

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS

Measurement tracking No. and Link: [VT250506-005830](#)

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

32 planes – 11,25°

5°

2,00 m

6,6 W – PF 0,51 – DPF 0,86

230 V – 0,056 A

50 Hz

Lamp stabilized in 22 min 8 sec – 2,0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

845628-3000K

845628-3000K – Dutchfulfillment

3-FASE RAILSPOT ELARA 7W WIT

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

574 lm – 0,04% / 99,96%

87 lm/W

1260 cd – 38,1°

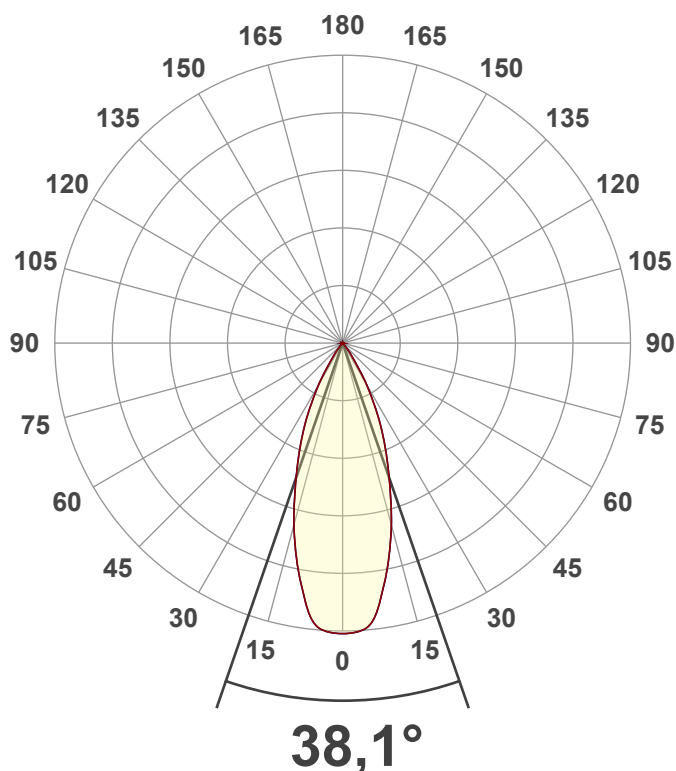
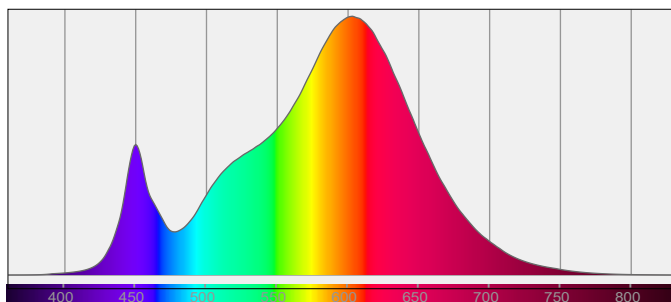
CCT = 3000 K / 2934 K

CRI 81,8

R_f 84,3 – R_g 96,4

Duv -0,0012 – SDCM 2,4

SVM 0,02 – PstLM 0,07



Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS

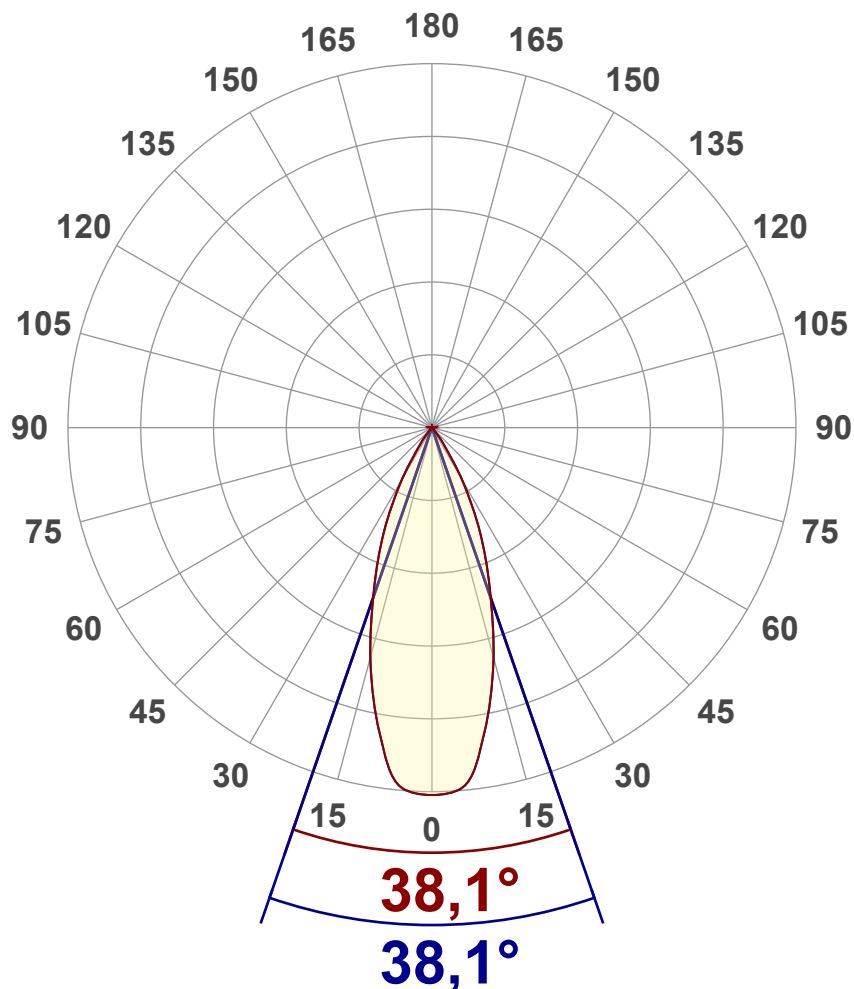
Measurement tracking No. and Link: [VT250506-005830](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	574 lm
Lumen Up% / Down%	0,04% / 99,96%
Peak Intensity	1260 cd
Beam Angle (50%)	38,1°
Beam Angle (90%)	38,1°
Beam Angle (10%)	38,1°

Cut-off Angle

Average 2,5%	77,1°
--------------	-------

Field Angle

Average 10%	65,9°
-------------	-------

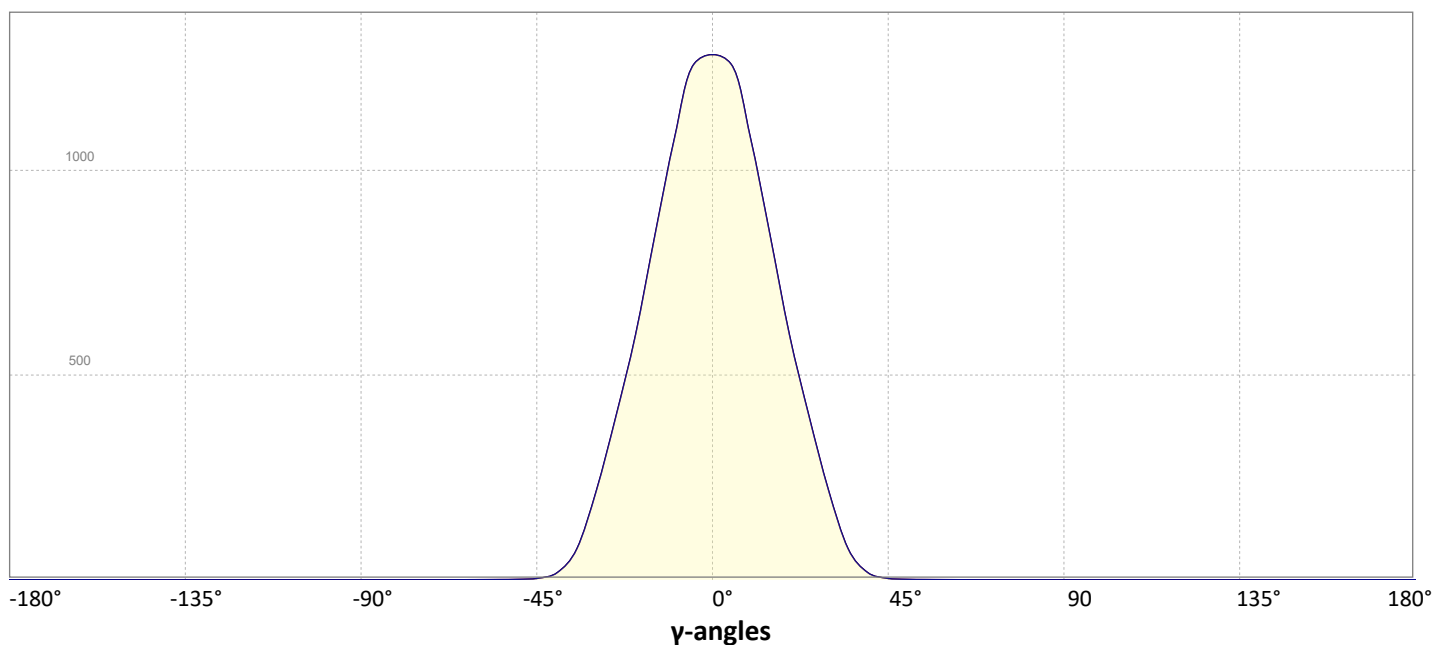
Intensity Ratio

In 120° cone	99,9%
In 90° cone	99,7%

C000-C180

C090-C270

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

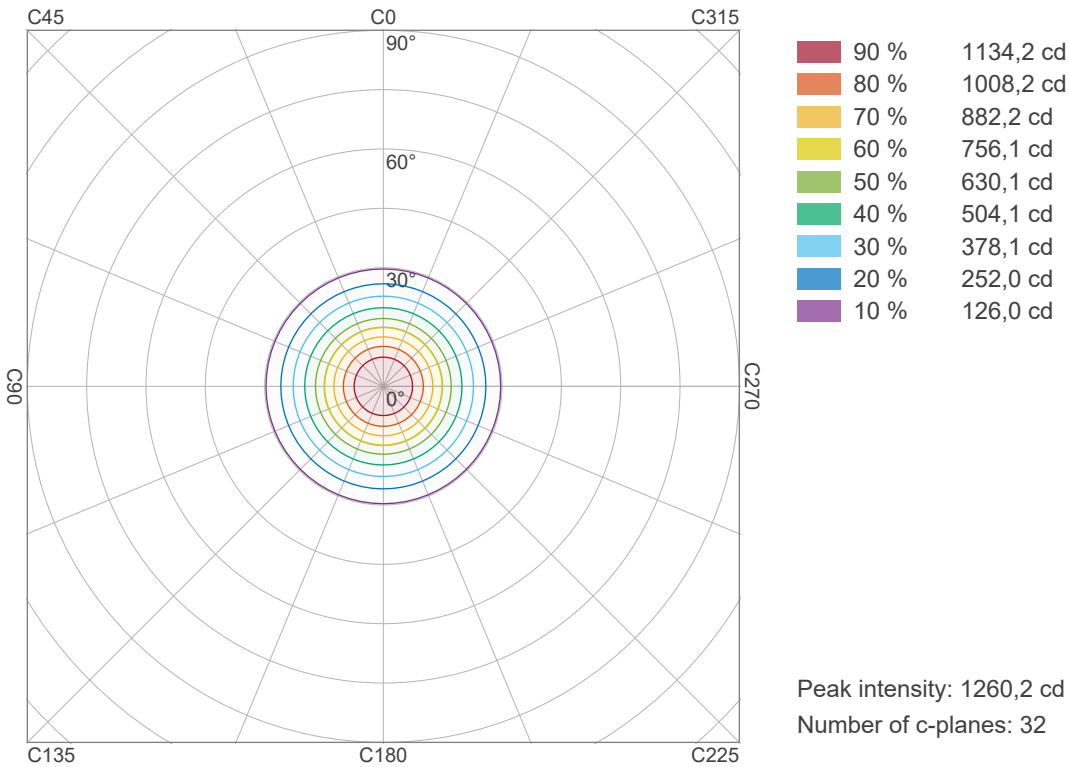


Light Measurement Report

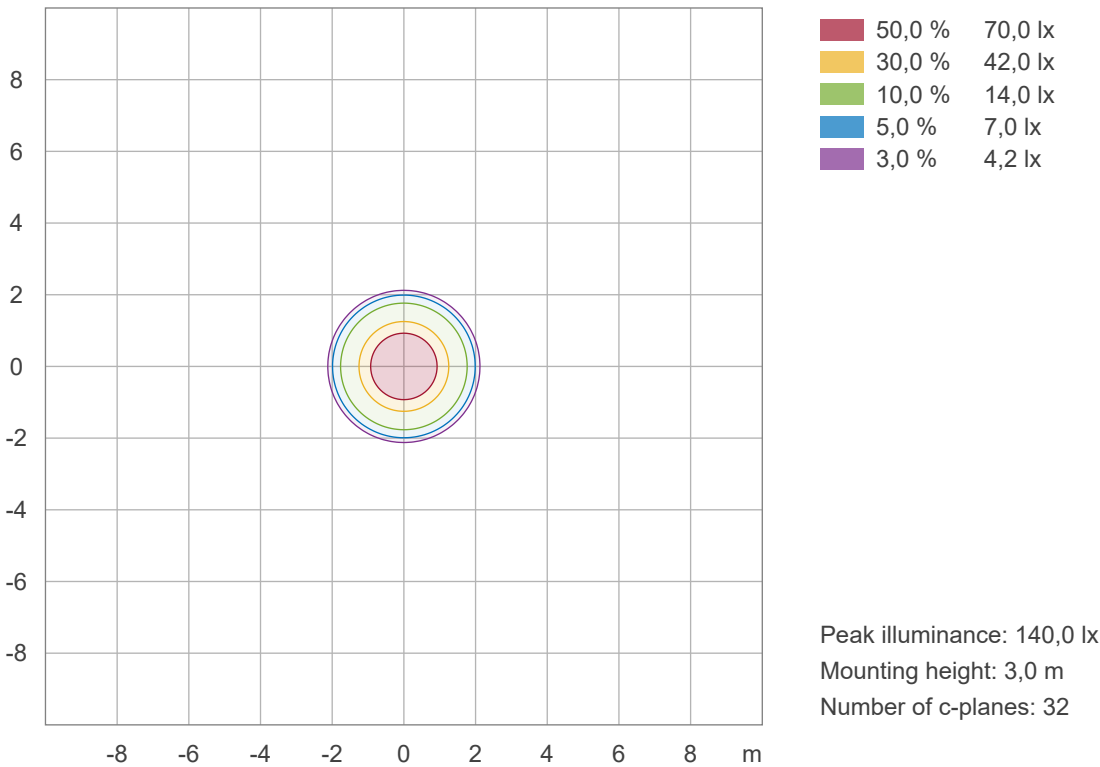
Print date: 6-5-2025
Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS
Measurement tracking No. and Link: [VT250506-005830](#)
Operator:



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS

Measurement tracking No. and Link: [VT250506-005830](#)

Operator:

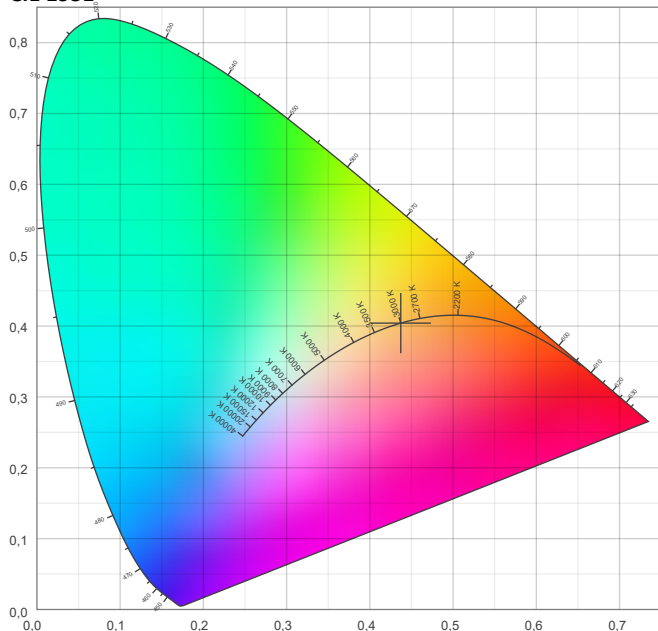


Color details

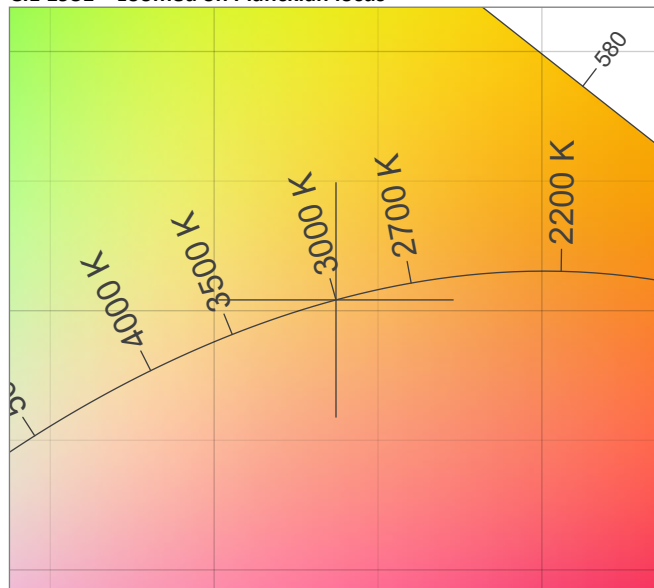
Correlated Color Temperature, Target CCT = 3000 K
Correlated Color Temperature, Measured CCT = 2934 K
Color Rendering Index CRI 81,8
Color Rendering Index, R9 (red component) R9 = 1,1
Color Rendering TM30-18 R_f 84,3 – R_g 96,4
Color Quality Scale CQS = 81,1

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0,437;0,404)
Color coordinate CIEs 1960 (u;v) = (0,251;0,348)
Color deviation from BBL Duv = -0,0012
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,251;0,521)

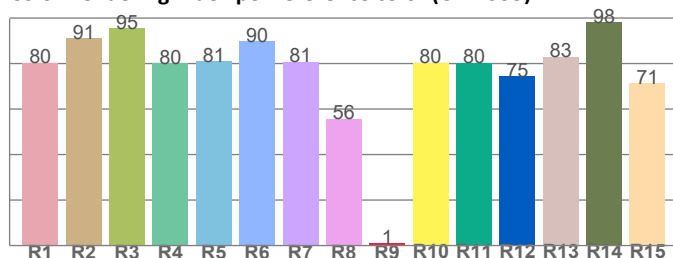
CIE 1931



CIE 1931 – zoomed on Planckian locus



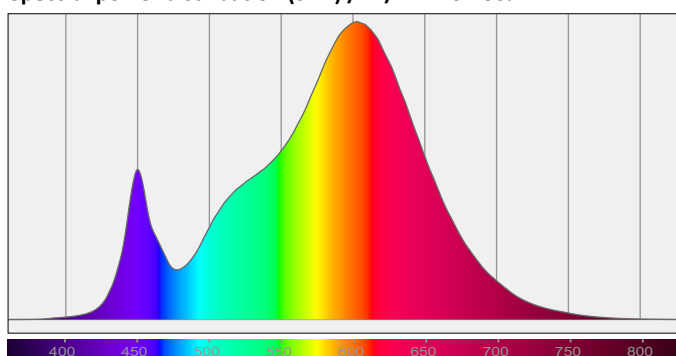
Color Rendering Index per reference color (CIE 1995)



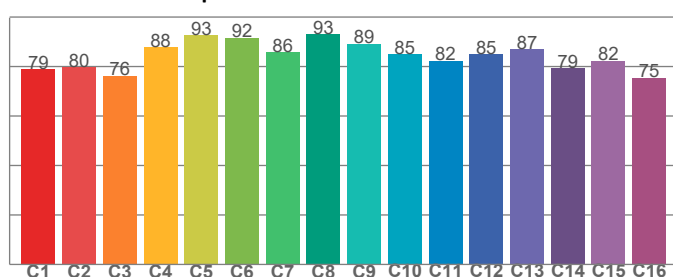
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
80,3	91,1	95,4	80,2	80,9	89,9	80,9	55,8	1,1	80,4	80,4	74,5	83,0	98,1	71,4

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



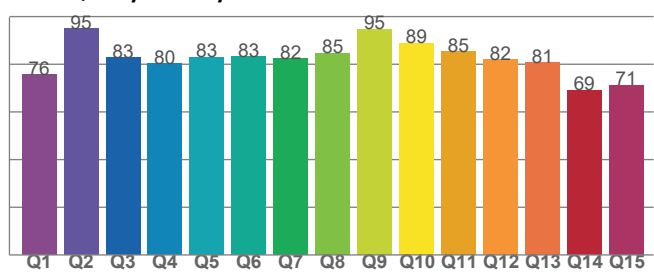
TM30-18 Rf-values per hue bin



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
78,8	79,7	76,2	87,8	92,7	91,6	85,7	92,9	89,2	84,9	82,3	84,9	87,0	79,3	82,4	75,4

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
75,5	95,0	82,7	80,2	82,9	83,1	82,4	84,6	94,6	88,9	85,2	81,8	80,6	69,1	71,1

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS

Measurement tracking No. and Link: [VT250506-005830](#)

Operator:



Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances											
	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											
H = mounting height above eye level											
X	Y	Viewed Crosswise (Viewing direction orthogonal to lamp length axis)					Viewed Endwise (Viewing direction parallel to lamp length axis)				
2H	2H	14,2	14,7	14,2	14,9	15,0	14,2	14,7	14,2	14,9	15,0
	3H	13,8	14,5	14,2	14,7	14,9	13,8	14,5	14,2	14,7	14,9
	4H	13,8	14,4	14,2	14,6	14,8	13,8	14,4	14,2	14,6	14,8
	6H	13,8	14,3	14,1	14,6	14,9	13,8	14,3	14,1	14,6	14,9
	8H	13,7	14,2	14,0	14,5	14,9	13,7	14,2	14,0	14,5	14,9
	12H	13,7	14,1	14,0	14,5	14,9	13,7	14,1	14,0	14,5	14,9
4H	2H	13,8	14,4	14,2	14,6	14,8	13,8	14,4	14,2	14,6	14,8
	3H	13,7	14,1	14,0	14,5	14,9	13,7	14,1	14,0	14,5	14,9
	4H	13,5	14,0	13,9	14,4	14,9	13,5	14,0	13,9	14,4	14,9
	6H	13,4	13,9	13,9	14,2	14,6	13,4	13,9	13,9	14,2	14,6
	8H	13,4	13,8	13,9	14,2	14,5	13,4	13,8	13,9	14,2	14,5
	12H	13,3	13,6	13,8	14,1	14,5	13,3	13,6	13,8	14,1	14,5
8H	4H	13,4	13,8	13,9	14,2	14,5	13,4	13,8	13,9	14,2	14,5
	6H	13,3	13,6	13,8	14,0	14,6	13,3	13,6	13,8	14,0	14,6
	8H	13,3	13,5	13,8	14,0	14,7	13,3	13,5	13,8	14,0	14,7
	12H	13,2	13,4	13,8	13,9	14,5	13,2	13,4	13,8	13,9	14,5
12H	4H	13,3	13,6	13,8	14,1	14,5	13,3	13,6	13,8	14,1	14,5
	6H	13,3	13,5	13,8	14,0	14,7	13,3	13,5	13,8	14,0	14,7
	8H	13,2	13,4	13,8	13,9	14,5	13,2	13,4	13,8	13,9	14,5
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H		6,5 / -23,5					6,5 / -23,5				
S = 1.5H		9,3 / -25,9					9,3 / -25,9				
S = 2.0H		11,3 / -29,7					11,3 / -29,7				

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	112	110	108	112	110	108	106	106	104	103	102	101	100	99	98	97	95
2	110	106	102	99	108	104	101	98	101	98	96	98	96	94	95	94	92	91
3	105	100	96	93	104	99	95	92	96	93	90	94	91	89	92	90	88	86
4	101	95	90	87	100	94	90	86	92	88	85	90	87	84	88	86	83	82
5	97	90	86	82	96	90	85	82	88	84	81	86	83	80	85	82	80	78
6	94	86	81	78	92	85	81	77	84	80	77	83	79	76	82	78	76	75
7	90	82	77	74	89	82	77	74	81	76	73	79	76	73	78	75	73	71
8	87	79	74	70	86	78	74	70	77	73	70	76	73	70	75	72	69	68
9	84	76	71	67	83	75	70	67	74	70	67	73	70	67	73	69	67	65
10	81	72	68	64	80	72	67	64	71	67	64	71	67	64	70	66	64	63

Light Measurement Report

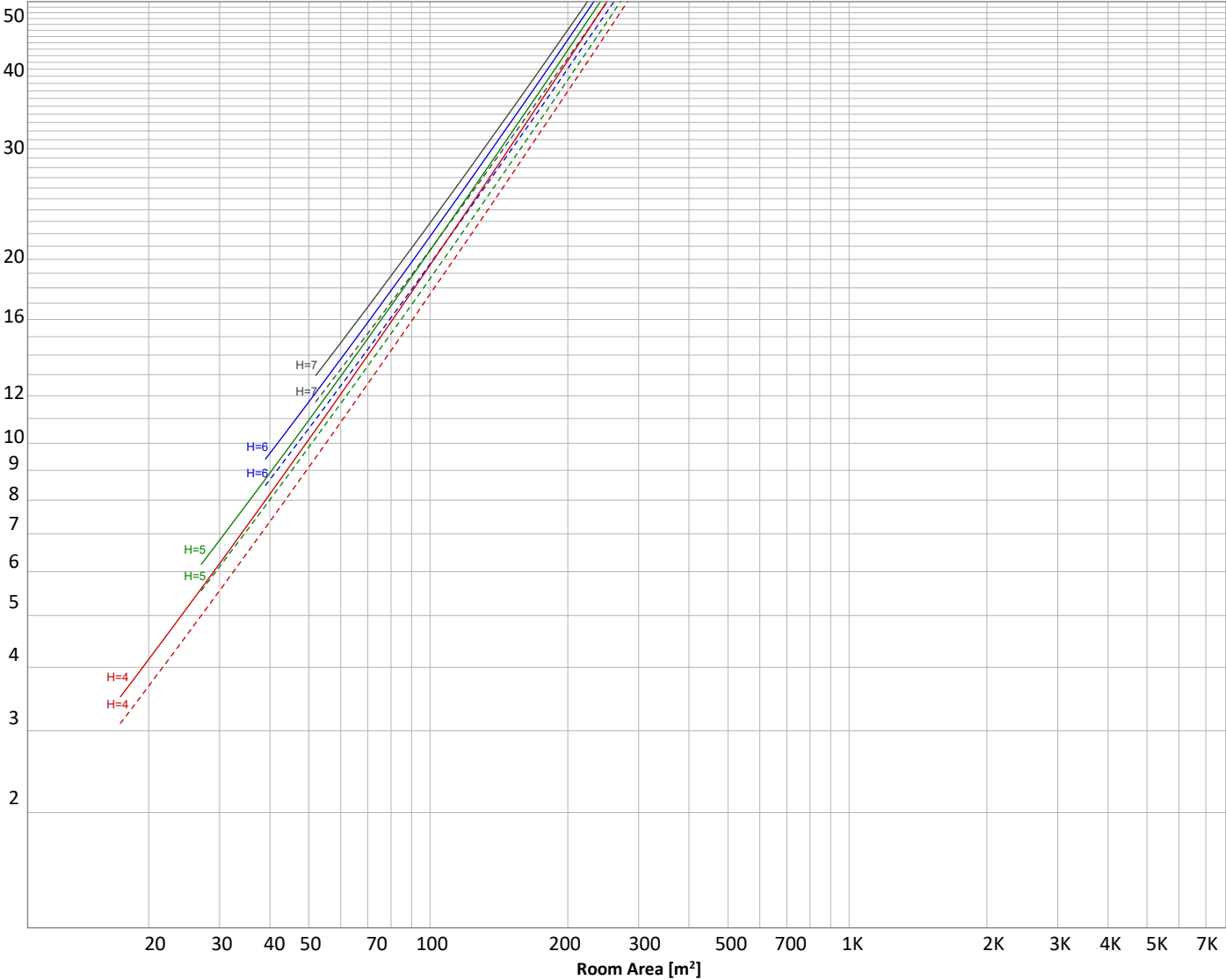
Print date: 6-5-2025
Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS
Measurement tracking No. and Link: [VT250506-005830](#)
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 574 lm	p(%)		
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	Wall reflectance
H _{work} = Work area height from floor =	0.00 m	-----	70	50
E _{work} = Average lux on work area =	100 lx	_____	50	30
				Floor reflectance
				30
				20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
112 lm	226 lm	176 lm	54,6 lm	4,51 lm	0,599 lm	0,208 lm	0,039 lm	0,026 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,001 lm	0,001 lm	0,004 lm	0,005 lm	0,006 lm	0,030 lm	0,080 lm	0,075 lm	0,023 lm

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS

Measurement tracking No. and Link: [VT250506-005830](#)

Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	112 lm	19,5%
10-20°	226 lm	39,4%
20-30°	176 lm	30,6%
30-40°	55 lm	9,5%
40-50°	5 lm	0,8%
50-60°	1 lm	0,1%
60-70°	0 lm	0,0%
70-80°	0 lm	0,0%
80-90°	0 lm	0,0%
90-100°	0 lm	0,0%
100-110°	0 lm	0,0%
110-120°	0 lm	0,0%
120-130°	0 lm	0,0%
130-140°	0 lm	0,0%
140-150°	0 lm	0,0%
150-160°	0 lm	0,0%
160-170°	0 lm	0,0%
170-180°	0 lm	0,0%
Total	574 lm	100,0%

Intensity peaks

Max intensity	1260 cd
Intensity, 90°	0 cd
Intensity, 0°	1260 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	514 lm	89,5%
0-40°	569 lm	99,0%
0-60°	574 lm	99,9%
60-90°	0 lm	0,0%
70-100°	0 lm	0,0%
90-120°	0 lm	0,0%
0-90°	574 lm	100,0%
90-180°	0 lm	0,0%
0-180°	574 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	257 lm	44,7%
Medium(30-60°)	30 lm	5,2%
High(60-80°)	0 lm	0,0%
Very high(80-90°)	0 lm	0,0%
Back light		
Low(0-30°)	257 lm	44,7%
Medium(30-60°)	30 lm	5,2%
High(60-80°)	0 lm	0,0%
Very high(80-90°)	0 lm	0,0%

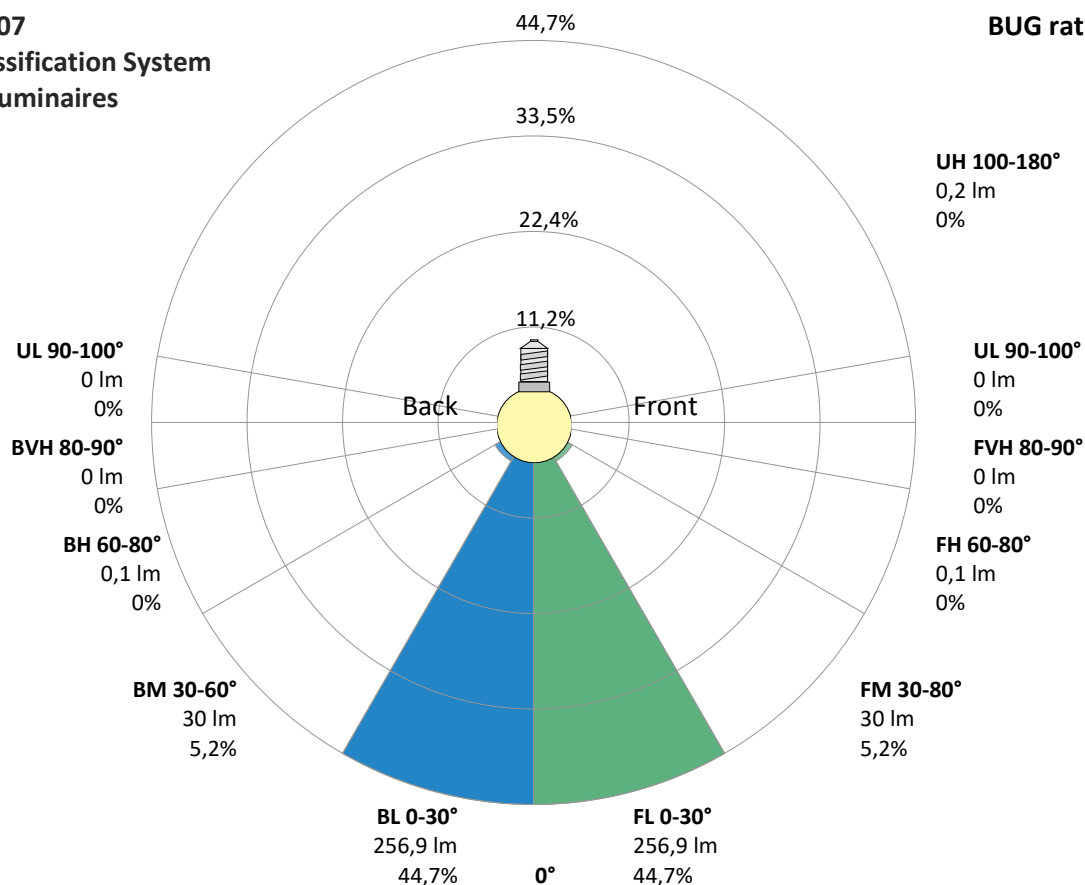
Uplight

Low(90-100°)	0 lm	0,0%
High(100-180°)	0 lm	0,0%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B1 U0 G0



Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS

Measurement tracking No. and Link: [VT250506-005830](#)

Operator:

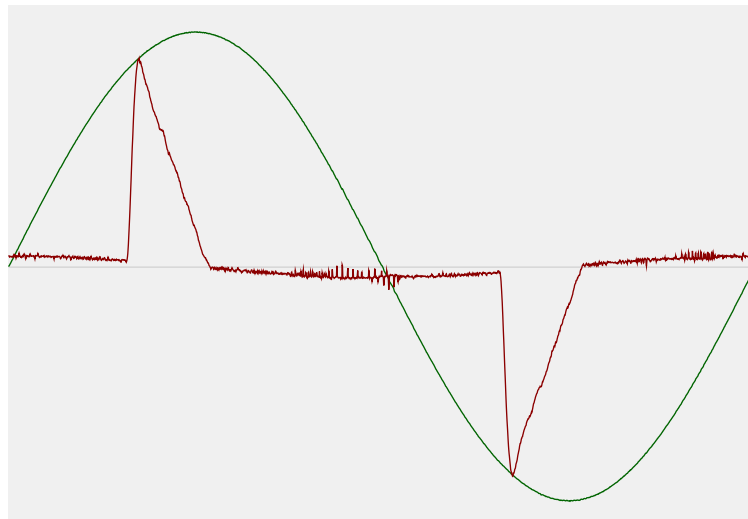


Power Details

Input Power

Power feed to light source	6,6 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,056 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	12,82 VA
Displacement factor of AC power feed	0,86
Power factor of AC current feed	0,51
Total harmonic distortion of the current	132,39%
Total harmonic distortion of the voltage	0,08%

Input Power Curve



Efficiency

Radiated power efficiency 26,3%



Lumen efficiency 87 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	2990 K
CCT shift	+10 K
CCT end	3000 K

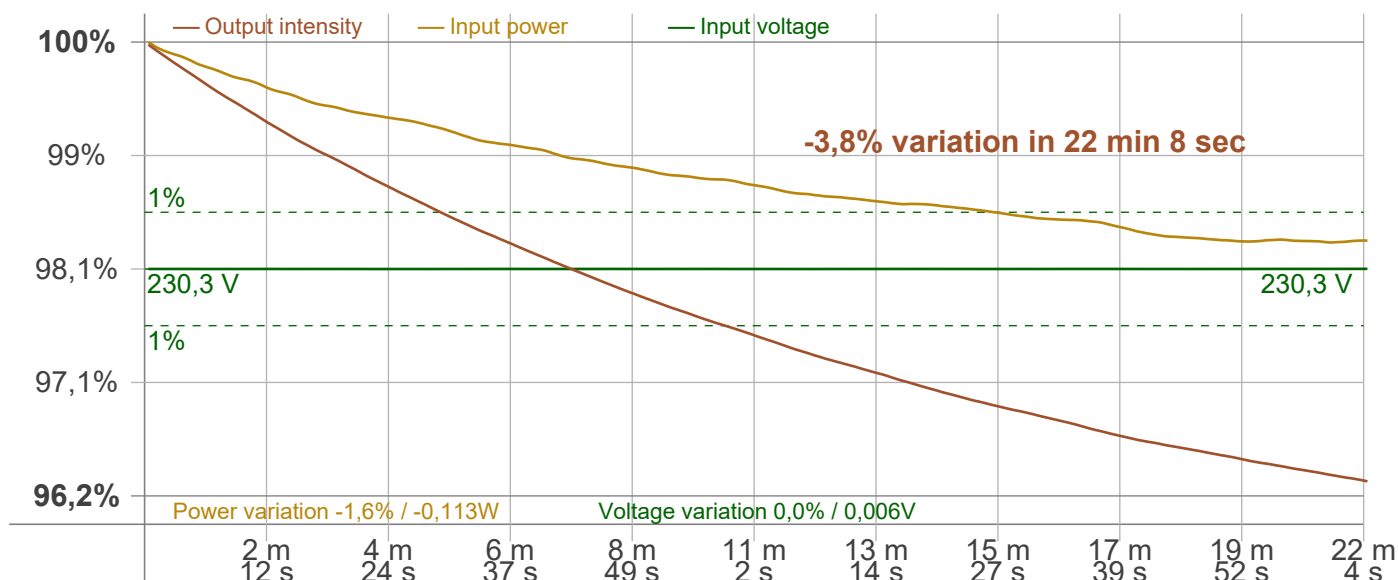
Warmup Result

Total warmup time	Lamp stabilized in 22 min 8 sec
Warmup variation	-3,8%

Output Change

Output start	597 lm
Output change	-23 lm
Output end	574 lm

Stabilization Curve



Light Measurement Report

Print date: 6-5-2025
Measurement date and time: 6-5-2025 13:05:45 – Measurement no. VFR-250506-1101-MS
Measurement tracking No. and Link: [VT250506-005830](#)
Operator:



Flicker /TLA details

Flicker Meter Type Viso Systems LabFlicker
Frequency of input power 50 Hz
Flicker/TLA sample rate 40000 samples/s

Measurement time
PstLM 180 sec
All other indices 1,2 sec

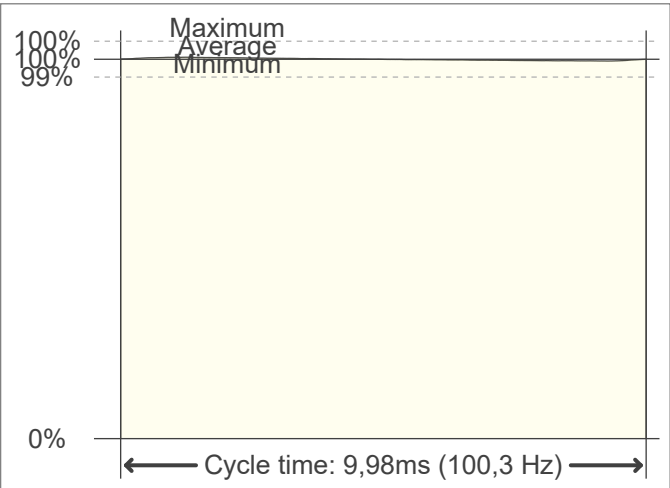
Flicker indices according to Illuminating Engineering Society (IES)
Flicker frequency 100,25 Hz
Percent Flicker 0,54 %
Flicker index 0

Flicker indices according to California Energy Commission (CEC) 2016b
JA8/10 40 Hz n/a %
JA8/10 90 Hz n/a %
JA8/10 200 Hz n/a %
JA8/10 400 Hz n/a %
JA8/10 1000 Hz n/a %

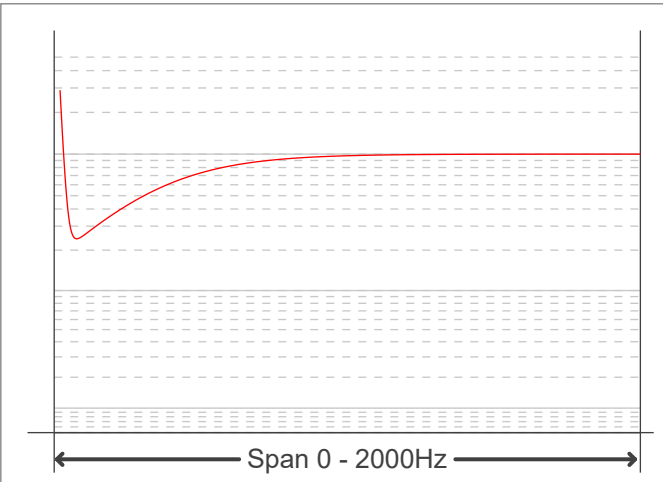
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)
PstLM value (F < 80 Hz) 0,07
SVM value (80 < F < 2000 Hz) 0,02

Flicker indices according to Lighting Research Center (2015)
Perception metric, Assist Mp n/a

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

