

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
 γ (gamma)-Resolution
Test Distance
Input Power
Input RMS Voltage and Current
Frequency of Input Power

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

Tested Light Source

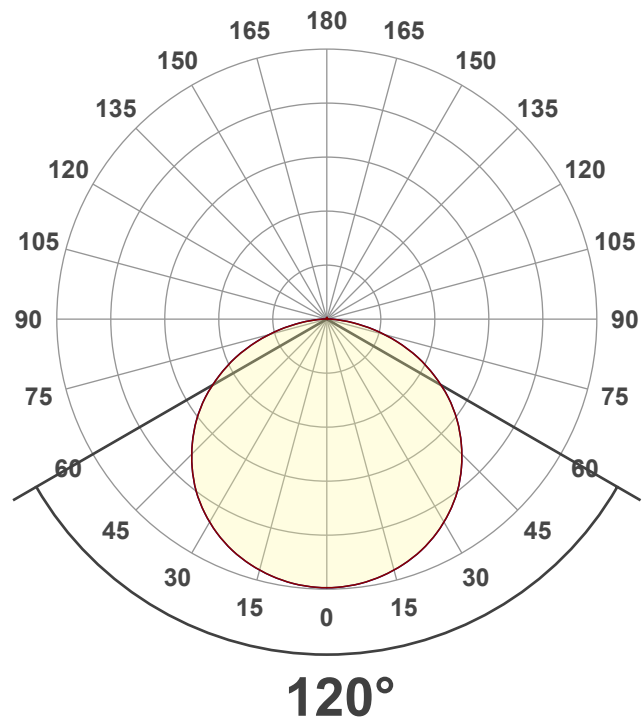
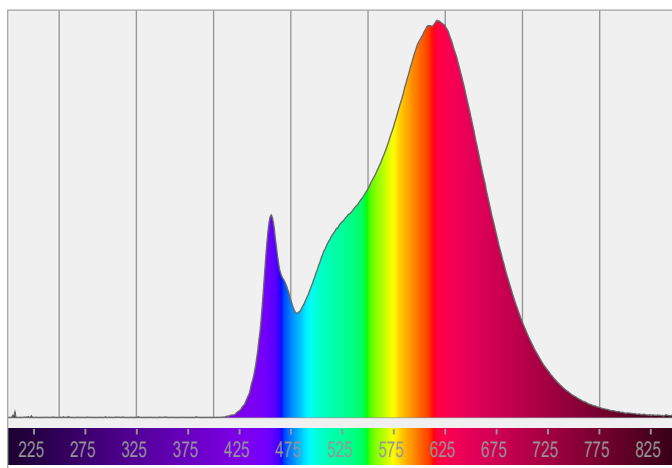
Product Name
SKU
Dimensions

SLM 09-010W-930-120-S3-Z1A
666561428013
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

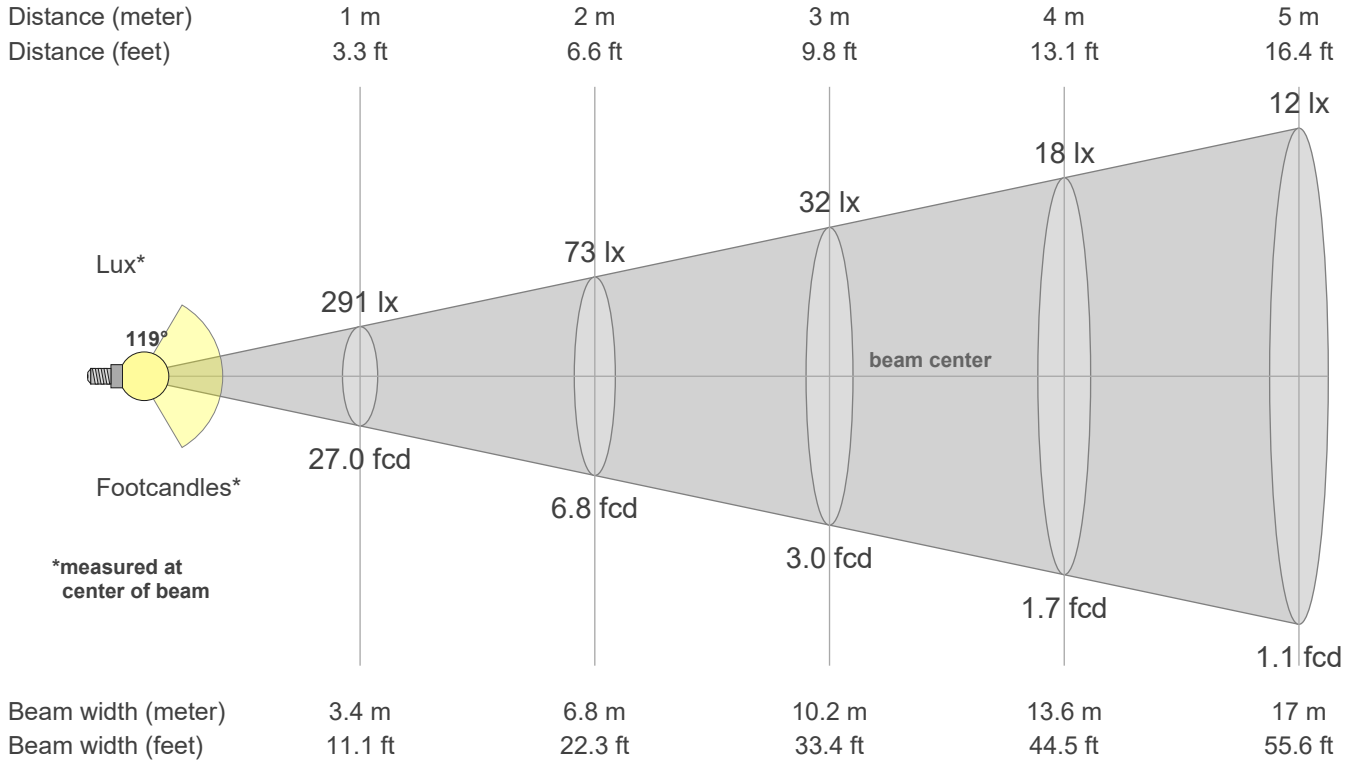
900 - 0.57% / 99.43%
291 cd - 120°
3000 - 3000 K / 2923 K
CRI 91.5
Rf 89.8 - Rg 96.4
Duv -0.0012 - SDCM 2.8



Light Measurement Report

Beam details

| | | | |
|--------------------------|--------|---------------------------|-------|
| Beam angle (Peak 50%) | 118.9° | Output ratio in 120° cone | 76.6% |
| Field angle (Peak 10%) | 164.1° | Output ratio in 90° cone | 51.2% |
| Cutoff angle (Peak 2.5%) | 177.3° | | |



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 |
| 291 lx | 73 lx | 32 lx | 18 lx | 12 lx | 8 lx | 6 lx | 5 lx | 4 lx | 3 lx | 2 lx | 2 lx | 2 lx | 1 lx | 1 lx | 1 lx | 1 lx | 1 lx | 1 lx | 1 lx |
| 27.0 fc | 6.8 fc | 3.0 fc | 1.7 fc | 1.1 fc | 0.8 fc | 0.6 fc | 0.4 fc | 0.3 fc | 0.3 fc | 0.2 fc | 0.2 fc | 0.2 fc | 0.1 fc | 0.1 fc | 0.1 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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 291 | 290 | 287 | 282 | 274 | 265 | 254 | 241 | 225 | 207 | 188 | 167 | 143 | 118 | 92 | 65 | 39 | 18 | 5 | 1 |
| 100% | 100% | 99% | 97% | 94% | 91% | 87% | 83% | 77% | 71% | 64% | 57% | 49% | 41% | 32% | 22% | 14% | 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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 291 | 290 | 287 | 282 | 274 | 265 | 254 | 241 | 225 | 207 | 188 | 167 | 143 | 118 | 92 | 65 | 39 | 18 | 5 | 1 |
| 100% | 100% | 99% | 97% | 94% | 91% | 87% | 83% | 77% | 71% | 64% | 57% | 49% | 41% | 32% | 22% | 14% | 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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 291 | 290 | 287 | 282 | 274 | 265 | 254 | 241 | 225 | 207 | 188 | 167 | 143 | 118 | 92 | 65 | 39 | 18 | 5 | 1 |
| 100% | 100% | 99% | 97% | 94% | 91% | 87% | 83% | 77% | 71% | 64% | 57% | 49% | 41% | 32% | 22% | 14% | 6% | 2% | 0% |

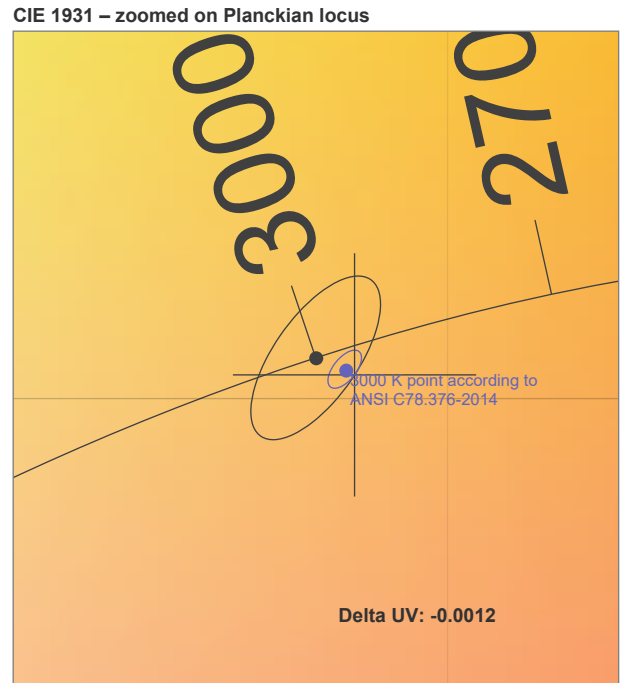
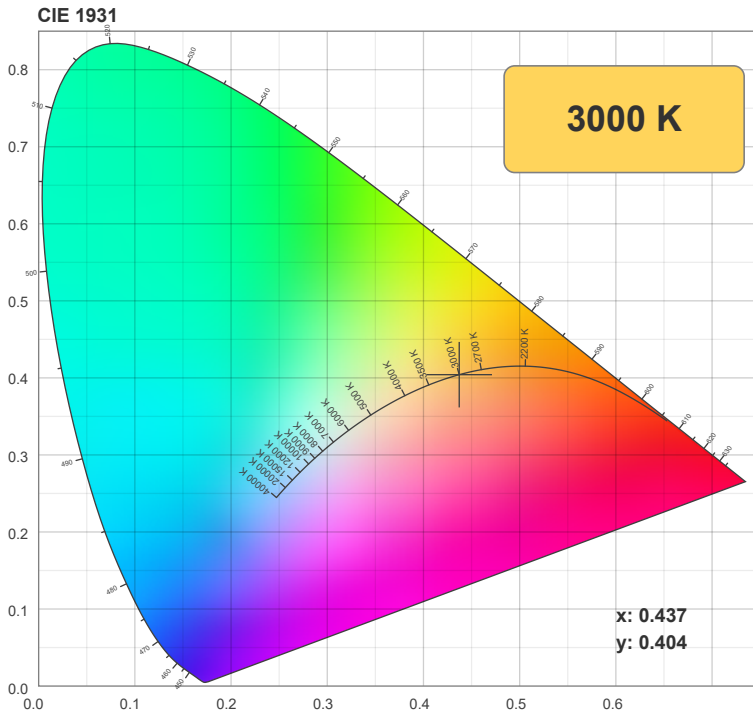
Intensities in 270° c-plane

| 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° | 95° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 291 | 290 | 287 | 282 | 274 | 265 | 254 | 241 | 225 | 207 | 188 | 167 | 143 | 118 | 92 | 65 | 39 | 18 | 5 | 1 |
| 100% | 100% | 99% | 97% | 94% | 91% | 87% | 83% | 77% | 71% | 64% | 57% | 49% | 41% | 32% | 22% | 14% | 6% | 2% | 0% |

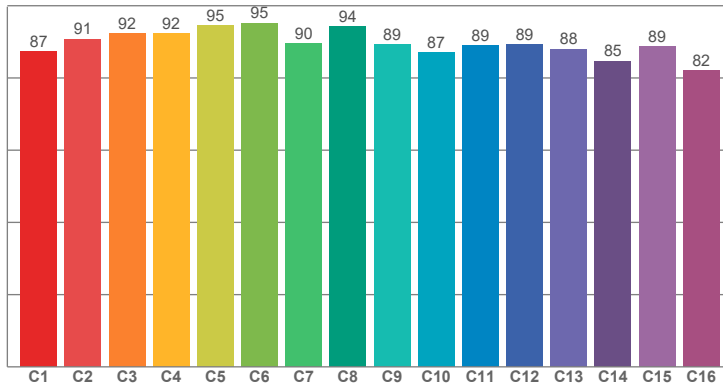
Color details

Correlated Color Temperature, Target CCT = 3000 K
 Correlated Color Temperature, Measured CCT = 2923 K
 Color Rendering Index CRI = 91.5
 Color Rendering Index, R9 (red component) R9 = 50.2
 Color Rendering TM30-18 Rf 89.8 - Rg 96.4
 Color Quality Scale CQS = 90.1

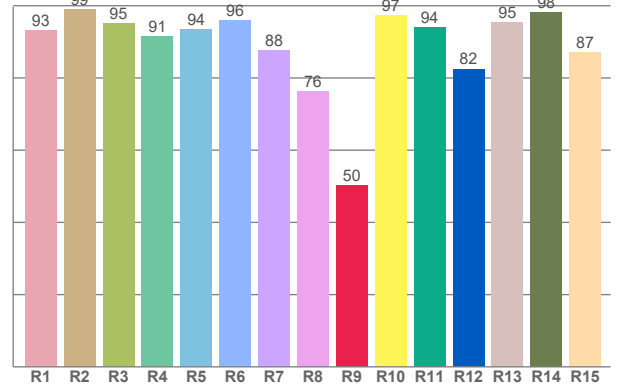
MacAdam Steps
 Color coordinates CIE 1931 (x,y) = (0.437,0.404)
 Color coordinate CIEs 1960 (u,v) = (0.251,0.348)
 Color deviation from BBL Duv = -0.0012
 Color coordinate CIEs 1976 (CIELUV) (u',v') = (0.251,0.521)



TM30-18 Rf-values per hue bin. Rf: 89.8



Color Rendering Index per reference color (CIE 1995). CRI: 91.5



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 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 93.19 | 98.99 | 95.19 | 91.49 | 93.51 | 95.86 | 87.60 | 76.20 | 50.24 | 97.39 | 93.95 | 82.49 | 95.29 | 98.22 | 87.09 |

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 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 87.44 | 90.83 | 92.23 | 92.33 | 94.62 | 95.22 | 89.63 | 94.26 | 89.35 | 86.97 | 89.02 | 89.20 | 88.02 | 84.74 | 88.74 | 82.16 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 85.11 | 93.83 | 91.65 | 88.69 | 89.80 | 91.56 | 92.87 | 92.51 | 95.33 | 96.36 | 94.38 | 92.14 | 90.75 | 84.35 | 84.69 |

Color Quality Scale by reference color. CQS: 90.1

