

Light Measurement Report

Print date: 1/7/2026

Measurement date and time: 1/7/2026 4:09:03 PM – Measurement no. VFR-260107-0774-MS

Measurement tracking No. and Link: [n/a](#)

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 – 4/8/2025 – 1516006613

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

12 planes – 30°

5°

10.57 m

22.1 W – PF 0.95 – DPF 0.97

121 V – 0.192 A

60 Hz

Not completed – 2.0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

HP1-P-I-4'-V-835-F-BLX2835

HP1-P-I-4'-V-835-F-BLX2835 – Finelite Inc.

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

2782 lm – 0.91% / 99.09%

126 lm/W

1093 cd – 100.2°

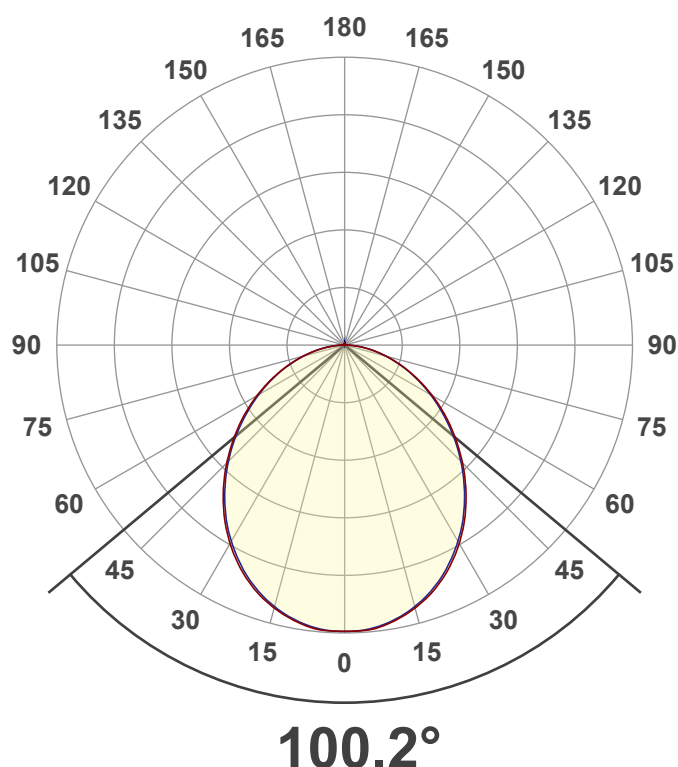
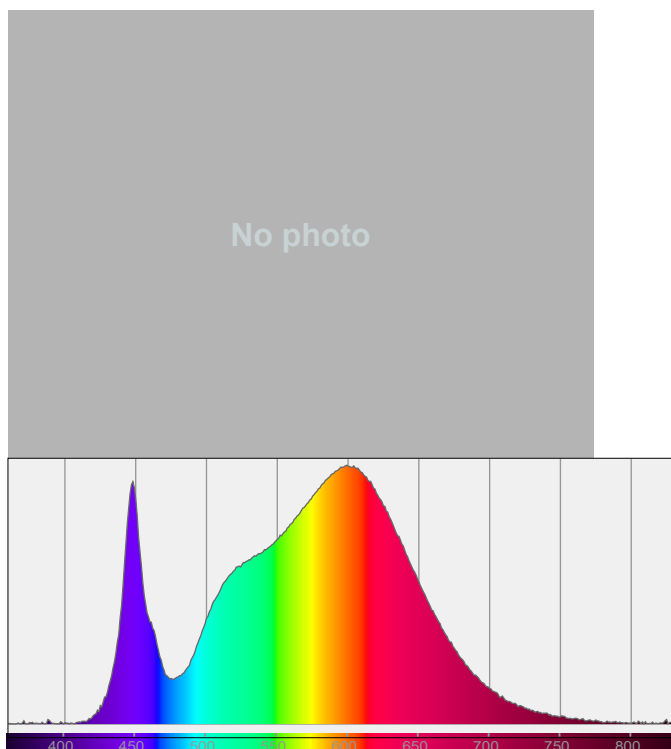
CCT = 3496 K / 3496 K

CRI 82.8

R_f 84.0 – R_g 97.6

Duv 0.0005 – SDCM n/a

SVM n/a – PstLM n/a



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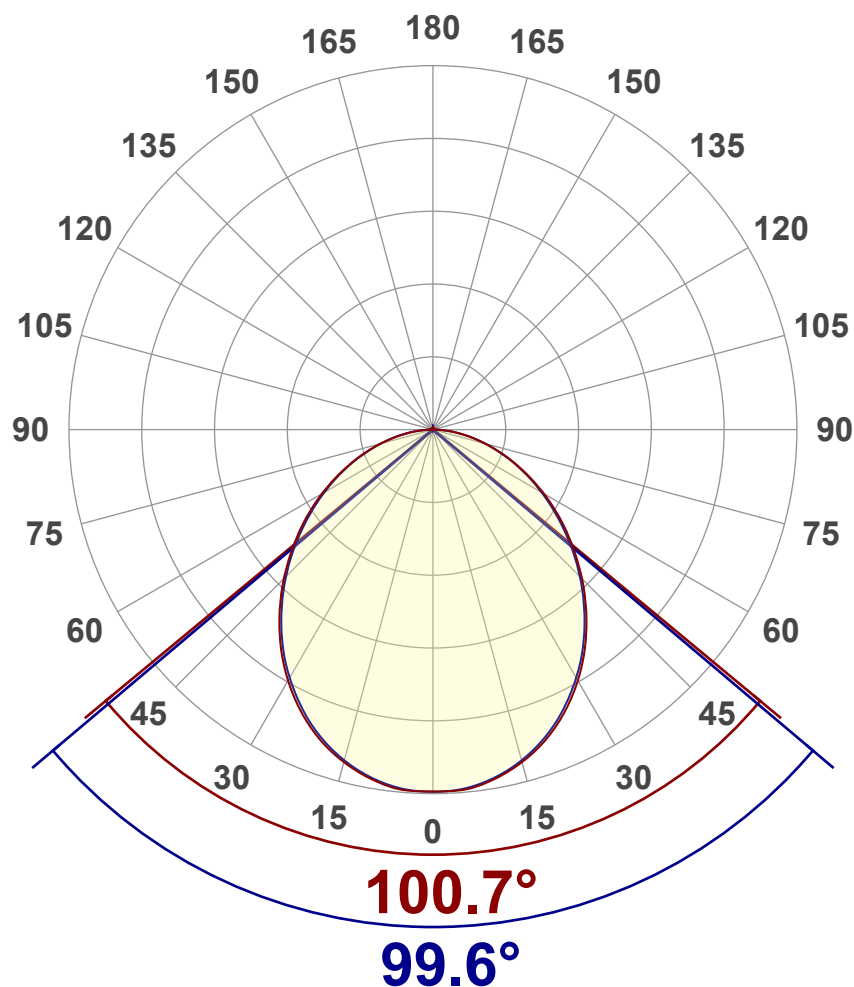
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2782 lm
Lumen Up% / Down%	0.91% / 99.09%
Peak Intensity	1093 cd
Beam Angle (50%)	100.2°
Beam Angle (90%)	99.6°
Beam Angle (10%)	100.7°

Cut-off Angle

Average 2,5%	175.2°
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Field Angle

Average 10%	158.9°
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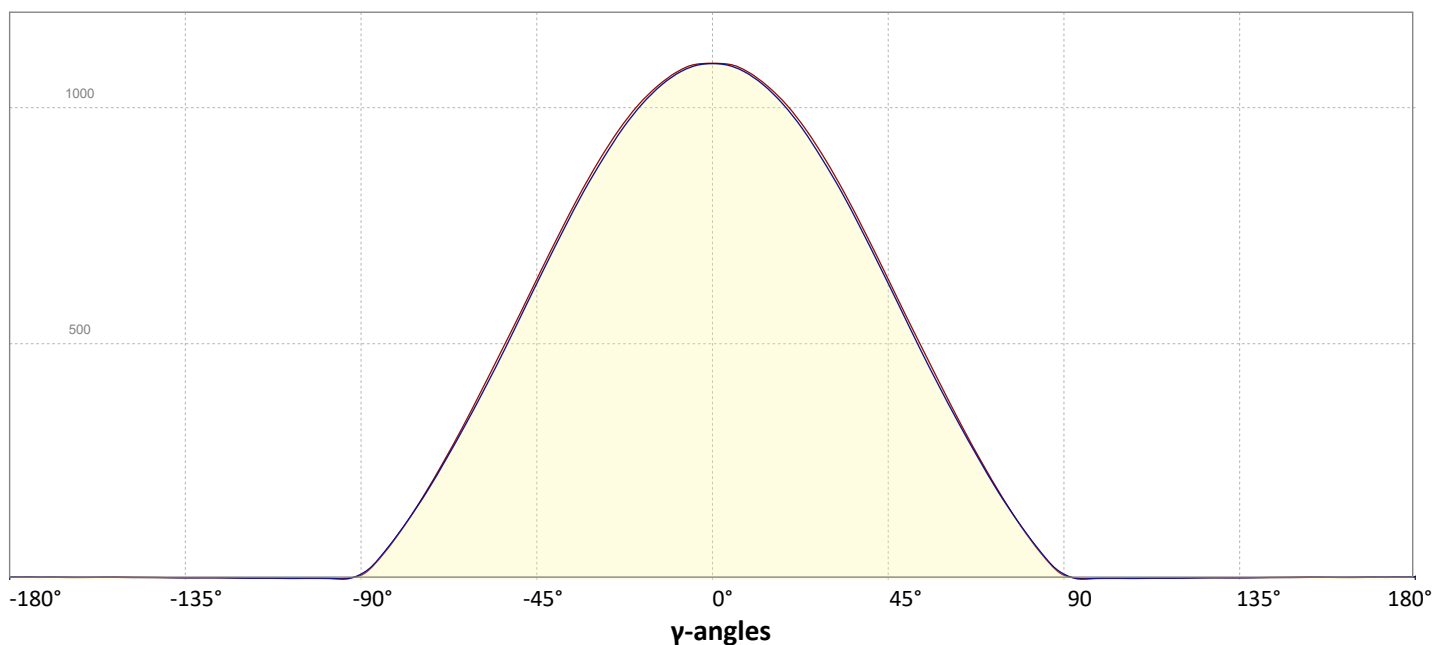
Intensity Ratio

In 120° cone	79.9%
In 90° cone	56.5%

C000-C180

C090-C270

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

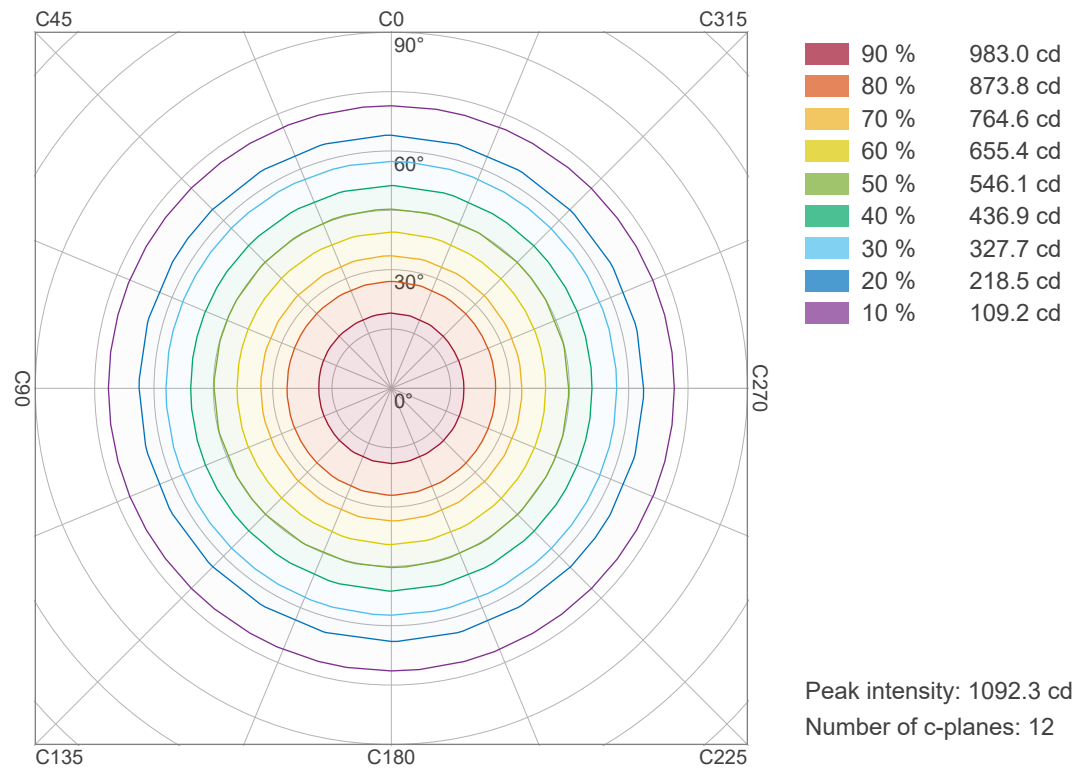


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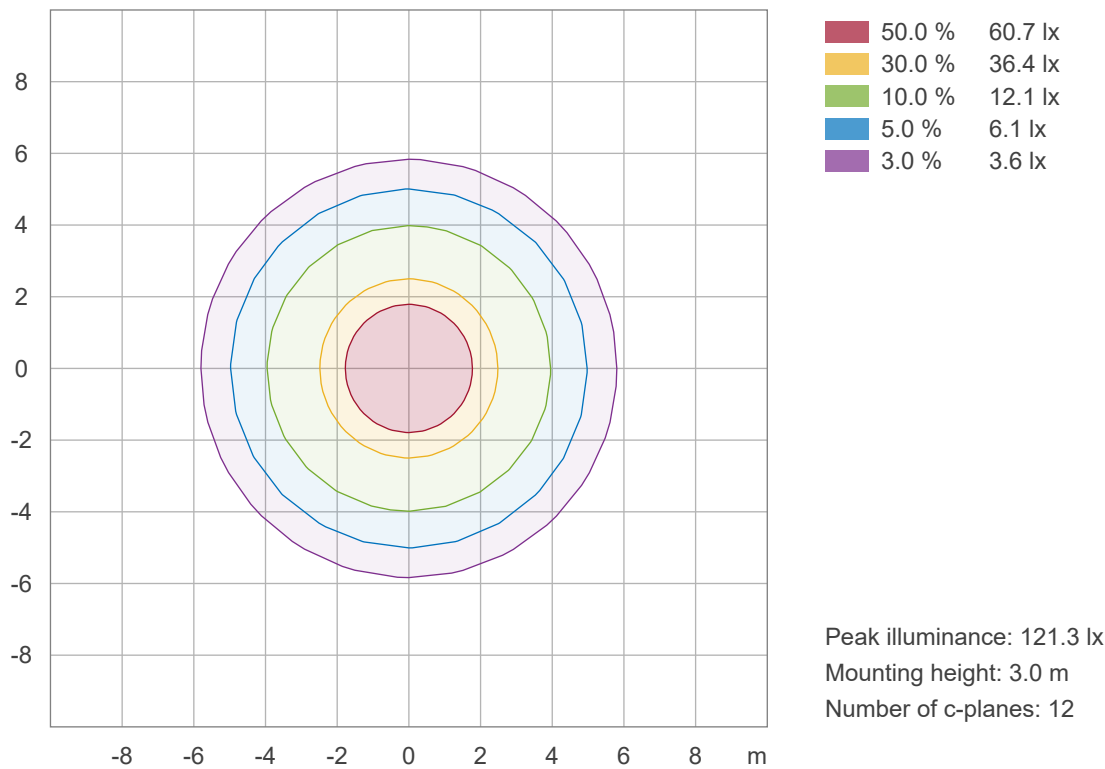
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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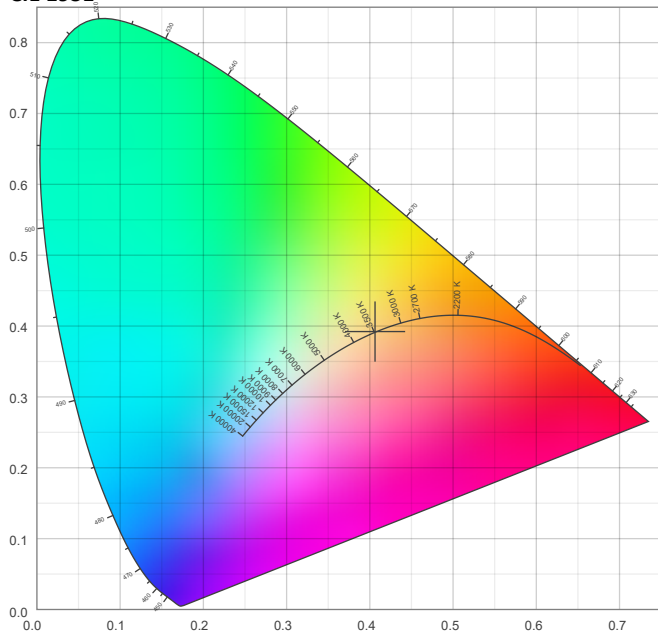


Color details

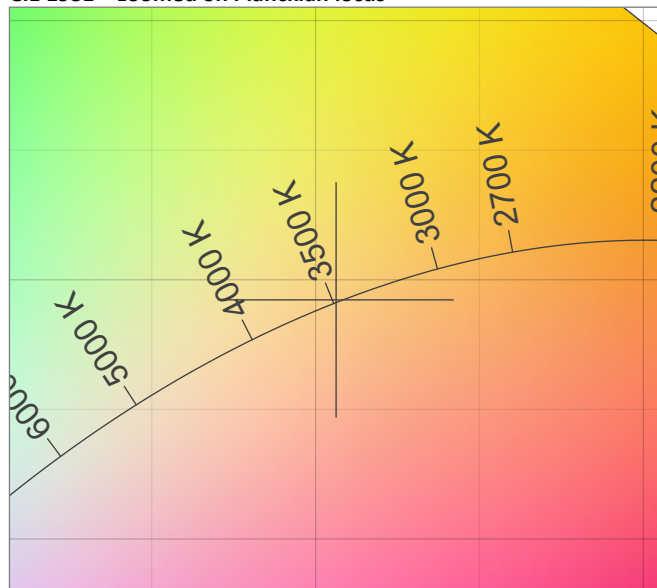
Correlated Color Temperature, Target CCT = 3496 K
Correlated Color Temperature, Measured CCT = 3496 K
Color Rendering Index CRI 82.8
Color Rendering Index, R9 (red component) R9 = 8.9
Color Rendering TM30-18 R_f 84.0 – R_g 97.6
Color Quality Scale CQS = 82.8

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0.406;0.392)
Color coordinate CIEs 1960 (u;v) = (0.236;0.341)
Color deviation from BBL Duv = 0.0005
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0.236;0.512)

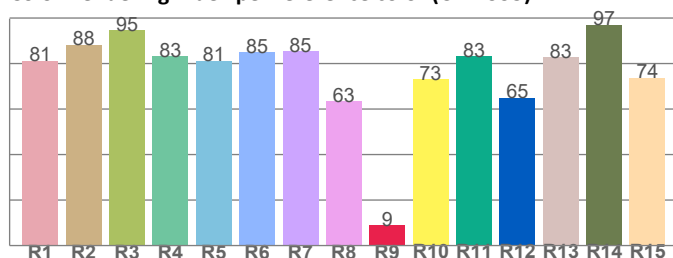
CIE 1931



CIE 1931 – zoomed on Planckian locus



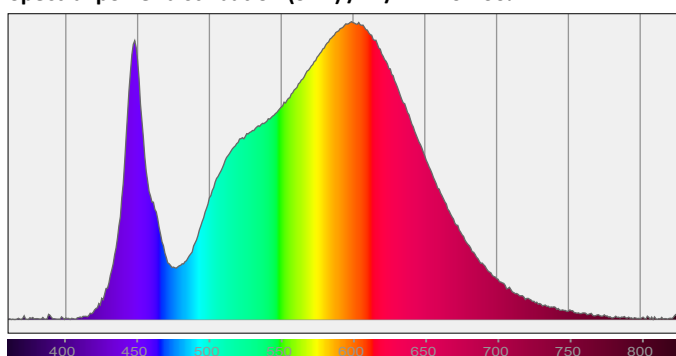
Color Rendering Index per reference color (CIE 1995)



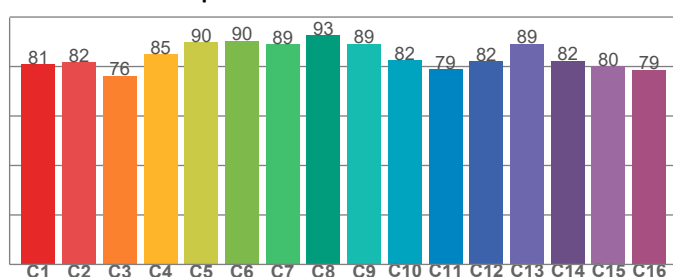
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
81.3	88.3	94.6	83.2	81.3	84.8	85.5	63.5	8.9	73.1	83.2	65.0	82.8	97.0	73.7

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



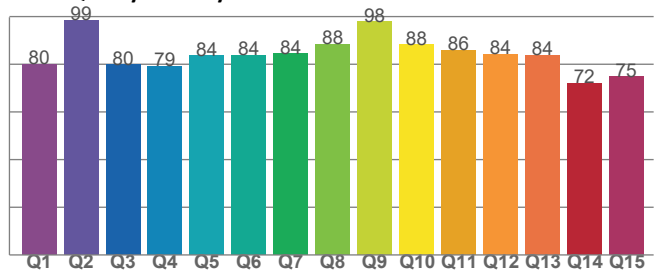
TM30-18 R_f-values per hue bin



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
81.0	81.8	76.3	85.0	89.8	90.5	89.0	92.5	89.2	82.4	79.0	82.1	89.2	82.3	80.1	78.8

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
80.1	98.5	79.7	79.2	83.6	83.8	84.5	88.3	97.9	88.1	85.8	84.3	83.8	71.9	74.8

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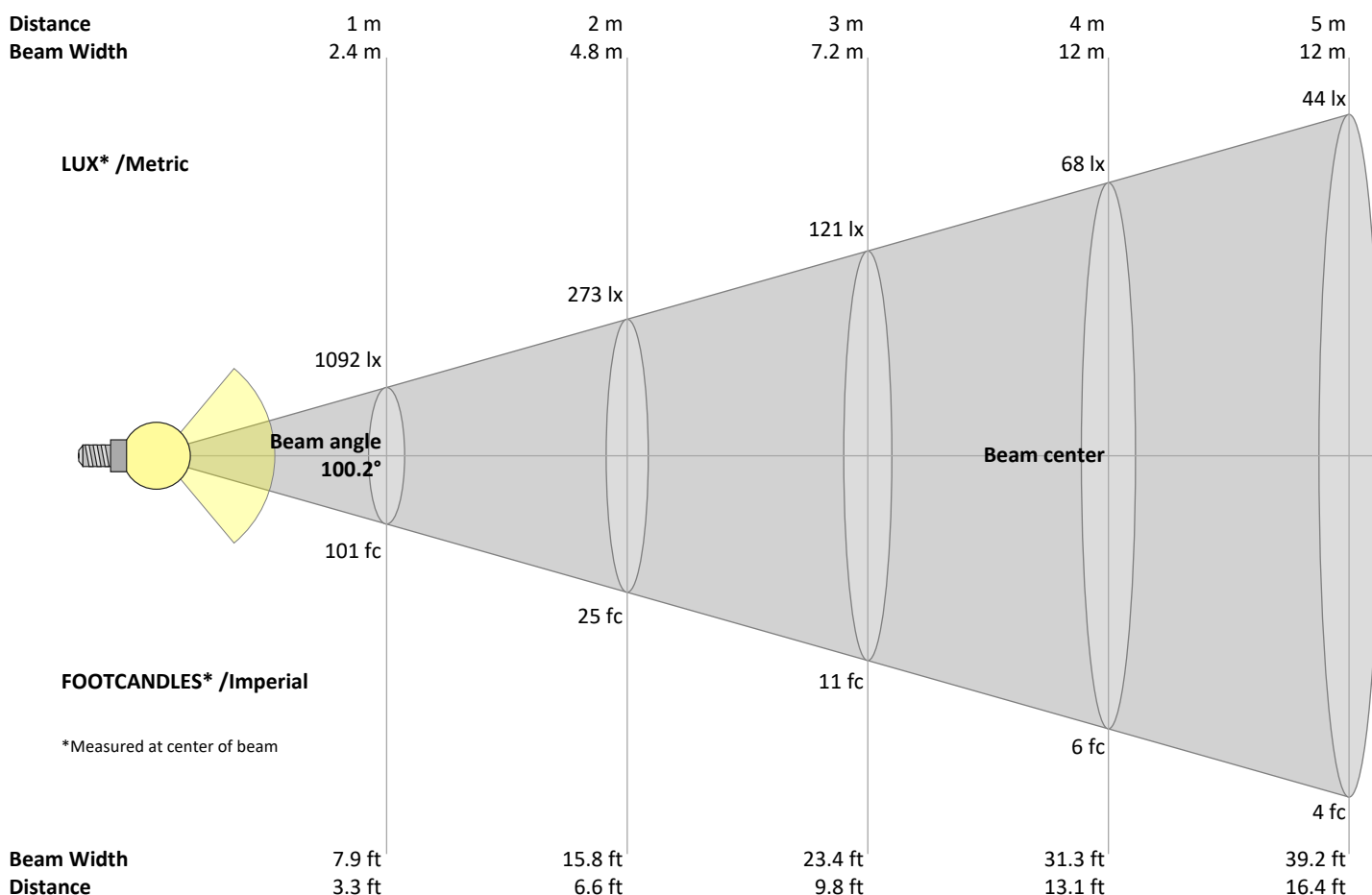
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Beam Details



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
1092	273	121	68	44	30	22	17	13	11	9	8	6	6	5	4	4	3	3	3	lux
101.4	25.4	11.3	6.3	4.1	2.8	2.1	1.6	1.3	1	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	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
1092	1089	1070	1038	995	940	874	800	720	636	552	469	387	308	234	165	102	49	12	3	cd
100%	100%	98%	95%	91%	86%	80%	73%	66%	58%	51%	43%	35%	28%	21%	15%	9%	4%	1%	0%	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
1092	1086	1065	1032	987	930	864	791	710	627	543	459	379	303	230	163	103	51	15	3	cd
100%	99%	98%	95%	90%	85%	79%	72%	65%	57%	50%	42%	35%	28%	21%	15%	9%	5%	1%	0%	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
1092	1089	1070	1038	995	940	874	800	720	636	552	469	387	308	234	165	102	49	12	3	cd
100%	100%	98%	95%	91%	86%	80%	73%	66%	58%	51%	43%	35%	28%	21%	15%	9%	4%	1%	0%	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
1092	1086	1065	1032	987	930	864	791	710	627	543	459	379	303	230	163	103	51	15	3	cd
100%	99%	98%	95%	90%	85%	79%	72%	65%	57%	50%	42%	35%	28%	21%	15%	9%	5%	1%	0%	of 0°val

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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)				
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Variations with the observer position for the luminaire spacings, S:											
	n/a			n/a					n/a		
	n/a			n/a					n/a		
	n/a			n/a					n/a		

UGR data could not be calculated due to missing light source dimensions. Go to Edit -> Photometric -> Dimensions and set the source dimensions.

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	109	104	100	96	106	102	98	94	97	94	91	93	91	88	90	88	86	83
2	99	91	84	79	97	89	83	78	86	80	76	82	78	74	79	75	72	70
3	91	80	72	66	88	79	71	65	76	69	64	73	67	63	70	66	62	60
4	83	72	63	56	81	70	62	56	68	61	55	65	59	54	63	58	53	51
5	77	64	55	49	75	63	55	48	61	53	48	59	52	47	57	51	47	45
6	71	58	49	43	69	57	49	43	55	48	42	53	47	42	52	46	41	39
7	66	53	44	38	64	52	44	38	50	43	37	49	42	37	47	41	37	35
8	61	48	40	34	60	47	39	34	46	39	34	45	38	33	43	38	33	31
9	57	44	36	31	56	44	36	31	42	35	30	41	35	30	40	34	30	28
10	54	41	33	28	53	40	33	28	39	32	28	38	32	28	37	32	27	26

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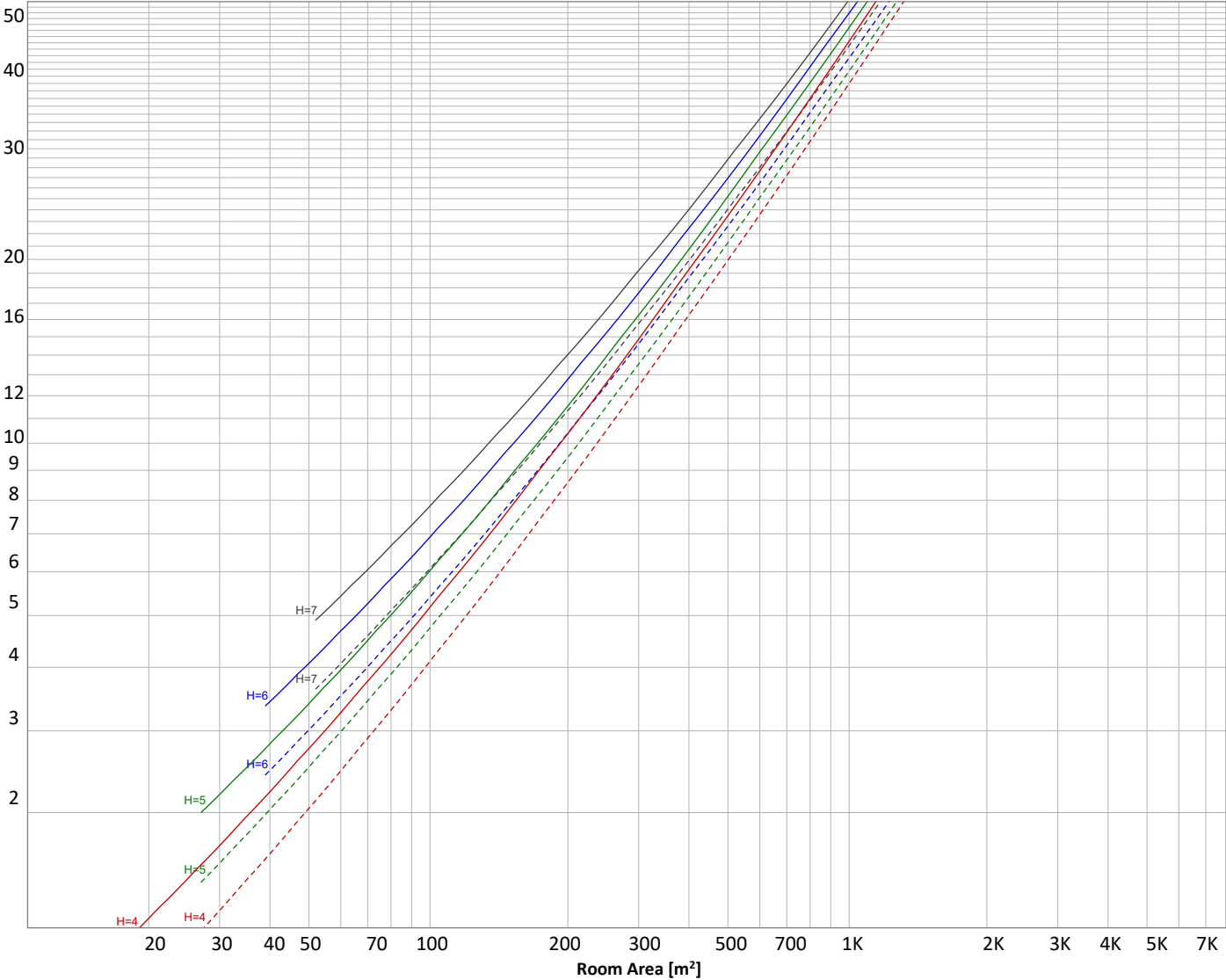
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Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2782 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°
103 lm	292 lm	430 lm	497 lm	487 lm	415 lm	303 lm	174 lm	56.1 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
4.54 lm	3.04 lm	3.39 lm	3.47 lm	3.31 lm	3.01 lm	2.40 lm	1.51 lm	0.524 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	103 lm	3.7%
10-20°	292 lm	10.5%
20-30°	430 lm	15.5%
30-40°	497 lm	17.9%
40-50°	487 lm	17.5%
50-60°	415 lm	14.9%
60-70°	303 lm	10.9%
70-80°	174 lm	6.3%
80-90°	56 lm	2.0%
90-100°	5 lm	0.2%
100-110°	3 lm	0.1%
110-120°	3 lm	0.1%
120-130°	3 lm	0.1%
130-140°	3 lm	0.1%
140-150°	3 lm	0.1%
150-160°	2 lm	0.1%
160-170°	2 lm	0.1%
170-180°	1 lm	0.0%
Total	2782 lm	100.0%

Intensity peaks

Max intensity	1093 cd
Intensity, 90°	12 cd
Intensity, 0°	1092 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	825 lm	29.7%
0-40°	1322 lm	47.5%
0-60°	2224 lm	79.9%
60-90°	533 lm	19.1%
70-100°	235 lm	8.4%
90-120°	11 lm	0.4%
0-90°	2757 lm	99.1%
90-180°	25 lm	0.9%
0-180°	2782 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	412 lm	14.8%
Medium(30-60°)	699 lm	25.1%
High(60-80°)	238 lm	8.6%
Very high(80-90°)	28 lm	1.0%
Back light		
Low(0-30°)	412 lm	14.8%
Medium(30-60°)	699 lm	25.1%
High(60-80°)	238 lm	8.6%
Very high(80-90°)	28 lm	1.0%

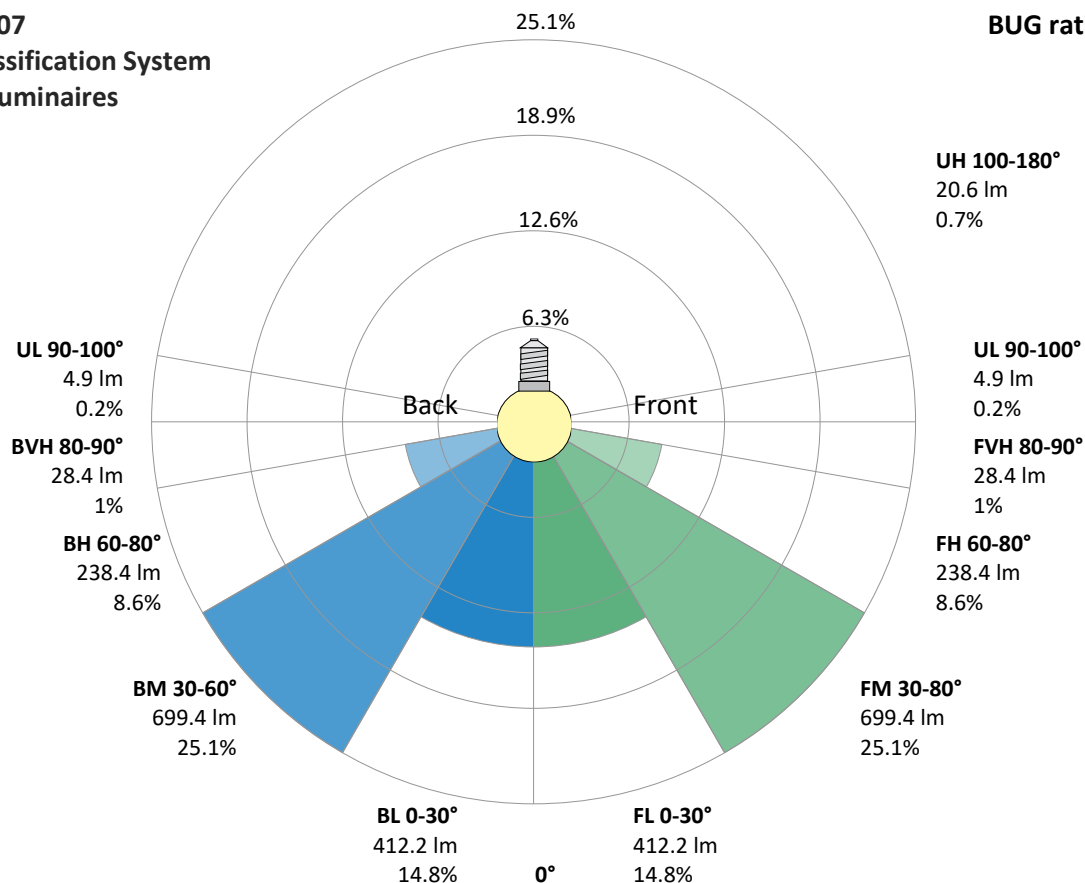
Uplight

Low(90-100°)	5 lm	0.2%
High(100-180°)	21 lm	0.7%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B1 U2 G1



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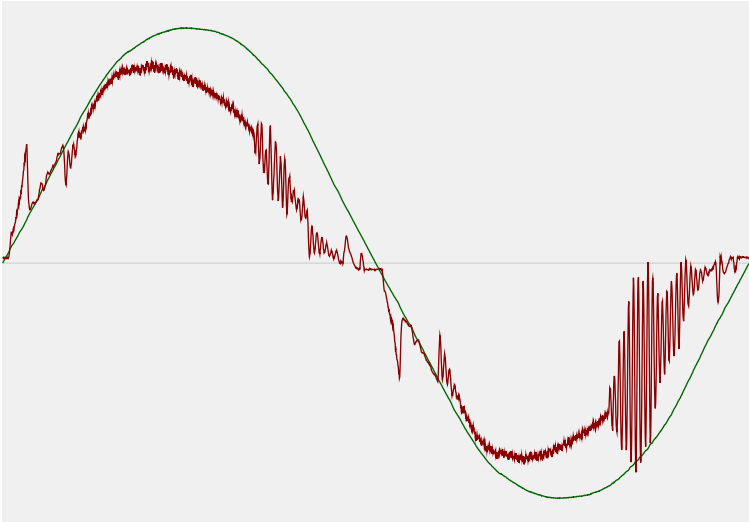


Power Details

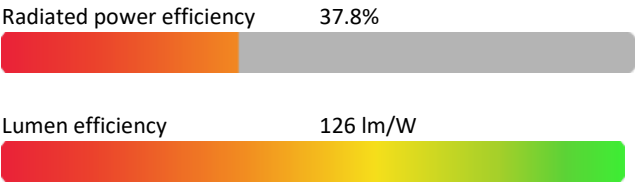
Input Power

Power feed to light source	22.1 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	121 V
RMS Input current feed, I_{RMS}	0.192 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	23.13 VA
Displacement factor of AC power feed	0.97
Power factor of AC current feed	0.95
Total harmonic distortion of the current	12.57%
Total harmonic distortion of the voltage	1.97%

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	3496 K
CCT shift	0 K
CCT end	3496 K

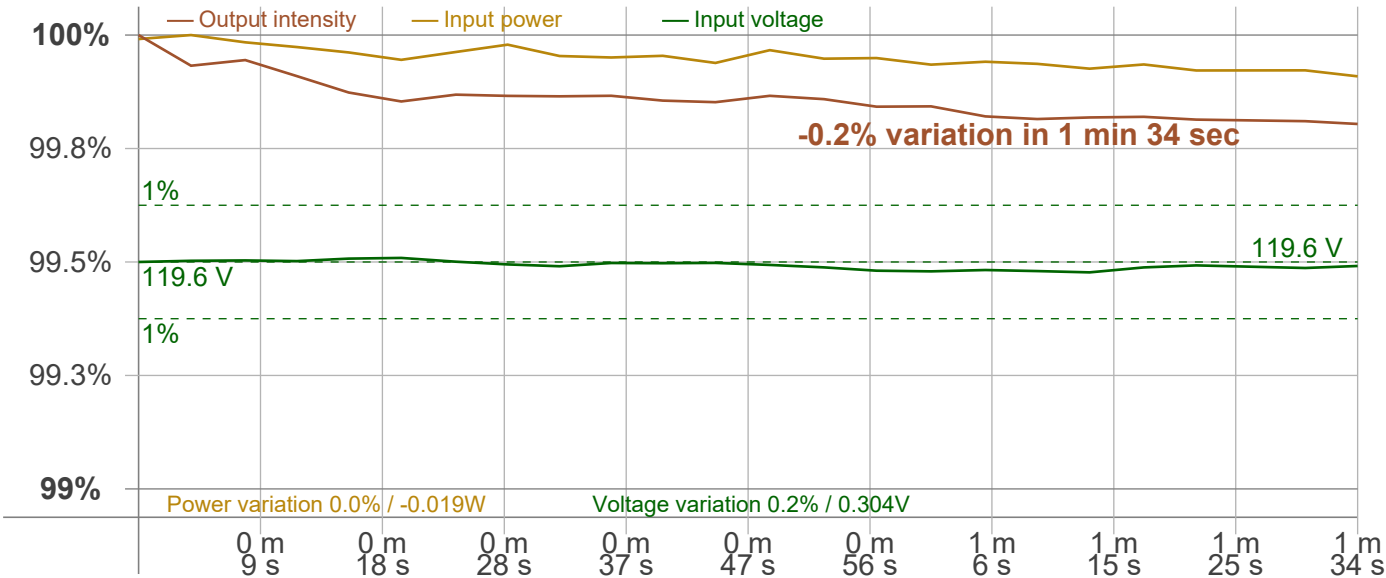
Warmup Result

Total warmup time	Not completed
Warmup variation	-0.2%

Output Change

Output start	2786 lm
Output change	-3 lm
Output end	2782 lm

Stabilization Curve



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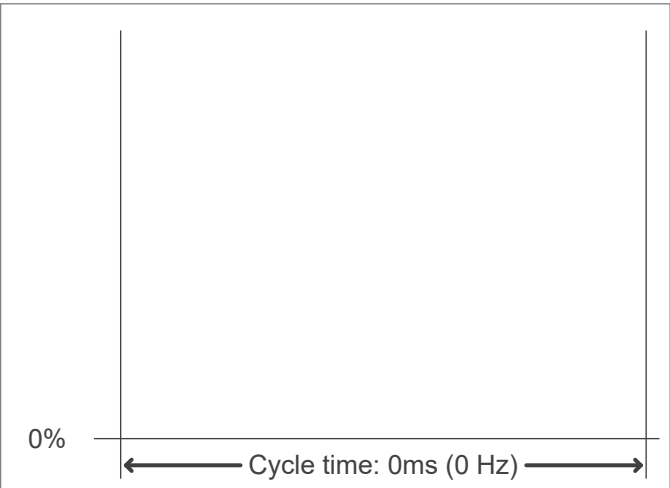
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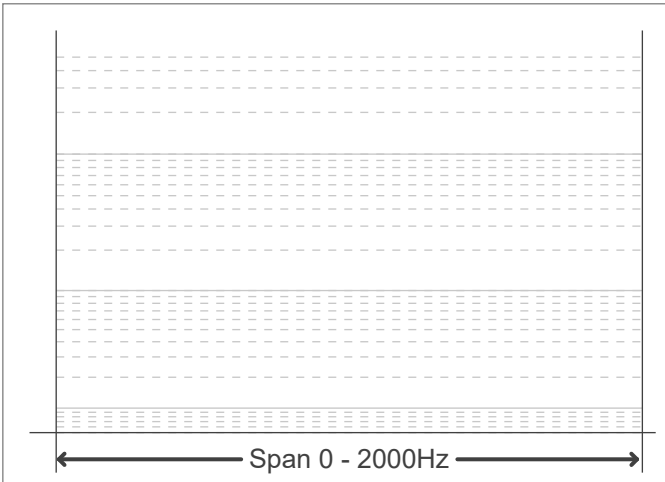
Flicker /TLA details

Flicker Meter Type	Viso Systems LabFlicker	Measurement time	
Frequency of input power	60 Hz	PstLM	180 sec
Flicker/TLA sample rate	n/a samples/s	All other indices	1,2 sec
Flicker indices according to Illuminating Engineering Society (IES)		Flicker indices according to California Energy Commission (CEC) 2016b	
Flicker frequency	n/a Hz	JA8/10 40 Hz	n/a %
Percent Flicker	n/a %	JA8/10 90 Hz	n/a %
Flicker index	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)		Flicker indices according to Lighting Research Center (2015)	
PstLM value (F < 80 Hz)	n/a	Perception metric, Assist Mp	n/a
SVM value (80 < F < 2000 Hz)	n/a		

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

