

Light Measurement Report

Print date: 19-12-2024

Measurement date and time: 19-12-2024 10:34:48 – Measurement no. VFR-241219-2594-MS

Measurement tracking No. and Link: [VT241219-008942](#)

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

48 planes – 7,5°
5°
7,71 m
6,5 W – PF 0,67 – DPF 0,72
230 V – 0,043 A
50 Hz
Not completed – 2,0%

Tested Light Source

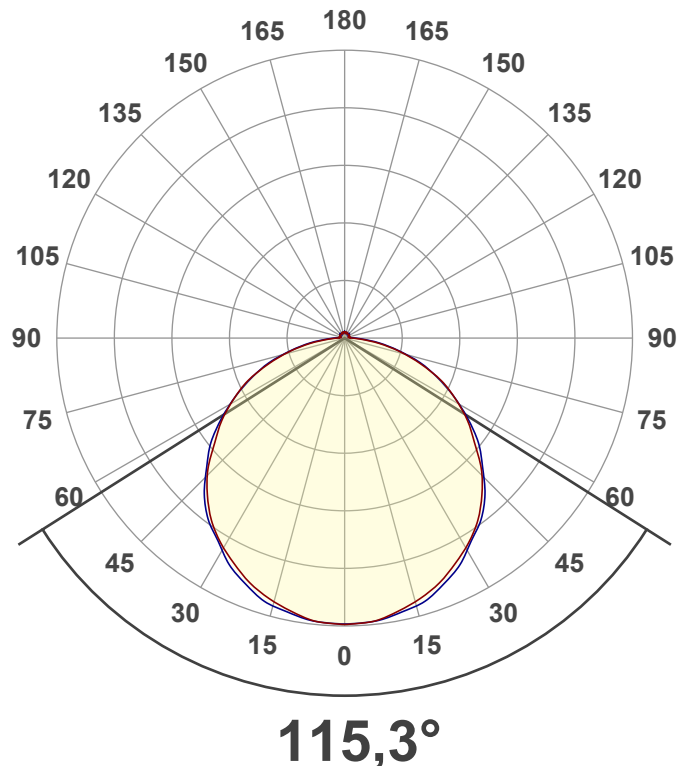
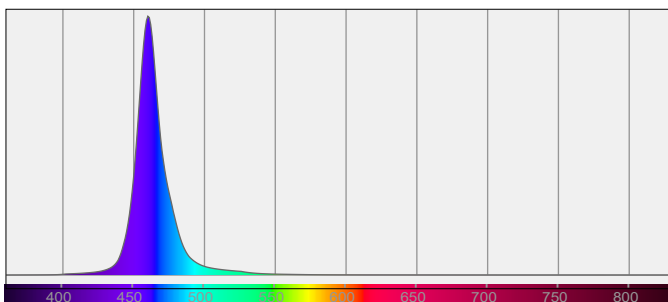
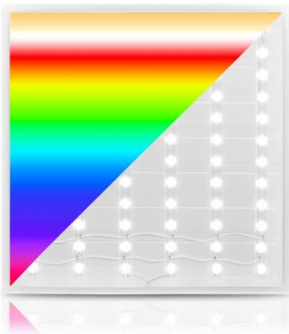
Product Name
Item No. and Manufacturer
Product Description (line 1)

808198-BLAUW
808198-BLAUW – Dutchfulfillment
BACK-LIT LED PANEEL | DOVER | 60x60CM | RGB+CCT | 40W

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

59,1 lm – 3,79% / 96,21%
9 lm/W
19,1 cd – 115,3°
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 0,03



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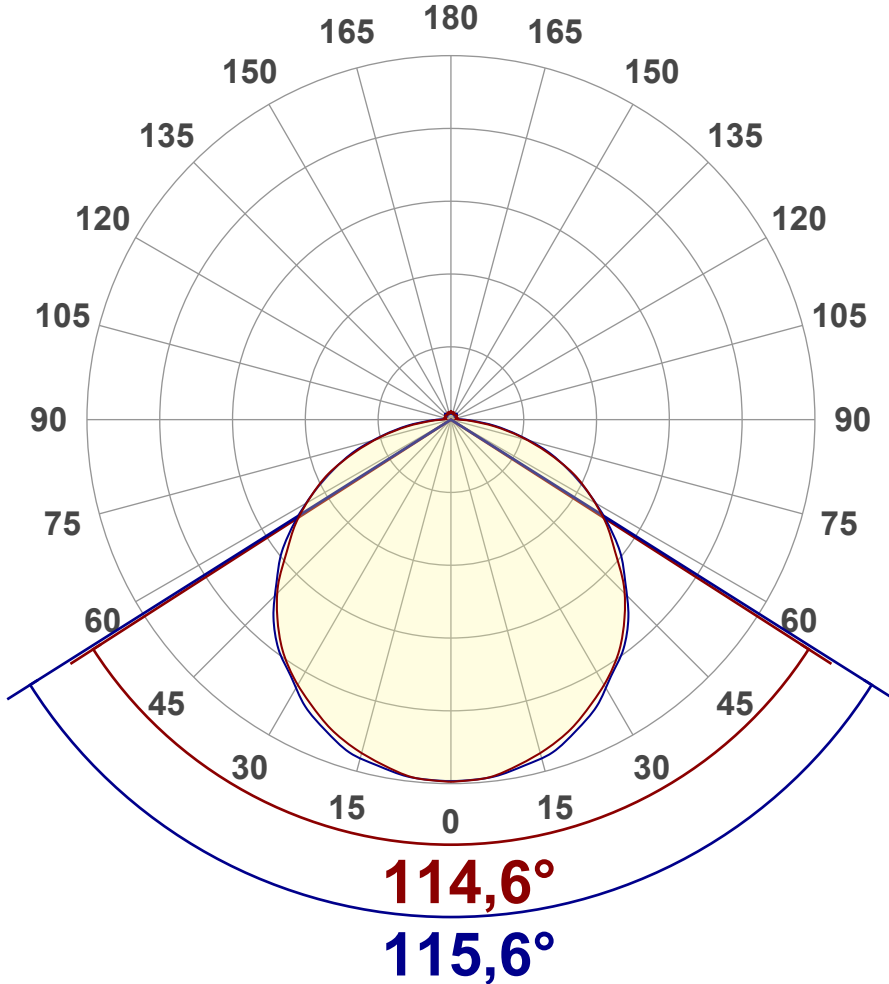
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	59,1 lm
Lumen Up% / Down%	3,79% / 96,21%
Peak Intensity	19,1 cd
Beam Angle (50%)	115,3°
Beam Angle (90%)	115,6°
Beam Angle (10%)	114,9°

Cut-off Angle

Average 2,5%	217,6°
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Field Angle

Average 10%	166,7°
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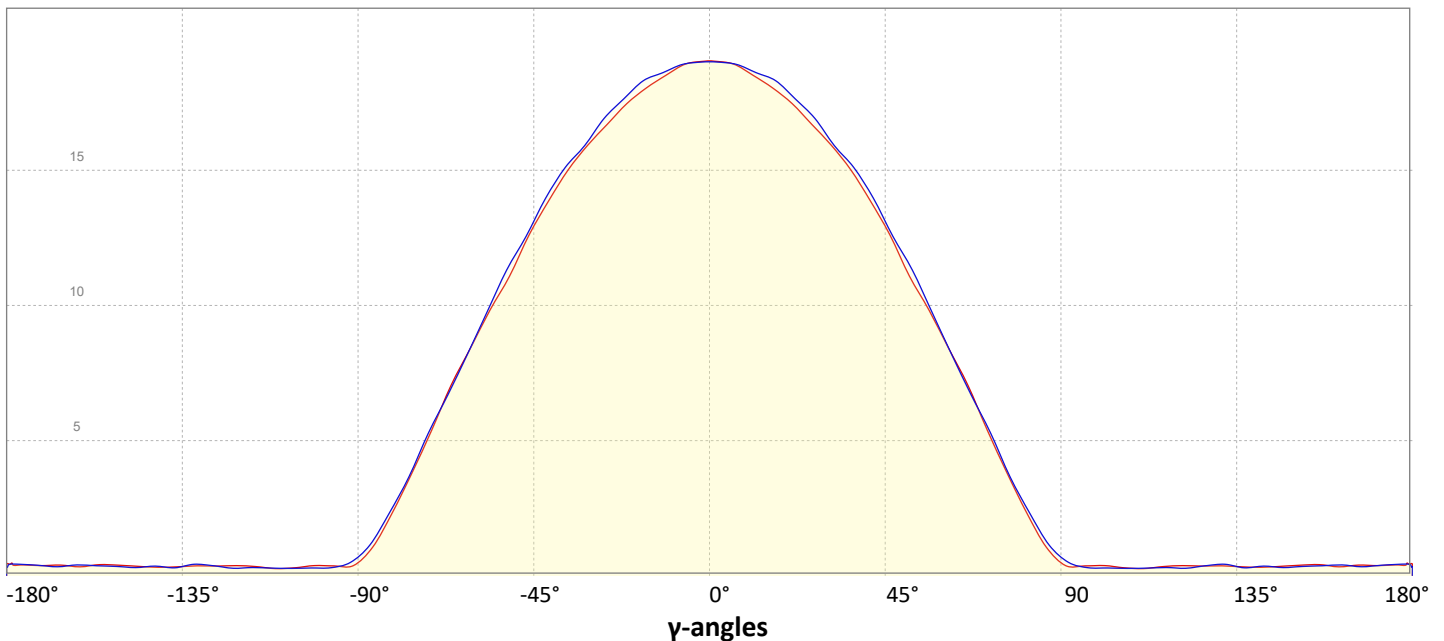
Intensity Ratio

In 120° cone	73,7%
In 90° cone	49,7%

C000-C180

C090-C270

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



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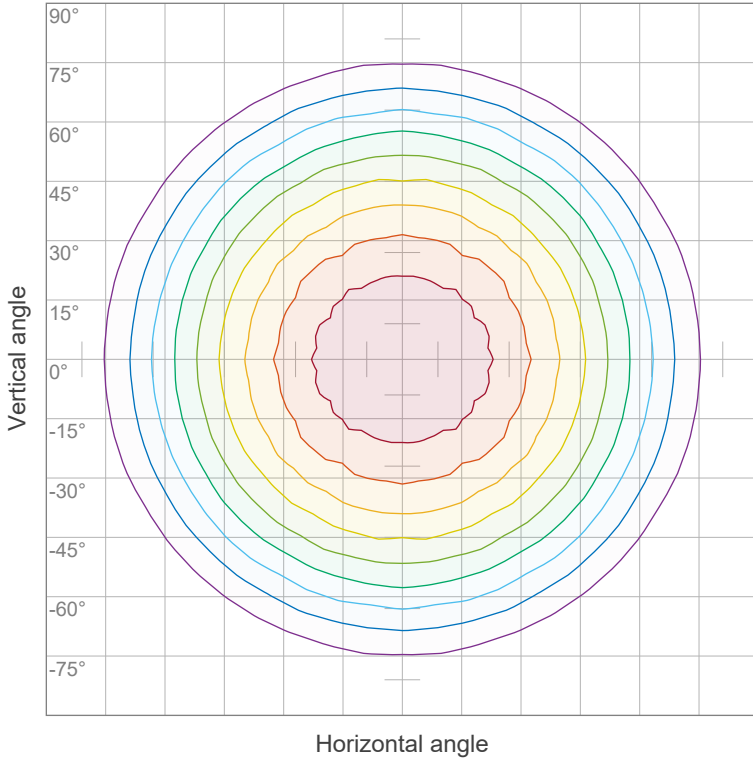
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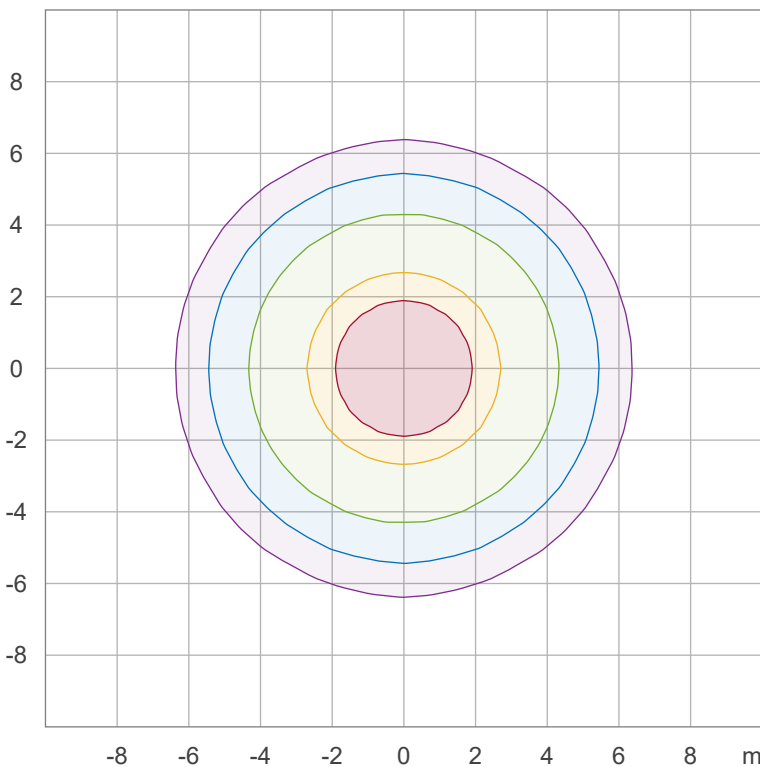
Iso-intensity Diagram (Iso-candela)



90 %	17,1 cd
80 %	15,2 cd
70 %	13,3 cd
60 %	11,4 cd
50 %	9,5 cd
40 %	7,6 cd
30 %	5,7 cd
20 %	3,8 cd
10 %	1,9 cd

Peak intensity: 19,0 cd
Number of c-planes: 48

Iso-illuminance Diagram (Iso-lux)



50,0 %	1,1 lx
30,0 %	0,6 lx
10,0 %	0,2 lx
5,0 %	0,1 lx
3,0 %	0,1 lx

Peak illuminance: 2,1 lx
Mounting height: 3,0 m
Number of c-planes: 48

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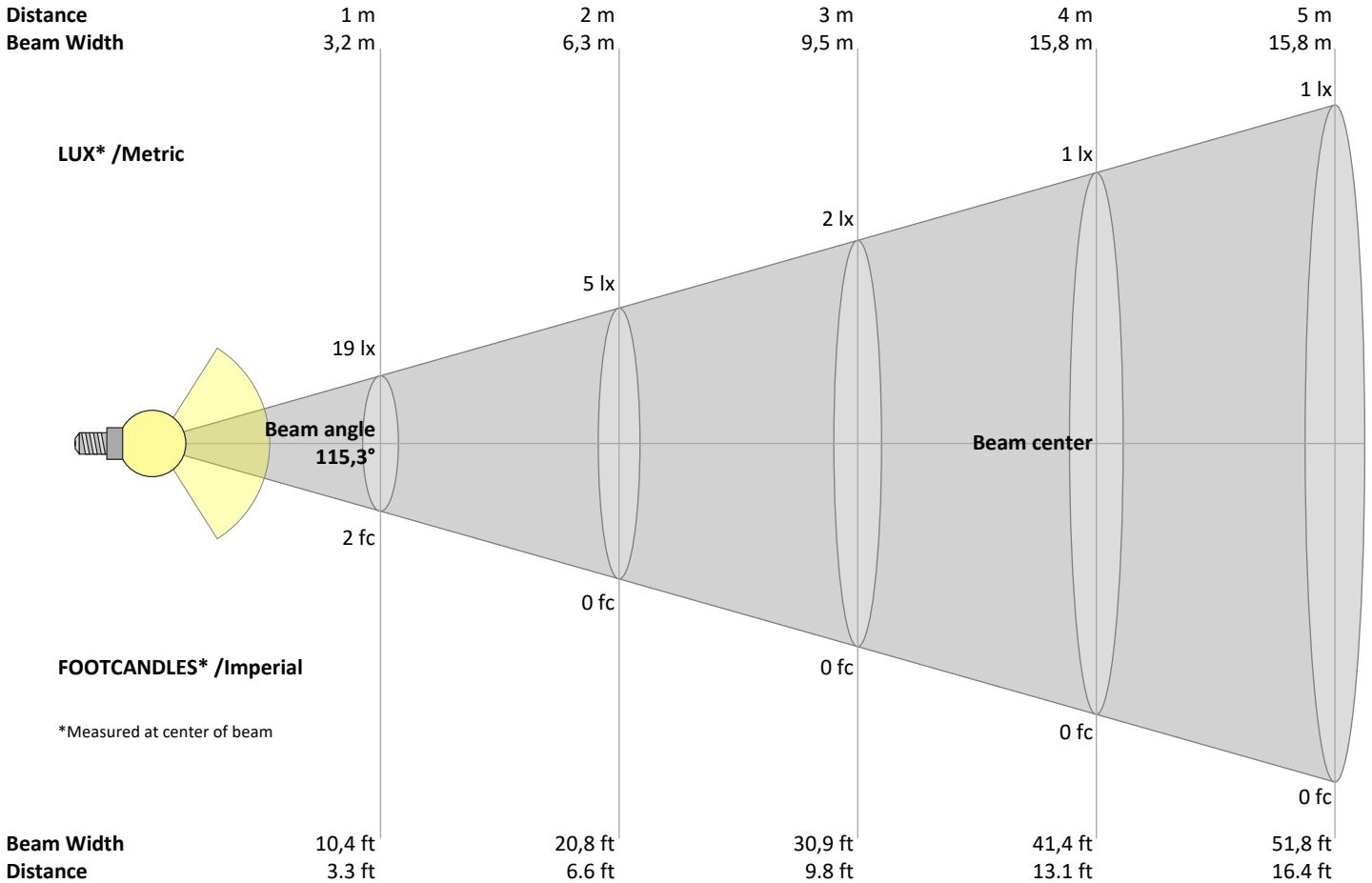
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Beam Details



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	
19	5	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	lux
1,8	0,4	0,2	0,1	0,1	0	0	0	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
19,0	19,0	18,6	18,2	17,6	16,9	16,1	15,2	14,1	12,9	11,4	10,1	8,8	7,4	5,8	4,2	2,7	1,4	0,5	0,4	cd
100%	100%	98%	96%	93%	89%	85%	80%	74%	68%	60%	53%	46%	39%	30%	22%	14%	7%	3%	2%	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
19,0	18,9	18,7	18,4	17,9	17,2	16,3	15,4	14,4	13,1	11,8	10,4	8,8	7,3	5,8	4,3	2,8	1,6	0,7	0,4	cd
100%	100%	99%	97%	94%	91%	86%	81%	76%	69%	62%	55%	46%	38%	31%	23%	15%	8%	4%	2%	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
19,0	19,0	18,6	18,2	17,6	16,9	16,1	15,2	14,1	12,9	11,4	10,1	8,8	7,4	5,8	4,2	2,7	1,4	0,5	0,4	cd
100%	100%	98%	96%	93%	89%	85%	80%	74%	68%	60%	53%	46%	39%	30%	22%	14%	7%	3%	2%	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
19,0	18,9	18,7	18,4	17,9	17,2	16,3	15,4	14,4	13,1	11,8	10,4	8,8	7,3	5,8	4,3	2,8	1,6	0,7	0,4	cd
100%	100%	99%	97%	94%	91%	86%	81%	76%	69%	62%	55%	46%	38%	31%	23%	15%	8%	4%	2%	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	2,4	3,6	2,7	4,0	4,3	2,5	3,7	2,8	4,1	4,4
	3H	4,0	5,2	4,4	5,6	5,9	4,1	5,3	4,5	5,7	5,9
	4H	4,7	5,9	5,1	6,2	6,5	4,8	6,0	5,2	6,3	6,6
	6H	5,3	6,3	5,7	6,7	7,1	5,4	6,5	5,8	6,8	7,3
	8H	5,5	6,5	5,9	6,9	7,3	5,6	6,7	6,0	7,0	7,5
	12H	5,6	6,6	6,0	7,0	7,5	5,8	6,8	6,2	7,2	7,7
4H	2H	3,1	4,2	3,5	4,6	4,9	3,1	4,3	3,6	4,6	5,0
	3H	4,9	5,9	5,4	6,3	6,8	5,0	6,0	5,4	6,4	6,9
	4H	5,7	6,6	6,2	7,1	7,7	5,8	6,7	6,3	7,1	7,8
	6H	6,3	7,2	6,9	7,6	8,1	6,5	7,4	7,0	7,8	8,2
	8H	6,6	7,4	7,2	7,8	8,3	6,8	7,6	7,3	8,0	8,4
	12H	6,8	7,5	7,4	8,0	8,5	7,0	7,7	7,6	8,2	8,7
8H	4H	6,0	6,8	6,6	7,2	7,7	6,1	6,9	6,6	7,3	7,8
	6H	6,8	7,4	7,4	8,0	8,6	7,0	7,6	7,5	8,1	8,7
	8H	7,2	7,8	7,8	8,3	9,0	7,4	7,9	8,0	8,5	9,2
	12H	7,5	8,0	8,2	8,5	9,2	7,7	8,2	8,4	8,8	9,4
12H	4H	6,0	6,7	6,6	7,2	7,7	6,1	6,8	6,6	7,3	7,8
	6H	7,0	7,5	7,5	8,1	8,8	7,1	7,6	7,6	8,2	8,9
	8H	7,4	7,8	8,0	8,4	9,0	7,5	8,0	8,2	8,5	9,2

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

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

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	104	104	104	99	99	99	96
1	107	102	98	94	104	100	96	92	95	91	88	90	87	85	86	84	82	79
2	97	89	82	76	94	87	80	75	82	77	72	78	74	70	75	71	68	65
3	88	78	69	63	86	76	68	62	72	66	60	69	63	59	66	61	57	55
4	81	69	60	53	78	67	59	52	64	57	51	61	55	50	59	53	49	47
5	74	61	52	45	72	60	51	45	57	50	44	55	48	43	53	47	42	40
6	69	55	46	39	66	54	45	39	52	44	38	50	43	38	48	42	37	35
7	63	50	41	35	61	49	40	34	47	39	34	45	38	33	43	37	33	31
8	59	45	37	31	57	45	36	31	43	35	30	41	35	30	40	34	29	27
9	55	42	33	28	54	41	33	28	39	32	27	38	32	27	37	31	27	25
10	52	38	30	25	50	38	30	25	36	29	25	35	29	24	34	28	24	22

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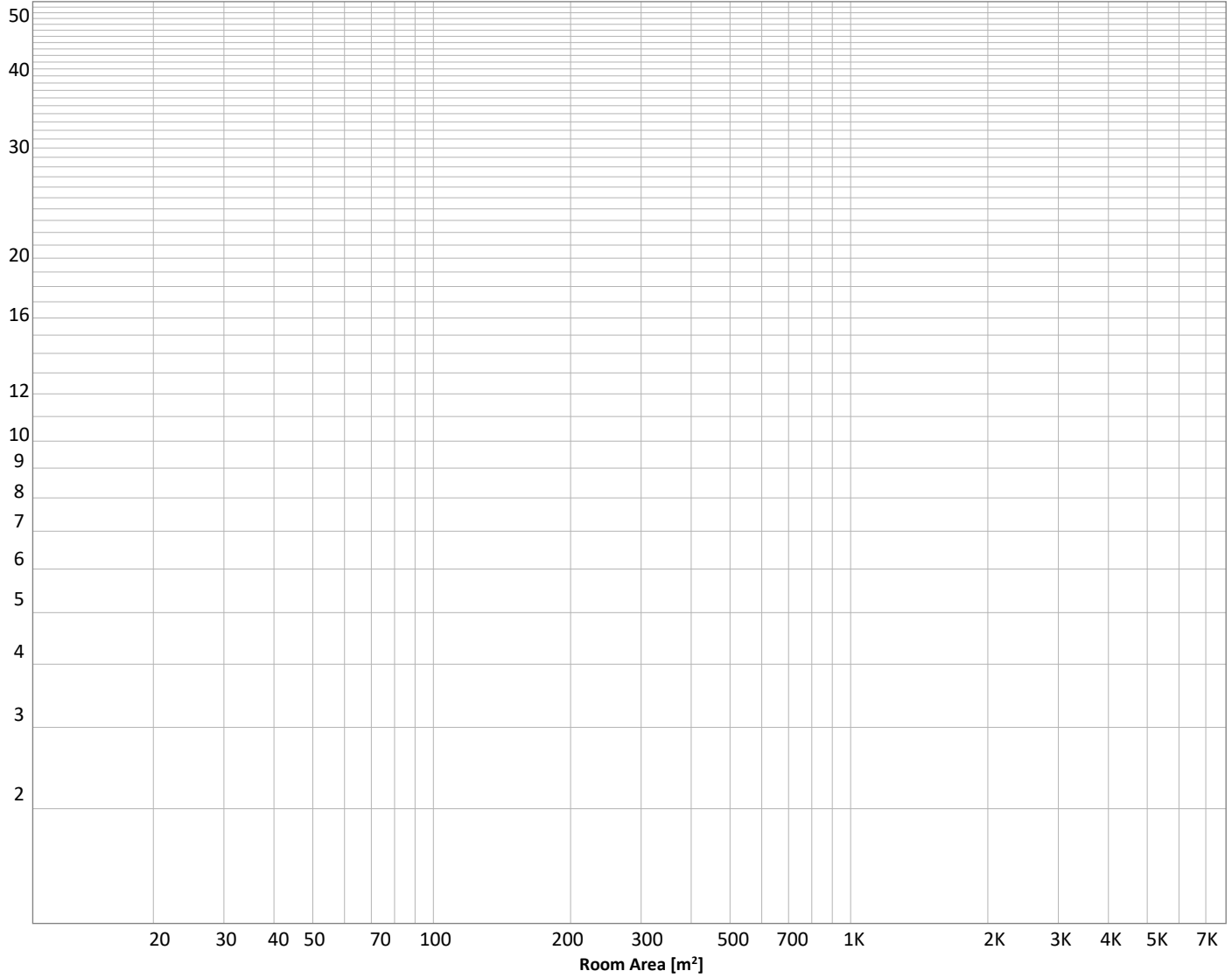
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 59,1 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°
1,80 lm	5,15 lm	7,84 lm	9,55 lm	10,0 lm	9,18 lm	7,20 lm	4,43 lm	1,65 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,409 lm	0,350 lm	0,349 lm	0,325 lm	0,265 lm	0,228 lm	0,173 lm	0,104 lm	0,036 lm

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Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	2 lm	3,0%
10-20°	5 lm	8,7%
20-30°	8 lm	13,3%
30-40°	10 lm	16,2%
40-50°	10 lm	17,0%
50-60°	9 lm	15,5%
60-70°	7 lm	12,2%
70-80°	4 lm	7,5%
80-90°	2 lm	2,8%
90-100°	0 lm	0,7%
100-110°	0 lm	0,6%
110-120°	0 lm	0,6%
120-130°	0 lm	0,6%
130-140°	0 lm	0,4%
140-150°	0 lm	0,4%
150-160°	0 lm	0,3%
160-170°	0 lm	0,2%
170-180°	0 lm	0,1%
Total	59 lm	100,0%

Intensity peaks

Max intensity	19 cd
Intensity, 90°	1 cd
Intensity, 0°	19 cd

Zonal Lumen summary

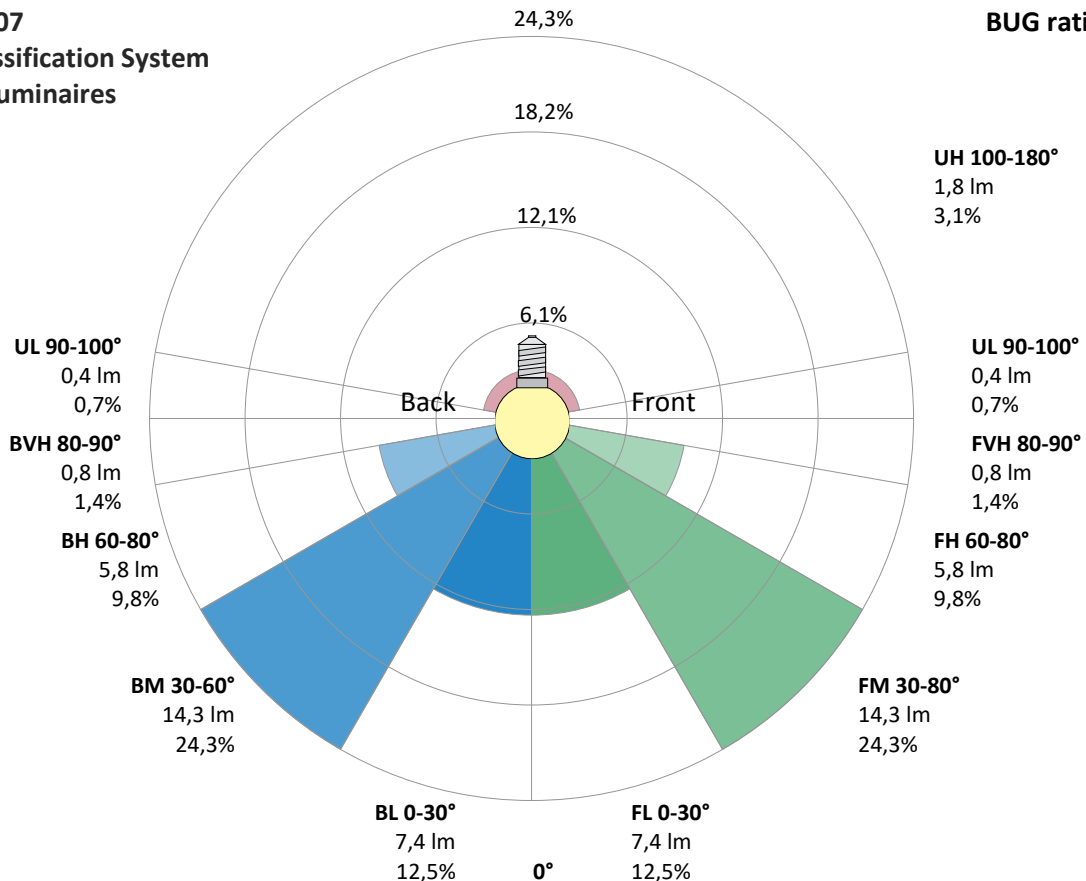
Zone (γ)	Lumen	% Total
0-30°	15 lm	25,0%
0-40°	24 lm	41,2%
0-60°	44 lm	73,7%
60-90°	13 lm	22,5%
70-100°	6 lm	11,0%
90-120°	1 lm	1,9%
0-90°	57 lm	96,2%
90-180°	2 lm	3,8%
0-180°	59 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	7 lm	12,5%
Medium(30-60°)	14 lm	24,3%
High(60-80°)	6 lm	9,8%
Very high(80-90°)	1 lm	1,4%
Back light		
Low(0-30°)	7 lm	12,5%
Medium(30-60°)	14 lm	24,3%
High(60-80°)	6 lm	9,8%
Very high(80-90°)	1 lm	1,4%
Uplight		
Low(90-100°)	0 lm	0,7%
High(100-180°)	2 lm	3,1%

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

BUG rating B0 U1 G0



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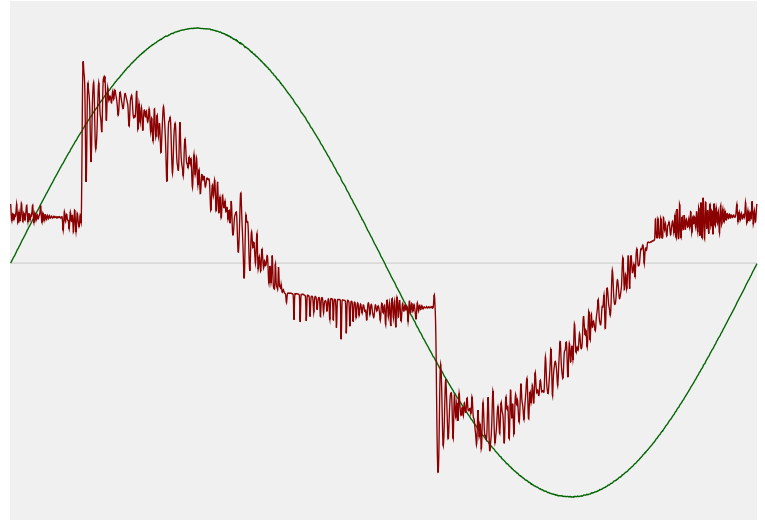


Power Details

Input Power

Power feed to light source	6,5 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,043 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	9,8 VA
Displacement factor of AC power feed	0,72
Power factor of AC current feed	0,67
Total harmonic distortion of the current	39,11%
Total harmonic distortion of the voltage	0,08%

Input Power Curve



Efficiency

Radiated power efficiency	14,6%
Lumen efficiency	9 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

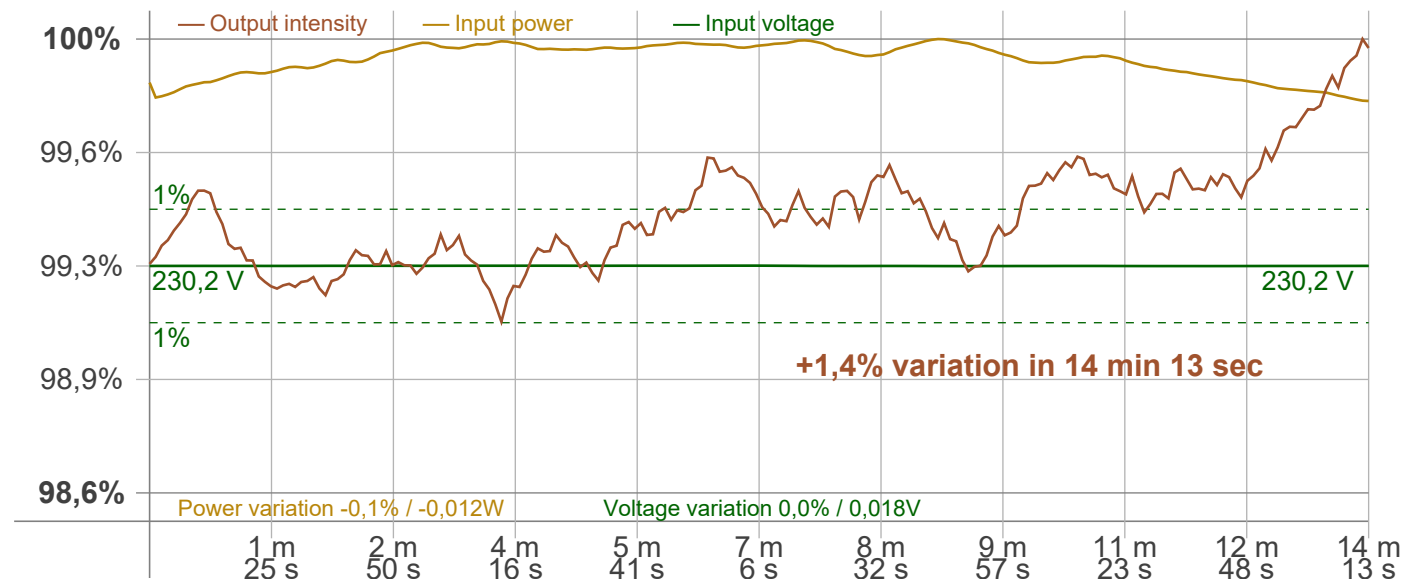
Warmup Result

Total warmup time	Not completed
Warmup variation	+1,4%

Output Change

Output start	58,8 lm
Output change	+0,2 lm
Output end	59,1 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 10000 Hz
 Percent Flicker 7,77 %
 Flicker index 0,02

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

JA8/10 40 Hz 0,06 %
 JA8/10 90 Hz 0,13 %
 JA8/10 200 Hz 0,27 %
 JA8/10 400 Hz 0,57 %
 JA8/10 1000 Hz 1,31 %

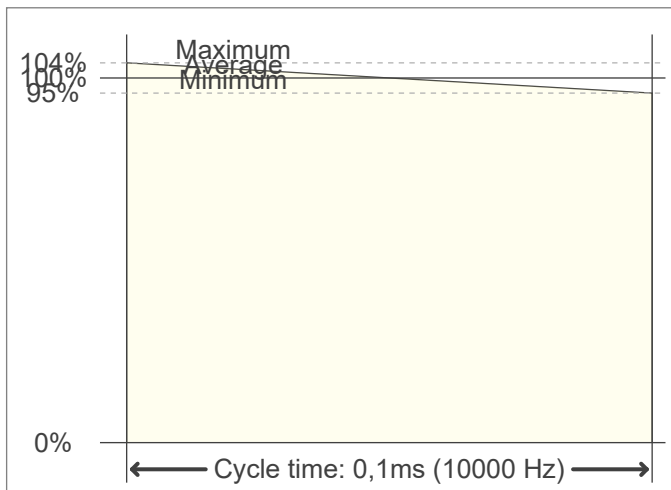
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

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

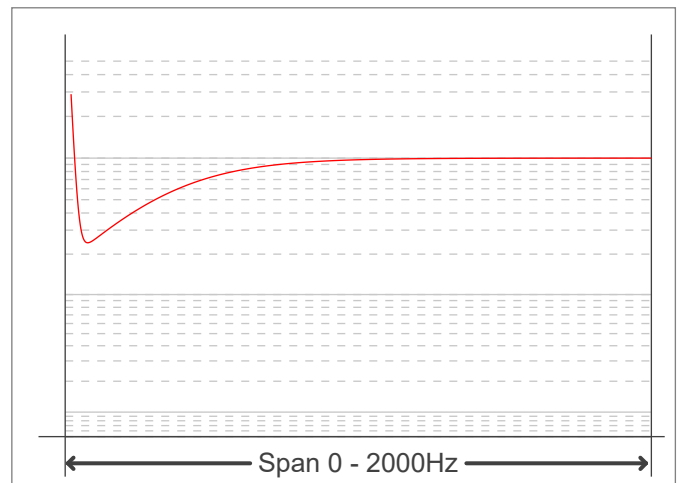
Flicker indices according to Lighting Research Center (2015)

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

