

# Light Measurement Report

## Laboratory and Equipment

Goniospectrometer System and Type  
Sensor Name, Calibr. Date and Serial No.  
Spectrometer Manufacturer and Model

Viso Systems LabSpion - Type C, horizontal  
Viso Systems LabSensor Model2 - 2022-11-08 - 3230088275  
Ibsen Photonics, Denmark - Freedom VIS (Custom Viso)

## Measurement Conditions

Number of C-planes and Resolution  
 $\gamma$  (gamma)-Resolution  
Test Distance  
Input Power  
Input RMS Voltage  
Frequency of Input Power

4 - 90°  
5°  
2.02 meter / 6.6 feet  
15 W  
120 V  
60 Hz

## Tested Light Source

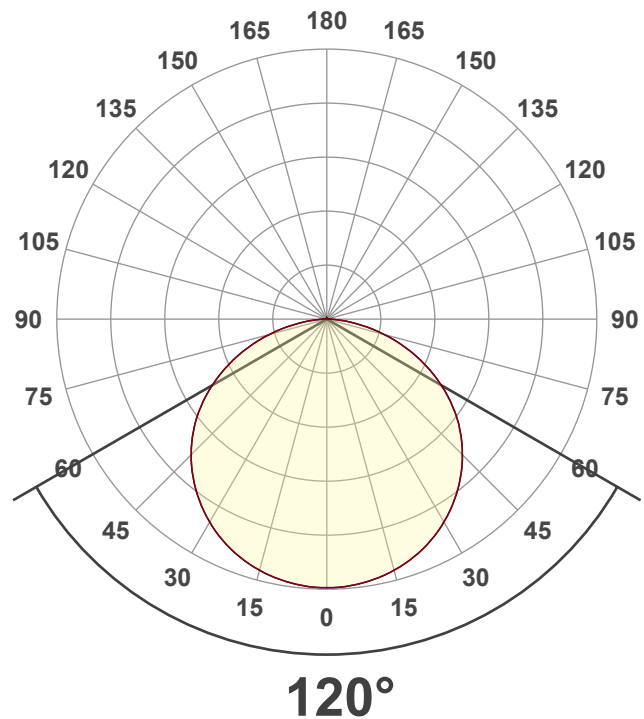
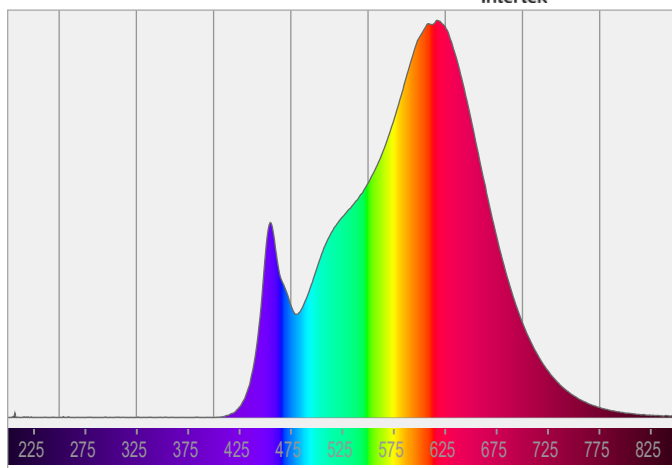
Product Name  
SKU  
Dimensions

**SLM 09-015W-930-120-S3-Z1B**  
**666561428037**  
**228.5mm (9 in) x 25mm (1 in) x 6mm (0.23 in)**

## Main Light Measurement Results

Output – Total Lumen (Up% / Down%)  
Peak Intensity and Beam Angle  
Correlated Color Temperature - Target/  
Measured Color Rendering Index  
Color Rendering TM30-18  
Color Shift - CIE duv and MacAdam Steps

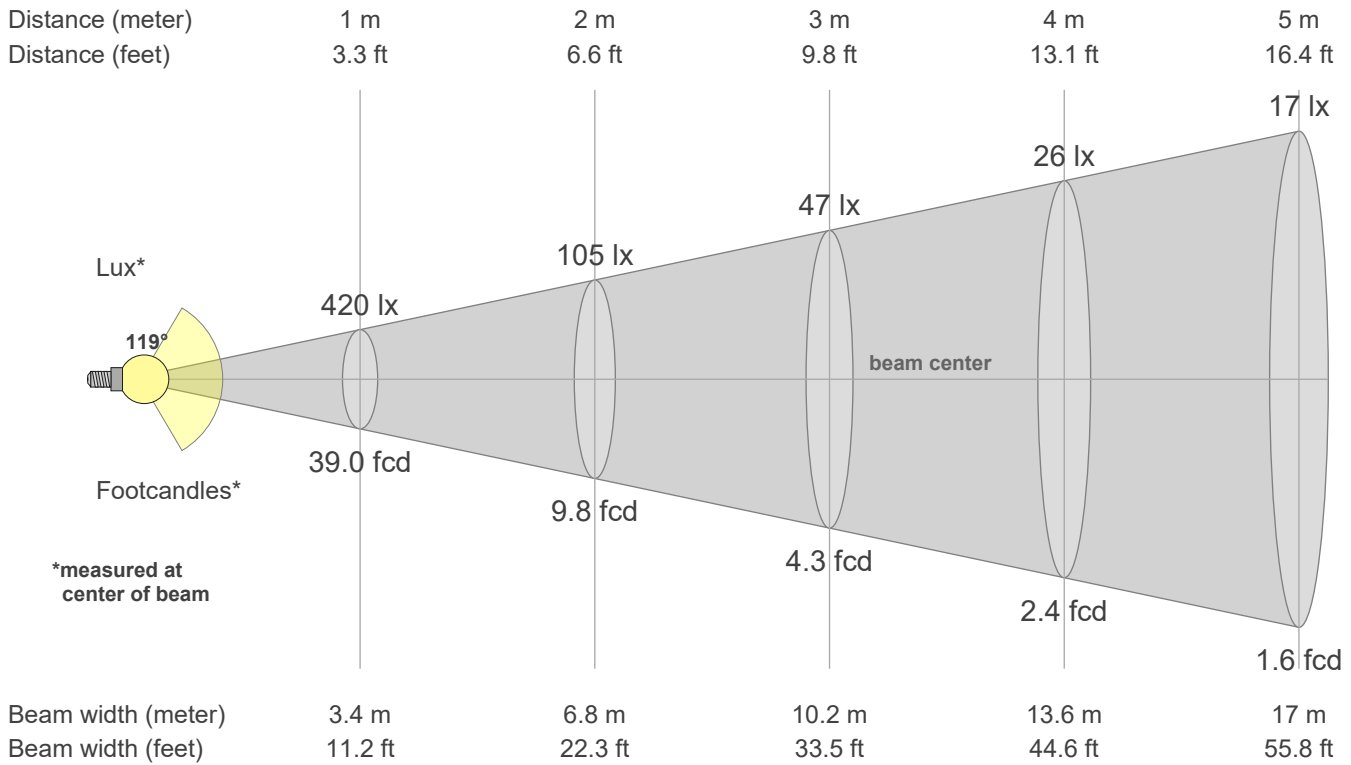
1300 - 0.6% / 99.4%  
420 cd - 120°  
3000 - 3000 K / 2952 K  
CRI 91.3  
Rf 90.2 - Rg 96.7  
Duv -0.0008 - SDCM 1.7



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## Beam details

Beam angle (Peak 50%)	119.1°	Output ratio in 120° cone	76.7%
Field angle (Peak 10%)	164.1°	Output ratio in 90° cone	51.2%
Cutoff angle (Peak 2.5%)	176.4°		



## Beam intensities from 1 - 20 m / 3 - 66 ft

1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m	14 m	15 m	16 m	17 m	18 m	19 m	20 m
3.3 ft	6.6 ft	9.8 ft	13.1 ft	16.4 ft	19.7 ft	23.0 ft	26.2 ft	29.5 ft	32.8 ft	36.1 ft	39.4 ft	42.7 ft	45.9 ft	49.2 ft	52.5 ft	55.8 ft	59.1 ft	62.3 ft	65.6 ft
420 lx	105 lx	47 lx	26 lx	17 lx	12 lx	9 lx	7 lx	5 lx	4 lx	3 lx	3 lx	2 lx	2 lx	2 lx	2 lx	1 lx	1 lx	1 lx	1 lx
39.0 fc	9.8 fc	4.3 fc	2.4 fc	1.6 fc	1.1 fc	0.8 fc	0.6 fc	0.5 fc	0.4 fc	0.3 fc	0.3 fc	0.2 fc	0.2 fc	0.2 fc	0.2 fc	0.1 fc	0.1 fc	0.1 fc	0.1 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°
420	419	414	407	396	383	366	347	325	300	272	241	207	170	132	94	57	25	7	1
100%	100%	99%	97%	94%	91%	87%	83%	77%	71%	65%	57%	49%	41%	31%	22%	13%	6%	2%	0%

## 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°
420	419	414	407	396	383	366	347	325	300	272	241	207	170	132	94	57	25	7	1
100%	100%	99%	97%	94%	91%	87%	83%	77%	71%	65%	57%	49%	41%	31%	22%	13%	6%	2%	0%

## 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°
420	419	414	407	396	383	366	347	325	300	272	241	207	170	132	94	57	25	7	1
100%	100%	99%	97%	94%	91%	87%	83%	77%	71%	65%	57%	49%	41%	31%	22%	13%	6%	2%	0%

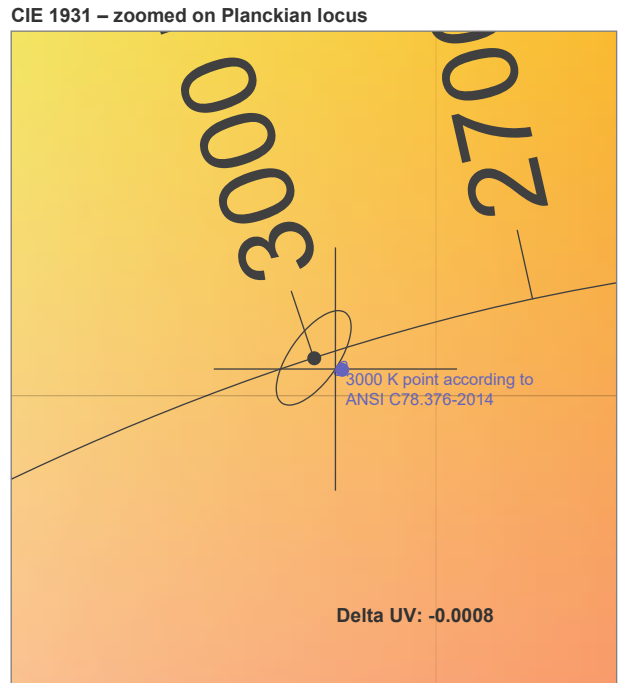
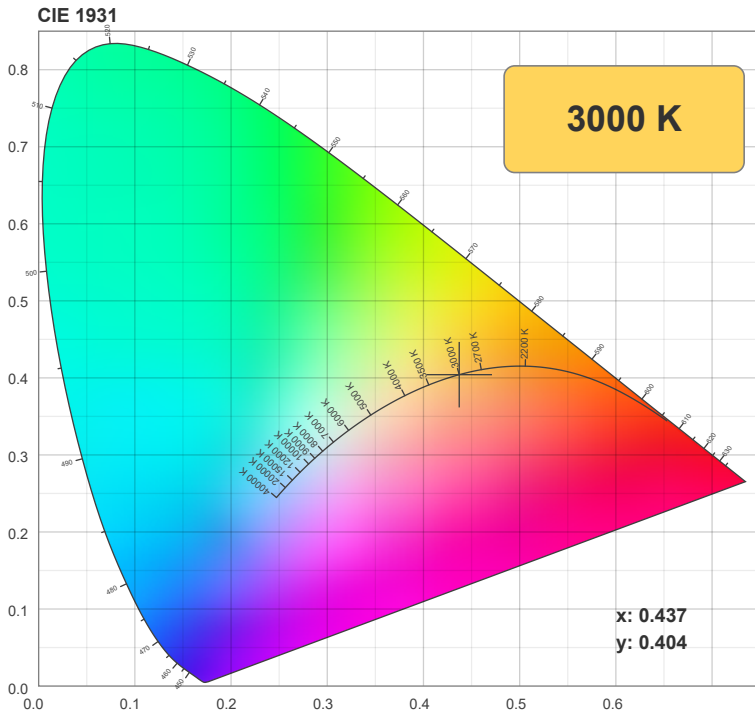
## Intensities in 270° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
420	419	414	407	396	383	366	347	325	300	272	241	207	170	132	94	57	25	7	1
100%	100%	99%	97%	94%	91%	87%	83%	77%	71%	65%	57%	49%	41%	31%	22%	13%	6%	2%	0%

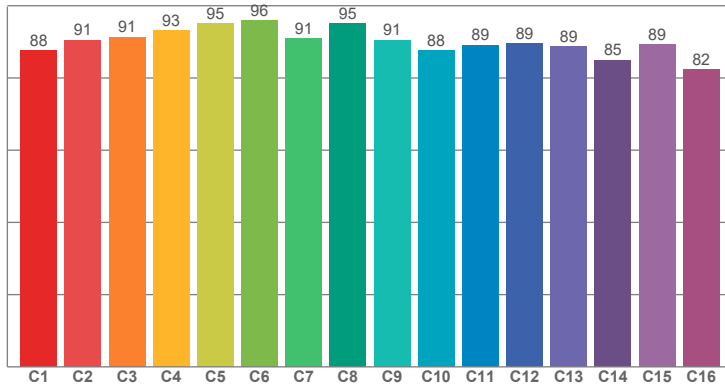
## Color details

Correlated Color Temperature, Target CCT = 3000 K  
 Correlated Color Temperature, Measured CCT = 2952 K  
 Color Rendering Index CRI = 91.3  
 Color Rendering Index, R9 (red component) R9 = 48.1  
 Color Rendering TM30-18 Rf 90.2 - Rg 96.7  
 Color Quality Scale CQS = 89.9

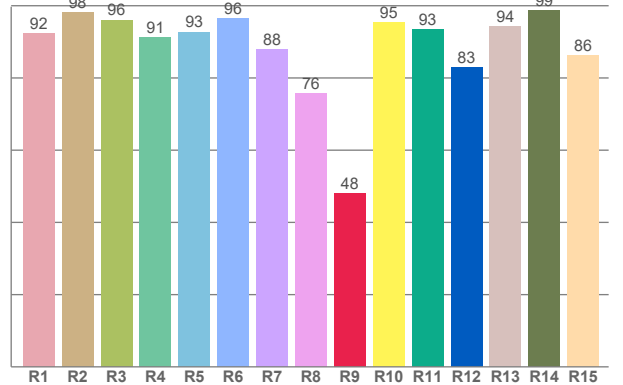
MacAdam Steps  
 Color coordinates CIE 1931 (x,y) = (0.437,0.404)  
 Color coordinate CIEs 1960 (u,v) = (0.251,0.348)  
 Color deviation from BBL Duv = -0.0008  
 Color coordinate CIEs 1976 (CIELUV) (u',v') = (0.251,0.521)



**TM30-18 Rf-values per hue bin. Rf: 90.2**



**Color Rendering Index per reference color (CIE 1995). CRI: 91.3**



**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
92.39	98.15	96.05	91.27	92.73	96.45	87.97	75.70	48.10	95.38	93.46	82.92	94.35	98.68	86.23

**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
87.57	90.55	91.36	93.21	95.18	95.94	90.98	95.15	90.52	87.72	89.14	89.49	88.72	85.00	89.31	82.39

**CQS Q values**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
85.24	94.22	91.10	88.60	90.25	91.87	92.50	92.40	95.65	95.81	93.99	91.90	90.58	83.70	84.27

**Color Quality Scale by reference color. CQS: 89.9**

