

# Light Measurement Report

Print date: 18-11-2024

Measurement date and time: 18-11-2024 13:33:26 – Measurement no. VFR-241118-2056-MS

Measurement tracking No. and Link: [VT241118-003194](https://vt241118-003194)

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  
 $\gamma$  (gamma)-Resolution  
Test Distance  
Input Power, Power and Displ. Factors  
Input RMS Voltage and Current  
Frequency of Input Power  
Warm-up Time and Variation

16 planes – 22,5°  
5°  
12,13 m  
56,5 W – PF 0,97 – DPF 0,97  
230 V – 0,253 A  
50 Hz  
Lamp stabilized in 15 min 1 sec – 2,0%

## Tested Light Source

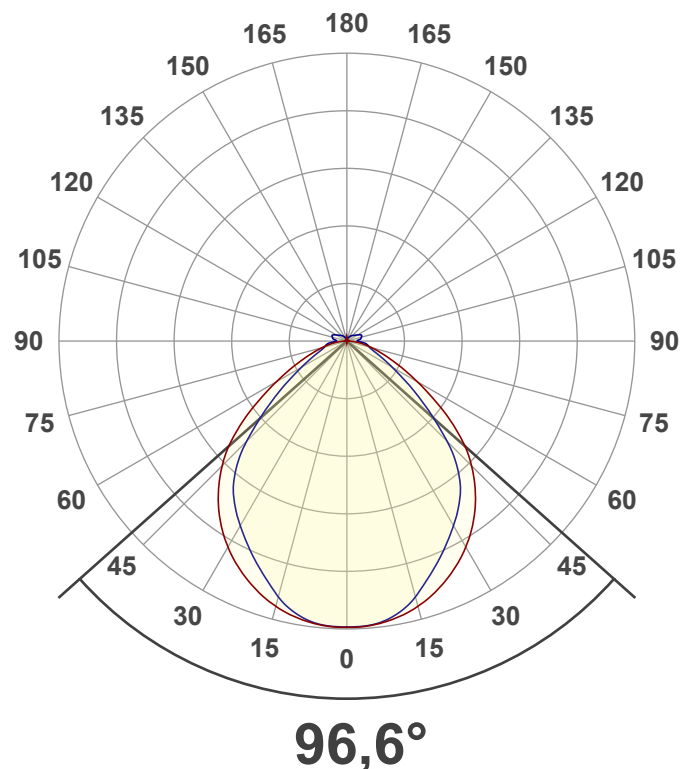
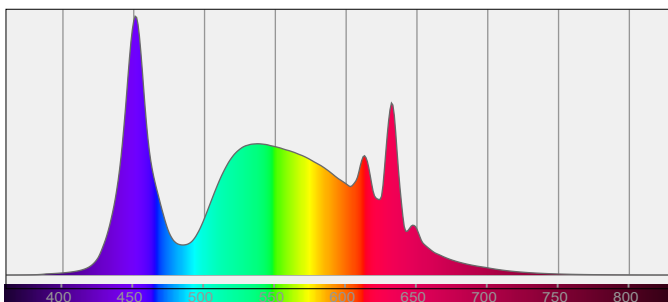
Product Name  
Item No. and Manufacturer  
Product Description (line 1)

805845-5700K  
805845-5700K – Dutchfulfillment  
RETROFIT PLUTO | LED MODULE | 32W/40W/48W/55W | 90°

## 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

9364 lm – 6,29% / 93,71%  
166 lm/W  
3892 cd – 96,6°  
CCT = 5700 K / 5697 K  
CRI 82,1  
 $R_f$  81,4 –  $R_g$  99,0  
Duv 0,0011 – SDCM 6,0  
SVM 0 – PstLM 0,01



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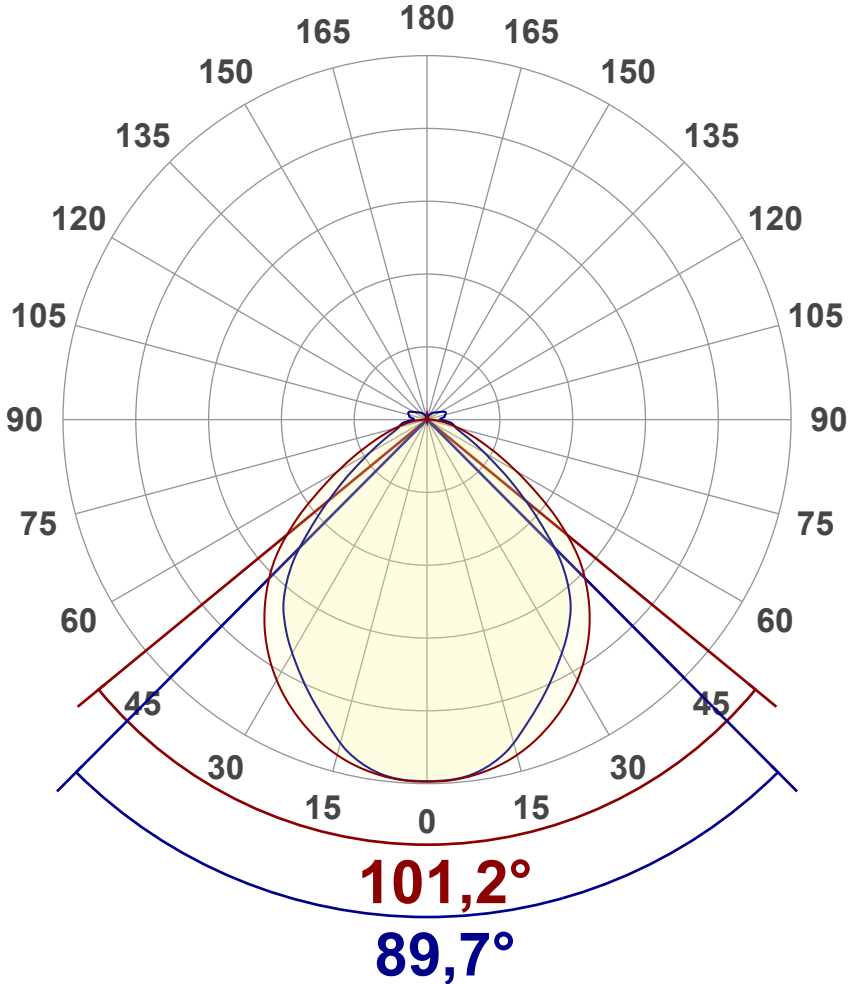
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## Luminous Intensity diagram

Unit: 0-100% of peak intensity



## Main Values

|                      |                |
|----------------------|----------------|
| Output (total Lumen) | 9364 lm        |
| Lumen Up% / Down%    | 6,29% / 93,71% |
| Peak Intensity       | 3892 cd        |
| Beam Angle (50%)     | 96,6°          |
| Beam Angle (90%)     | 89,7°          |
| Beam Angle (10%)     | 101,2°         |

## Cut-off Angle

|              |        |
|--------------|--------|
| Average 2,5% | 231,3° |
|--------------|--------|

## Field Angle

|             |        |
|-------------|--------|
| Average 10% | 144,4° |
|-------------|--------|

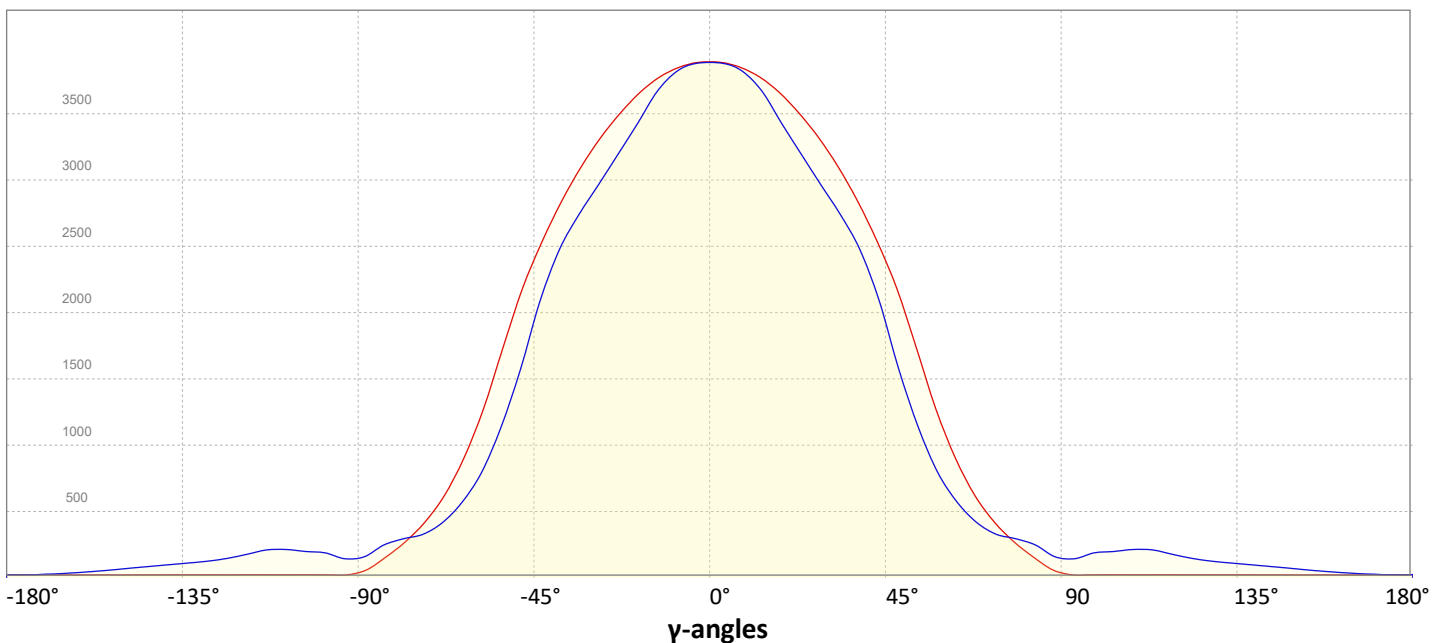
## Intensity Ratio

|              |       |
|--------------|-------|
| In 120° cone | 80,7% |
| In 90° cone  | 59,4% |

**C000-C180**

**C090-C270**

## Linear distribution diagram - Intensity (candela) vs $\gamma$ -angle



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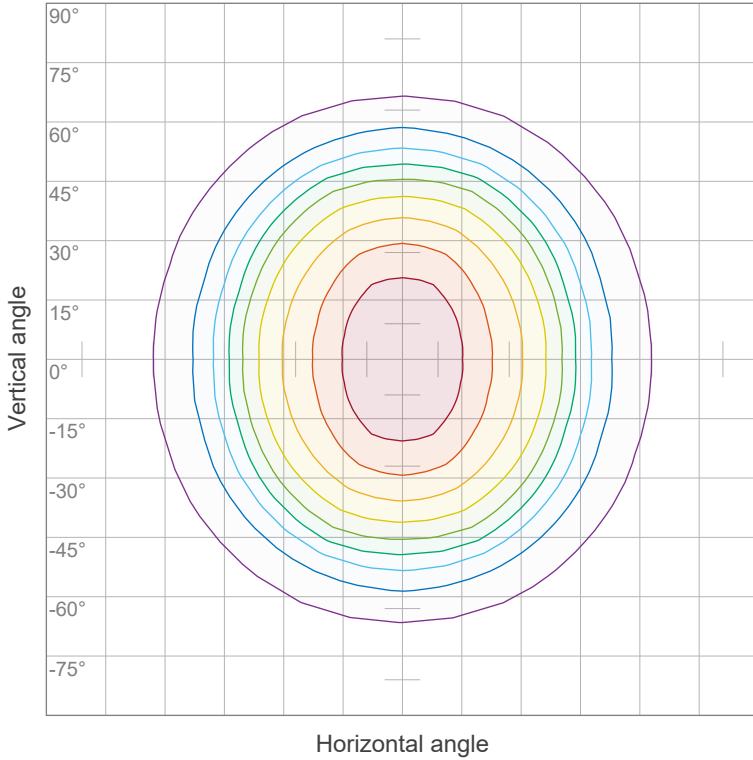
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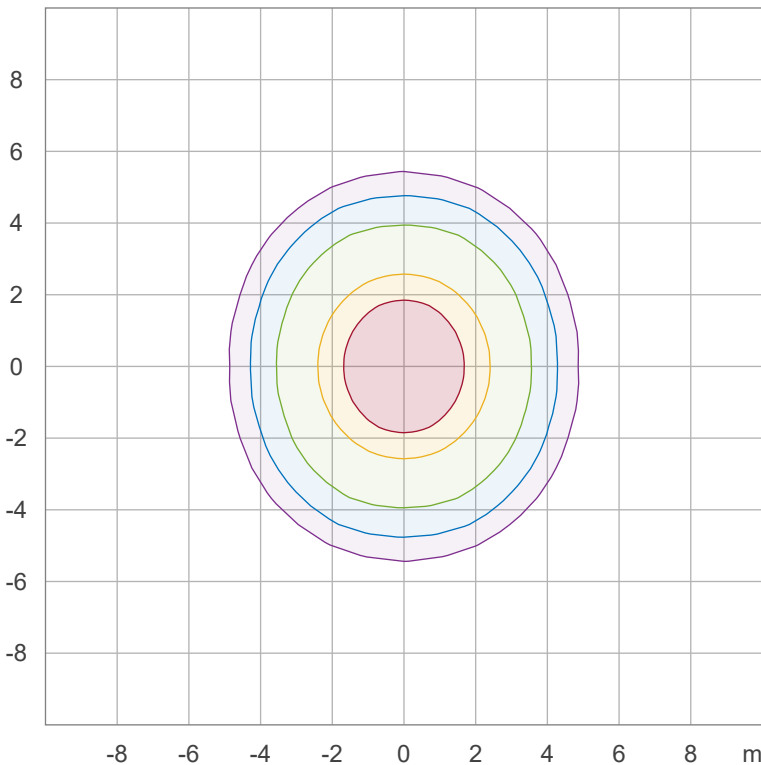
## Iso-intensity Diagram (Iso-candela)



|      |           |
|------|-----------|
| 90 % | 3502,5 cd |
| 80 % | 3113,3 cd |
| 70 % | 2724,2 cd |
| 60 % | 2335,0 cd |
| 50 % | 1945,8 cd |
| 40 % | 1556,7 cd |
| 30 % | 1167,5 cd |
| 20 % | 778,3 cd  |
| 10 % | 389,2 cd  |

Peak intensity: 3891,7 cd  
Number of c-planes: 16

## Iso-illuminance Diagram (Iso-lux)



|        |          |
|--------|----------|
| 50,0 % | 216,1 lx |
| 30,0 % | 129,7 lx |
| 10,0 % | 43,2 lx  |
| 5,0 %  | 21,6 lx  |
| 3,0 %  | 13,0 lx  |

Peak illuminance: 432,2 lx  
Mounting height: 3,0 m  
Number of c-planes: 16

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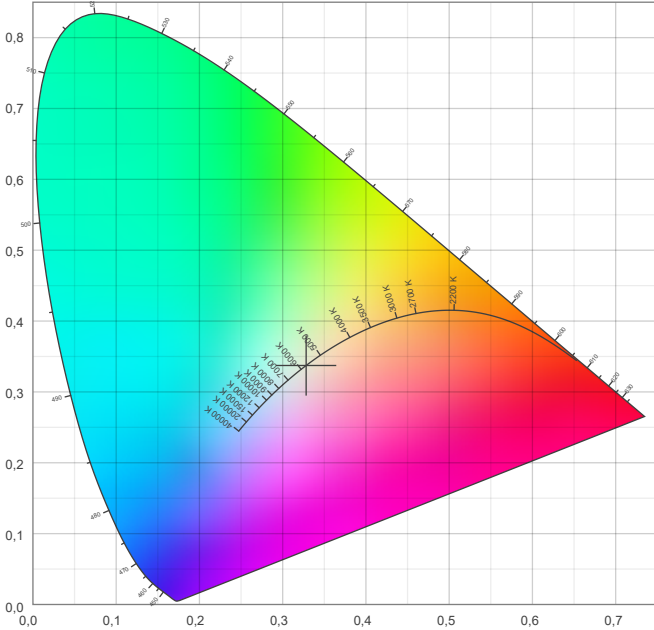


## Color details

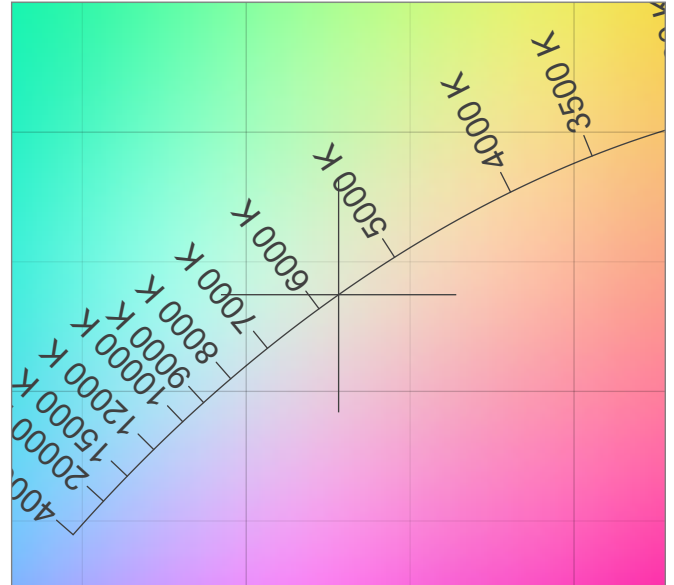
Correlated Color Temperature, Target CCT = 5700 K  
 Correlated Color Temperature, Measured CCT = 5697 K  
 Color Rendering Index CRI 82,1  
 Color Rendering Index, R9 (red component) R9 = 38,2  
 Color Rendering TM30-18 R<sub>f</sub> 81,4 – R<sub>g</sub> 99,0  
 Color Quality Scale CQS = 80,8

MacAdam Steps SDCM = 6,0  
 Color coordinates CIE 1931 (x;y) = (0,328;0,337)  
 Color coordinate CIEs 1960 (u;v) = (0,205;0,317)  
 Color deviation from BBL Duv = 0,0011  
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,205;0,475)

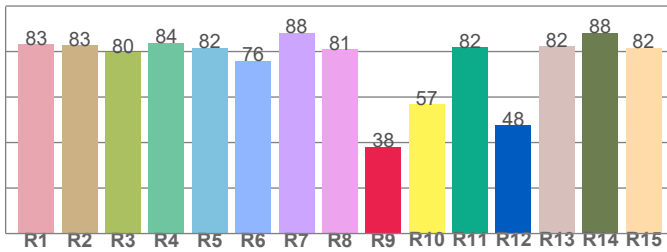
### CIE 1931



### CIE 1931 – zoomed on Planckian locus



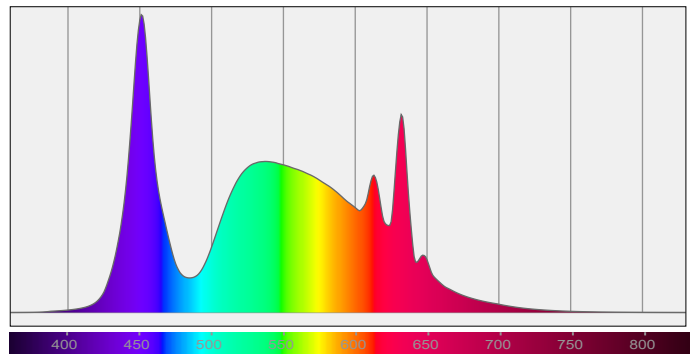
### Color Rendering Index per reference color (CIE 1995)



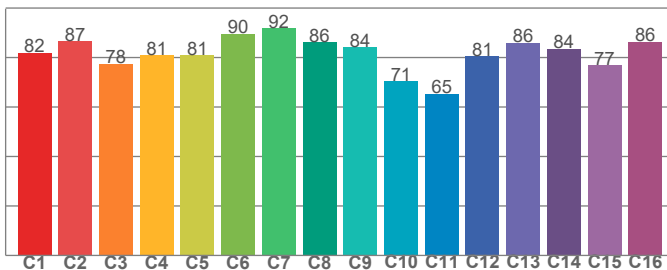
CRI R values, only R1-R8 are used to calculate final CRI value

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   | R9   | R10  | R11  | R12  | R13  | R14  | R15  |
| 83,2 | 82,9 | 79,7 | 83,8 | 81,8 | 75,9 | 88,2 | 81,0 | 38,2 | 56,8 | 81,9 | 47,7 | 82,3 | 88,2 | 81,7 |

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



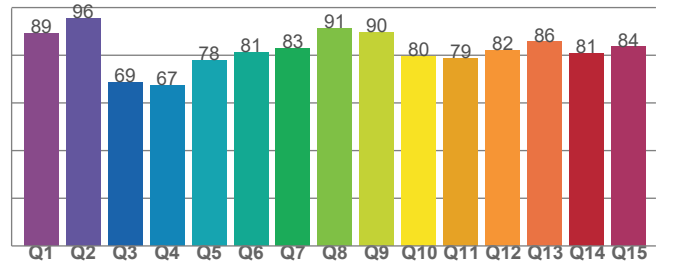
### TM30-18 Rf-values per hue bin



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  |
| 81,9 | 86,6 | 77,5 | 80,8 | 81,0 | 89,6 | 91,8 | 86,2 | 84,2 | 70,5 | 65,4 | 80,5 | 86,0 | 83,5 | 76,8 | 86,4 |

### Color Quality Scale by reference color



CQS Q values

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |
| 89,2 | 95,6 | 68,6 | 67,5 | 77,9 | 81,2 | 82,9 | 91,3 | 89,6 | 79,6 | 78,7 | 82,2 | 85,7 | 80,9 | 83,6 |

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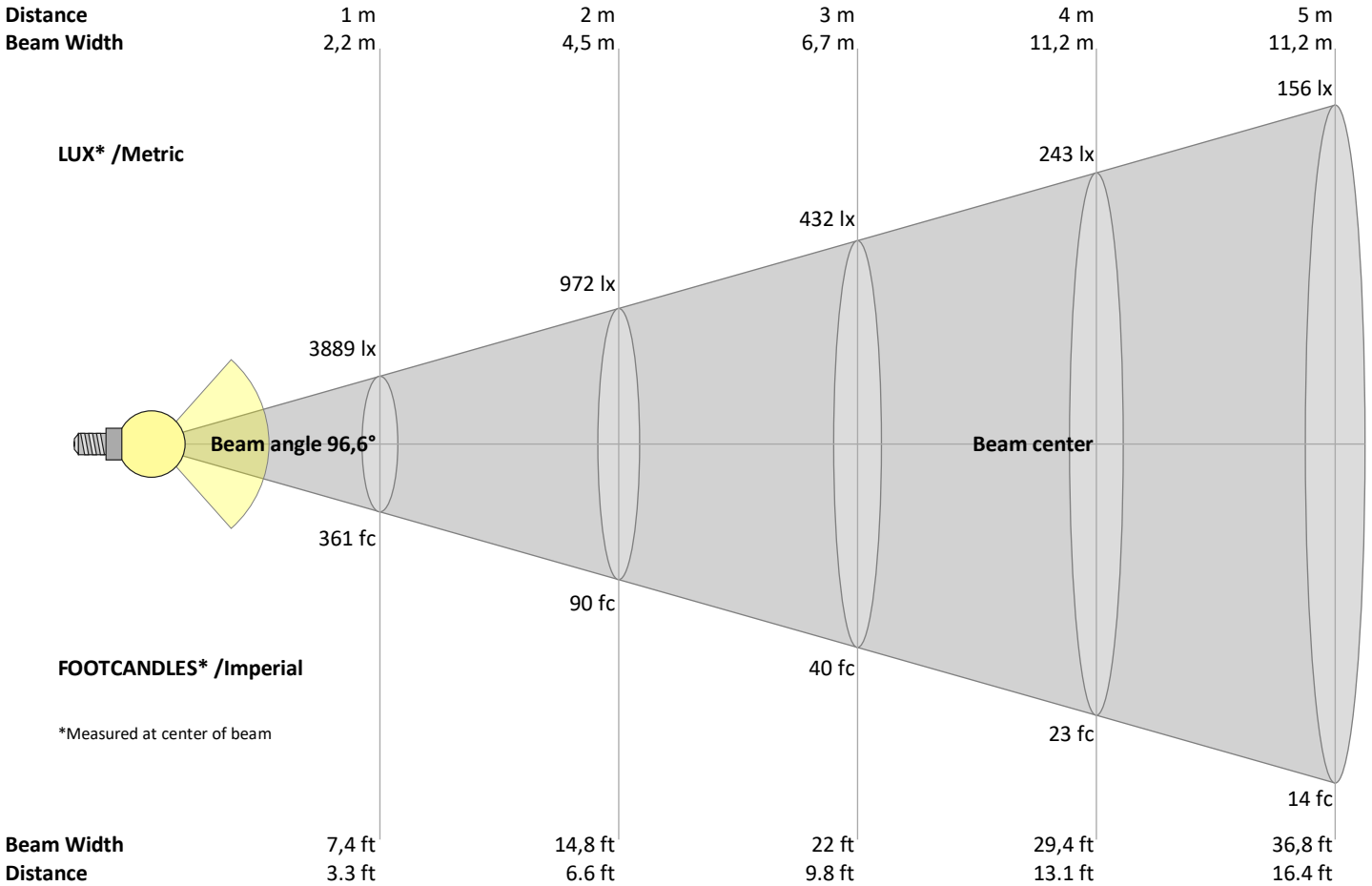
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## Beam Details



### 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  |
| 3889  | 972  | 432  | 243  | 156  | 108  | 79  | 61   | 48   | 39   | 32   | 27   | 23   | 20   | 17   | 15   | 13   | 12   | 11   | 10   | lux |
| 361,3 | 90,3 | 40,1 | 22,6 | 14,5 | 10   | 7,4 | 5,6  | 4,5  | 3,6  | 3    | 2,5  | 2,1  | 1,8  | 1,6  | 1,4  | 1,3  | 1,1  | 1    | 0,9  | 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        |
|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|----------|
| 3889 | 3871 | 3818 | 3726 | 3593 | 3426 | 3227 | 2990 | 2712 | 2387 | 1996 | 1542 | 1118 | 785 | 536 | 357 | 223 | 115 | 43  | 22  | cd       |
| 100% | 100% | 98%  | 96%  | 92%  | 88%  | 83%  | 77%  | 70%  | 61%  | 51%  | 40%  | 29%  | 20% | 14% | 9%  | 6%  | 3%  | 1%  | 1%  | 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        |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 3889 | 3860 | 3772 | 3593 | 3354 | 3123 | 2895 | 2658 | 2355 | 1925 | 1434 | 1027 | 722 | 520 | 388 | 317 | 279 | 219 | 154 | 157 | cd       |
| 100% | 99%  | 97%  | 92%  | 86%  | 80%  | 74%  | 68%  | 61%  | 50%  | 37%  | 26%  | 19% | 13% | 10% | 8%  | 7%  | 6%  | 4%  | 4%  | 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        |
|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|----------|
| 3889 | 3871 | 3818 | 3726 | 3593 | 3426 | 3227 | 2990 | 2712 | 2387 | 1996 | 1542 | 1118 | 785 | 536 | 357 | 223 | 115 | 43  | 22  | cd       |
| 100% | 100% | 98%  | 96%  | 92%  | 88%  | 83%  | 77%  | 70%  | 61%  | 51%  | 40%  | 29%  | 20% | 14% | 9%  | 6%  | 3%  | 1%  | 1%  | 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        |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 3889 | 3860 | 3772 | 3593 | 3354 | 3123 | 2895 | 2658 | 2355 | 1925 | 1434 | 1027 | 722 | 520 | 388 | 317 | 279 | 219 | 154 | 157 | cd       |
| 100% | 99%  | 97%  | 92%  | 86%  | 80%  | 74%  | 68%  | 61%  | 50%  | 37%  | 26%  | 19% | 13% | 10% | 8%  | 7%  | 6%  | 4%  | 4%  | of 0°val |

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## 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        | 23,4   | 24,4 | 23,7 | 24,8 | 25,1 | 21,4   | 22,4 | 21,7 | 22,8 | 23,1 |
|                                     | 3H        | 24,0   | 25,1 | 24,5 | 25,5 | 25,8 | 21,8   | 22,9 | 22,3 | 23,3 | 23,6 |
|                                     | 4H        | 24,3   | 25,4 | 24,8 | 25,7 | 26,1 | 22,1   | 23,1 | 22,6 | 23,5 | 23,9 |
|                                     | 6H        | 24,6   | 25,5 | 25,0 | 25,9 | 26,4 | 22,6   | 23,4 | 23,0 | 23,8 | 24,3 |
|                                     | 8H        | 24,7   | 25,6 | 25,2 | 26,0 | 26,5 | 22,7   | 23,6 | 23,2 | 24,0 | 24,5 |
|                                     | 12H       | 24,8   | 25,7 | 25,2 | 26,1 | 26,6 | 22,9   | 23,8 | 23,4 | 24,2 | 24,8 |
| 4H                                  | 2H        | 23,4   | 24,5 | 23,9 | 24,8 | 25,2 | 21,8   | 22,8 | 22,3 | 23,2 | 23,5 |
|                                     | 3H        | 24,4   | 25,3 | 24,9 | 25,7 | 26,2 | 22,5   | 23,4 | 23,0 | 23,8 | 24,3 |
|                                     | 4H        | 24,7   | 25,6 | 25,3 | 26,0 | 26,7 | 22,8   | 23,7 | 23,4 | 24,1 | 24,8 |
|                                     | 6H        | 25,1   | 25,9 | 25,7 | 26,3 | 26,8 | 23,4   | 24,1 | 23,9 | 24,6 | 25,0 |
|                                     | 8H        | 25,3   | 26,0 | 25,9 | 26,4 | 26,9 | 23,6   | 24,3 | 24,2 | 24,8 | 25,3 |
|                                     | 12H       | 25,4   | 26,0 | 26,0 | 26,5 | 27,1 | 23,9   | 24,5 | 24,5 | 25,0 | 25,6 |
| 8H                                  | 4H        | 24,8   | 25,5 | 25,4 | 26,0 | 26,5 | 23,1   | 23,7 | 23,7 | 24,2 | 24,7 |
|                                     | 6H        | 25,3   | 25,8 | 25,9 | 26,4 | 27,0 | 23,8   | 24,3 | 24,4 | 24,9 | 25,5 |
|                                     | 8H        | 25,6   | 26,0 | 26,2 | 26,7 | 27,4 | 24,2   | 24,6 | 24,8 | 25,3 | 26,0 |
|                                     | 12H       | 25,8   | 26,2 | 26,5 | 26,8 | 27,5 | 24,6   | 25,0 | 25,3 | 25,6 | 26,3 |
| 12H                                 | 4H        | 24,8   | 25,4 | 25,4 | 25,9 | 26,5 | 23,1   | 23,6 | 23,7 | 24,2 | 24,7 |
|                                     | 6H        | 25,4   | 25,8 | 26,0 | 26,4 | 27,2 | 23,9   | 24,3 | 24,5 | 24,9 | 25,7 |
|                                     | 8H        | 25,7   | 26,1 | 26,3 | 26,7 | 27,3 | 24,4   | 24,7 | 25,0 | 25,3 | 26,0 |

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

|          |            |            |
|----------|------------|------------|
| S = 1.0H | 0,1 / -0,2 | 0,3 / -0,3 |
| S = 1.5H | 0,5 / -0,7 | 0,6 / -0,7 |
| S = 2.0H | 1,3 / -1,3 | 1,1 / -1,1 |

## 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                   | 118  | 118 | 118 | 118 | 114 | 114 | 114 | 114 | 108 | 108 | 108 | 102 | 102 | 102 | 96 | 96 | 96 | 94 |
| 1                   | 108  | 104 | 100 | 96  | 105 | 101 | 97  | 94  | 96  | 93  | 90  | 91  | 88  | 86  | 86 | 84 | 83 | 80 |
| 2                   | 99   | 92  | 86  | 81  | 96  | 90  | 84  | 79  | 85  | 80  | 76  | 81  | 77  | 74  | 77 | 74 | 71 | 69 |
| 3                   | 91   | 82  | 74  | 68  | 89  | 80  | 73  | 67  | 76  | 70  | 65  | 72  | 68  | 64  | 69 | 65 | 62 | 59 |
| 4                   | 84   | 73  | 65  | 59  | 82  | 72  | 64  | 58  | 68  | 62  | 57  | 65  | 60  | 55  | 63 | 58 | 54 | 52 |
| 5                   | 78   | 66  | 58  | 51  | 75  | 65  | 57  | 51  | 62  | 55  | 50  | 59  | 53  | 49  | 57 | 52 | 48 | 46 |
| 6                   | 72   | 60  | 51  | 45  | 70  | 59  | 51  | 45  | 56  | 49  | 44  | 54  | 48  | 43  | 52 | 47 | 42 | 40 |
| 7                   | 67   | 54  | 46  | 40  | 65  | 53  | 46  | 40  | 51  | 44  | 39  | 49  | 43  | 39  | 48 | 42 | 38 | 36 |
| 8                   | 63   | 50  | 42  | 36  | 61  | 49  | 41  | 36  | 47  | 40  | 35  | 45  | 39  | 35  | 44 | 38 | 34 | 32 |
| 9                   | 59   | 46  | 38  | 33  | 57  | 45  | 38  | 33  | 43  | 37  | 32  | 42  | 36  | 32  | 41 | 35 | 31 | 29 |
| 10                  | 55   | 42  | 35  | 30  | 53  | 42  | 35  | 30  | 40  | 34  | 29  | 39  | 33  | 29  | 38 | 32 | 28 | 27 |

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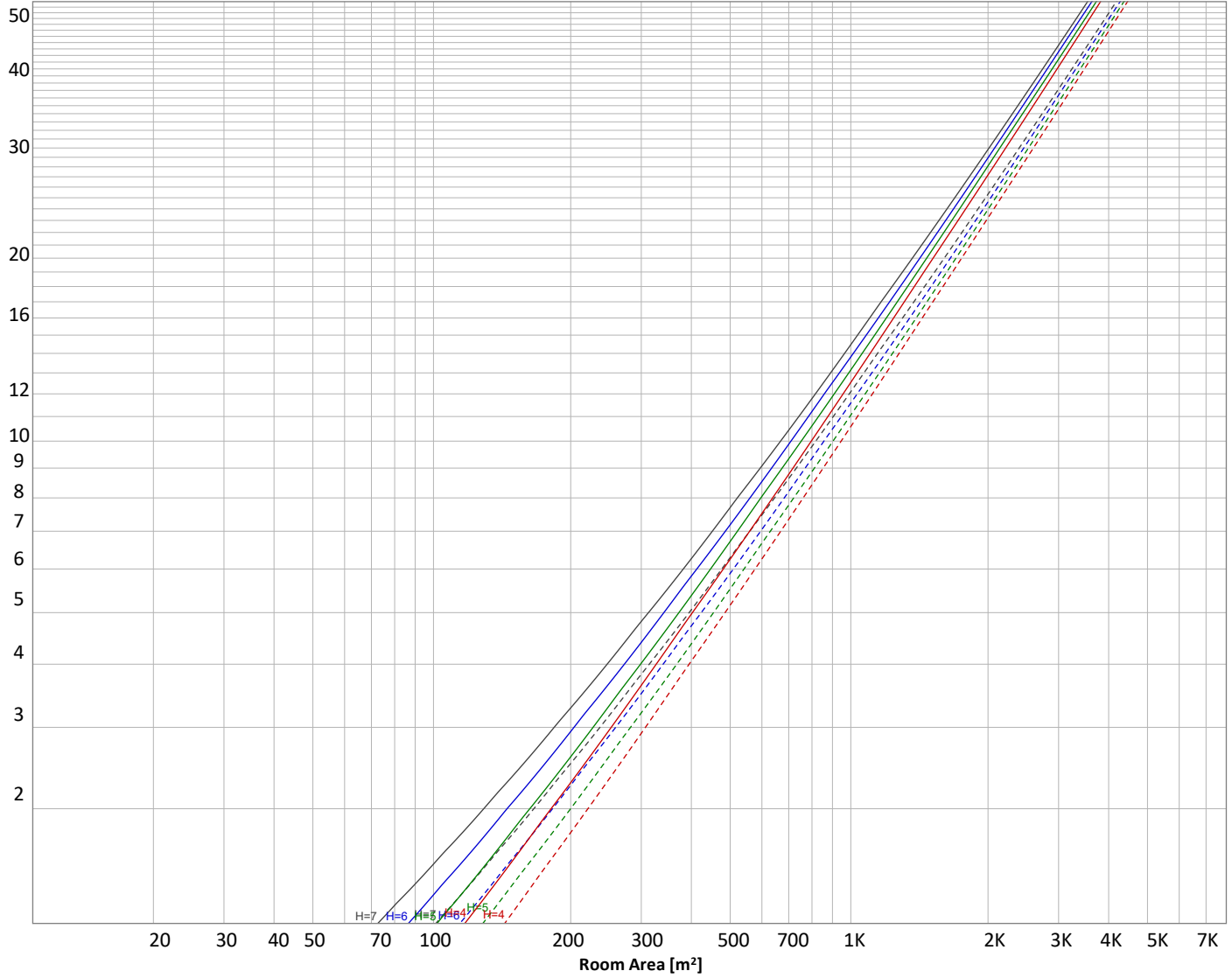
Operator:



## Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



### Conditions

|   |                |           |                     |                          |                   |
|---|----------------|-----------|---------------------|--------------------------|-------------------|
| H = Room height                                   | Flux = 9364 lm |           |                     |                          |                   |
| H <sub>down</sub> = Lamp distance from ceiling =  | 0.00 m         | Line type | Ceiling reflectance | ρ(%)<br>Wall reflectance | Floor reflectance |
| H <sub>work</sub> = Work area height from floor = | 0.00 m         | -----     | 70                  | 50                       | 30                |
| E <sub>work</sub> = 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°   |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 368 lm   | 1035 lm   | 1512 lm   | 1764 lm   | 1688 lm   | 1188 lm   | 656 lm    | 362 lm    | 203 lm    |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 131 lm   | 144 lm    | 120 lm    | 80,0 lm   | 54,0 lm   | 33,0 lm   | 17,5 lm   | 7,75 lm   | 2,15 lm   |

# Light Measurement Report

Print date: 18-11-2024

Measurement date and time: 18-11-2024 13:33:26 – Measurement no. VFR-241118-2056-MS

Measurement tracking No. and Link: [VT241118-003194](https://www.viso-systems.com/VT241118-003194)

Operator:



## Outdoor Light Planning

### Lumen per Zone

| Zone (γ)     | Lumen          | % Total       |
|--------------|----------------|---------------|
| 0-10°        | 368 lm         | 3,9%          |
| 10-20°       | 1035 lm        | 11,0%         |
| 20-30°       | 1512 lm        | 16,1%         |
| 30-40°       | 1764 lm        | 18,8%         |
| 40-50°       | 1688 lm        | 18,0%         |
| 50-60°       | 1188 lm        | 12,7%         |
| 60-70°       | 656 lm         | 7,0%          |
| 70-80°       | 362 lm         | 3,9%          |
| 80-90°       | 203 lm         | 2,2%          |
| 90-100°      | 131 lm         | 1,4%          |
| 100-110°     | 144 lm         | 1,5%          |
| 110-120°     | 120 lm         | 1,3%          |
| 120-130°     | 80 lm          | 0,9%          |
| 130-140°     | 54 lm          | 0,6%          |
| 140-150°     | 33 lm          | 0,4%          |
| 150-160°     | 18 lm          | 0,2%          |
| 160-170°     | 8 lm           | 0,1%          |
| 170-180°     | 2 lm           | 0,0%          |
| <b>Total</b> | <b>9364 lm</b> | <b>100,0%</b> |

### Intensity peaks

|                |         |
|----------------|---------|
| Max intensity  | 3892 cd |
| Intensity, 90° | 43 cd   |
| Intensity, 0°  | 3889 cd |

### Zonal Lumen summary

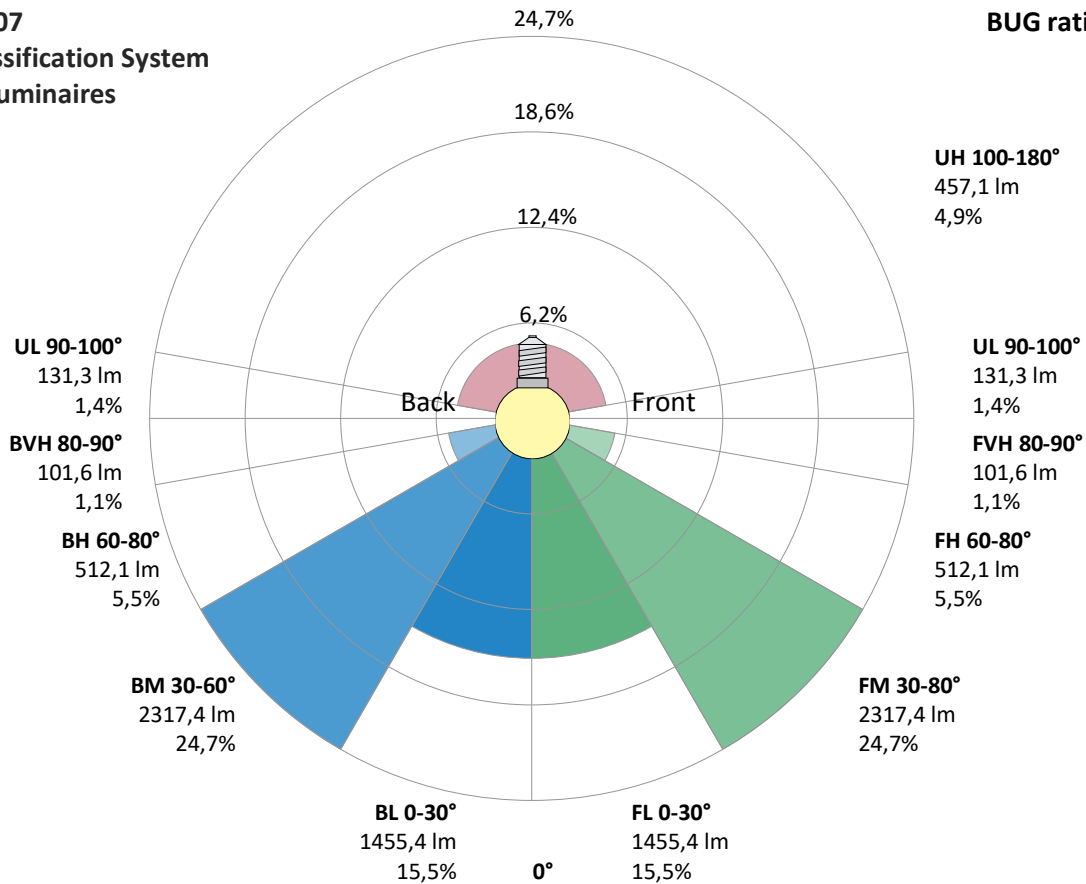
| Zone (γ) | Lumen   | % Total |
|----------|---------|---------|
| 0-30°    | 2914 lm | 31,1%   |
| 0-40°    | 4678 lm | 50,0%   |
| 0-60°    | 7554 lm | 80,7%   |
| 60-90°   | 1221 lm | 13,0%   |
| 70-100°  | 696 lm  | 7,4%    |
| 90-120°  | 394 lm  | 4,2%    |
| 0-90°    | 8775 lm | 93,7%   |
| 90-180°  | 589 lm  | 6,3%    |
| 0-180°   | 9364 lm | 100,0%  |

### BUG rating

|                      | Lumen   | % Total |
|----------------------|---------|---------|
| <b>Forward light</b> |         |         |
| Low(0-30°)           | 1455 lm | 15,5%   |
| Medium(30-60°)       | 2317 lm | 24,7%   |
| High(60-80°)         | 512 lm  | 5,5%    |
| Very high(80-90°)    | 102 lm  | 1,1%    |
| <b>Back light</b>    |         |         |
| Low(0-30°)           | 1455 lm | 15,5%   |
| Medium(30-60°)       | 2317 lm | 24,7%   |
| High(60-80°)         | 512 lm  | 5,5%    |
| Very high(80-90°)    | 102 lm  | 1,1%    |
| <b>Uplight</b>       |         |         |
| Low(90-100°)         | 131 lm  | 1,4%    |
| High(100-180°)       | 457 lm  | 4,9%    |

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

BUG rating B3 U3 G2



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Operator:

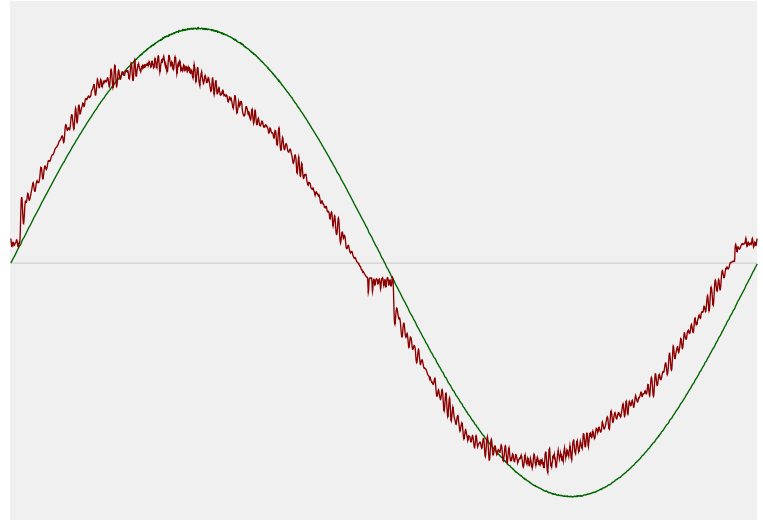


## Power Details

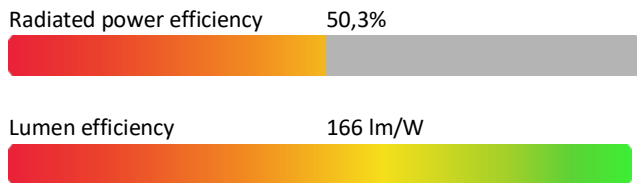
### Input Power

|   |          |
|---|----------|
| Power feed to light source                          | 56,5 W   |
| Frequency of input power                            | 50 Hz    |
| RMS Input voltage feed, $V_{RMS}$                   | 230 V    |
| RMS Input current feed, $I_{RMS}$                   | 0,253 A  |
| Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$ | 58,15 VA |
| Displacement factor of AC power feed                | 0,97     |
| Power factor of AC current feed                     | 0,97     |
| Total harmonic distortion of the current            | 6,01%    |
| 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 | 5700 K |
| CCT shift | +0 K   |
| CCT end   | 5700 K |

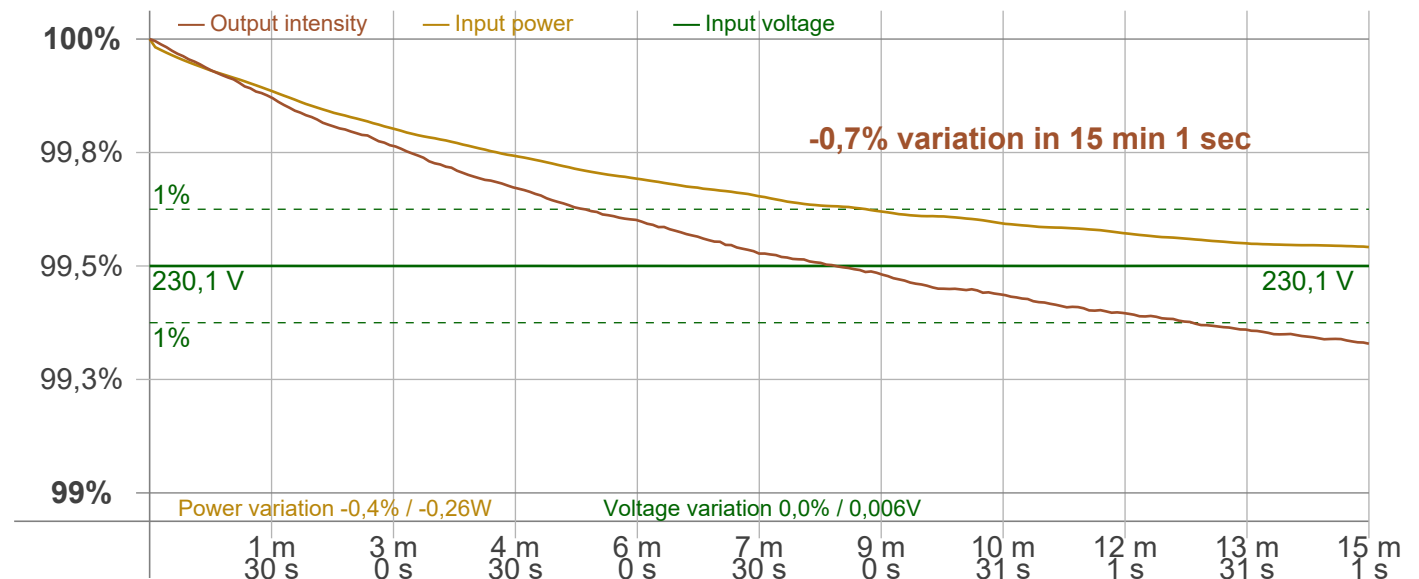
### Warmup Result

|                   |                                 |
|-------------------|---------------------------------|
| Total warmup time | Lamp stabilized in 15 min 1 sec |
| Warmup variation  | -0,7%                           |

### Output Change

|               |         |
|---------------|---------|
| Output start  | 9428 lm |
| Output change | -64 lm  |
| Output end    | 9364 lm |

## Stabilization Curve



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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 100 Hz  
 Percent Flicker 0,15 %  
 Flicker index 0

### Flicker indices according to California Energy Commission (CEC) 2016b

JA8/10 40 Hz 0,01 %  
 JA8/10 90 Hz 0,02 %  
 JA8/10 200 Hz 0,14 %  
 JA8/10 400 Hz 0,14 %  
 JA8/10 1000 Hz 0,15 %

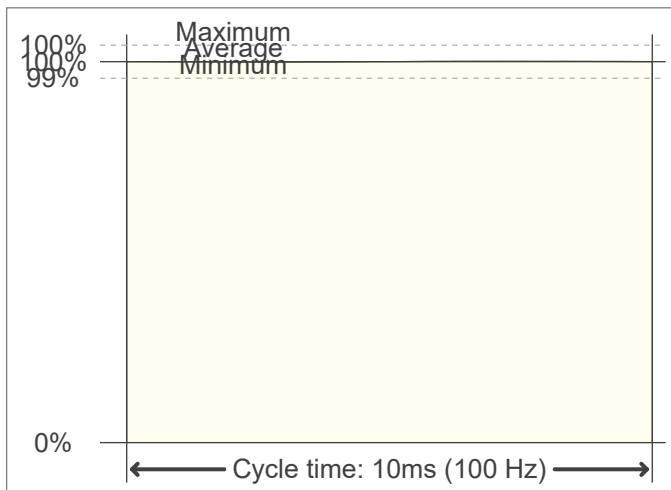
### TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz) 0,01  
 SVM value (80 < F < 2000 Hz) 0

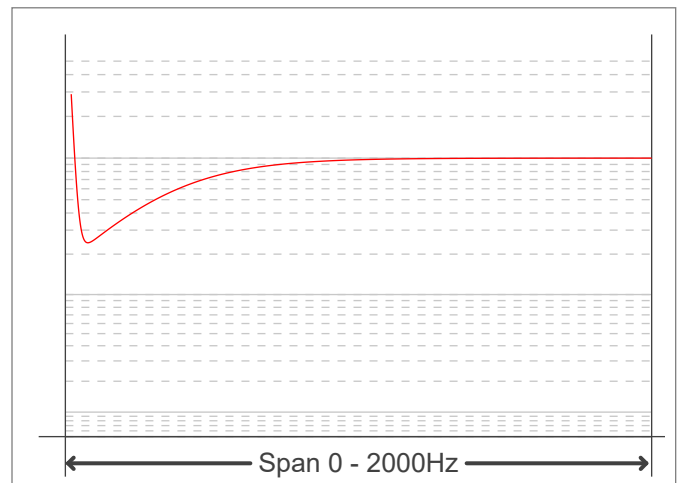
### Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp 0,01

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



### Flicker FFT (flicker curve in frequency domain)



### IEEE 1789 Frequency/modulation plot

