

Light Measurement Report

Print date: 7-1-2025
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS
Measurement tracking No. and Link: [VT250107-004332](#)
Operator:



Laboratory and Equipment

Laboratory Owner and Location	Viso Systems, Copenhagen V, Denmark
Goniospectrometer System and Type	LabSpion – Type C, horizontal
Sensor Name, Calibr. Date and Serial No.	LabSensor Model2 – 11-1-2024 – 3130191315
Spectrometer Manufacturer and Model	Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

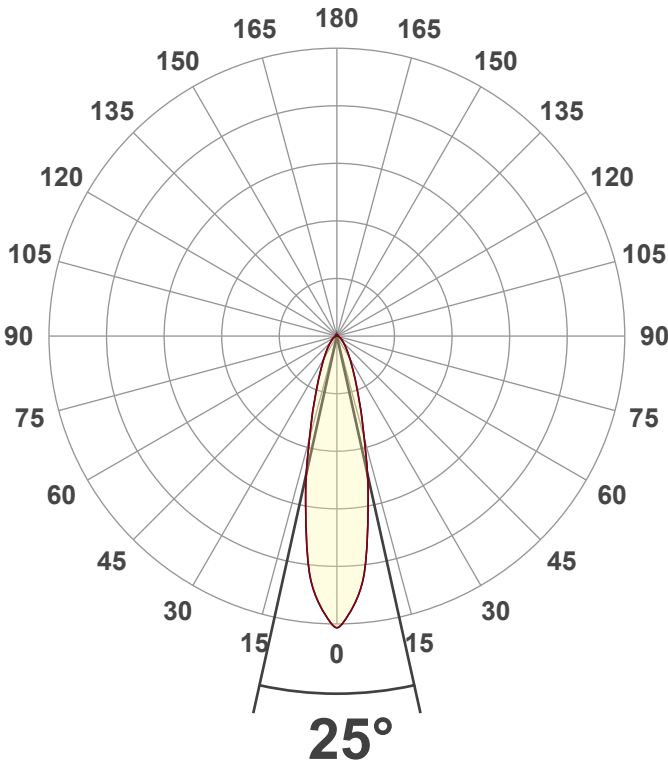
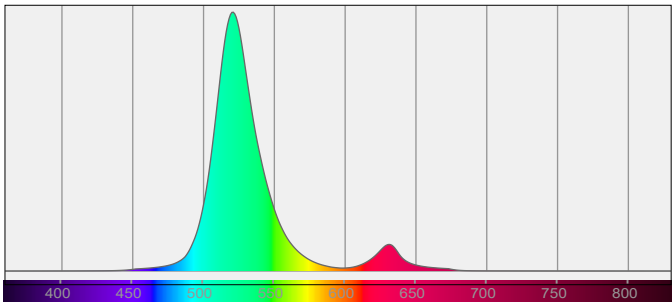
Number of C-planes and Resolution	72 planes – 5°
γ (gamma)-Resolution	5°
Test Distance	2,00 m
Input Power, Power and Displ. Factors	1,8 W – PF 0,39 – DPF 0,99
Input RMS Voltage and Current	230 V – 0,020 A
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Not completed – 2,0%

Tested Light Source

Product Name	FUT103-GROEN
Item No. and Manufacturer	FUT103-GROEN – Dutchfulfillment
Product Description (line 1)	Mi-Light GU10 RGB+CCT 4W

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	77,1 lm – 0,79% / 99,21%
Efficiency	42 lm/W
Peak Intensity and Beam Angle	219 cd – 25°
Correlated Color Temperature, Target/Measured	CCT = 0 K / 0 K
Color Rendering Index	CRI 0,0
Color Rendering TM30-18	R _f 0,0 – R _g 0,0
Color Shift, CIE duv and MacAdam Steps	Duv n/a – SDCM n/a
Flicker	SVM 0 – PstLM 0,02



Light Measurement Report

Print date: 7-1-2025

Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS

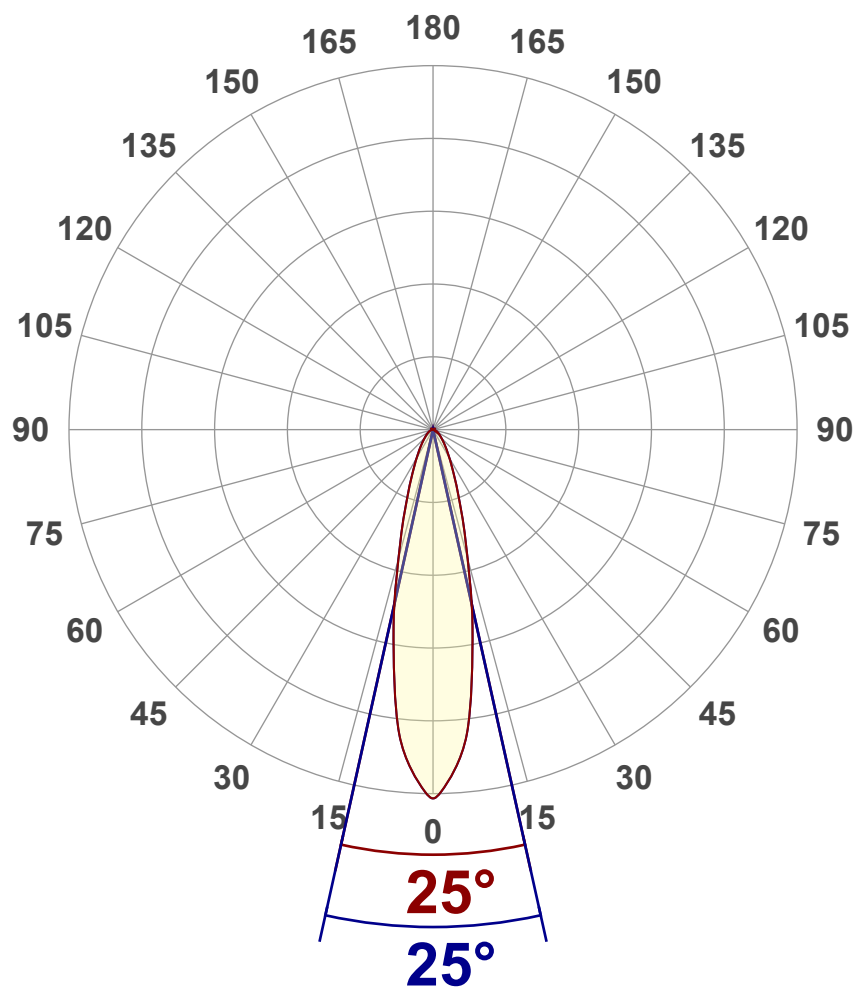
Measurement tracking No. and Link: [VT250107-004332](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	77,1 lm
Lumen Up% / Down%	0,79% / 99,21%
Peak Intensity	219 cd
Beam Angle (50%)	25°
Beam Angle (90%)	25°
Beam Angle (10%)	25°

Cut-off Angle

Average 2,5%	100,1°
--------------	--------

Field Angle

Average 10%	57,9°
-------------	-------

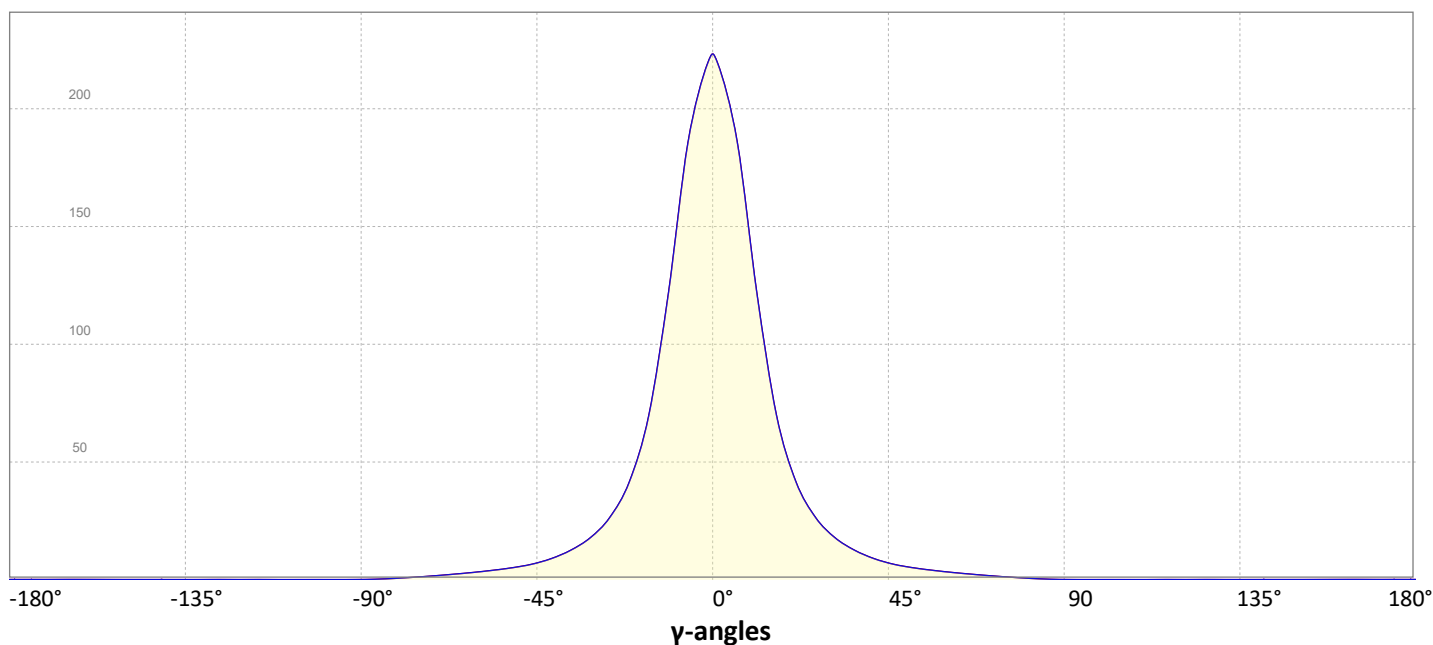
Intensity Ratio

In 120° cone	93,7%
In 90° cone	85,5%

C000-C180

C090-C270

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

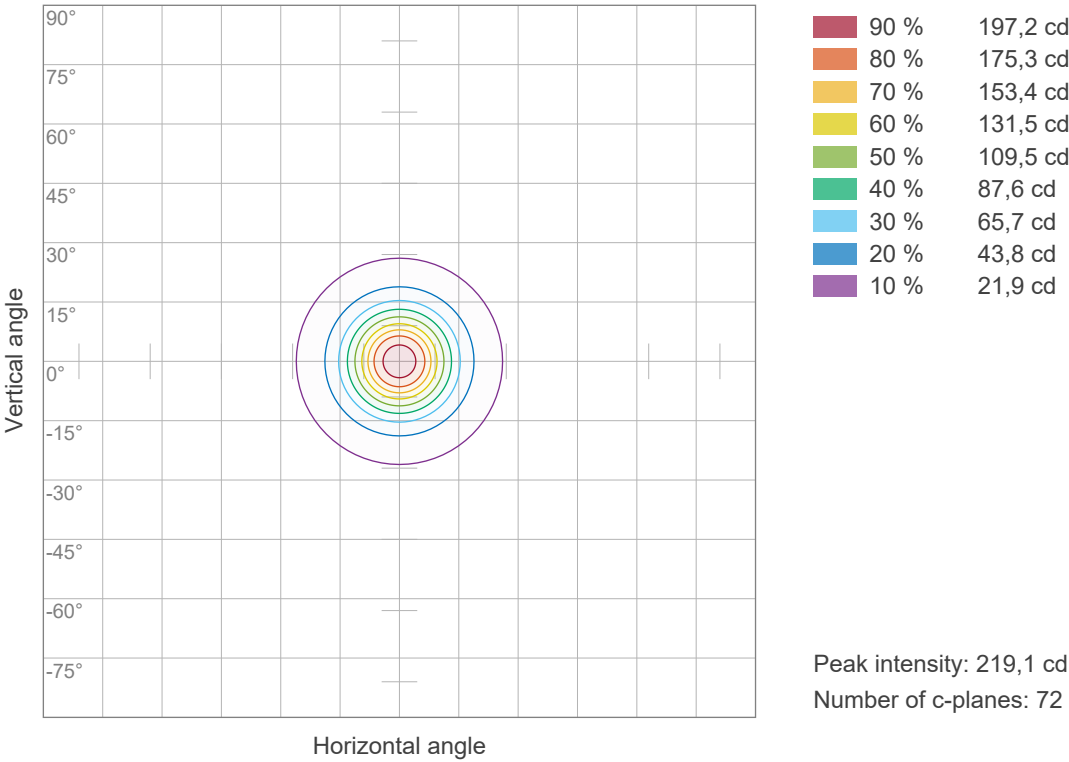


Light Measurement Report

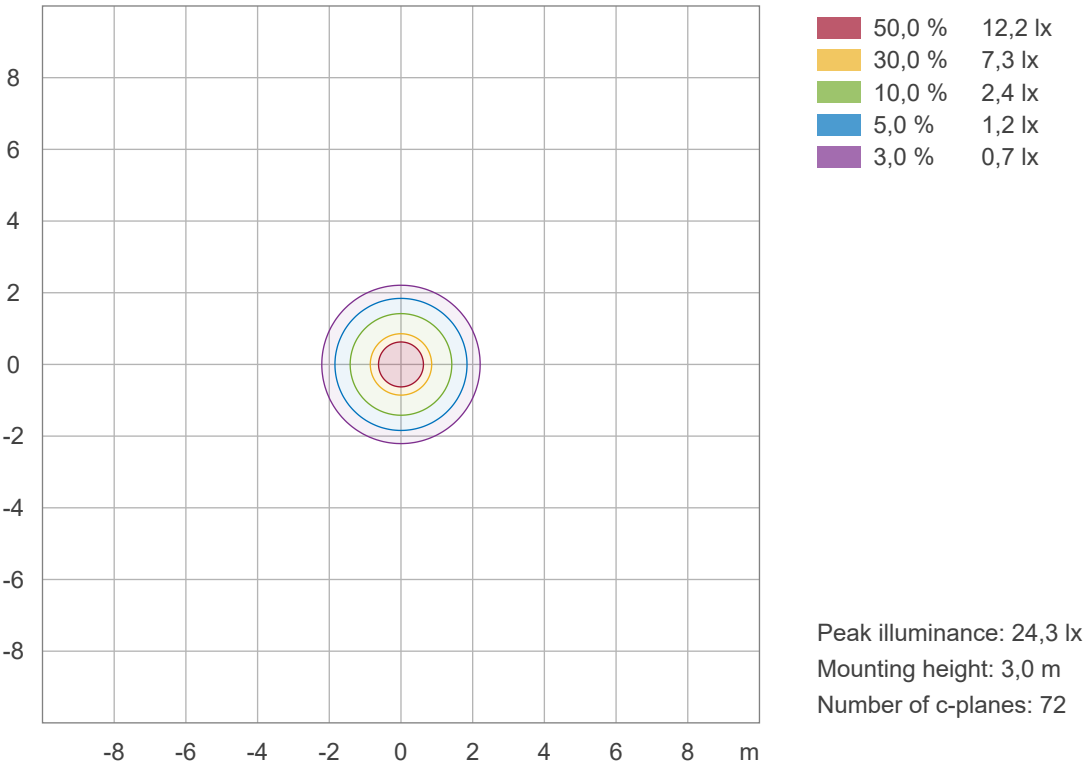
Print date: 7-1-2025
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS
Measurement tracking No. and Link: [VT250107-004332](#)
Operator:



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



Light Measurement Report

Print date: 7-1-2025
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS
Measurement tracking No. and Link: [VT250107-004332](#)
Operator:



Color details

Correlated Color Temperature, Target

Correlated Color Temperature, Measured

Color Rendering Index

Color Rendering Index, R9 (red component)

Color Rendering TM30-18

Color Quality Scale

CCT = 0 K

CCT = 0 K

CRI 0,0

R9 = 0,0

R_f 0,0 – R_g 0,0

CQS = 0,0

MacAdam Steps

Color coordinates CIE 1931

Color coordinate CIEs 1960

Color deviation from BBL

Color coordinate CIEs 1976 (CIELUV)

SDCM = n/a

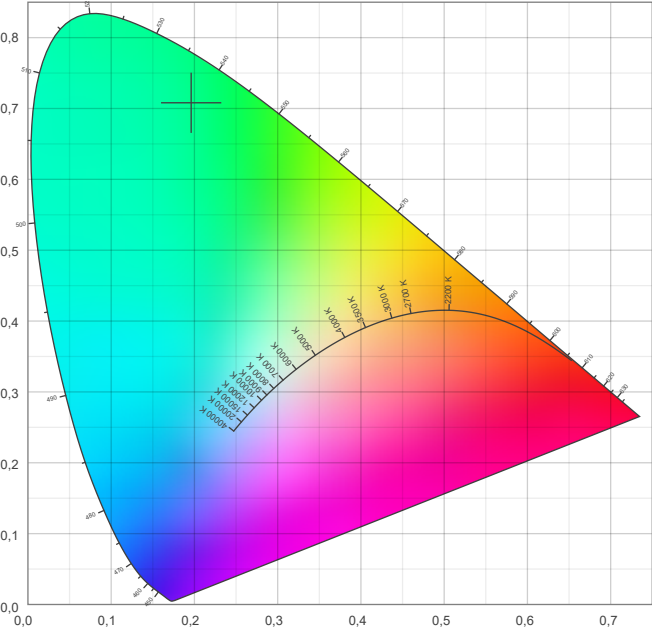
(x;y) = (0,196;0,708)

(u;v) = (0,071;0,383)

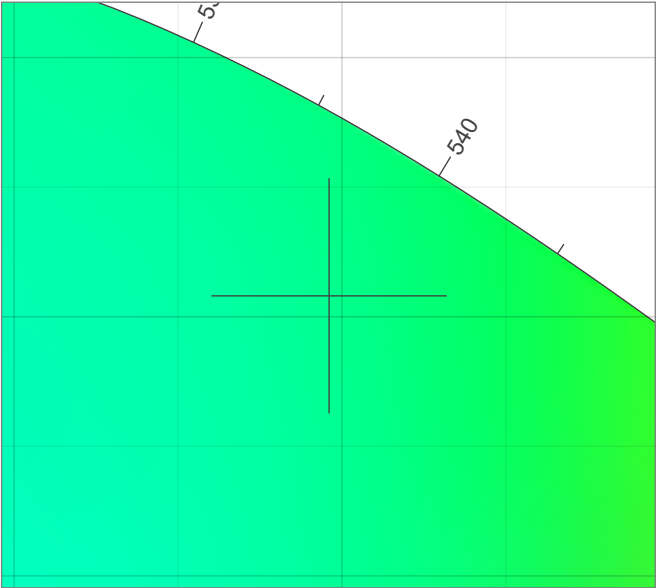
Duv = n/a

(u';v') = (0,071;0,574)

CIE 1931



CIE 1931 – zoomed on Planckian locus



Color Rendering Index per reference color (CIE 1995)

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	

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
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

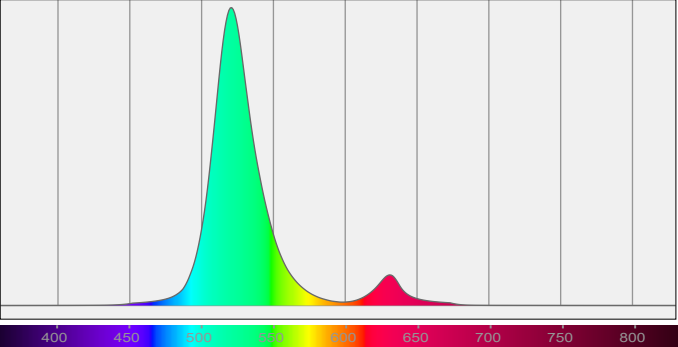
TM30-18 Rf-values per hue bin

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16

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
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

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



Color Quality Scale by reference color

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Light Measurement Report

Print date: 7-1-2025

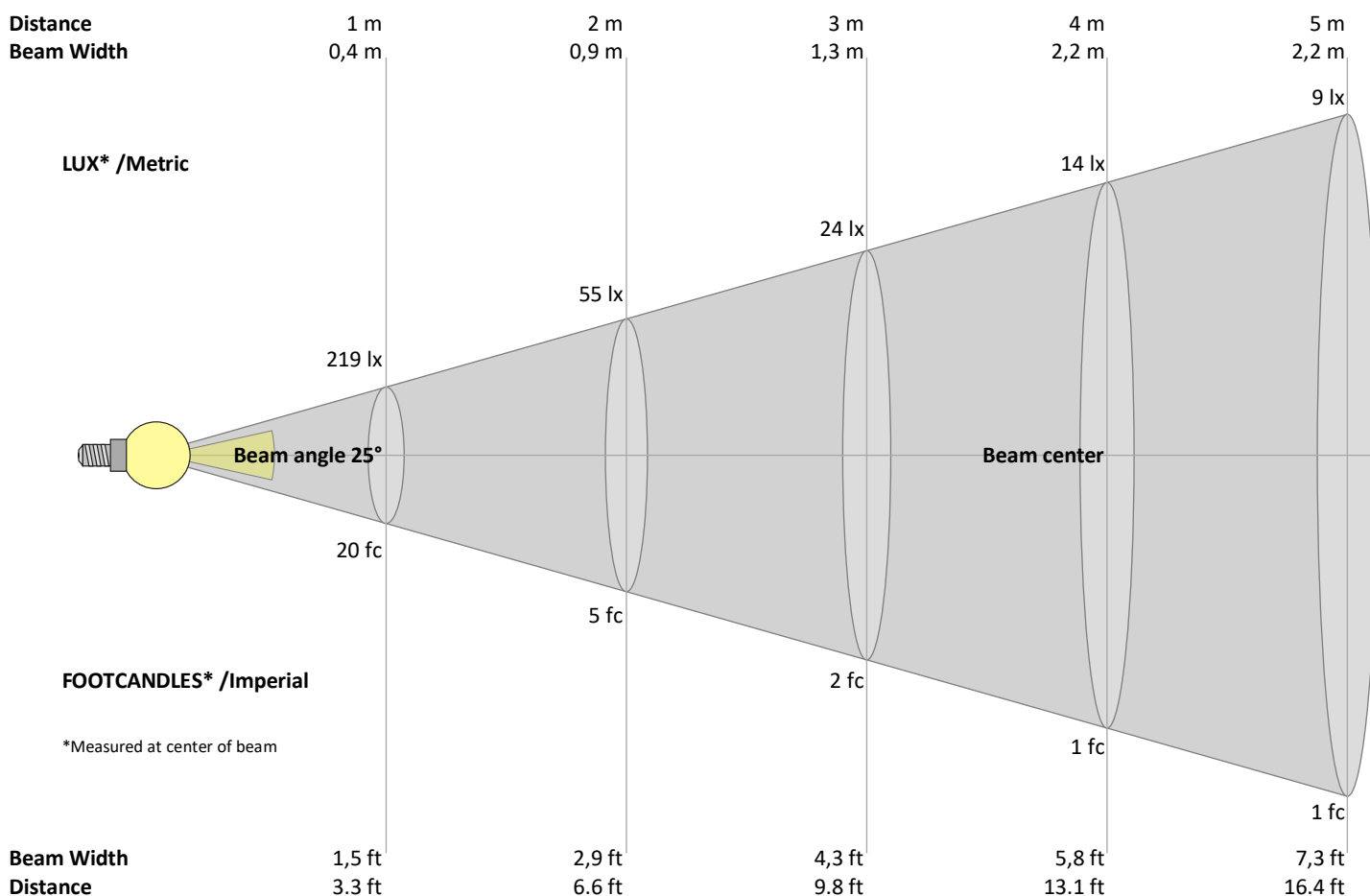
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS

Measurement tracking No. and Link: [VT250107-004332](#)

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
219	55	24	14	9	6	4	3	3	2	2	2	1	1	1	1	1	1	1	1	lux
20,4	5,1	2,3	1,3	0,8	0,6	0,4	0,3	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	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
219	215	201	188	164	139	115	94	73	60	49	40	34	28	24	20	17	15	13	11	cd
100%	98%	92%	86%	75%	63%	52%	43%	33%	28%	22%	18%	15%	13%	11%	9%	8%	7%	6%	5%	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
219	215	201	188	164	139	115	94	73	60	49	40	34	28	24	20	17	15	13	11	cd
100%	98%	92%	86%	75%	63%	52%	43%	33%	28%	22%	18%	15%	13%	11%	9%	8%	7%	6%	5%	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
219	215	201	188	164	139	115	94	73	60	49	40	34	28	24	20	17	15	13	11	cd
100%	98%	92%	86%	75%	63%	52%	43%	33%	28%	22%	18%	15%	13%	11%	9%	8%	7%	6%	5%	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
219	215	201	188	164	139	115	94	73	60	49	40	34	28	24	20	17	15	13	11	cd
100%	98%	92%	86%	75%	63%	52%	43%	33%	28%	22%	18%	15%	13%	11%	9%	8%	7%	6%	5%	of 0°val

Light Measurement Report

Print date: 7-1-2025

Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS

Measurement tracking No. and Link: [VT250107-004332](#)

Operator:



Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances											
	p Ceiling	70	70	50	50	30	70	70	50	50	30
	p Walls	50	30	50	30	30	50	30	50	30	30
	p 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	13,9	14,6	14,1	14,8	15,0	13,9	14,6	14,1	14,8	15,0
	3H	14,5	15,3	14,9	15,5	15,7	14,5	15,3	14,9	15,5	15,7
	4H	14,7	15,5	15,2	15,8	16,0	14,7	15,5	15,2	15,8	16,0
	6H	15,0	15,6	15,3	15,9	16,3	15,0	15,6	15,3	15,9	16,3
	8H	15,0	15,6	15,3	15,9	16,3	15,0	15,6	15,3	15,9	16,3
	12H	15,0	15,6	15,3	15,9	16,4	15,0	15,6	15,3	15,9	16,4
4H	2H	14,1	14,9	14,5	15,1	15,4	14,1	14,9	14,5	15,1	15,4
	3H	15,0	15,6	15,4	16,0	16,4	15,0	15,6	15,4	16,0	16,4
	4H	15,3	15,9	15,7	16,3	16,8	15,3	15,9	15,7	16,3	16,8
	6H	15,5	16,1	16,0	16,4	16,8	15,5	16,1	16,0	16,4	16,8
	8H	15,5	16,1	16,1	16,4	16,8	15,5	16,1	16,1	16,4	16,8
	12H	15,5	16,0	16,1	16,4	16,9	15,5	16,0	16,1	16,4	16,9
8H	4H	15,4	15,9	15,9	16,3	16,7	15,4	15,9	15,9	16,3	16,7
	6H	15,7	16,1	16,2	16,5	17,1	15,7	16,1	16,2	16,5	17,1
	8H	15,8	16,1	16,3	16,6	17,3	15,8	16,1	16,3	16,6	17,3
	12H	15,8	16,1	16,4	16,6	17,2	15,8	16,1	16,4	16,6	17,2
12H	4H	15,3	15,8	15,9	16,2	16,7	15,3	15,8	15,9	16,2	16,7
	6H	15,7	16,0	16,2	16,6	17,2	15,7	16,0	16,2	16,6	17,2
	8H	15,8	16,1	16,4	16,6	17,2	15,8	16,1	16,4	16,6	17,2
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H		0,7 / -0,6					0,7 / -0,6				
S = 1.5H		1,6 / -1,0					1,6 / -1,0				
S = 2.0H		2,7 / -1,6					2,7 / -1,6				

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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	101	101	101	99
1	113	110	107	105	110	108	105	103	103	101	100	99	98	97	96	95	94	92
2	107	102	98	94	105	100	96	93	97	93	91	94	91	89	91	89	87	85
3	102	95	90	86	99	93	89	85	91	87	83	88	85	82	86	83	81	79
4	97	89	83	79	95	88	83	79	85	81	78	83	80	77	81	78	76	74
5	92	84	78	74	90	83	77	73	81	76	73	79	75	72	78	74	71	70
6	88	79	73	69	87	78	73	69	77	72	68	75	71	68	74	70	67	66
7	84	75	69	65	83	75	69	65	73	68	65	72	68	64	71	67	64	63
8	81	72	66	62	80	71	66	62	70	65	62	69	64	61	68	64	61	60
9	78	69	63	59	77	68	63	59	67	62	59	66	62	59	65	61	58	57
10	75	66	60	57	74	65	60	56	64	60	56	64	59	56	63	59	56	55

Light Measurement Report

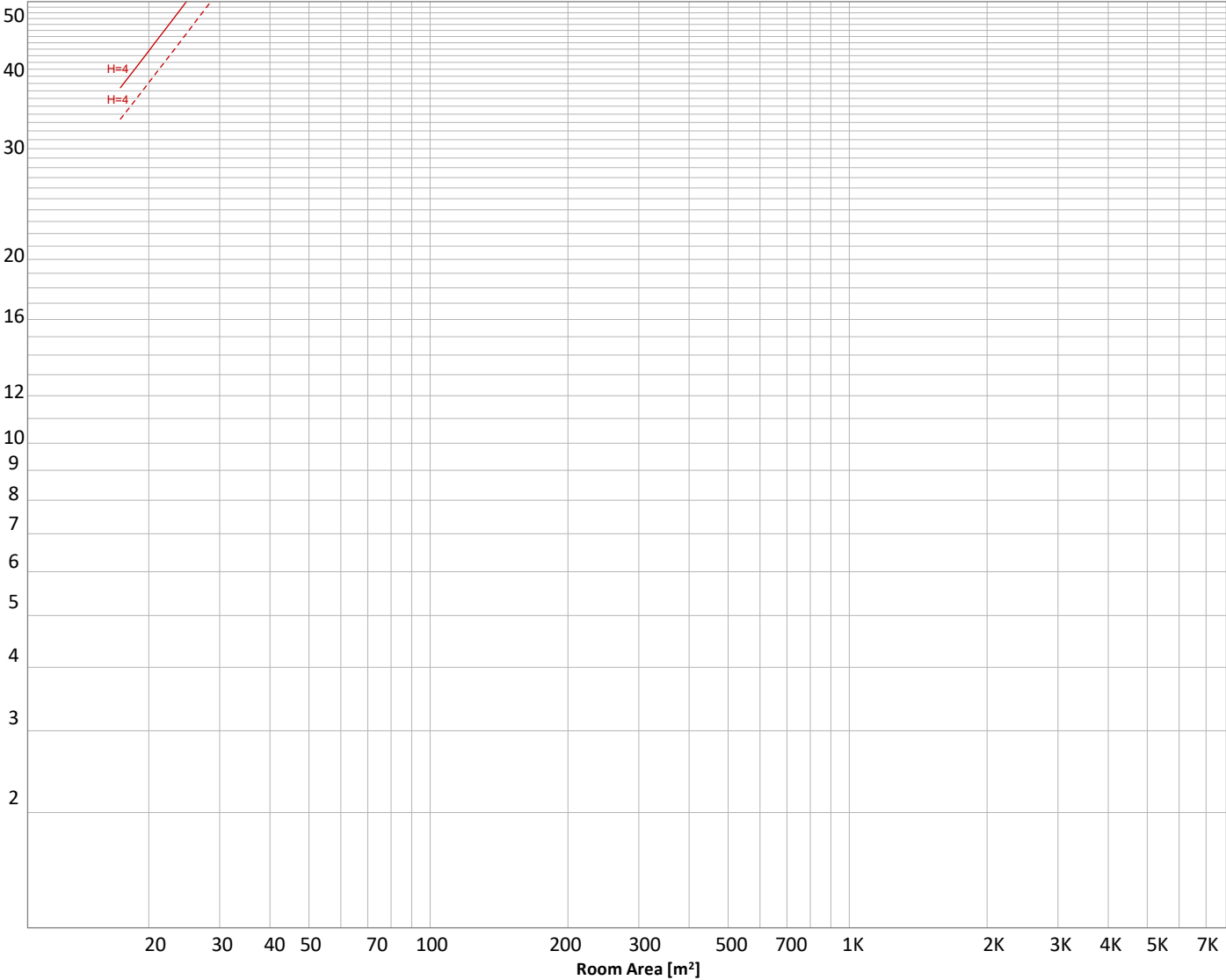
Print date: 7-1-2025
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS
Measurement tracking No. and Link: [VT250107-004332](#)
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 77,1 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
				20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
16,8 lm	23,1 lm	14,1 lm	8,77 lm	5,62 lm	3,85 lm	2,53 lm	1,32 lm	0,380 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,101 lm	0,088 lm	0,096 lm	0,093 lm	0,070 lm	0,061 lm	0,053 lm	0,039 lm	0,012 lm

Light Measurement Report

Print date: 7-1-2025

Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS

Measurement tracking No. and Link: [VT250107-004332](https://vfr-250107-004332)

Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	17 lm	21,8%
10-20°	23 lm	30,0%
20-30°	14 lm	18,3%
30-40°	9 lm	11,4%
40-50°	6 lm	7,3%
50-60°	4 lm	5,0%
60-70°	3 lm	3,3%
70-80°	1 lm	1,7%
80-90°	0 lm	0,5%
90-100°	0 lm	0,1%
100-110°	0 lm	0,1%
110-120°	0 lm	0,1%
120-130°	0 lm	0,1%
130-140°	0 lm	0,1%
140-150°	0 lm	0,1%
150-160°	0 lm	0,1%
160-170°	0 lm	0,1%
170-180°	0 lm	0,0%
Total	77 lm	100,0%

Intensity peaks

Max intensity	219 cd
Intensity, 90°	0 cd
Intensity, 0°	219 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	54 lm	70,1%
0-40°	63 lm	81,4%
0-60°	72 lm	93,7%
60-90°	4 lm	5,5%
70-100°	2 lm	2,3%
90-120°	0 lm	0,4%
0-90°	76 lm	99,2%
90-180°	1 lm	0,8%
0-180°	77 lm	100,0%

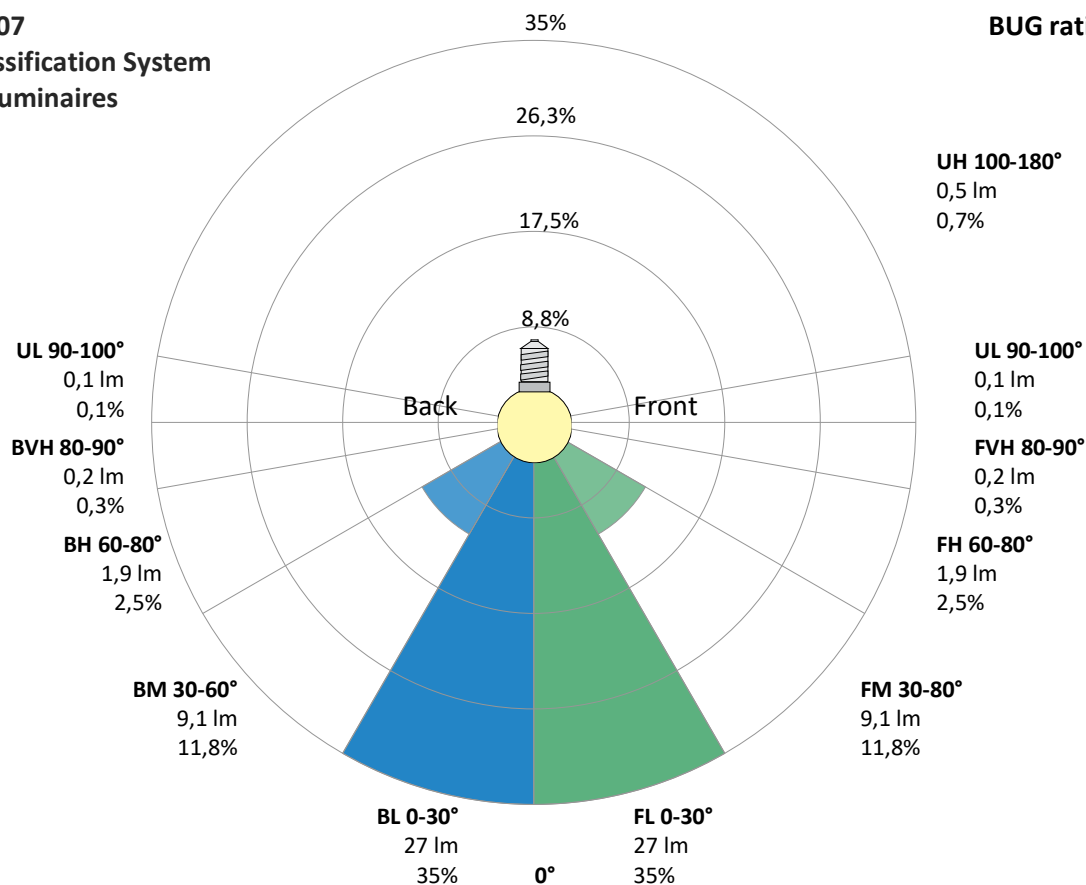
BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	27 lm	35,0%
Medium(30-60°)	9 lm	11,8%
High(60-80°)	2 lm	2,5%
Very high(80-90°)	0 lm	0,3%
Back light		
Low(0-30°)	27 lm	35,0%
Medium(30-60°)	9 lm	11,8%
High(60-80°)	2 lm	2,5%
Very high(80-90°)	0 lm	0,3%
Uplight		
Low(90-100°)	0 lm	0,1%
High(100-180°)	1 lm	0,7%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B0 U1 G0



Light Measurement Report

Print date: 7-1-2025
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS
Measurement tracking No. and Link: [VT250107-004332](#)
Operator:

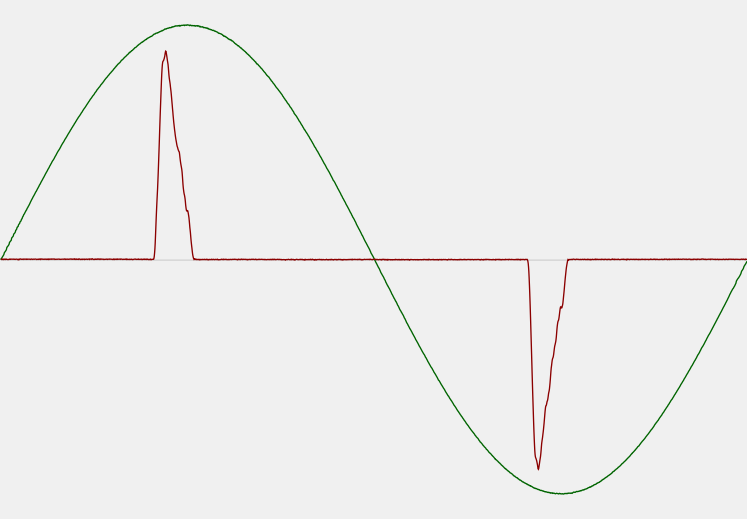


Power Details

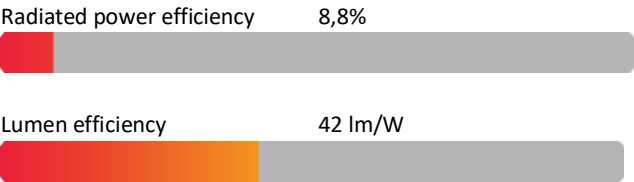
Input Power

Power feed to light source	1,8 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,020 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	4,71 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,39
Total harmonic distortion of the current	228,58%
Total harmonic distortion of the voltage	0,06%

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	0 K
CCT shift	0 K
CCT end	0 K

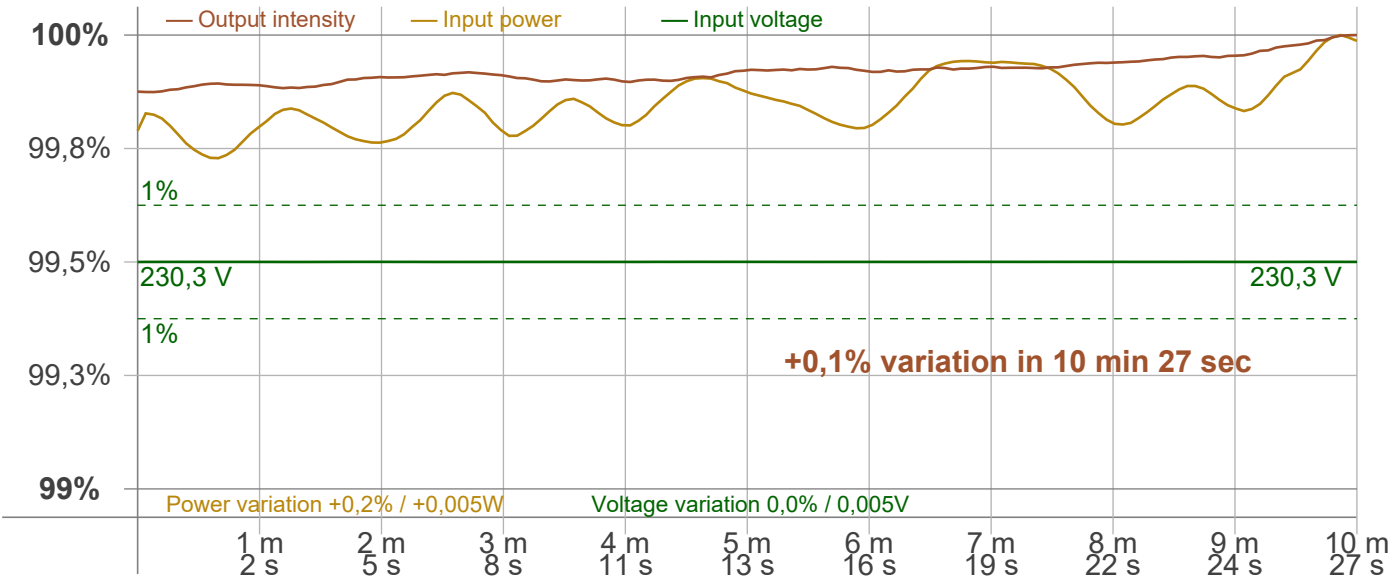
Warmup Result

Total warmup time	Not completed
Warmup variation	+0,1%

Output Change

Output start	77,0 lm
Output change	+0,1 lm
Output end	77,1 lm

Stabilization Curve



Light Measurement Report

Print date: 7-1-2025
Measurement date and time: 7-1-2025 12:00:14 – Measurement no. VFR-250107-2748-MS
Measurement tracking No. and Link: [VT250107-004332](#)
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

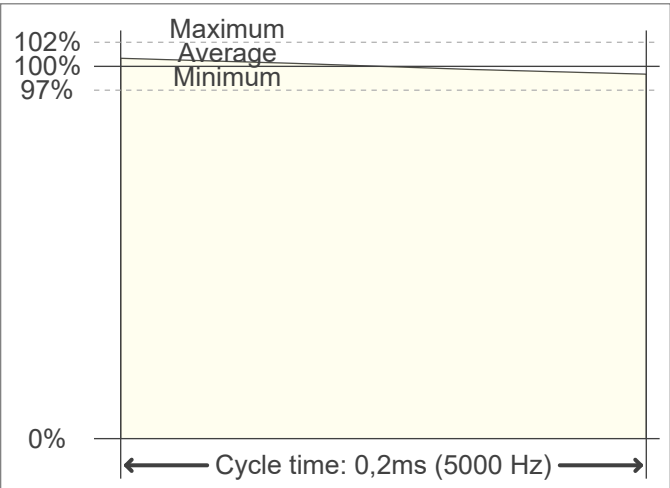
Flicker indices according to Illuminating Engineering Society (IES)
Flicker frequency 5000 Hz
Percent Flicker 3,83 %
Flicker index 0,01

Flicker indices according to California Energy Commission (CEC) 2016b
JA8/10 40 Hz 0,03 %
JA8/10 90 Hz 0,06 %
JA8/10 200 Hz 0,11 %
JA8/10 400 Hz 0,23 %
JA8/10 1000 Hz 0,5 %

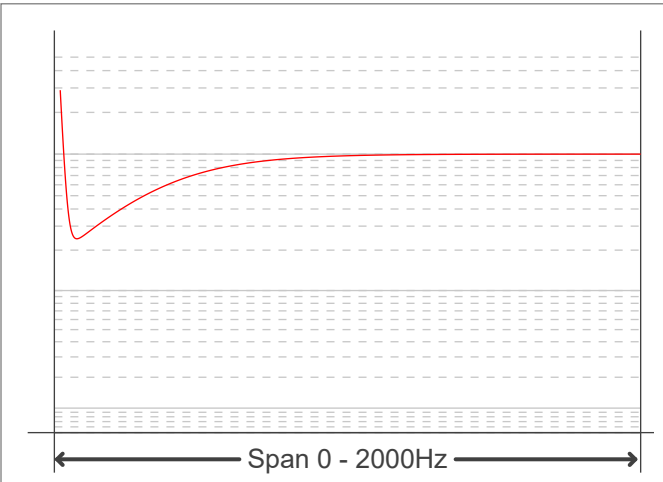
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)
PstLM value (F < 80 Hz) 0,02
SVM value (80 < F < 2000 Hz) 0

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

