0	32,3	33,3	32,7	33,6	34,0
	12H	32,3	33,2	32,6	33,6	34,0	32,3	33,3	32,7	33,6	34,1
4H	2H	31,9	33,0	32,3	33,3	33,6	31,8	33,0	32,2	33,2	33,5
	3H	32,5	33,4	32,8	33,8	34,2	32,5	33,4	32,8	33,8	34,2
	4H	32,6	33,4	33,0	33,9	34,4	32,6	33,5	33,1	33,9	34,5
	6H	32,7	33,6	33,2	33,9	34,3	32,8	33,6	33,3	34,0	34,4
	8H	32,8	33,5	33,3	33,9	34,3	32,9	33,6	33,4	34,0	34,4
	12H	32,8	33,4	33,3	33,9	34,3	32,9	33,5	33,4	34,0	34,4
8H	4H	32,6	33,4	33,1	33,7	34,1	32,7	33,4	33,2	33,8	34,2
	6H	32,9	33,4	33,4	33,9	34,4	32,9	33,5	33,4	34,0	34,5
	8H	33,0	33,5	33,5	34,0	34,6	33,1	33,6	33,6	34,1	34,7
	12H	33,1	33,5	33,7	34,0	34,6	33,2	33,6	33,8	34,1	34,7
12H	4H	32,6	33,2	33,1	33,6	34,1	32,6	33,3	33,1	33,7	34,2
	6H	32,9	33,4	33,4	33,9	34,5	33,0	33,4	33,5	34,0	34,6
	8H	33,0	33,4	33,6	33,9	34,5	33,1	33,5	33,7	34,0	34,6

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

S = 1.0H	0,4 / -0,4	0,3 / -0,3
S = 1.5H	1,2 / -1,3	1,0 / -1,1
S = 2.0H	2,3 / -2,3	2,0 / -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	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
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72
3	92	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61
4	84	72	64	57	81	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	52	47	57	51	47	45
6	71	57	49	42	69	56	48	42	55	47	42	53	46	41	51	45	41	39
7	65	52	43	37	64	51	43	37	49	42	36	48	41	36	47	41	36	34
8	61	47	38	33	59	46	38	32	45	38	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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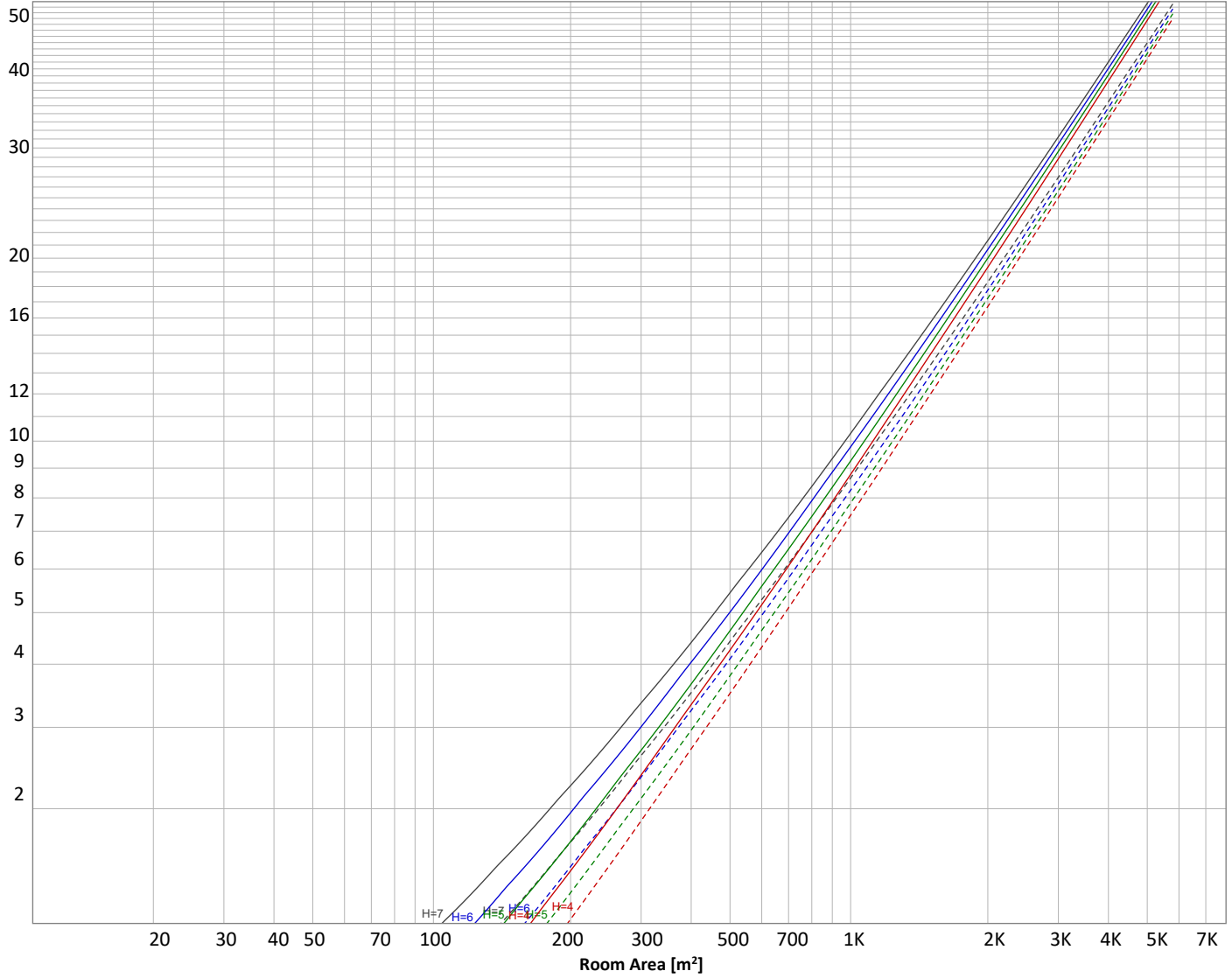
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 12545 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°
368 lm	1063 lm	1664 lm	2283 lm	3212 lm	2308 lm	1081 lm	412 lm	133 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
8,21 lm	0,948 lm	1,75 lm	2,25 lm	2,23 lm	1,92 lm	1,48 lm	0,926 lm	0,321 lm

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Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	368 lm	2,9%
10-20°	1063 lm	8,5%
20-30°	1664 lm	13,3%
30-40°	2283 lm	18,2%
40-50°	3212 lm	25,6%
50-60°	2308 lm	18,4%
60-70°	1081 lm	8,6%
70-80°	412 lm	3,3%
80-90°	133 lm	1,1%
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	12545 lm	100,0%

Intensity peaks

Max intensity	4415 cd
Intensity, 90°	42 cd
Intensity, 0°	3887 cd

Zonal Lumen summary

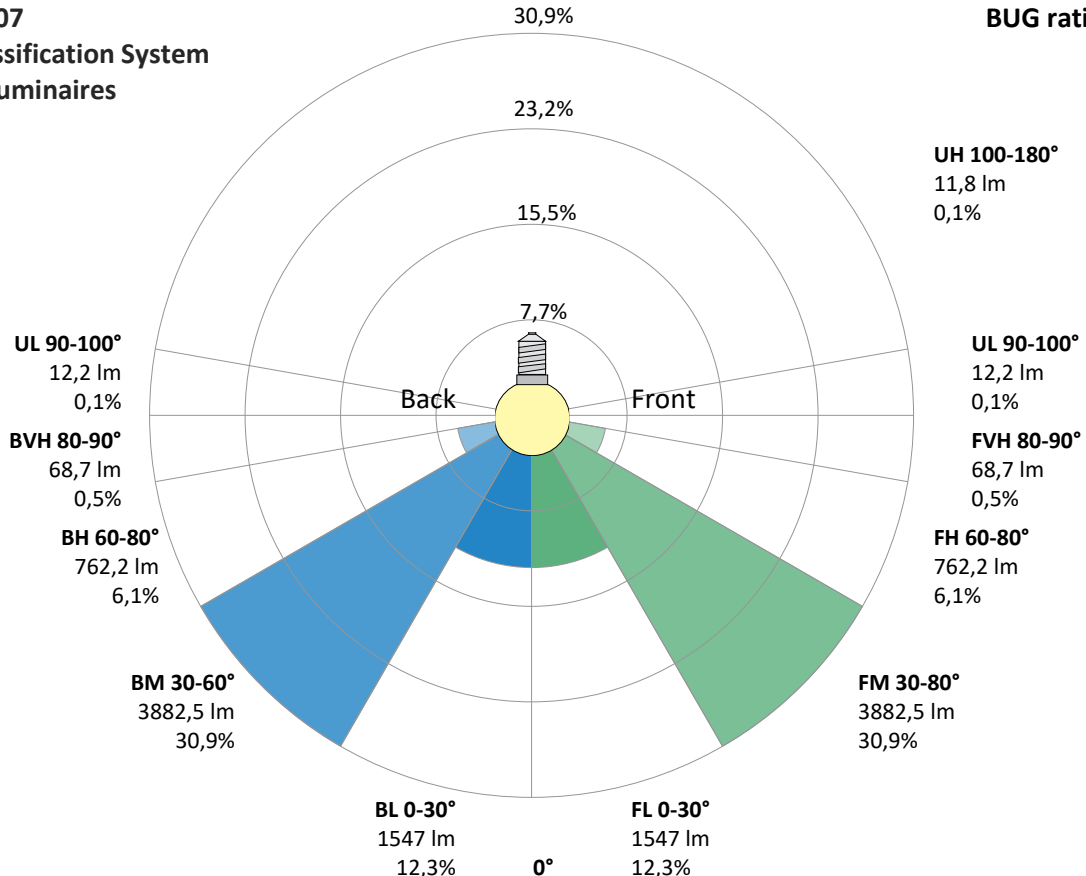
Zone (γ)	Lumen	% Total
0-30°	3095 lm	24,7%
0-40°	5379 lm	42,9%
0-60°	10898 lm	86,9%
60-90°	1626 lm	13,0%
70-100°	553 lm	4,4%
90-120°	11 lm	0,1%
0-90°	12525 lm	99,8%
90-180°	20 lm	0,2%
0-180°	12545 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1547 lm	12,3%
Medium(30-60°)	3883 lm	30,9%
High(60-80°)	762 lm	6,1%
Very high(80-90°)	69 lm	0,5%
Back light		
Low(0-30°)	1547 lm	12,3%
Medium(30-60°)	3883 lm	30,9%
High(60-80°)	762 lm	6,1%
Very high(80-90°)	69 lm	0,5%
Uplight		
Low(90-100°)	12 lm	0,1%
High(100-180°)	12 lm	0,1%

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

BUG rating B3 U2 G1



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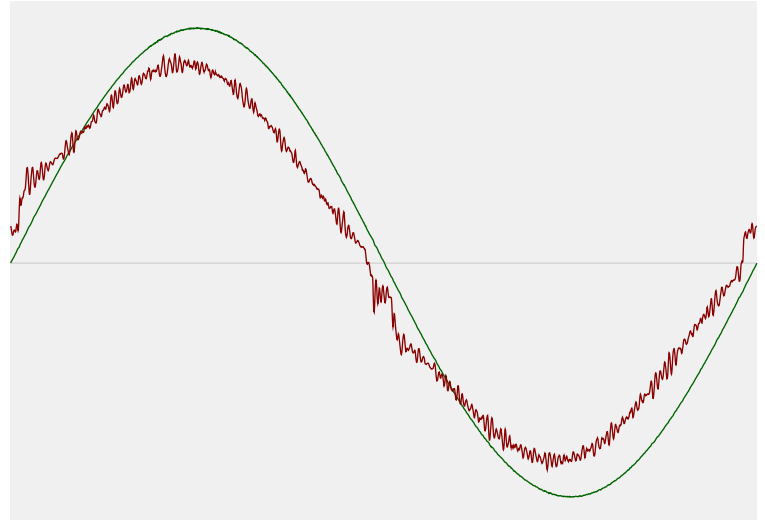


Power Details

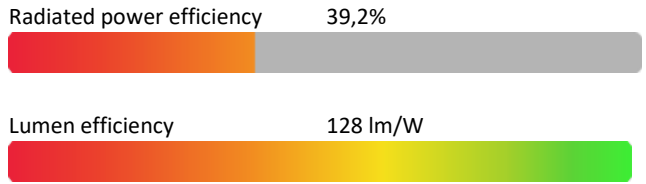
Input Power

Power feed to light source	97,7 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,431 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	99,26 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,98
Total harmonic distortion of the current	4,25%
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	5992 K
CCT shift	+8 K
CCT end	6000 K

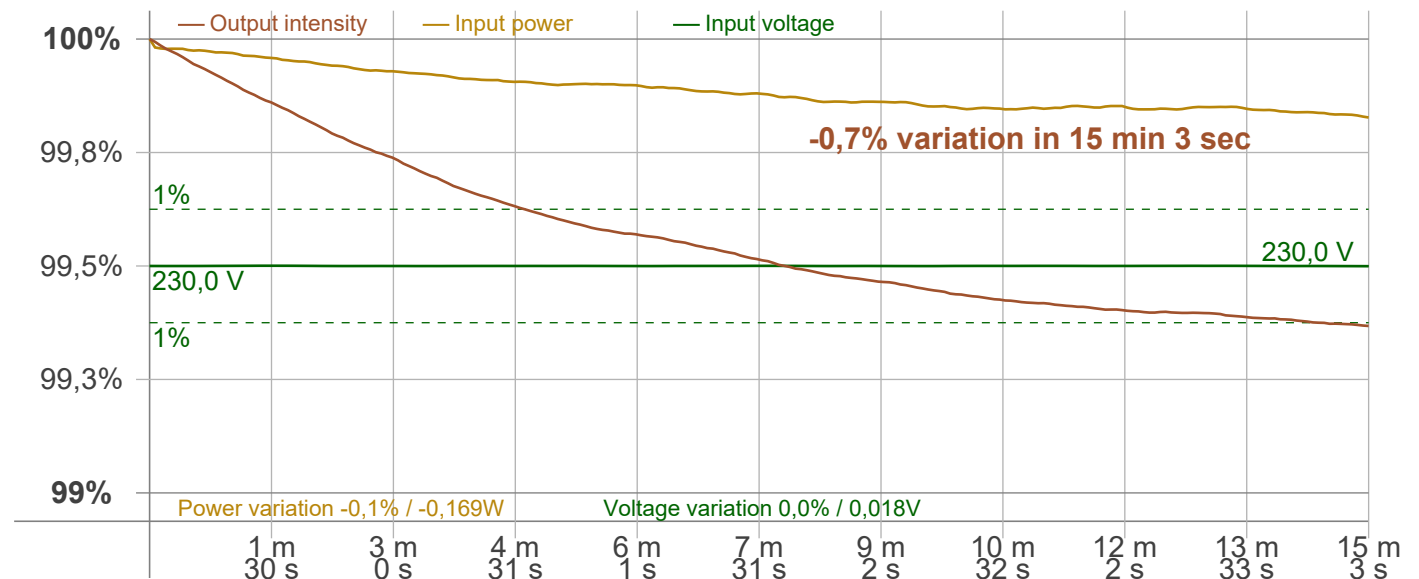
Warmup Result

Total warmup time	Lamp stabilized in 15 min 3 sec
Warmup variation	-0,7%

Output Change

Output start	12627 lm
Output change	-82 lm
Output end	12545 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 0,28 %
 Flicker index 0

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

JA8/10 40 Hz 0,16 %
 JA8/10 90 Hz 0,16 %
 JA8/10 200 Hz 0,21 %
 JA8/10 400 Hz 0,22 %
 JA8/10 1000 Hz 0,28 %

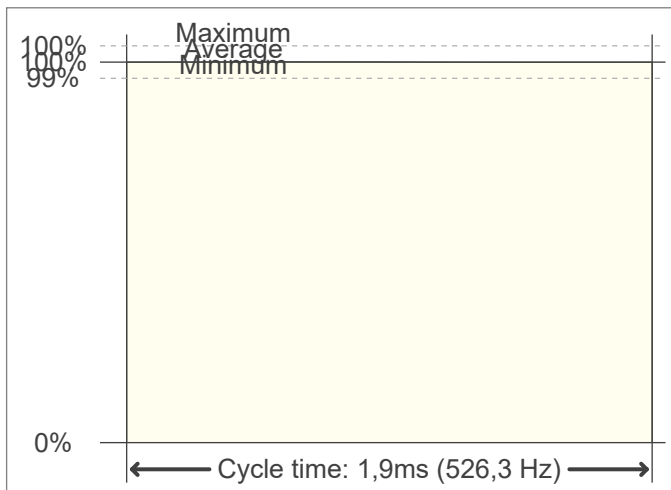
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz) 0,08
 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

