

Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](#)

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°
2,79 m
29,2 W – PF 0,88 – DPF 0,99
230 V – 0,143 A
50 Hz
Lamp stabilized in 15 min 2 sec – 2,0%

Tested Light Source

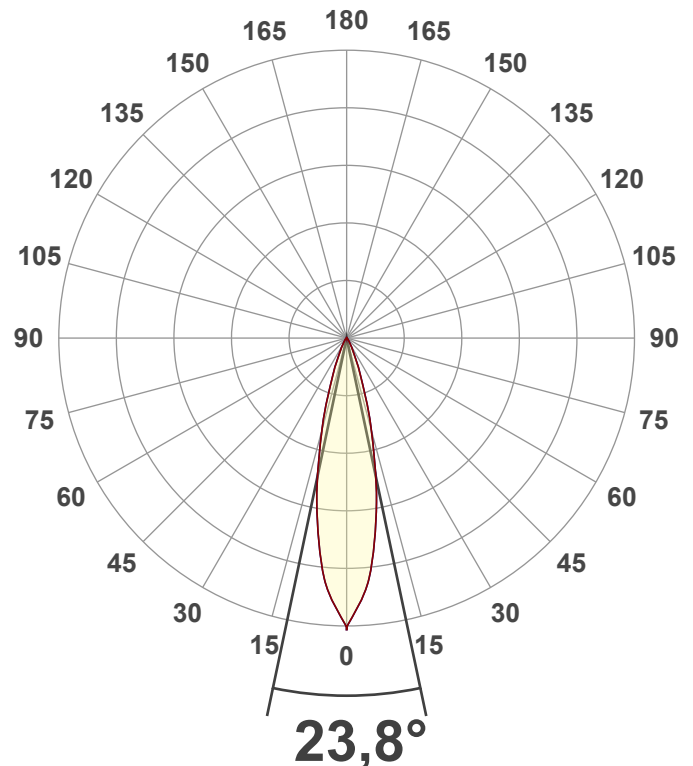
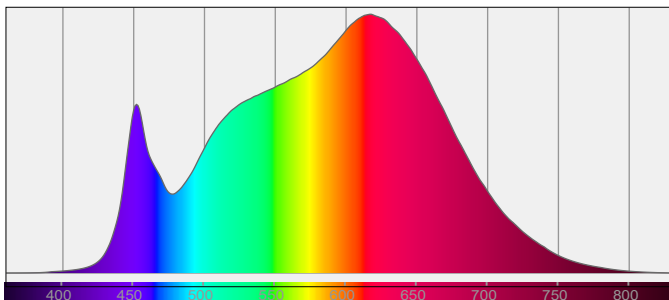
Product Name
Item No. and Manufacturer
Product Description (line 1)

812027-3000K-30W
812027-3000K-30W – Dutchfulfillment
3-FASE RAILSPOT | ZOOMABLE | WATT SWITCH | CCT-SWITCH | 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

2102 lm – 0,04% / 99,96%
72 lm/W
9603 cd – 23,8°
CCT = 3000 K / 3395 K
CRI 94,8
 R_f 92,6 – R_g 98,4
Duv 0,0023 – SDCM 12,7
SVM 0,03 – PstLM 0,04



Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

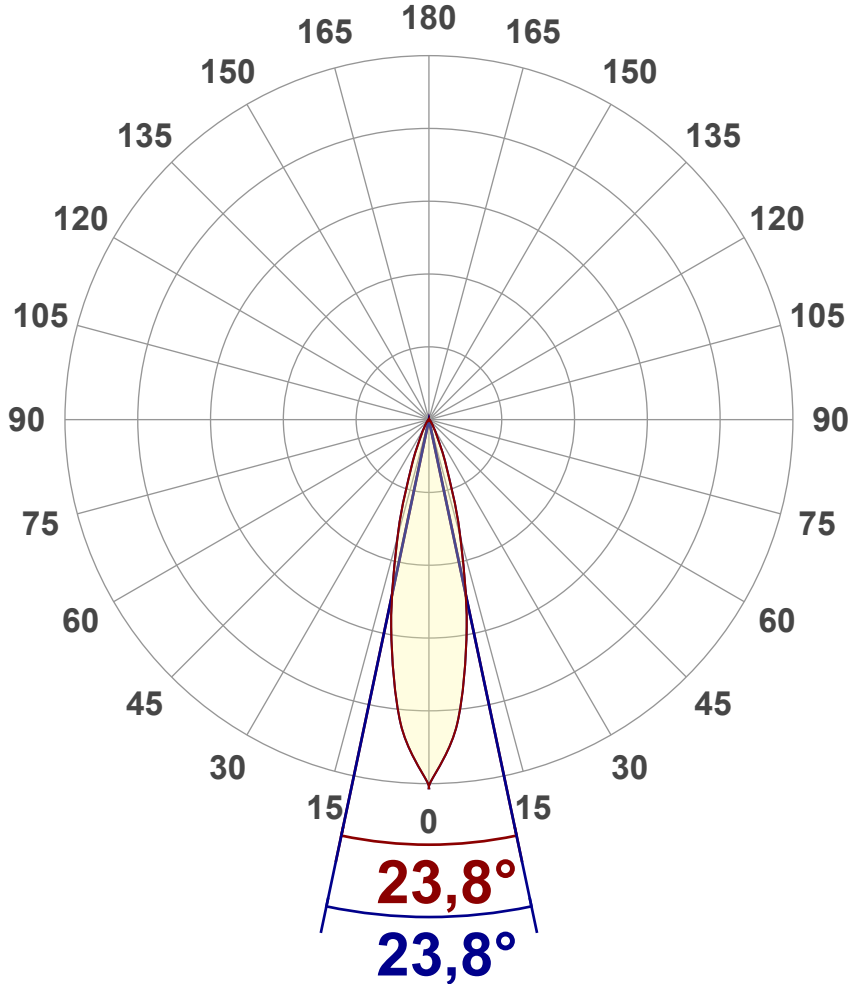
Measurement tracking No. and Link: [VT250707-002764](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2102 lm
Lumen Up% / Down%	0,04% / 99,96%
Peak Intensity	9603 cd
Beam Angle (50%)	23,8°
Beam Angle (90%)	23,8°
Beam Angle (10%)	23,8°

Cut-off Angle

Average 2,5%	62°
--------------	-----

Field Angle

Average 10%	45,4°
-------------	-------

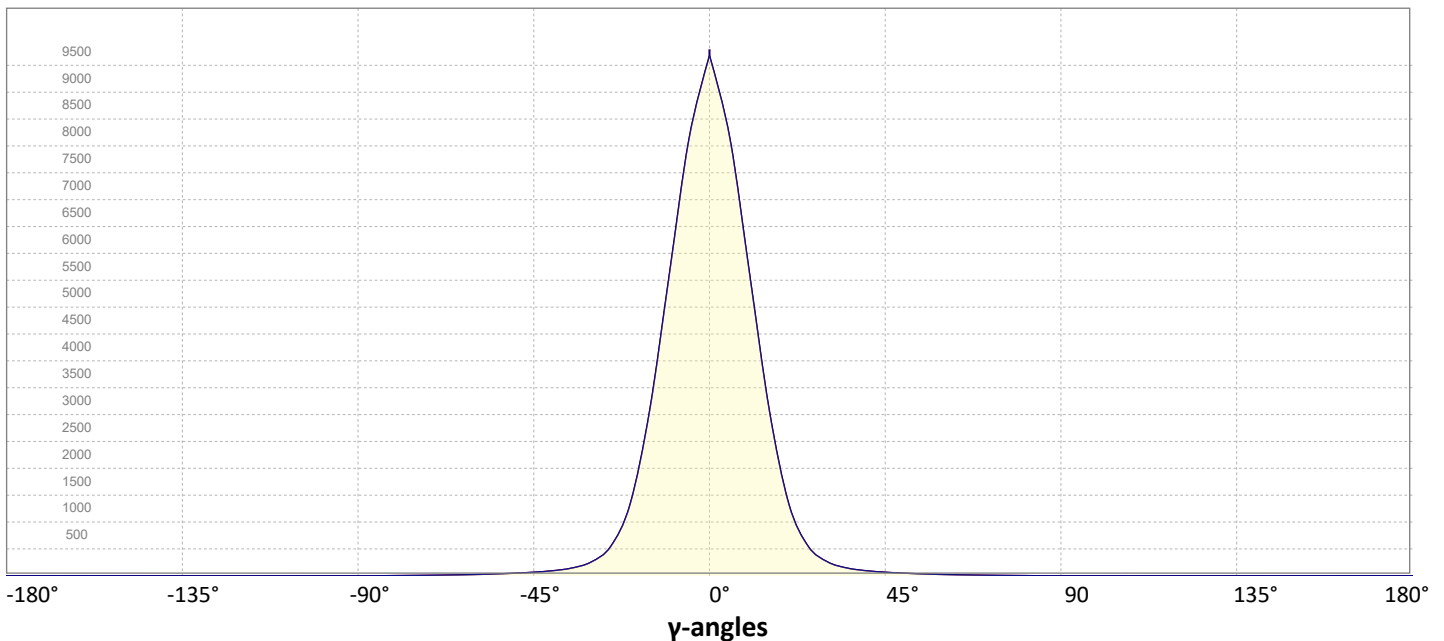
Intensity Ratio

In 120° cone	98,7%
In 90° cone	96,2%

C000-C180

C090-C270

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



Light Measurement Report

Print date: 7-7-2025

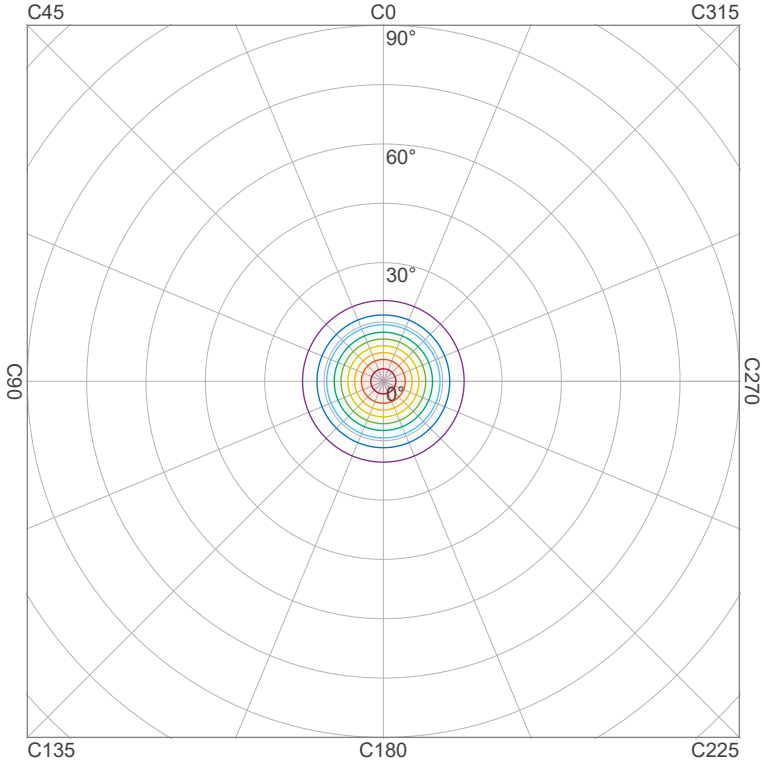
Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](#)

Operator:



Iso-intensity Diagram (Iso-candela)

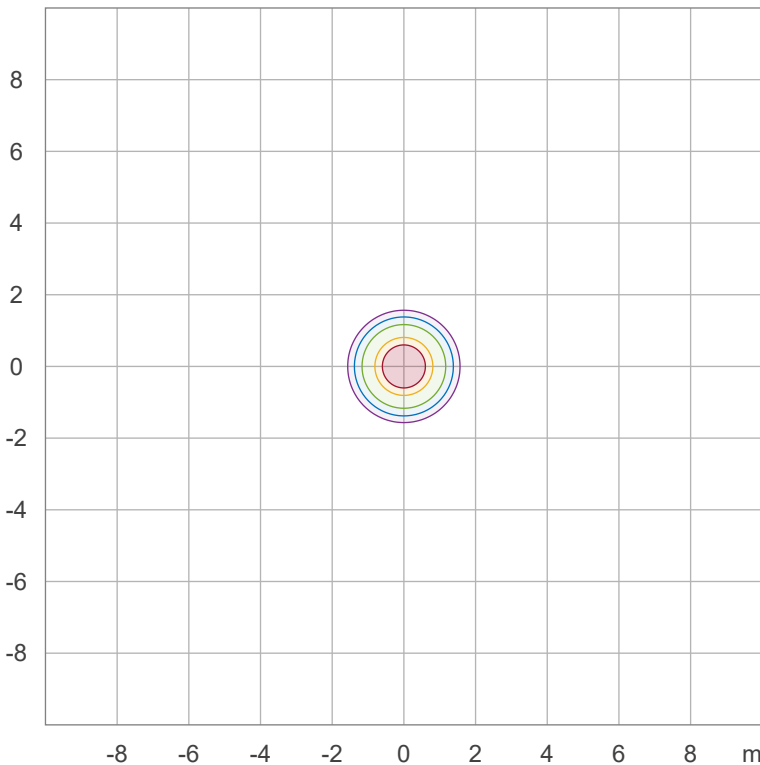


90 %	8642,3 cd
80 %	7682,1 cd
70 %	6721,8 cd
60 %	5761,5 cd
50 %	4801,3 cd
40 %	3841,0 cd
30 %	2880,8 cd
20 %	1920,5 cd
10 %	960,3 cd

Peak intensity: 9602,6 cd

Number of c-planes: 72

Iso-illuminance Diagram (Iso-lux)



50,0 %	533,5 lx
30,0 %	320,1 lx
10,0 %	106,7 lx
5,0 %	53,3 lx
3,0 %	32,0 lx

Peak illuminance: 1067,0 lx

Mounting height: 3,0 m

Number of c-planes: 72

Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](#)

Operator:

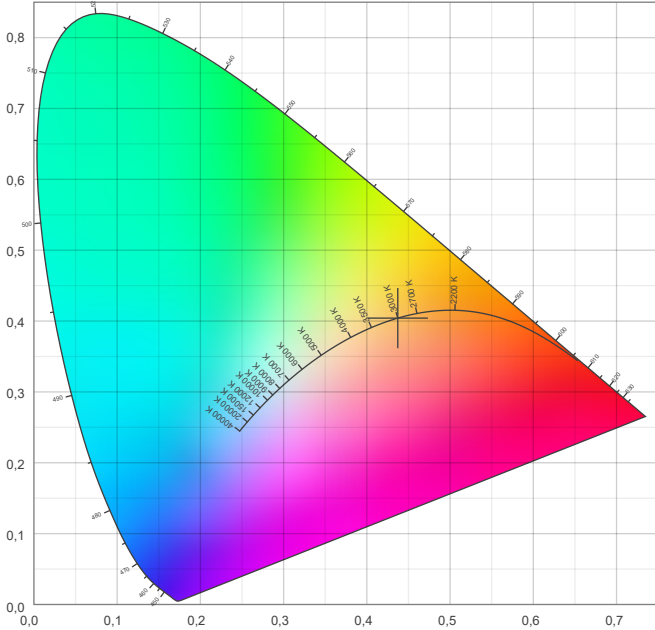


Color details

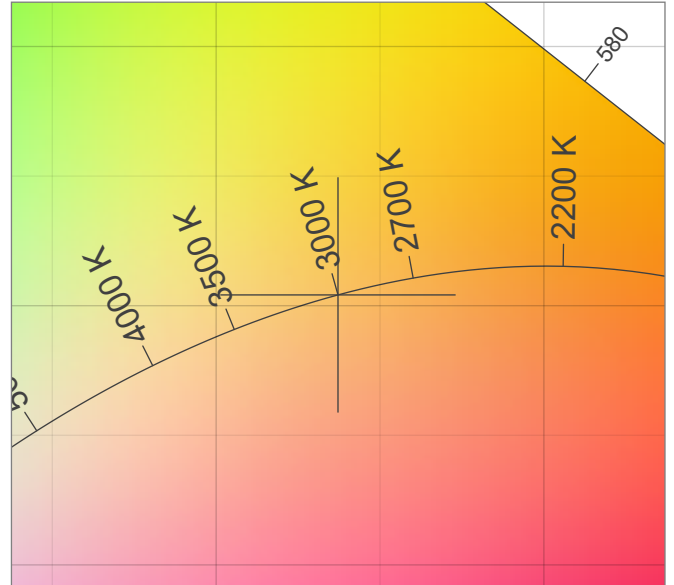
Correlated Color Temperature, Target CCT = 3000 K
 Correlated Color Temperature, Measured CCT = 3395 K
 Color Rendering Index CRI 94,8
 Color Rendering Index, R9 (red component) R9 = 67,8
 Color Rendering TM30-18 R_f 92,6 – R_g 98,4
 Color Quality Scale CQS = 94,0

MacAdam Steps SDCM = 12,7
 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 = 0,0023
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,251;0,521)

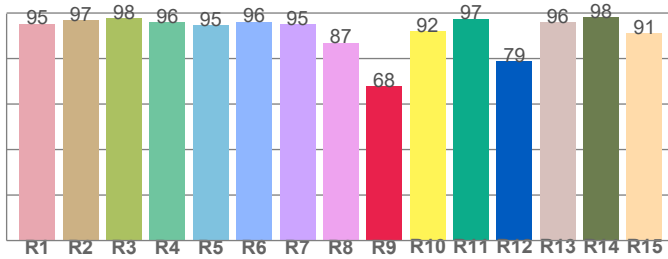
CIE 1931



CIE 1931 – zoomed on Planckian locus



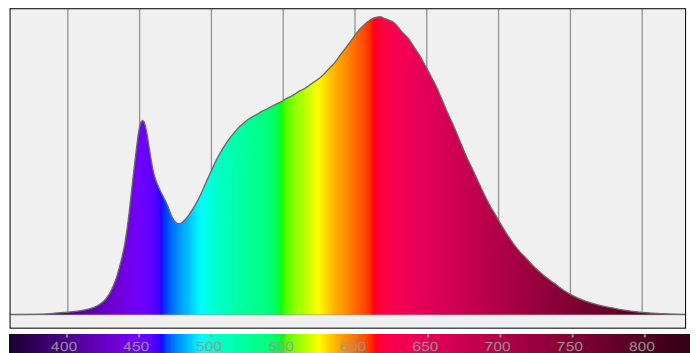
Color Rendering Index per reference color (CIE 1995)



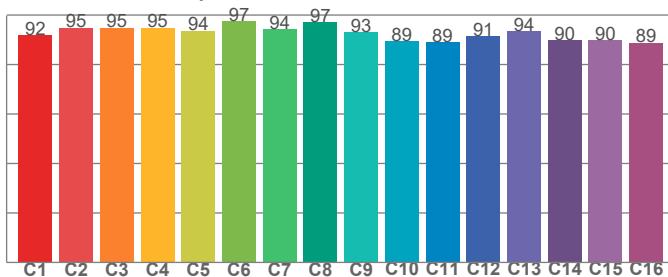
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
95,4	96,9	97,7	96,0	94,6	96,1	95,0	86,9	67,8	92,0	97,4	78,9	96,0	98,1	91,2

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



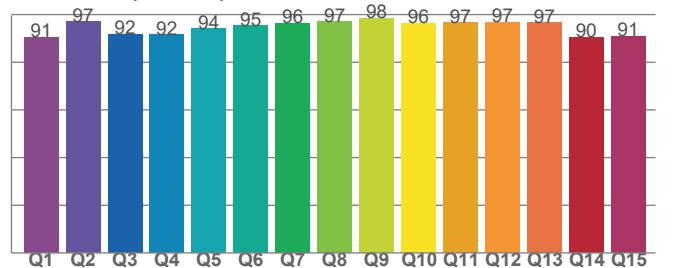
TM30-18 R_f-values per hue bin



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
92,0	94,8	94,8	94,8	93,7	97,4	94,3	97,2	93,0	89,5	89,0	91,4	93,5	89,7	89,8	88,9

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
90,6	97,1	91,9	91,5	94,1	95,4	96,4	97,1	98,4	96,5	96,6	96,8	96,6	90,5	90,8

Light Measurement Report

Print date: 7-7-2025

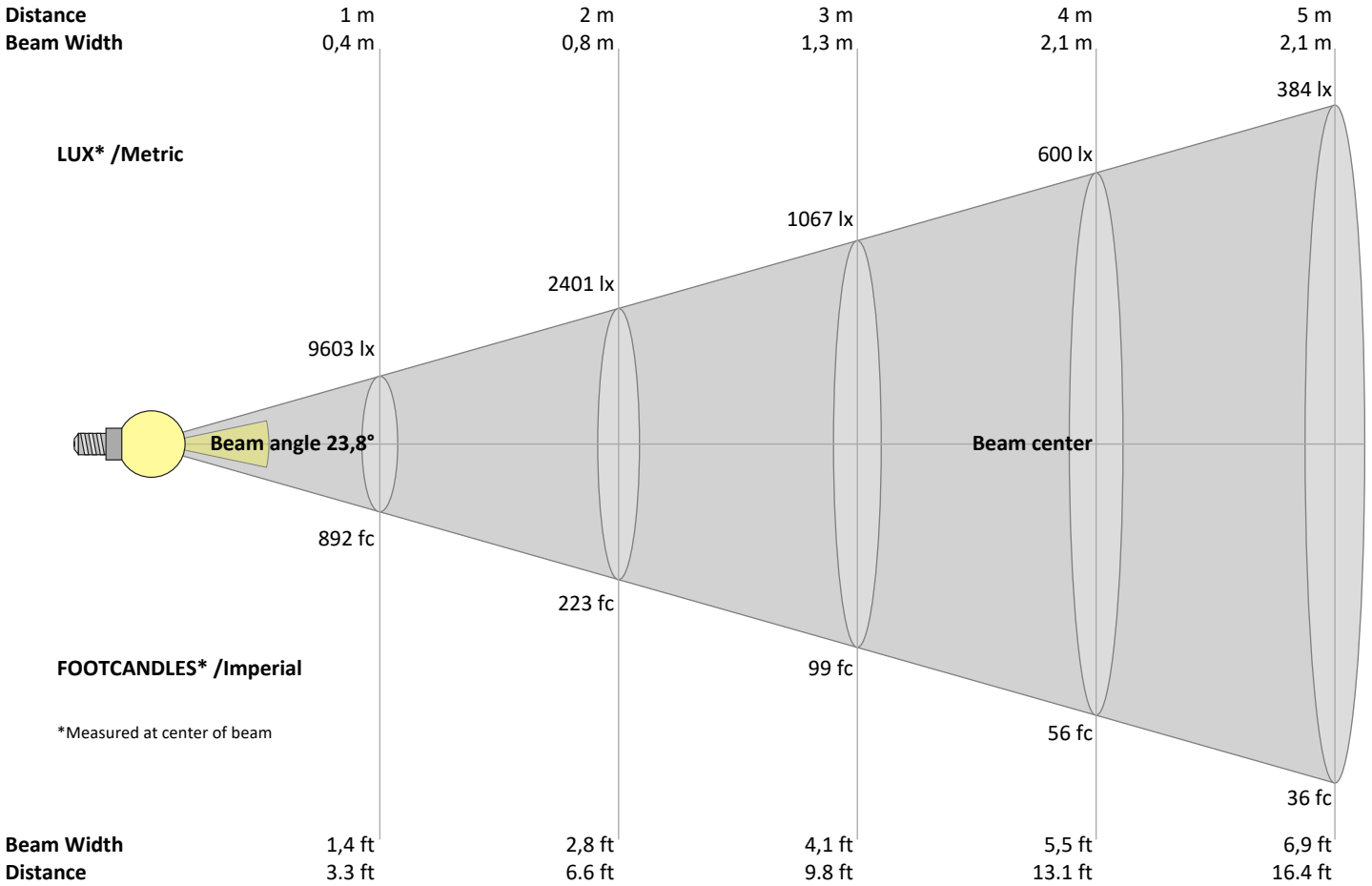
Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](https://www.viso-systems.com/VT250707-002764)

Operator:



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
9603	2401	1067	600	384	267	196	150	119	96	79	67	57	49	43	38	33	30	27	24	lux
892,1	223	99,1	55,8	35,7	24,8	18,2	13,9	11	8,9	7,4	6,2	5,3	4,6	4	3,5	3,1	2,8	2,5	2,2	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
9603	9097	8499	7762	6758	5754	4749	3743	2843	2145	1447	1071	753	506	390	274	218	172	136	116	cd
100%	95%	89%	81%	70%	60%	49%	39%	30%	22%	15%	11%	8%	5%	4%	3%	2%	2%	1%	1%	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
9603	9097	8499	7762	6758	5754	4749	3743	2843	2145	1447	1071	753	506	390	274	218	172	136	116	cd
100%	95%	89%	81%	70%	60%	49%	39%	30%	22%	15%	11%	8%	5%	4%	3%	2%	2%	1%	1%	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
9603	9097	8499	7762	6758	5754	4749	3743	2843	2145	1447	1071	753	506	390	274	218	172	136	116	cd
100%	95%	89%	81%	70%	60%	49%	39%	30%	22%	15%	11%	8%	5%	4%	3%	2%	2%	1%	1%	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
9603	9097	8499	7762	6758	5754	4749	3743	2843	2145	1447	1071	753	506	390	274	218	172	136	116	cd
100%	95%	89%	81%	70%	60%	49%	39%	30%	22%	15%	11%	8%	5%	4%	3%	2%	2%	1%	1%	of 0°val

Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](https://www.viso-systems.com/VT250707-002764)

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

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

S = 1.0H	1,8 / -1,2	1,8 / -1,2
S = 1.5H	3,5 / -2,0	3,5 / -2,0
S = 2.0H	5,0 / -2,7	5,0 / -2,7

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	115	112	110	108	112	110	108	107	106	105	103	103	101	100	99	98	97	96
2	110	107	103	101	108	105	102	99	102	99	97	99	97	95	96	95	93	92
3	107	101	98	94	105	100	97	94	98	95	92	95	93	91	93	91	89	88
4	103	97	93	90	101	96	92	89	94	91	88	92	89	87	90	88	86	85
5	100	93	89	85	98	92	88	85	91	87	84	89	86	84	88	85	83	82
6	96	90	85	82	95	89	85	82	88	84	81	86	83	81	85	82	80	79
7	93	87	82	79	92	86	82	79	85	81	78	84	80	78	83	80	78	76
8	91	84	79	76	90	83	79	76	82	78	76	81	78	75	80	77	75	74
9	88	81	77	74	87	81	76	74	80	76	73	79	76	73	78	75	73	72
10	86	79	74	72	85	78	74	71	78	74	71	77	73	71	76	73	71	70

Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](#)

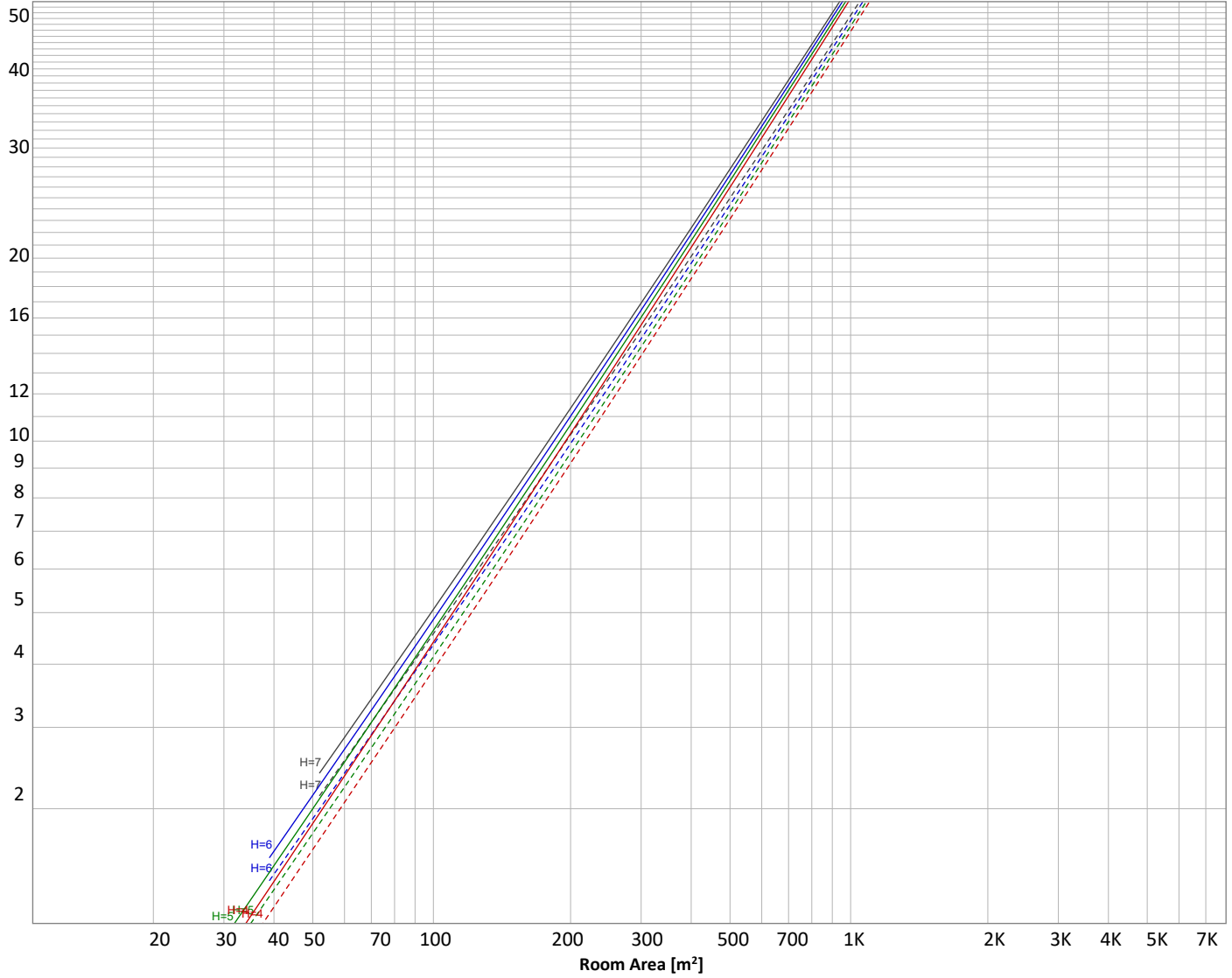
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2102 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°
692 lm	892 lm	308 lm	100 lm	52,8 lm	30,5 lm	16,3 lm	7,98 lm	1,76 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,015 lm	0,001 lm	0,002 lm	0,001 lm	0,026 lm	0,180 lm	0,316 lm	0,260 lm	0,052 lm

Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](#)

Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	692 lm	32,9%
10-20°	892 lm	42,4%
20-30°	308 lm	14,7%
30-40°	100 lm	4,8%
40-50°	53 lm	2,5%
50-60°	31 lm	1,5%
60-70°	16 lm	0,8%
70-80°	8 lm	0,4%
80-90°	2 lm	0,1%
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	2102 lm	100,0%

Intensity peaks

Max intensity	9603 cd
Intensity, 90°	0 cd
Intensity, 0°	9603 cd

Zonal Lumen summary

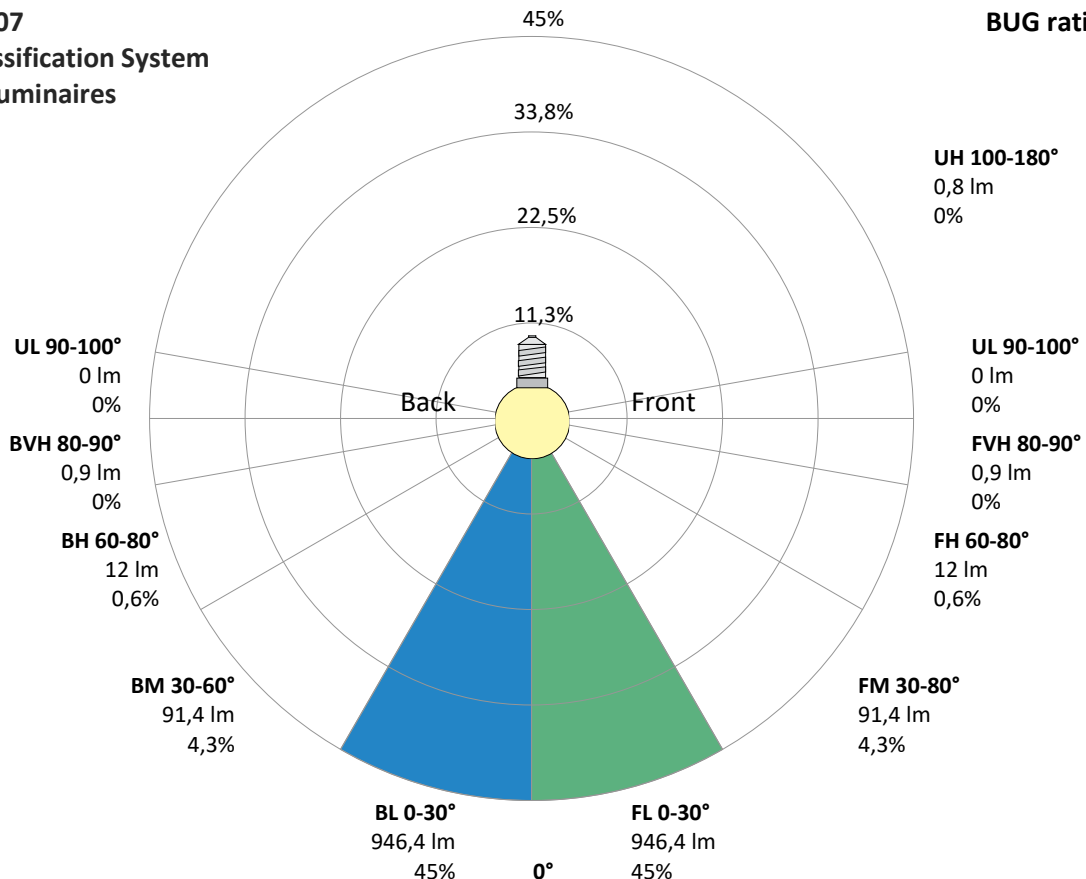
Zone (γ)	Lumen	% Total
0-30°	1892 lm	90,0%
0-40°	1992 lm	94,8%
0-60°	2075 lm	98,7%
60-90°	26 lm	1,2%
70-100°	10 lm	0,5%
90-120°	0 lm	0,0%
0-90°	2101 lm	100,0%
90-180°	1 lm	0,0%
0-180°	2102 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	946 lm	45,0%
Medium(30-60°)	91 lm	4,3%
High(60-80°)	12 lm	0,6%
Very high(80-90°)	1 lm	0,0%
Back light		
Low(0-30°)	946 lm	45,0%
Medium(30-60°)	91 lm	4,3%
High(60-80°)	12 lm	0,6%
Very high(80-90°)	1 lm	0,0%
Uplight		
Low(90-100°)	0 lm	0,0%
High(100-180°)	1 lm	0,0%

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

BUG rating B2 U1 G0



Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](#)

Operator:

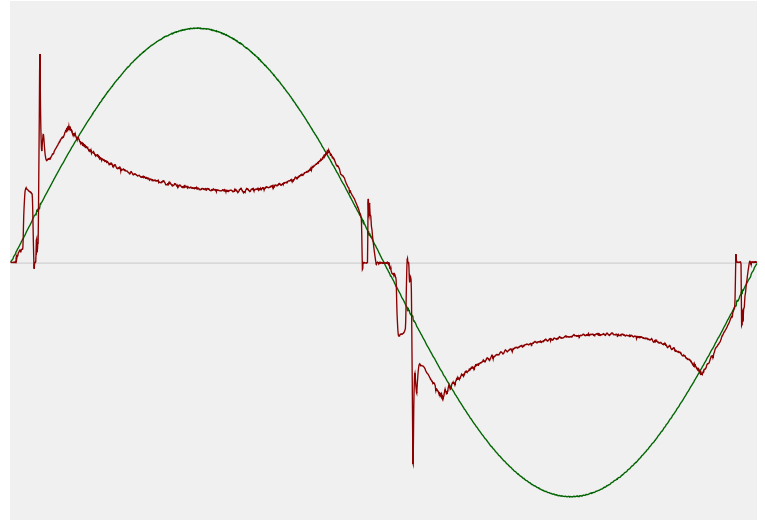


Power Details

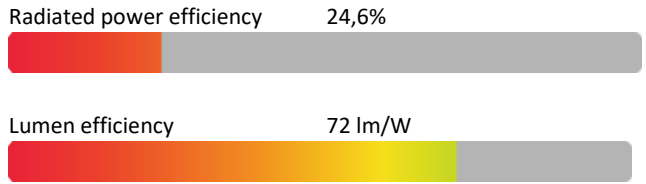
Input Power

Power feed to light source	29,2 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,143 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	32,97 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,88
Total harmonic distortion of the current	48,73%
Total harmonic distortion of the voltage	0,07%

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	3000 K
CCT shift	+0 K
CCT end	3000 K

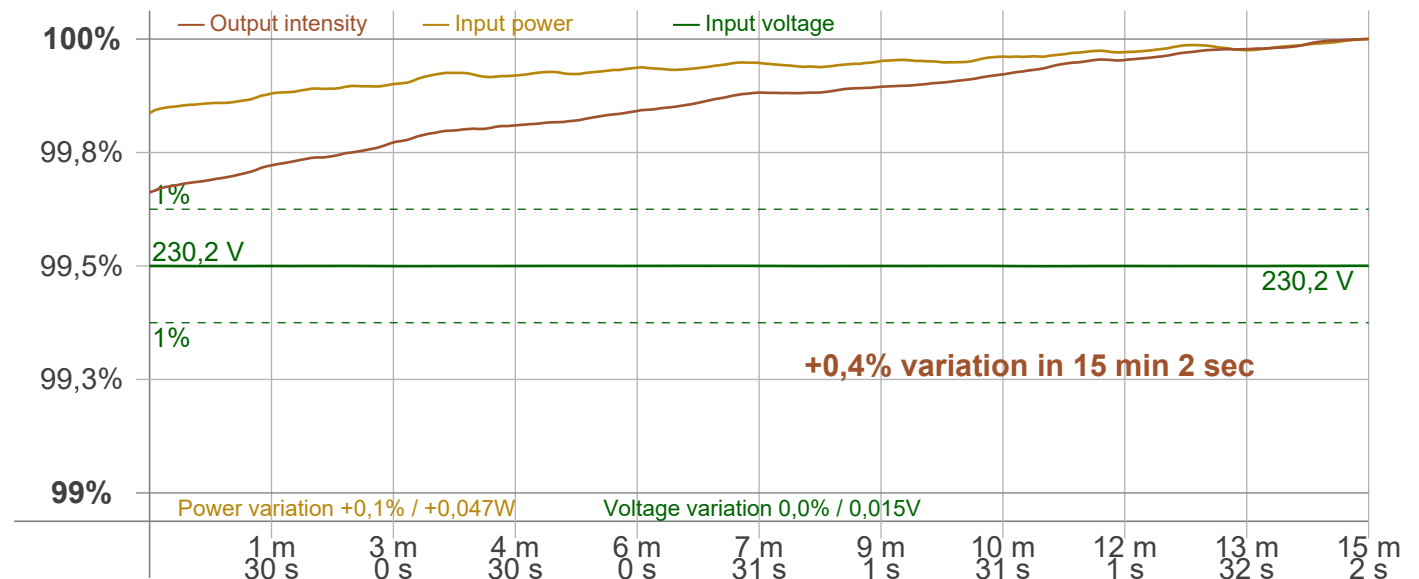
Warmup Result

Total warmup time	Lamp stabilized in 15 min 2 sec
Warmup variation	+0,4%

Output Change

Output start	2095 lm
Output change	+7 lm
Output end	2102 lm

Stabilization Curve



Light Measurement Report

Print date: 7-7-2025

Measurement date and time: 7-7-2025 10:56:30 – Measurement no. VFR-250707-1965-MS

Measurement tracking No. and Link: [VT250707-002764](https://www.viso-systems.com/VT250707-002764)

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 99,5 Hz
 Percent Flicker 0,92 %
 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 0,74 %
 JA8/10 400 Hz 0,91 %
 JA8/10 1000 Hz 0,91 %

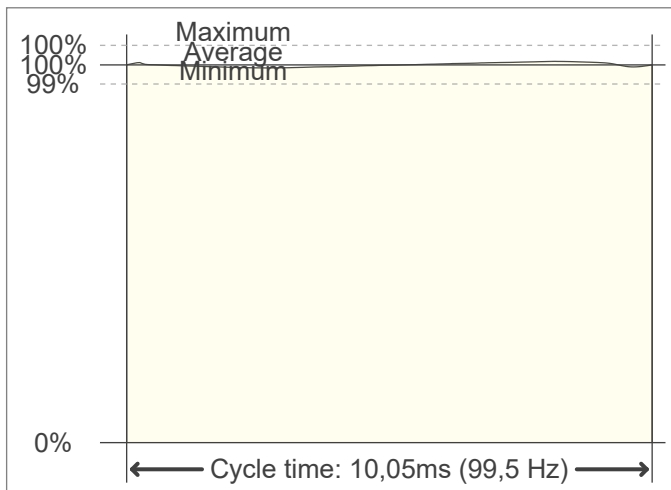
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz) 0,04
 SVM value (80 < F < 2000 Hz) 0,03

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

