

# Light Measurement Report

Print date: 15-1-2025

Measurement date and time: 15-1-2025 10:18:09 – Measurement no. VFR-250115-2947-MS

Measurement tracking No. and Link: [VT250115-009574](#)

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  
 $\gamma$  (gamma)-Resolution  
Test Distance  
Input Power, Power and Displ. Factors  
Input RMS Voltage and Current  
Frequency of Input Power  
Warm-up Time and Variation

20 planes – 18°  
5°  
10,00 m  
10,0 W – PF 0,4 – DPF 0,68  
230 V – 0,109 A  
50 Hz  
Lamp stabilized in 15 min 0 sec – 2,0%

## Tested Light Source

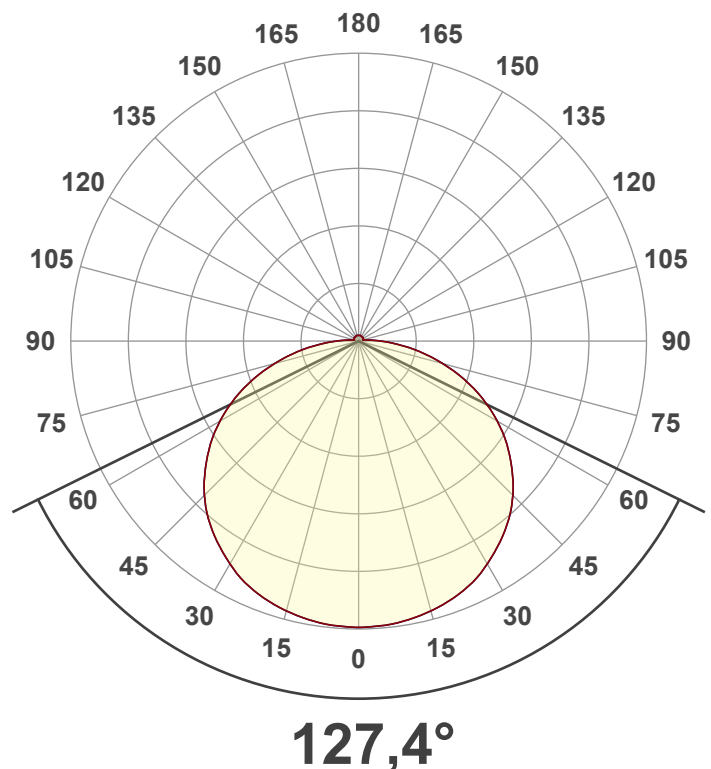
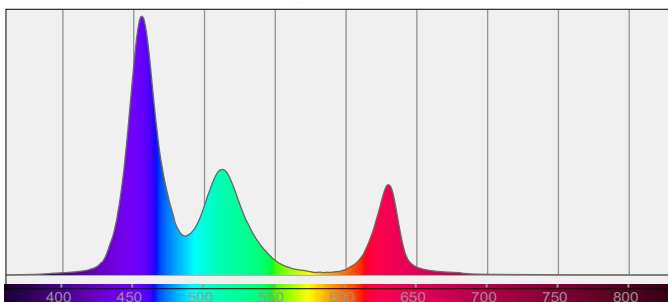
Product Name  
Item No. and Manufacturer  
Product Description (line 1)

5050 30-24V-IP65-RGB  
5050 30-24V-IP65-RGB – Dutchfulfillment  
sauna rgb ledstrip ip66

## 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

132 lm – 3,99% / 96,01%  
13 lm/W  
36,9 cd – 127,4°  
CCT = 0 K / 0 K  
CRI 0,0  
 $R_f$  0,0 –  $R_g$  0,0  
Duv n/a – SDCM n/a  
SVM 0 – PstLM 0,27



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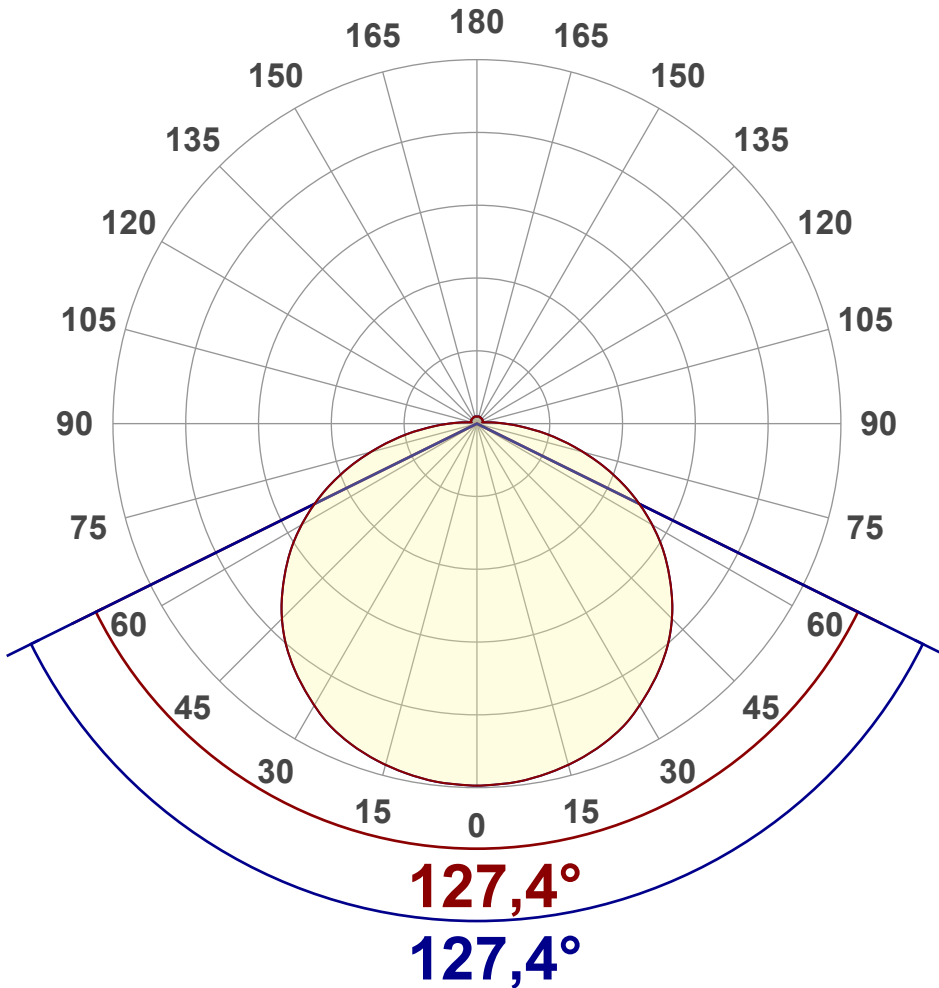
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## Luminous Intensity diagram

Unit: 0-100% of peak intensity



## Main Values

Output (total Lumen)	132 lm
Lumen Up% / Down%	3,99% / 96,01%
Peak Intensity	36,9 cd
Beam Angle (50%)	127,4°
Beam Angle (90%)	127,4°
Beam Angle (10%)	127,4°

## Cut-off Angle

Average 2,5%	197,7°
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## Field Angle

Average 10%	176,4°
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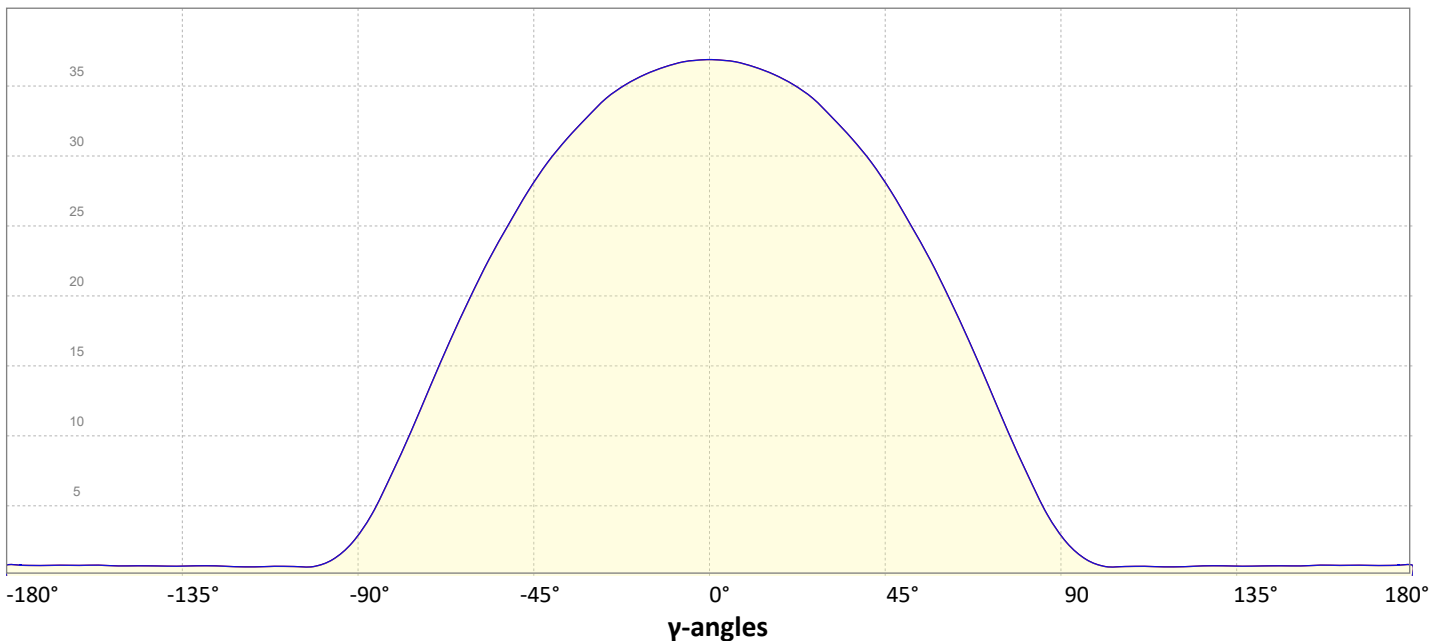
## Intensity Ratio

In 120° cone	69,5%
In 90° cone	45,5%

**C000-C180**

**C090-C270**

## Linear distribution diagram - Intensity (candela) vs $\gamma$ -angle



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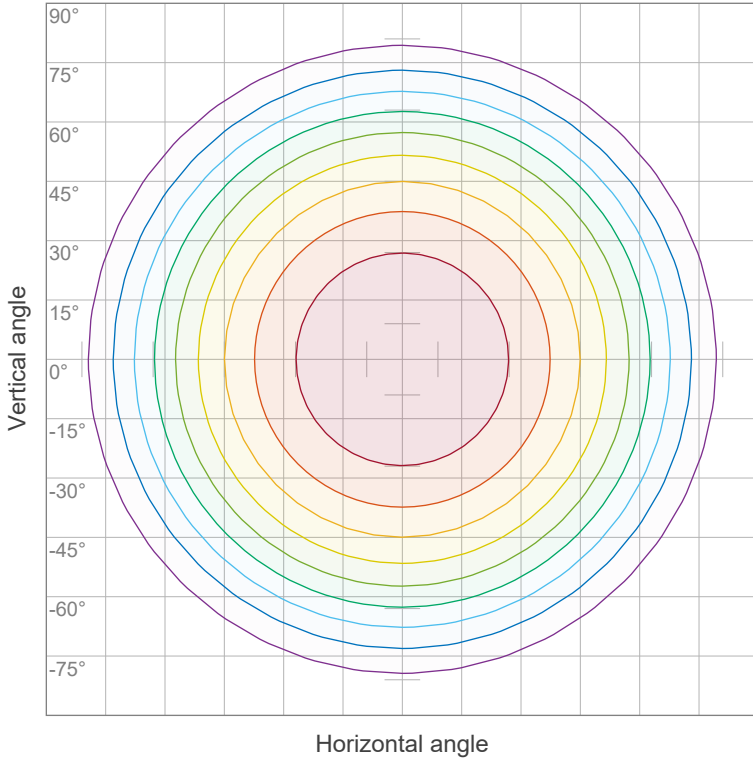
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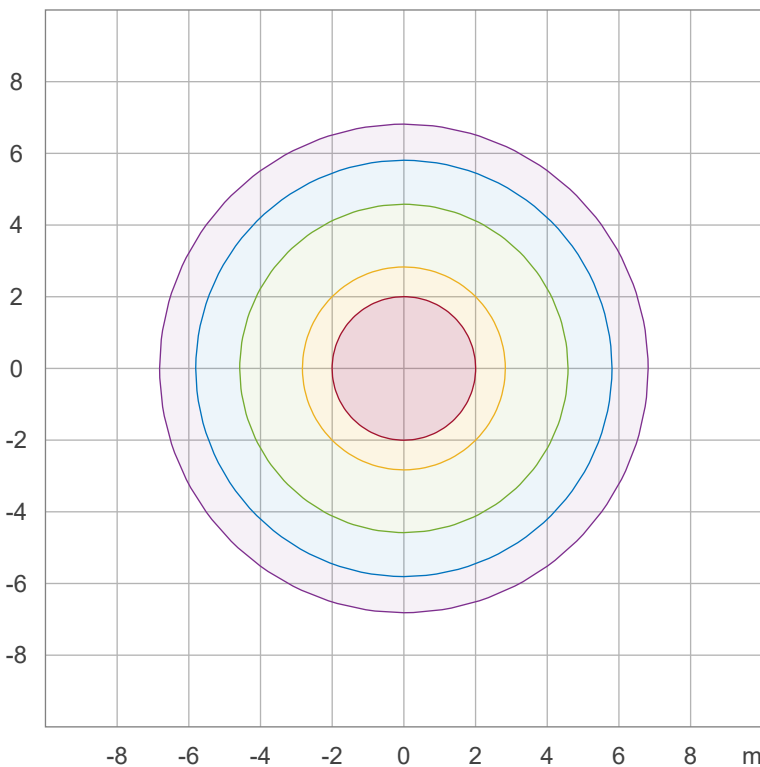
## Iso-intensity Diagram (Iso-candela)



90 %	33,2 cd
80 %	29,5 cd
70 %	25,8 cd
60 %	22,1 cd
50 %	18,4 cd
40 %	14,7 cd
30 %	11,1 cd
20 %	7,4 cd
10 %	3,7 cd

Peak intensity: 36,9 cd  
Number of c-planes: 20

## Iso-illuminance Diagram (Iso-lux)



50,0 %	2,0 lx
30,0 %	1,2 lx
10,0 %	0,4 lx
5,0 %	0,2 lx
3,0 %	0,1 lx

Peak illuminance: 4,1 lx  
Mounting height: 3,0 m  
Number of c-planes: 20



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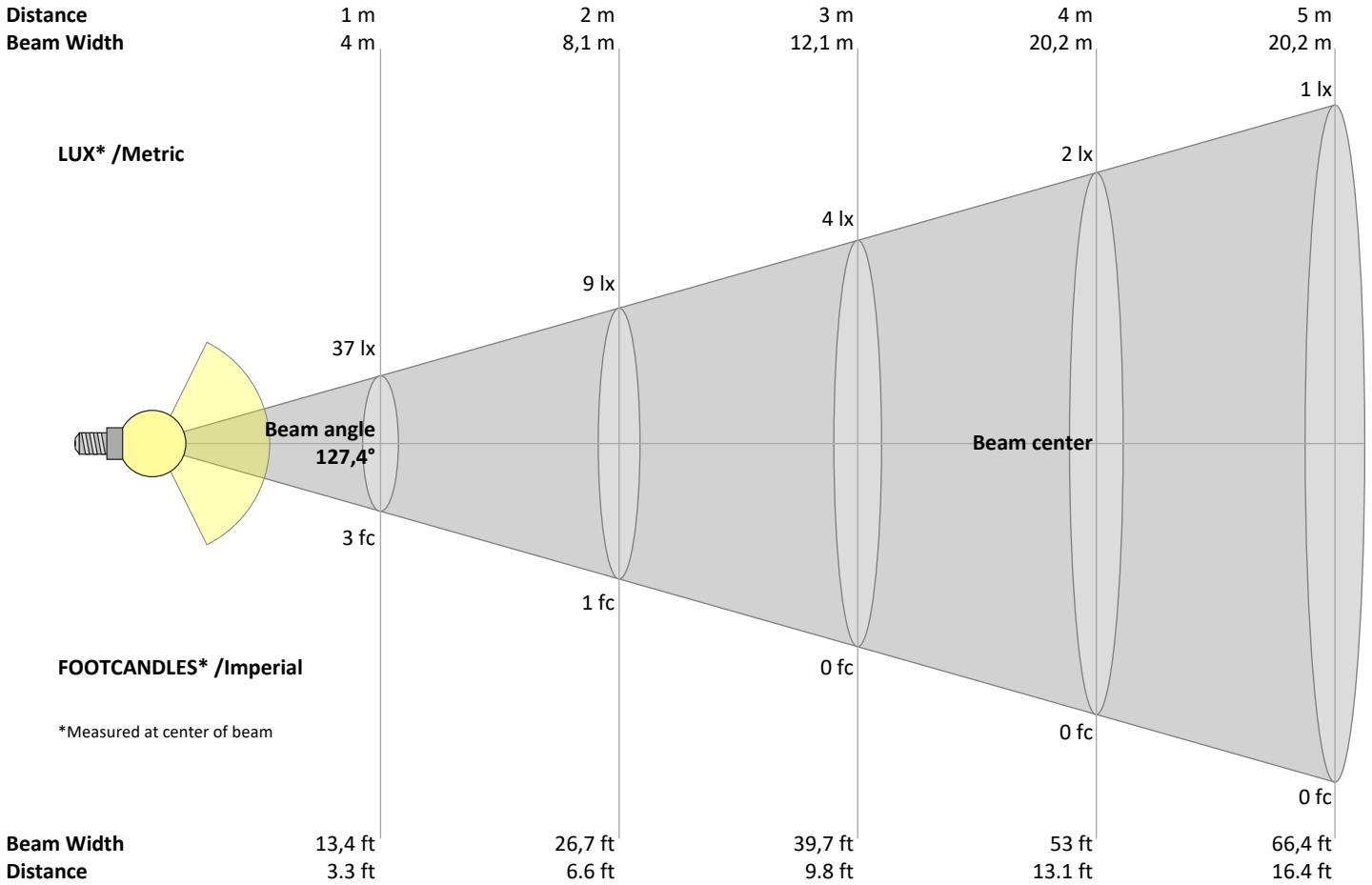
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## Beam Details



### 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	
37	9	4	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	lux
3,4	0,9	0,4	0,2	0,1	0,1	0,1	0,1	0	0	0	0	0	0	0	0	0	0	0	0	0	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
36,9	36,8	36,5	36,0	35,3	34,4	33,1	31,7	30,0	28,1	25,8	23,3	20,6	17,7	14,5	11,2	8,1	5,2	3,0	1,5	cd
100%	100%	99%	98%	96%	93%	90%	86%	81%	76%	70%	63%	56%	48%	39%	30%	22%	14%	8%	4%	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
36,9	36,8	36,5	36,0	35,3	34,4	33,1	31,7	30,0	28,1	25,8	23,3	20,6	17,7	14,5	11,2	8,1	5,2	3,0	1,5	cd
100%	100%	99%	98%	96%	93%	90%	86%	81%	76%	70%	63%	56%	48%	39%	30%	22%	14%	8%	4%	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
36,9	36,8	36,5	36,0	35,3	34,4	33,1	31,7	30,0	28,1	25,8	23,3	20,6	17,7	14,5	11,2	8,1	5,2	3,0	1,5	cd
100%	100%	99%	98%	96%	93%	90%	86%	81%	76%	70%	63%	56%	48%	39%	30%	22%	14%	8%	4%	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
36,9	36,8	36,5	36,0	35,3	34,4	33,1	31,7	30,0	28,1	25,8	23,3	20,6	17,7	14,5	11,2	8,1	5,2	3,0	1,5	cd
100%	100%	99%	98%	96%	93%	90%	86%	81%	76%	70%	63%	56%	48%	39%	30%	22%	14%	8%	4%	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	15,6	16,9	15,9	17,3	17,6	14,1	15,3	14,4	15,7	16,0
	3H	17,5	18,8	17,9	19,1	19,4	15,4	16,7	15,9	17,1	17,4
	4H	18,3	19,6	18,8	19,9	20,3	16,0	17,2	16,5	17,6	17,9
	6H	19,2	20,3	19,6	20,6	21,1	16,5	17,6	16,8	17,9	18,4
	8H	19,5	20,6	19,9	21,0	21,5	16,6	17,7	17,0	18,1	18,5
	12H	19,8	20,9	20,3	21,3	21,8	16,7	17,8	17,1	18,1	18,7
4H	2H	16,0	17,2	16,5	17,6	17,9	14,8	16,0	15,2	16,4	16,7
	3H	18,1	19,1	18,5	19,5	20,1	16,4	17,5	16,8	17,9	18,4
	4H	19,0	20,0	19,5	20,4	21,0	17,0	18,0	17,5	18,5	19,1
	6H	19,9	20,8	20,4	21,2	21,7	17,5	18,5	18,1	18,9	19,3
	8H	20,3	21,1	20,8	21,6	22,0	17,7	18,6	18,3	19,0	19,5
	12H	20,7	21,4	21,2	21,9	22,4	17,9	18,6	18,4	19,1	19,6
8H	4H	19,1	20,0	19,7	20,4	20,9	17,4	18,2	17,9	18,6	19,1
	6H	20,2	20,8	20,7	21,3	22,0	18,1	18,7	18,6	19,2	19,8
	8H	20,7	21,2	21,2	21,8	22,5	18,3	18,9	18,9	19,5	20,2
	12H	21,1	21,6	21,8	22,2	22,9	18,6	19,1	19,2	19,6	20,3
12H	4H	19,1	19,8	19,7	20,3	20,9	17,4	18,1	18,0	18,6	19,2
	6H	20,2	20,8	20,8	21,4	22,1	18,2	18,7	18,7	19,3	20,0
	8H	20,7	21,2	21,3	21,8	22,4	18,5	19,0	19,1	19,5	20,2

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

S = 1.0H	0,1 / -0,1	0,1 / -0,1
S = 1.5H	0,2 / -0,3	0,1 / -0,3
S = 2.0H	0,6 / -0,6	0,4 / -0,6

## 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	118	118	118	118	115	115	115	115	109	109	109	103	103	103	98	98	98	96
1	106	101	96	91	103	98	94	90	93	89	86	88	85	83	84	82	79	77
2	96	87	79	73	93	84	78	72	80	74	69	76	71	67	73	69	65	63
3	87	75	67	60	84	74	65	59	70	63	57	67	61	56	63	59	54	52
4	79	66	57	50	76	65	56	49	62	54	48	59	52	47	56	51	46	44
5	73	59	50	43	70	58	49	42	55	47	41	53	46	40	50	44	40	37
6	67	53	44	37	65	52	43	36	49	42	36	47	40	35	45	39	35	32
7	62	48	39	32	60	47	38	32	45	37	31	43	36	31	41	35	30	28
8	57	43	35	29	56	43	34	28	41	33	28	39	32	28	38	32	27	25
9	54	40	31	26	52	39	31	25	38	30	25	36	29	25	35	29	24	22
10	50	37	28	23	49	36	28	23	35	28	23	33	27	22	32	26	22	20

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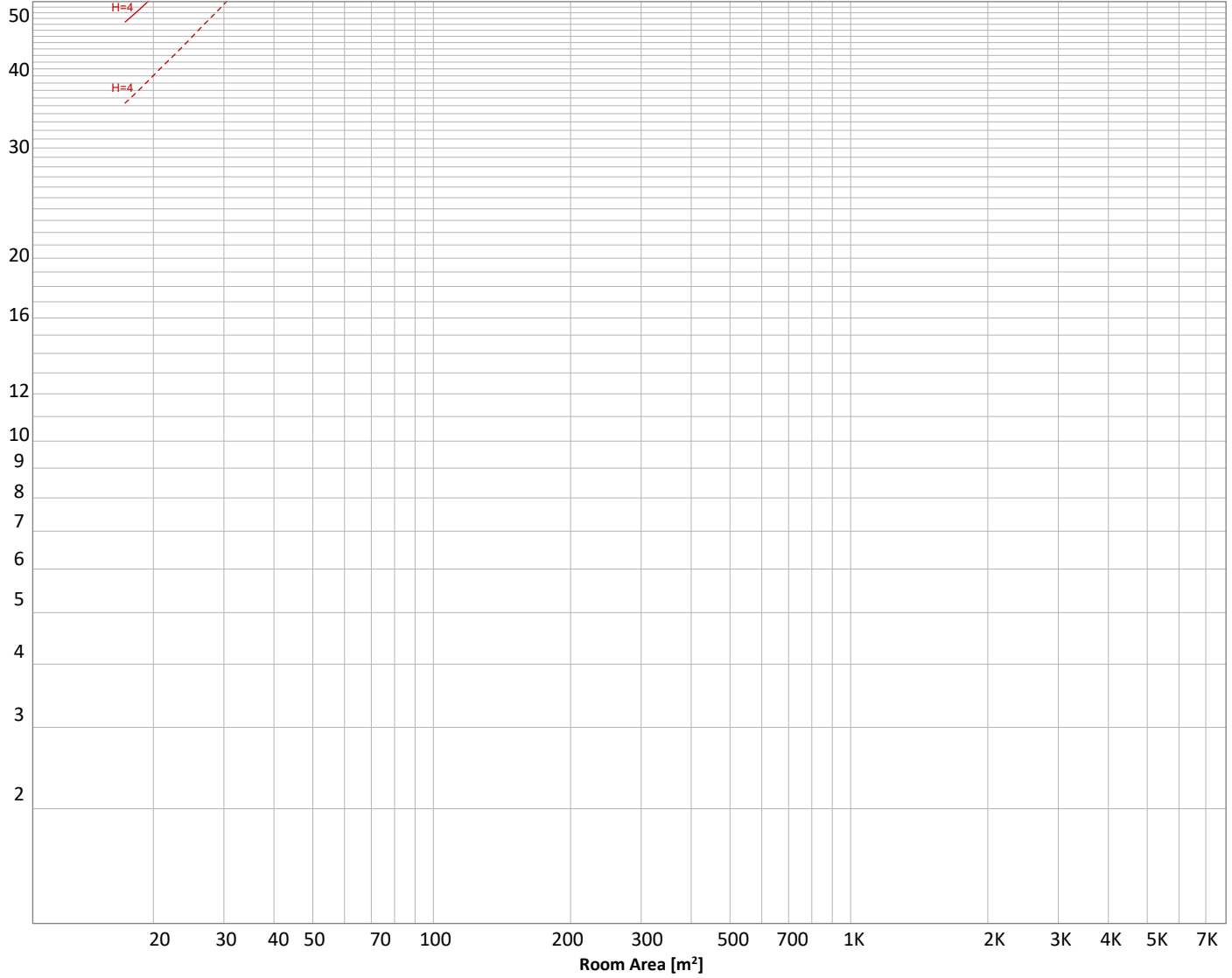
Operator:



## Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



### Conditions

H = Room height	Flux = 132 lm				
H <sub>down</sub> = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	ρ(%) Wall reflectance	Floor reflectance
H <sub>work</sub> = Work area height from floor =	0.00 m	-----	70	50	30
E <sub>work</sub> = 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°
3,50 lm	10,2 lm	15,9 lm	19,8 lm	21,7 lm	20,9 lm	17,5 lm	11,9 lm	5,78 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
1,74 lm	0,697 lm	0,645 lm	0,610 lm	0,536 lm	0,441 lm	0,338 lm	0,211 lm	0,070 lm

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## Outdoor Light Planning

### Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	4 lm	2,6%
10-20°	10 lm	7,7%
20-30°	16 lm	12,0%
30-40°	20 lm	15,0%
40-50°	22 lm	16,4%
50-60°	21 lm	15,8%
60-70°	17 lm	13,2%
70-80°	12 lm	9,0%
80-90°	6 lm	4,4%
90-100°	2 lm	1,3%
100-110°	1 lm	0,5%
110-120°	1 lm	0,5%
120-130°	1 lm	0,5%
130-140°	1 lm	0,4%
140-150°	0 lm	0,3%
150-160°	0 lm	0,3%
160-170°	0 lm	0,2%
170-180°	0 lm	0,1%
<b>Total</b>	<b>132 lm</b>	<b>100,0%</b>

### Intensity peaks

Max intensity	37 cd
Intensity, 90°	3 cd
Intensity, 0°	37 cd

### Zonal Lumen summary

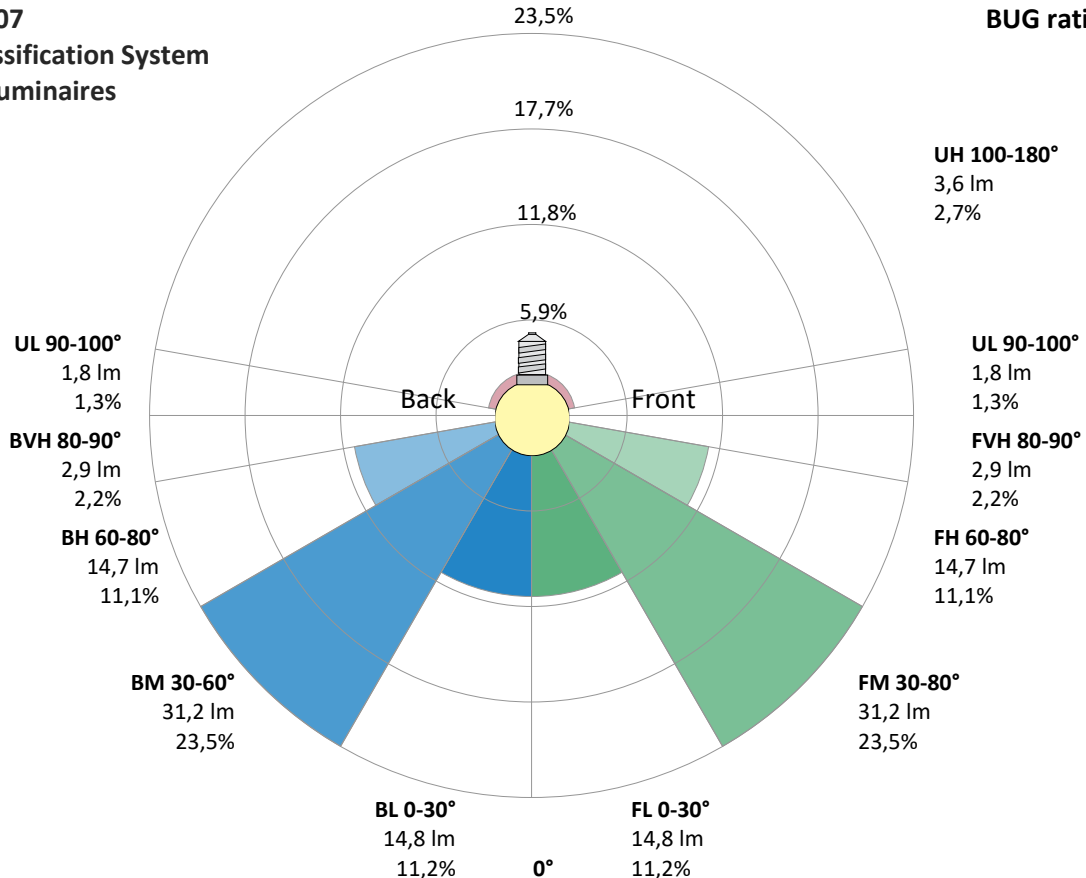
Zone (γ)	Lumen	% Total
0-30°	30 lm	22,3%
0-40°	49 lm	37,3%
0-60°	92 lm	69,5%
60-90°	35 lm	26,5%
70-100°	19 lm	14,7%
90-120°	3 lm	2,3%
0-90°	127 lm	96,0%
90-180°	5 lm	4,0%
0-180°	132 lm	100,0%

### BUG rating

	Lumen	% Total
<b>Forward light</b>		
Low(0-30°)	15 lm	11,2%
Medium(30-60°)	31 lm	23,5%
High(60-80°)	15 lm	11,1%
Very high(80-90°)	3 lm	2,2%
<b>Back light</b>		
Low(0-30°)	15 lm	11,2%
Medium(30-60°)	31 lm	23,5%
High(60-80°)	15 lm	11,1%
Very high(80-90°)	3 lm	2,2%
<b>Uplight</b>		
Low(90-100°)	2 lm	1,3%
High(100-180°)	4 lm	2,7%

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

**BUG rating B0 U1 G0**



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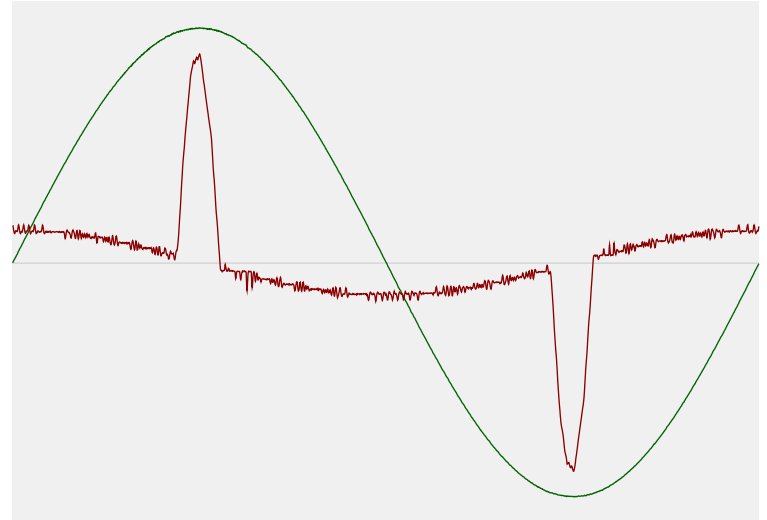


## Power Details

### Input Power

Power feed to light source	10,0 W
Frequency of input power	50 Hz
RMS Input voltage feed, $V_{RMS}$	230 V
RMS Input current feed, $I_{RMS}$	0,109 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	25,17 VA
Displacement factor of AC power feed	0,68
Power factor of AC current feed	0,4
Total harmonic distortion of the current	140,32%
Total harmonic distortion of the voltage	0,1%

### Input Power Curve



### Efficiency

Radiated power efficiency	7,3%
Lumen efficiency	13 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

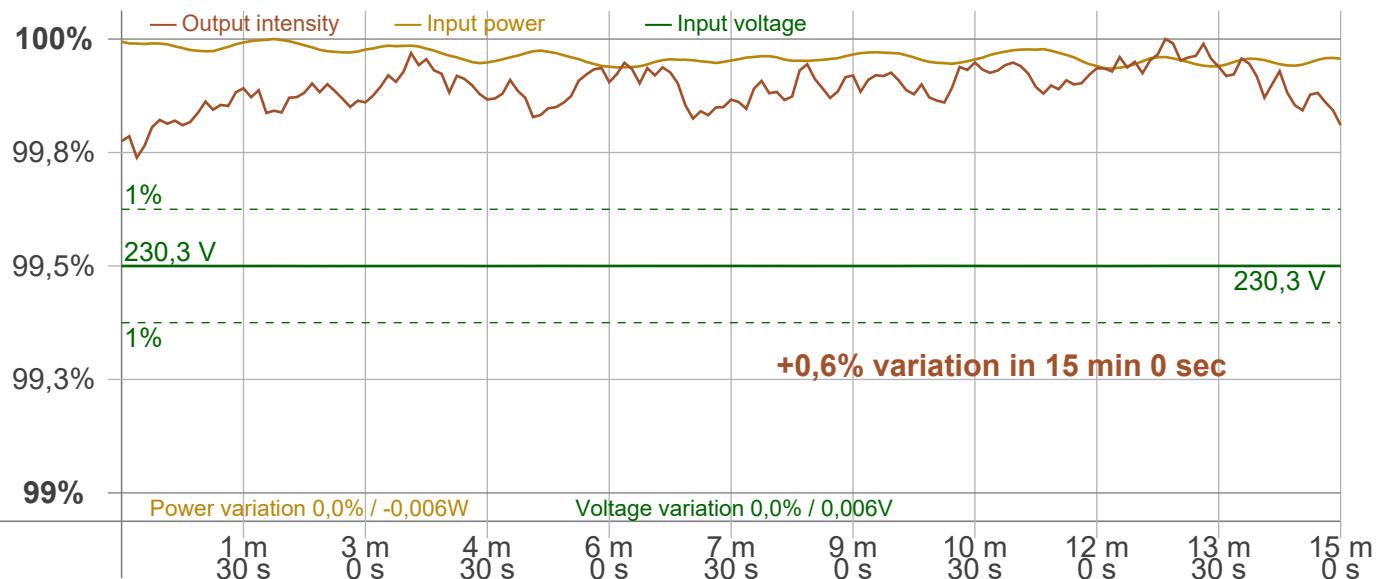
### Warmup Result

Total warmup time	Lamp stabilized in 15 min 0 sec
Warmup variation	+0,6%

### Output Change

Output start	132 lm
Output change	+ lm
Output end	132 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 108,11 Hz  
 Percent Flicker 0,07 %  
 Flicker index 0

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

JA8/10 40 Hz 0,04 %  
 JA8/10 90 Hz 0,04 %  
 JA8/10 200 Hz 0,06 %  
 JA8/10 400 Hz 0,06 %  
 JA8/10 1000 Hz 0,06 %

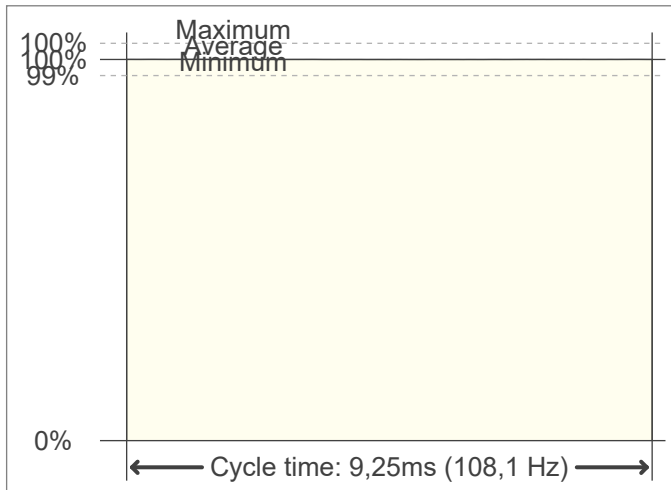
### TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz) 0,27  
 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

