

Light Measurement Report

Print date: 3-11-2025

Measurement date and time: 3-11-2025 09:02:53 – Measurement no. VFR-251103-3860-MS

Measurement tracking No. and Link: [VT251103-003722](#)

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

72 planes – 5°
5°
3,77 m
20,3 W – PF 0,8 – DPF 0,96
230 V – 0,110 A
50 Hz
Lamp stabilized in 15 min 1 sec – 2,0%

Tested Light Source

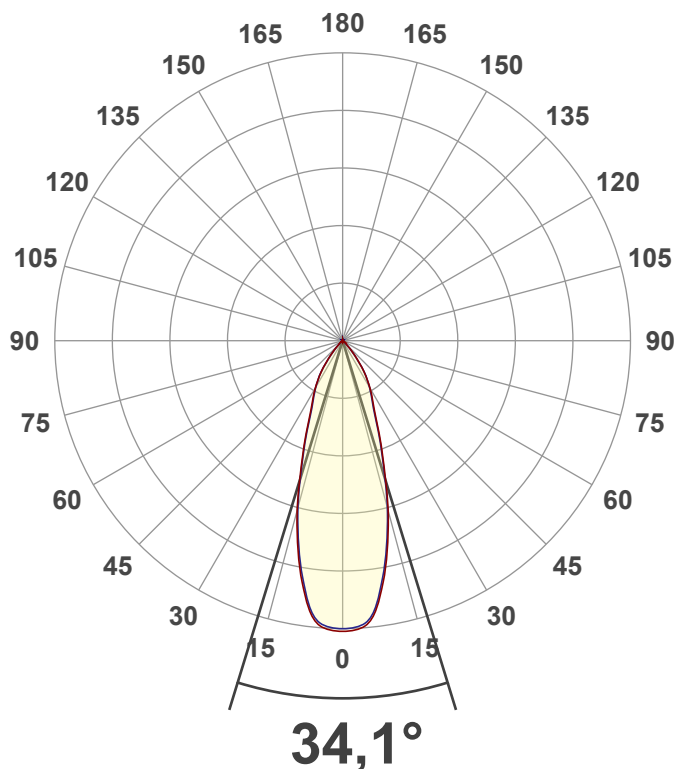
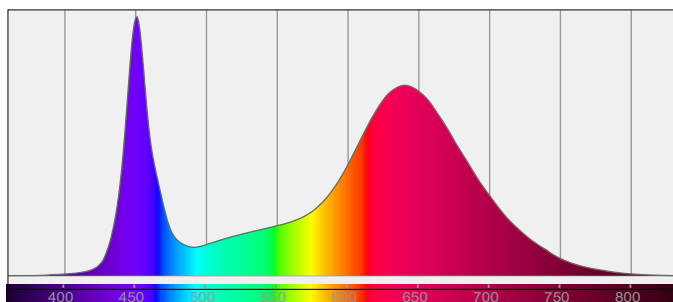
Product Name
Item No. and Manufacturer
Product Description (line 1)
| WIT | DIMBAAR | CCT-SWITCH

813871-MEAT-20W
813871-MEAT-20W – Dutchfulfillment
3-FASE RAILSPOT | ROSALIN – FOOD | SLAGER – BAKKER | 10W-20W-30W

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

947 lm – 0,17% / 99,83%
47 lm/W
2100 cd – 34,1°
CCT = 0 K / 0 K
CRI 0,0
 R_f 0,0 – R_g 0,0
Duv n/a – SDCM n/a
SVM 0,05 – PstLM 0,03



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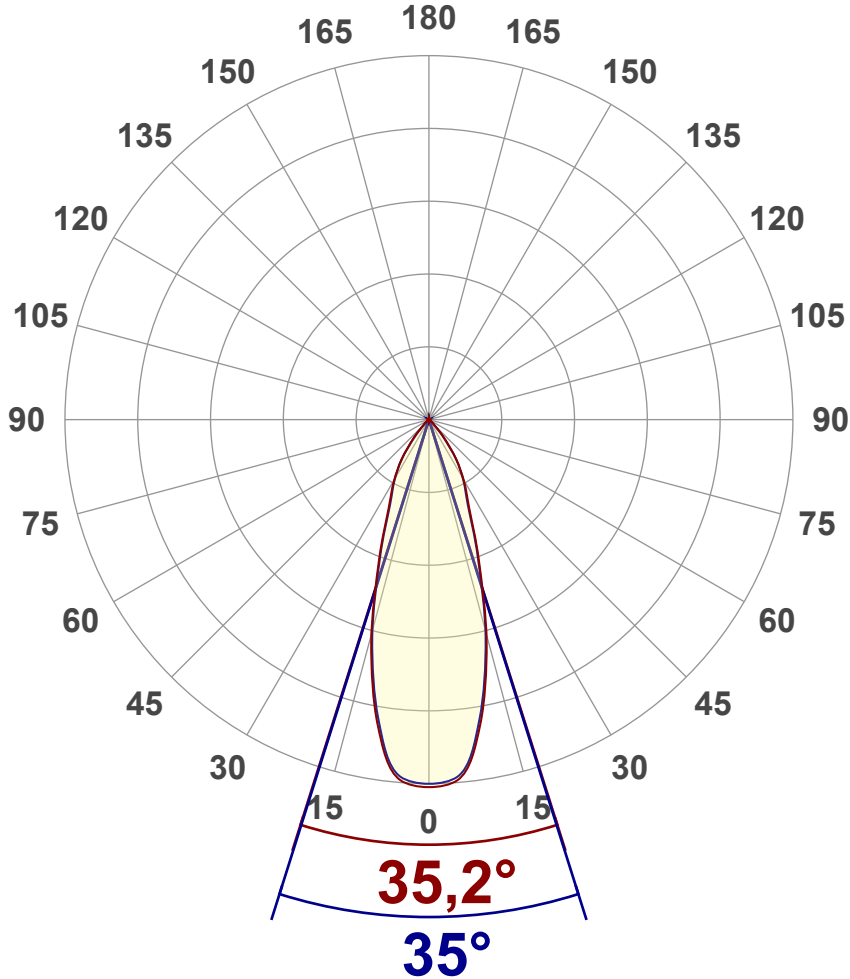
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	947 lm
Lumen Up% / Down%	0,17% / 99,83%
Peak Intensity	2100 cd
Beam Angle (50%)	34,1°
Beam Angle (90%)	35°
Beam Angle (10%)	34,1°

Cut-off Angle

Average 2,5%	87,8°
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Field Angle

Average 10%	73,4°
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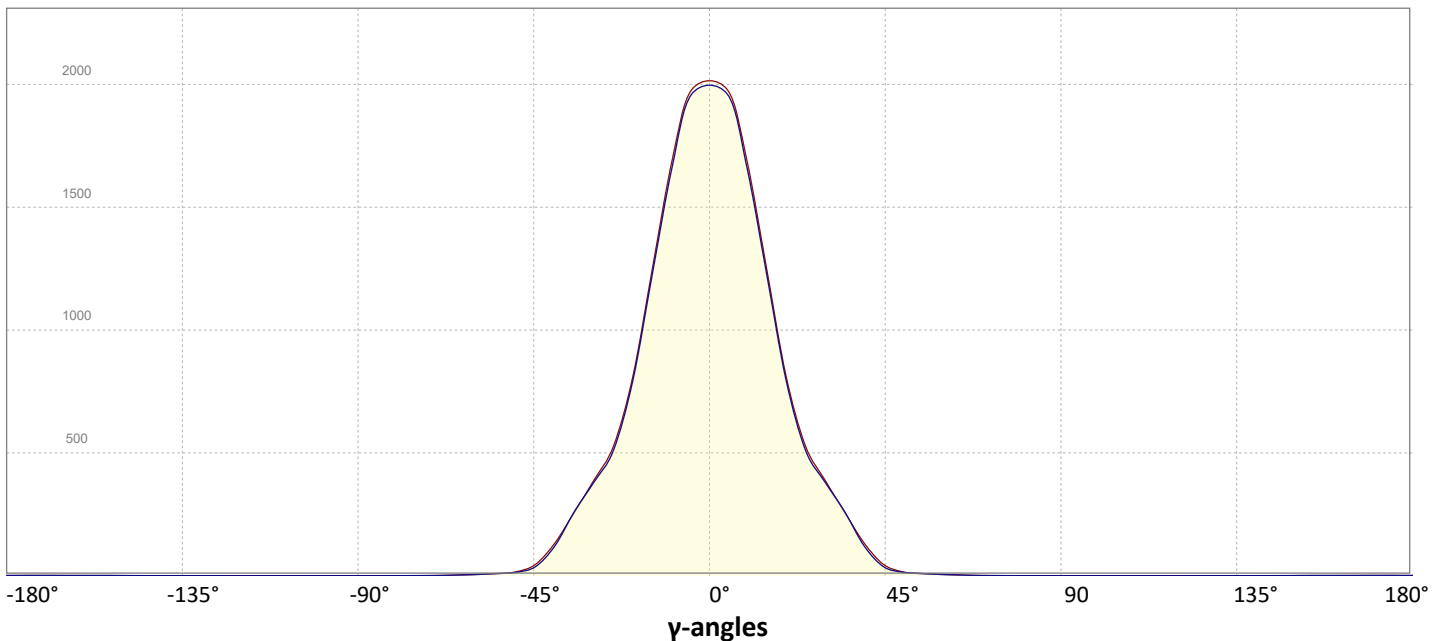
Intensity Ratio

In 120° cone	99,5%
In 90° cone	97,7%

C000-C180

C090-C270

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



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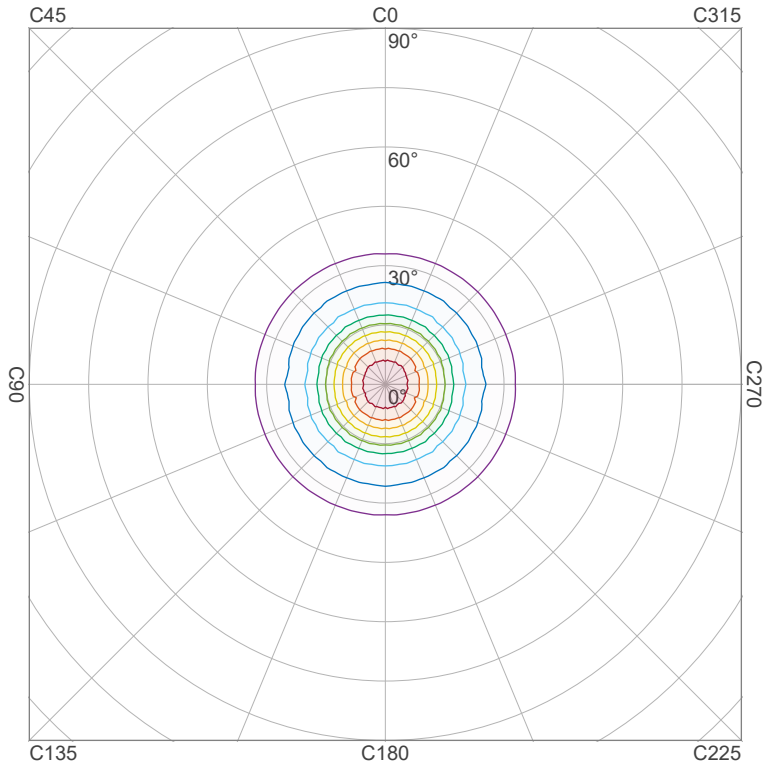
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Iso-intensity Diagram (Iso-candela)

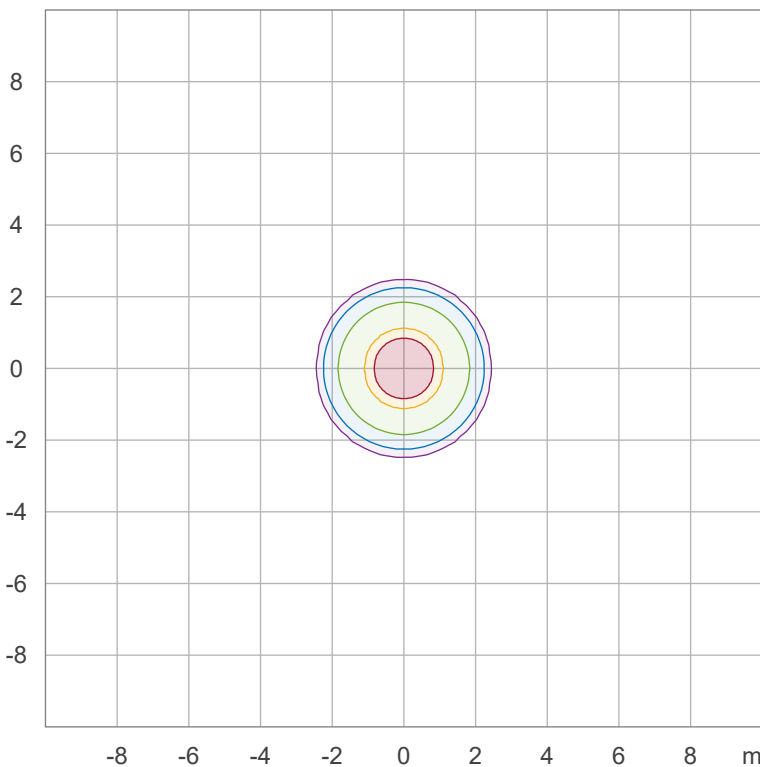


90 %	1869,4 cd
80 %	1661,7 cd
70 %	1454,0 cd
60 %	1246,3 cd
50 %	1038,6 cd
40 %	830,9 cd
30 %	623,1 cd
20 %	415,4 cd
10 %	207,7 cd

Peak intensity: 2077,1 cd

Number of c-planes: 72

Iso-illuminance Diagram (Iso-lux)



50,0 %	115,3 lx
30,0 %	69,2 lx
10,0 %	23,1 lx
5,0 %	11,5 lx
3,0 %	6,9 lx

Peak illuminance: 230,7 lx

Mounting height: 3,0 m

Number of c-planes: 72

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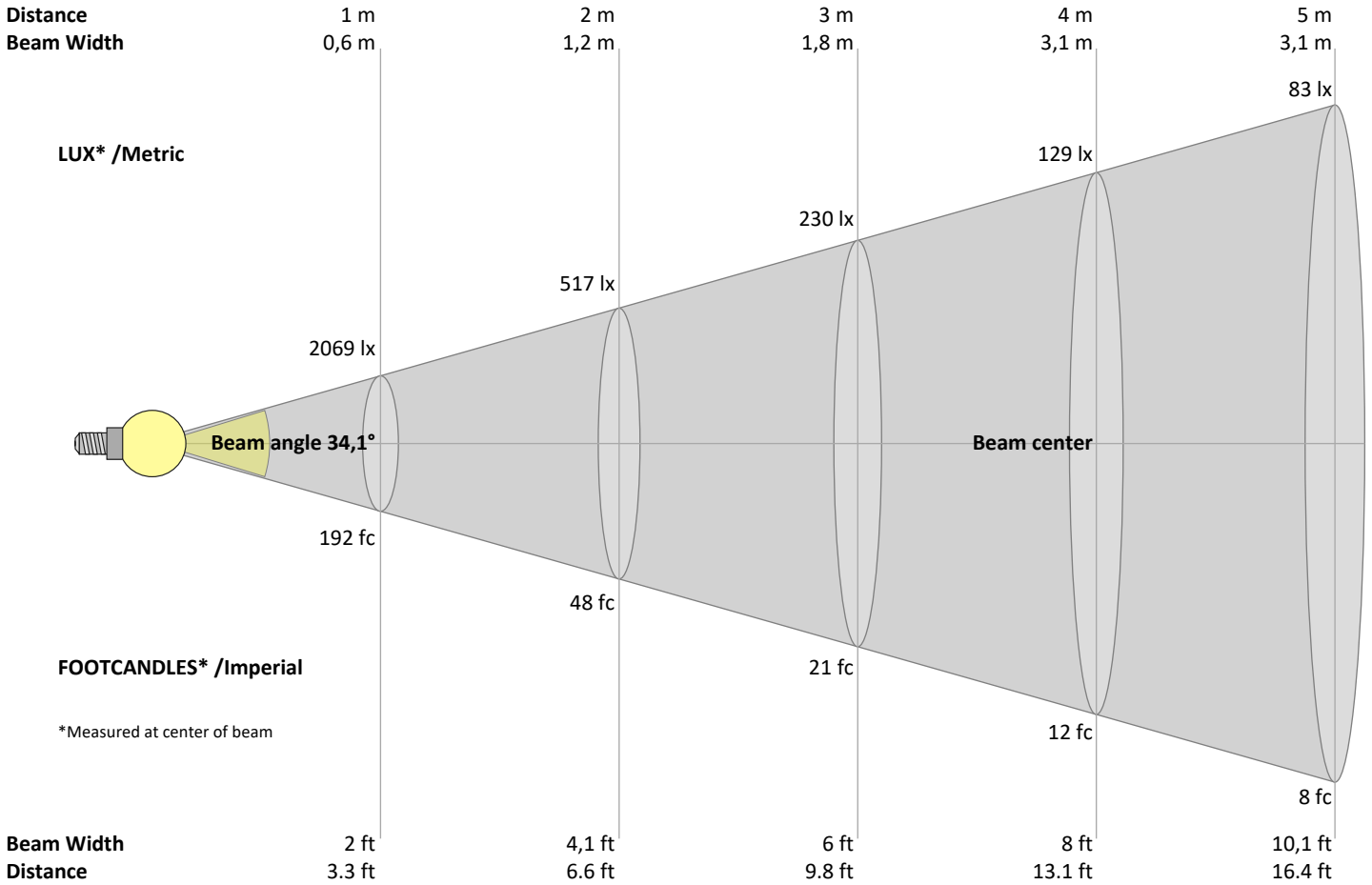
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Beam Details



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
2069	517	230	129	83	57	42	32	26	21	17	14	12	11	9	8	7	6	6	5	lux
192,2	48,1	21,4	12	7,7	5,3	3,9	3	2,4	1,9	1,6	1,3	1,1	1	0,9	0,8	0,7	0,6	0,5	0,5	fc

Intensities in 0° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2069	1979	1979	1894	1781	1652	1478	1305	1129	952	791	675	560	489	433	378	326	275	224	173	cd
100%	96%	96%	92%	86%	80%	71%	63%	55%	46%	38%	33%	27%	24%	21%	18%	16%	13%	11%	8%	of 0°val

Intensities in 90° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2069	1959	1959	1875	1756	1626	1454	1282	1109	935	773	659	544	474	422	371	323	276	222	166	cd
100%	95%	95%	91%	85%	79%	70%	62%	54%	45%	37%	32%	26%	23%	20%	18%	16%	13%	11%	8%	of 0°val

Intensities in 180° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2069	1979	1979	1894	1781	1652	1478	1305	1129	952	791	675	560	489	433	378	326	275	224	173	cd
100%	96%	96%	92%	86%	80%	71%	63%	55%	46%	38%	33%	27%	24%	21%	18%	16%	13%	11%	8%	of 0°val

Intensities in 270° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2069	1959	1959	1875	1756	1626	1454	1282	1109	935	773	659	544	474	422	371	323	276	222	166	cd
100%	95%	95%	91%	85%	79%	70%	62%	54%	45%	37%	32%	26%	23%	20%	18%	16%	13%	11%	8%	of 0°val

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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	17,6	18,1	17,7	18,4	18,6	17,4	17,9	17,5	18,2	18,4
	3H	17,3	18,0	17,7	18,2	18,4	17,1	17,8	17,5	18,0	18,2
	4H	17,2	17,9	17,6	18,1	18,4	17,0	17,7	17,4	17,9	18,1
	6H	17,2	17,8	17,5	18,1	18,4	17,0	17,6	17,3	17,9	18,2
	8H	17,2	17,7	17,5	18,0	18,4	17,0	17,5	17,3	17,8	18,2
	12H	17,1	17,6	17,5	18,0	18,4	16,9	17,4	17,2	17,8	18,2
4H	2H	17,2	17,9	17,6	18,1	18,4	17,0	17,7	17,4	17,9	18,2
	3H	17,1	17,6	17,5	18,0	18,4	16,9	17,4	17,3	17,8	18,2
	4H	17,0	17,5	17,4	17,9	18,4	16,8	17,2	17,2	17,7	18,2
	6H	16,9	17,4	17,4	17,7	18,1	16,7	17,2	17,2	17,5	17,9
	8H	16,8	17,3	17,4	17,7	18,0	16,6	17,1	17,1	17,5	17,8
	12H	16,8	17,1	17,3	17,6	18,0	16,6	16,9	17,1	17,3	17,8
8H	4H	16,8	17,3	17,4	17,7	18,0	16,6	17,1	17,1	17,5	17,8
	6H	16,8	17,1	17,3	17,5	18,1	16,6	16,9	17,1	17,3	17,9
	8H	16,8	17,0	17,3	17,5	18,2	16,6	16,8	17,1	17,3	18,0
	12H	16,7	16,9	17,3	17,4	18,0	16,5	16,7	17,1	17,2	17,8
12H	4H	16,8	17,1	17,3	17,6	18,0	16,6	16,9	17,1	17,3	17,8
	6H	16,8	17,0	17,3	17,5	18,2	16,6	16,8	17,1	17,3	18,0
	8H	16,7	16,9	17,3	17,4	18,0	16,5	16,7	17,1	17,2	17,8

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

S = 1.0H	4,9 / -11,5	5,1 / -11,8
S = 1.5H	7,5 / -14,7	7,7 / -14,7
S = 2.0H	9,5 / -17,3	9,7 / -17,8

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	114	111	109	107	112	109	107	105	105	104	102	102	100	99	98	97	96	94
2	109	105	101	98	107	103	100	97	100	97	95	97	94	93	94	92	91	89
3	104	98	94	90	102	97	93	90	94	91	88	92	89	87	90	87	85	84
4	100	93	88	84	98	92	87	84	90	86	83	88	84	82	86	83	81	79
5	95	88	83	79	94	87	82	78	85	81	78	84	80	77	82	79	76	75
6	91	83	78	74	90	83	78	74	81	77	73	80	76	73	78	75	72	71
7	87	79	74	70	86	79	73	70	77	73	69	76	72	69	75	71	69	67
8	84	75	70	66	83	75	70	66	74	69	66	73	69	66	72	68	65	64
9	81	72	67	63	80	72	66	63	71	66	63	70	66	63	69	65	62	61
10	77	69	64	60	77	68	63	60	68	63	60	67	63	60	66	62	60	58

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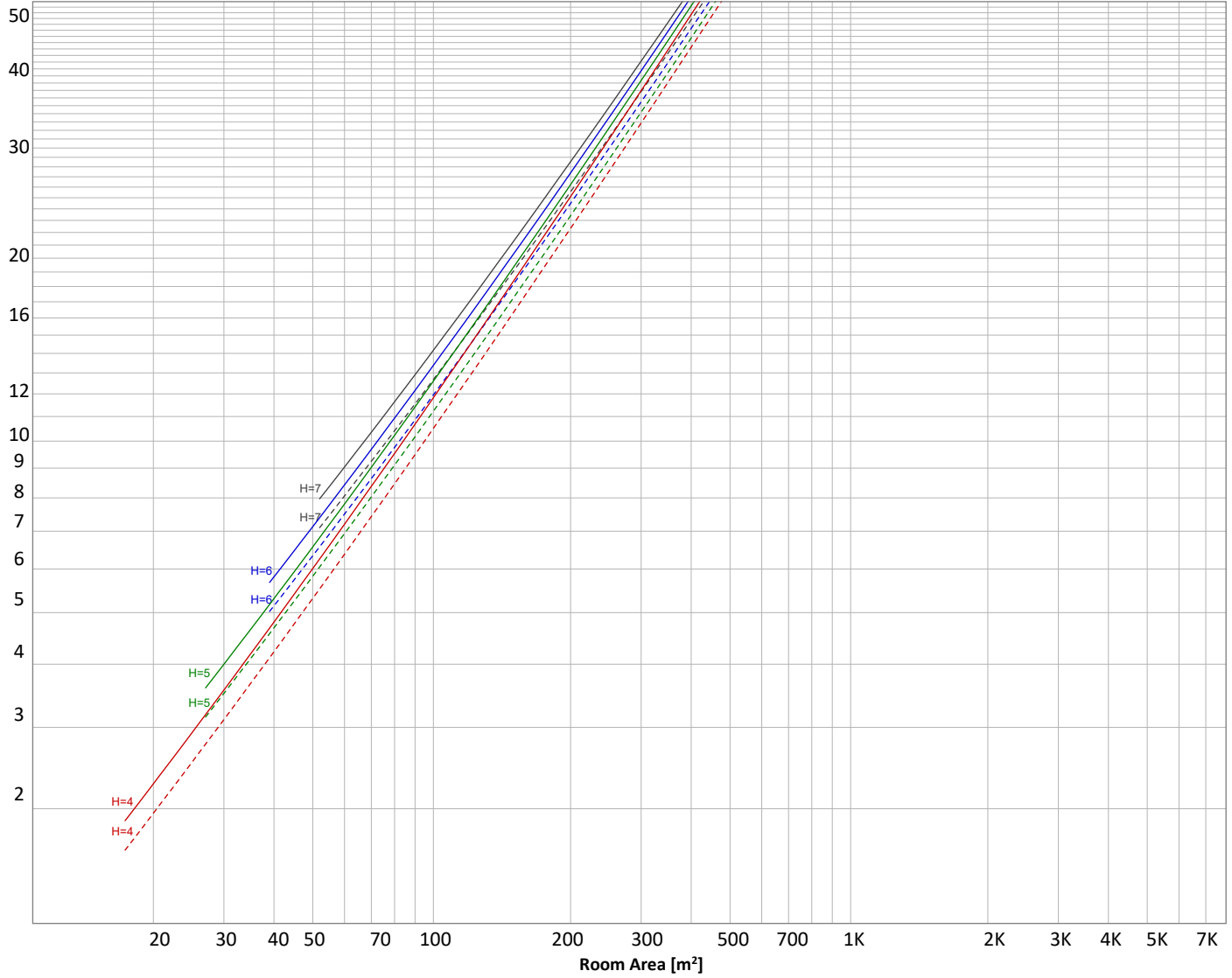
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 947 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°
175 lm	329 lm	241 lm	152 lm	37,0 lm	7,64 lm	2,58 lm	0,703 lm	0,120 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,025 lm	0,026 lm	0,023 lm	0,080 lm	0,201 lm	0,339 lm	0,435 lm	0,334 lm	0,113 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	{LUM00-10} lm	#VALUE!
10-20°	{LUM10-20} lm	#VALUE!
20-30°	{LUM20-30} lm	#VALUE!
30-40°	{LUM30-40} lm	#VALUE!
40-50°	{LUM40-50} lm	#VALUE!
50-60°	{LUM50-60} lm	#VALUE!
60-70°	{LUM60-70} lm	#VALUE!
70-80°	{LUM70-80} lm	#VALUE!
80-90°	{LUM80-90} lm	#VALUE!
90-100°	{LUM90-100} lm	#VALUE!
100-110°	{LUM100-110} lm	#VALUE!
110-120°	{LUM110-120} lm	#VALUE!
120-130°	{LUM120-130} lm	#VALUE!
130-140°	{LUM130-140} lm	#VALUE!
140-150°	{LUM140-150} lm	#VALUE!
150-160°	{LUM150-160} lm	#VALUE!
160-170°	{LUM160-170} lm	#VALUE!
170-180°	{LUM170-180} lm	#VALUE!
Total	0 lm	#VALUE!

Intensity peaks

Max intensity	{PEAK} cd
Intensity, 90°	{INT90} cd
Intensity, 0°	{INT0} cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	{LUM00-30} lm	#VALUE!
0-40°	{LUM00-40} lm	#VALUE!
0-60°	{LUM00-60} lm	#VALUE!
60-90°	{LUM60-90} lm	#VALUE!
70-100°	{LUM70-100} lm	#VALUE!
90-120°	{LUM90-120} lm	#VALUE!
0-90°	{LUM00-90} lm	#VALUE!
90-180°	{LUM90-180} lm	#VALUE!
0-180°	{LUM00-180} lm	#VALUE!

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	{BUG0} lm	#VALUE!
Medium(30-60°)	{BUG1} lm	#VALUE!
High(60-80°)	{BUG2} lm	#VALUE!
Very high(80-90°)	{BUG3} lm	#VALUE!

Back light

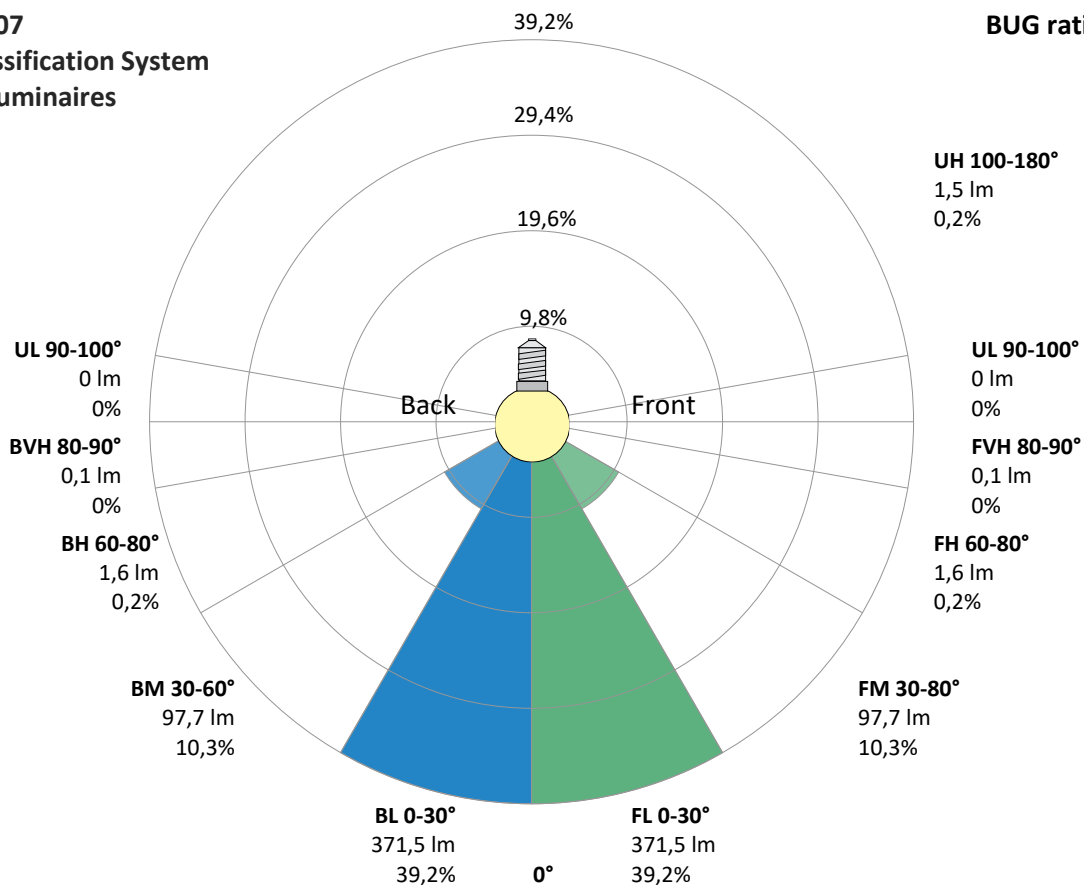
Low(0-30°)	{BUG4} lm	#VALUE!
Medium(30-60°)	{BUG5} lm	#VALUE!
High(60-80°)	{BUG6} lm	#VALUE!
Very high(80-90°)	{BUG7} lm	#VALUE!

Uplight

Low(90-100°)	{BUG8} lm	#VALUE!
High(100-180°)	{BUG9} lm	#VALUE!

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

BUG rating B1 U1 G0



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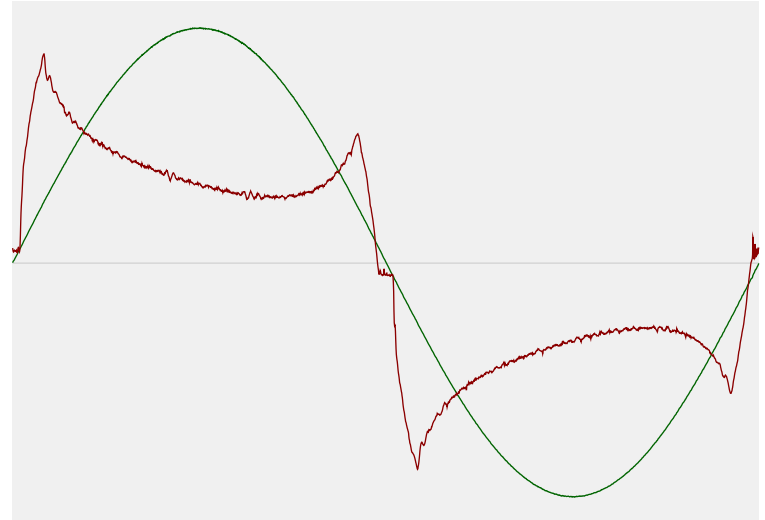


Power Details

Input Power

Power feed to light source	20,3 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,110 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	25,26 VA
Displacement factor of AC power feed	0,96
Power factor of AC current feed	0,8
Total harmonic distortion of the current	65,8%
Total harmonic distortion of the voltage	0,07%

Input Power Curve



Efficiency

Radiated power efficiency	26,0%
Lumen efficiency	47 lm/W

Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	0 K
CCT shift	0 K
CCT end	0 K

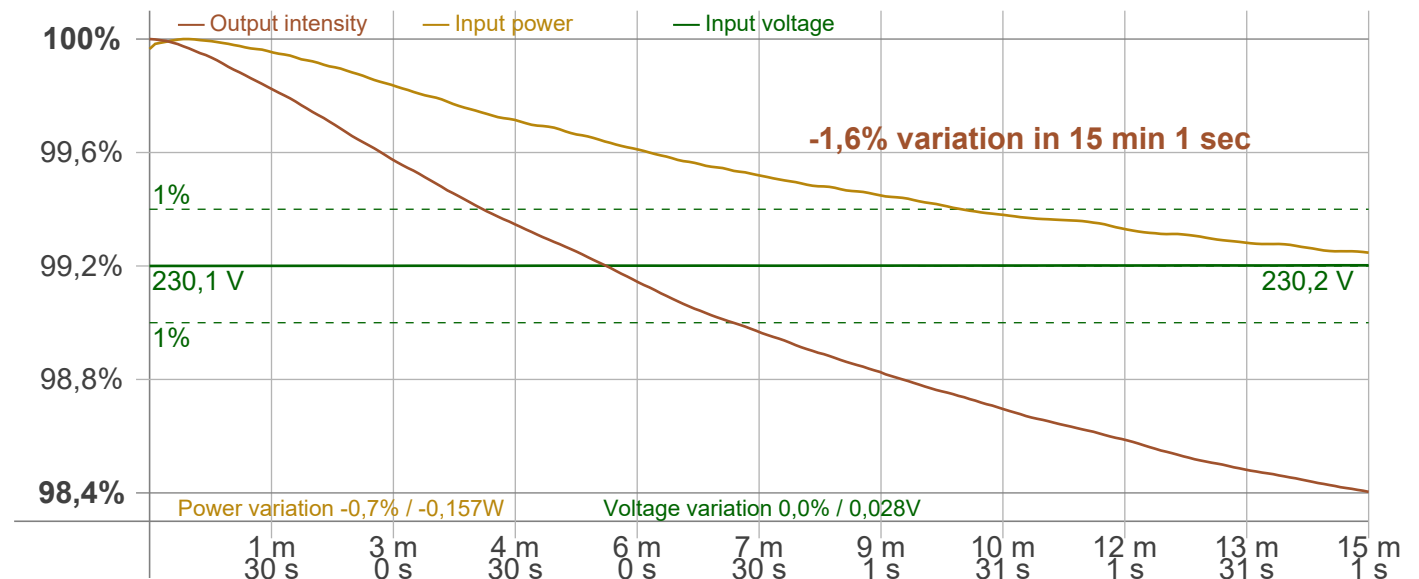
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	-1,6%

Output Change

Output start	963 lm
Output change	-16 lm
Output end	947 lm

Stabilization Curve



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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: 1,41 %
 Flicker index: 0

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

JA8/10 40 Hz: 0,03 %
 JA8/10 90 Hz: 0,04 %
 JA8/10 200 Hz: 1,24 %
 JA8/10 400 Hz: 1,35 %
 JA8/10 1000 Hz: 1,4 %

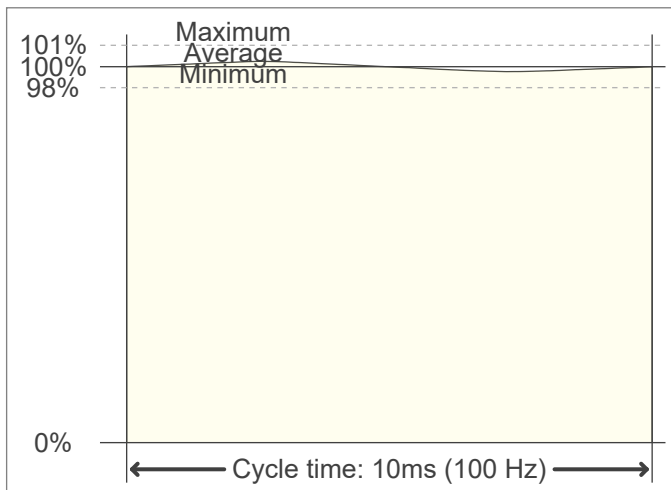
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz): 0,03
 SVM value (80 < F < 2000 Hz): 0,05

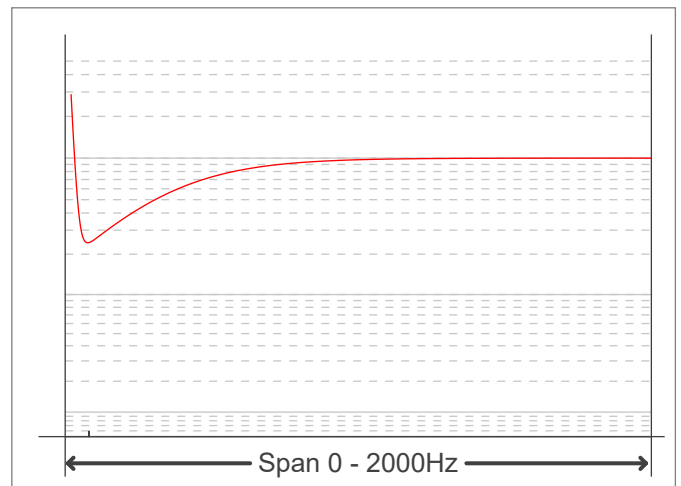
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp: 0,02

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

