TRIDONIC

## Module CLE Quadrant ADV4

Modules CLE advanced

### Product description

_ Ideal for round shaped and flat ceiling and pendant luminaires
_ THE solution to realise XXL luminaires
_ For uniform illumination of prestige areas or rooms designed to impress
_ High Output and High Efficiency Mode enables more flexibility on luminarie design
_ Narrow diffuser distances possible
_ Self-cooling (no additional heat sink required)
_ HE ... High Efficiency, NM ... Nominal Mode, HO ... High Output
_ Long lifetime up to 102,000 hours
_ 5 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)

### Optical properties

_ Colour temperatures 3,000 and 4,000 K
_ Efficacy of the LED module up to 222 lm/W
_ High colour rendering index CRI > 80
_ Small colour tolerance (MacAdam 3) ①
_ Small luminous flux tolerances

### Mechanical properties

_ Module dimension ø522 mm, ø802 mm und ø1,082 mm with several module segments
_ Simple installation (e.g. screws)

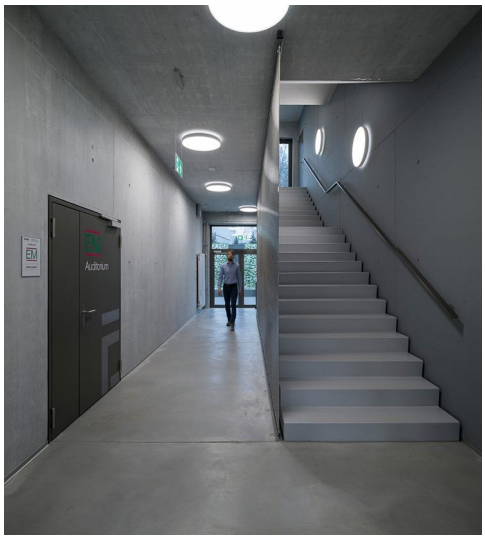
### System solution

_ Combine Tridonic's LED modules and dimmable drivers to achieve an outstanding system efficacy (configuration possible via https://setbuilder.tridonic.com/)

① Integral measurement over the complete module.

### Website

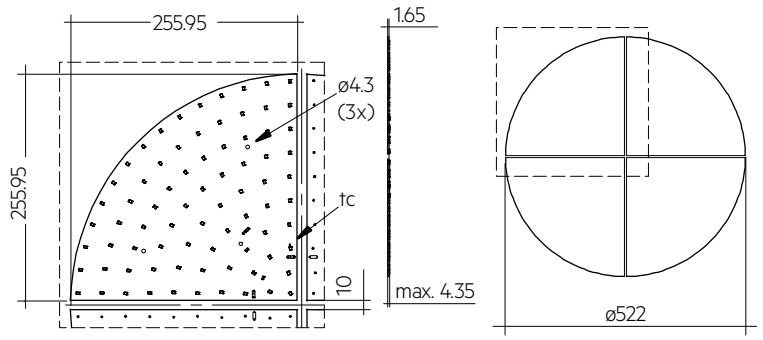
http://www.tridonic.com/28005495



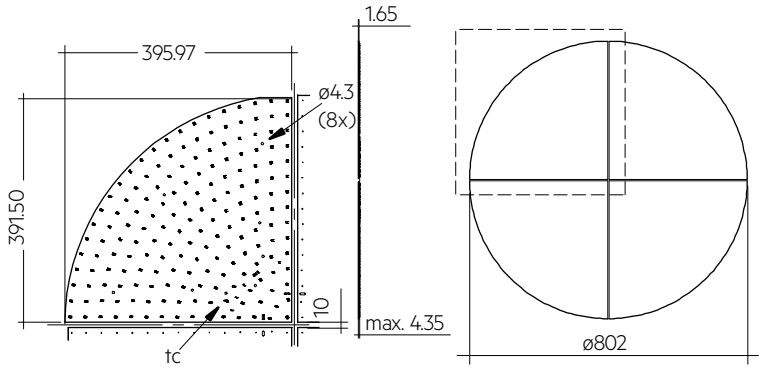
Spotlights | Downlights | Linear | **Area** | **Floor | Wall** | **Free-standing** | Street | Decorative | High bay

## Module CLE Quadrant ADV4

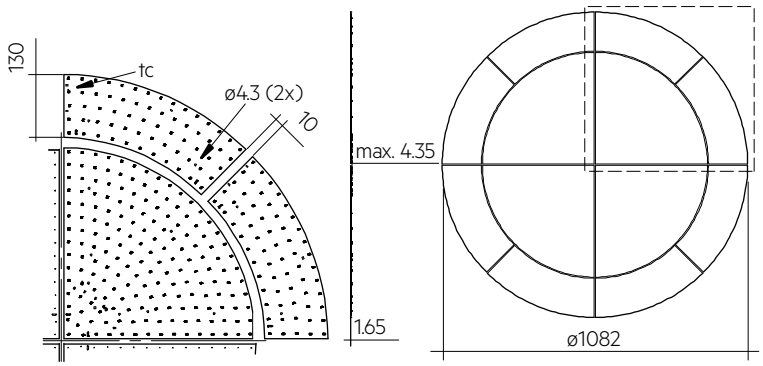
Modules CLE advanced




CLE Quadrant 261mm 1200lm ADV4 (details see data sheet 3.4 mounting instruction)




CLE Quadrant 401mm 2500lm ADV4 (details see data sheet 3.4 mounting instruction)




CLE Quadrant 401mm 2500lm ADV4 + CLE Quadrant 541mm 1000lm ADV4 (details see data sheet 3.4 mounting instruction)

## Ordering data

| Type | Article number | Colour temperature | Packaging, carton | Weight per pc. |
|---|---|---|---|---|
| **CLE Quadrant 261mm 1200lm 830 ADV4** | **28005495** | 3,000 K | 8 pc(s). | 0.131 kg |
| **CLE Quadrant 261mm 1200lm 840 ADV4** | **28005496** | 4,000 K | 8 pc(s). | 0.131 kg |
| **CLE Quadrant 401mm 2500lm 830 ADV4** | **28005497** | 3,000 K | 8 pc(s). | 0.316 kg |
| **CLE Quadrant 401mm 2500lm 840 ADV4** | **28005498** | 4,000 K | 8 pc(s). | 0.316 kg |
| **CLE Quadrant 541mm 1000lm 830 ADV4** | **28005499** | 3,000 K | 10 pc(s). | 0.123 kg |
| **CLE Quadrant 541mm 1000lm 840 ADV4** | **28005500** | 4,000 K | 10 pc(s). | 0.123 kg |

## Technical data

| | |
|---|---|
| Beam characteristic | 120° |
| Ambient temperature ta | -25 … +45 °C |
| tp rated | 45 °C |
| tc | 85 °C |
| Irated for CLE Quadrant G3 261mm | 225 mA |
| Irated for CLE Quadrant G3 401mm | 450 mA |
| Irated for CLE Quadrant G3 541mm | 250 mA |
| Imax for CLE Quadrant G3 261mm | 1,200 mA |
| Imax for CLE Quadrant G3 401mm | 2,800 mA |
| Imax for CLE Quadrant G3 541mm | 1,400 mA |
| Max. permissible LF current ripple for CLE Quadrant 261mm | 1,320 mA |
| Max. permissible LF current ripple for CLE Quadrant 401mm | 3,080 mA |
| Max. permissible LF current ripple for CLE Quadrant 541mm | 1,540 mA |
| Max. permissible peak current for CLE Quadrant 261mm | 2,800 mA / max. 10 ms |
| Max. permissible peak current for CLE Quadrant 401mm | 4,400 mA / max. 10 ms |
| Max. permissible peak current for CLE Quadrant 541mm | 3,200 mA / max. 10 ms |
| Max. working voltage for insulation ② | 400 V |
| Insulation test voltage | 1.8 kV |
| Colour tolerance | 3 SDCM |
| ESD classification | Severity level 2 |
| Risk group (IEC 62471) ③ | RG1 |
| Risk group (IEC 62471) for 261 mm | RG1 (> 669 – 1200 mA (Imax)), RGO (≤ 669 mA) |
| Risk group (IEC 62471) for 401 mm | RG1 (> 1530 – 2800 mA (Imax)), RGO (≤ 1530 mA) |
| Risk group (IEC 62471) for 541 mm | RG1 (> 765 – 1400 mA (Imax)), RGO (≤ 765 mA) |
| Classification acc. to IEC 62031 | Built-in |
| Type of protection | IP00 |
| Lumen maintenance L70B50 | 102,000 h |
| Guarantee (conditions at www.tridonic.com) | 5 Year(s) |

## Approval marks

RoHS

## Standards

IEC 62031, IEC 62471, IEC 61547, IEC 55015, IEC 61000-4-2

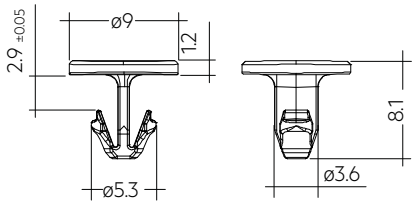
**Specific technical data**

| Type | Article number | Photometric code | Useful luminous flux at tp = 25 °C ④ | Expected luminous flux at tp rated ⑤ | Typ. forward current | Min. forward voltage at tp rated | Max. forward voltage at tp = 25 °C | Power consumption Pon at tp = 25 °C ⑥ | Efficacy of the module at tp = 25 °C | Expected efficacy of the module at tp rated | Colour rendering index CRI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Operating mode HE** | | | | | | | | | | | |
| **CLE Quadrant 261mm 1200lm 830 ADV4** | **28005495** | 830/359 | – | 1,182 lm | 200 mA | 27.8 V | 29.1 V | – | – | 206 lm/W | >80 |
| **CLE Quadrant 261mm 1200lm 840 ADV4** | **28005496** | 840/359 | – | 1,245 lm | 200 mA | 27.8 V | 29.1 V | – | – | 217 lm/W | >80 |
| **CLE Quadrant 401mm 2500lm 830 ADV4** | **28005497** | 830/359 | – | 2,058 lm | 350 mA | 27.6 V | 29.0 V | – | – | 206 lm/W | >80 |
| **CLE Quadrant 401mm 2500lm 840 ADV4** | **28005498** | 840/359 | – | 2,168 lm | 350 mA | 27.6 V | 29.0 V | – | – | 217 lm/W | >80 |
| **CLE Quadrant 541mm 1000lm 830 ADV4** | **28005499** | 830/359 | – | 858 lm | 200 mA | 20.1 V | 21.1 V | – | – | 206 lm/W | >80 |
| **CLE Quadrant 541mm 1000lm 840 ADV4** | **28005500** | 840/359 | – | 904 lm | 200 mA | 20.1 V | 21.1 V | – | – | 217 lm/W | >80 |
| **Operating mode NM** | | | | | | | | | | | |
| **CLE Quadrant 261mm 1200lm 830 ADV4** | **28005495** | 830/359 | 1,367 lm | 1,338 lm | 225 mA | 27.9 V | 29.2 V | 6.5 W | 210 lm/W | 207 lm/W | >80 |
| **CLE Quadrant 261mm 1200lm 840 ADV4** | **28005496** | 840/359 | 1,440 lm | 1,409 lm | 225 mA | 27.9 V | 29.2 V | 6.5 W | 222 lm/W | 218 lm/W | >80 |
| **CLE Quadrant 401mm 2500lm 830 ADV4** | **28005497** | 830/359 | 2,719 lm | 2,660 lm | 450 mA | 27.8 V | 29.1 V | 13.0 W | 209 lm/W | 206 lm/W | >80 |
| **CLE Quadrant 401mm 2500lm 840 ADV4** | **28005498** | 840/359 | 2,864 lm | 2,802 lm | 450 mA | 27.8 V | 29.1 V | 13.0 W | 220 lm/W | 217 lm/W | >80 |
| **CLE Quadrant 541mm 1000lm 830 ADV4** | **28005499** | 830/359 | 1,100 lm | 1,076 lm | 250 mA | 20.2 V | 21.2 V | 5.3 W | 208 lm/W | 206 lm/W | >80 |
| **CLE Quadrant 541mm 1000lm 840 ADV4** | **28005500** | 840/359 | 1,159 lm | 1,134 lm | 250 mA | 20.2 V | 21.2 V | 5.3 W | 219 lm/W | 217 lm/W | >80 |
| **Operating mode HO** | | | | | | | | | | | |
| **CLE Quadrant 261mm 1200lm 830 ADV4** | **28005495** | 830/359 | – | 1,922 lm | 325 mA | 28.2 V | 29.5 V | – | – | 203 lm/W | >80 |
| **CLE Quadrant 261mm 1200lm 840 ADV4** | **28005496** | 840/359 | – | 2,025 lm | 325 mA | 28.2 V | 29.5 V | – | – | 214 lm/W | >80 |
| **CLE Quadrant 401mm 2500lm 830 ADV4** | **28005497** | 830/359 | – | 4,147 lm | 700 mA | 28.1 V | 29.5 V | – | – | 204 lm/W | >80 |
| **CLE Quadrant 401mm 2500lm 840 ADV4** | **28005498** | 840/359 | – | 4,368 lm | 700 mA | 28.1 V | 29.5 V | – | – | 215 lm/W | >80 |
| **CLE Quadrant 541mm 1000lm 830 ADV4** | **28005499** | 830/359 | – | 1,508 lm | 350 mA | 20.5 V | 21.4 V | – | – | 204 lm/W | >80 |
| **CLE Quadrant 541mm 1000lm 840 ADV4** | **28005500** | 840/359 | – | 1,589 lm | 350 mA | 20.5 V | 21.4 V | – | – | 215 lm/W | >80 |

② If mounted with M4 screws.
③ Measured at operating mode HO.
④ Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.
⑤ Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.
⑥ Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

## ACL CLIP 4.3mm

Accessory




**Product description**

_ Clip for fixation of LED modules with 4.3 mm holes
_ Fast snap on mounting (sheet thickness 0.5 – 1.0 mm for PUSH-FIX and 1 – 2 mm for PUSH-FIX Long)
_ For drilling hole 4 mm
_ Clip made of polycarbonate
_ Minimum sales quantity 500 pcs.

**Website**

http://www.tridonic.com/28001036

### Ordering data

| Type | Article number | Colour | Packaging, bag ① | Weight per pc. |
|---|---|---|---|---|
| **ACL CLIP 4.3mm PUSH-FIX** | **28001036** | White | 500 pc(s). | 0.001 kg |
| **ACL CLIP 4,3mm PUSH-FIX Long** | **28002314** | Transparent | 500 pc(s). | 0.001 kg |

① Minimum sales quantity 500 pcs.

## 1. Standards

IEC 62031
IEC 62471
IEC 62778
IEC 61547
IEC 61000-4-2

### 1.1 Photometric code

Key for photometric code, e. g. 830 / 449

| 1st digit | | 2nd + 3rd digit | 4th digit | 5th digit | 6th digit | |
|---|---|---|---|---|---|---|
| Code | CRI | Colour temperature in Kelvin x 100 | MacAdam initial | MacAdam after 25% of the lifetime (max.6000h) | Luminous flux after 25% of the lifetime (max.6000h) | |
| | | | | | Code | Luminous flux |
| 7 | 70 – 79 | | | | 7 | ≥ 70 % |
| 8 | 80 – 89 | | | | 8 | ≥ 80 % |
| 9 | ≥90 | | | | 9 | ≥ 90 % |

### 1.2 Energy classification

| Type | Colour tempera-ture | Forward current | Energy classifi-cation | Energy consumption |
|---|---|---|---|---|
| CLE Quadrant 261mm 1200lm 830 ADV4 | 3,000 K | 225 mA | B | 7 kWh / 1,000 h |
| CLE Quadrant 261mm 1200lm 840 ADV4 | 4,000 K | 225 mA | B | 7 kWh / 1,000 h |
| CLE Quadrant 401mm 2500lm 830 ADV4 | 3,000 K | 450 mA | B | 13 kWh / 1,000 h |
| CLE Quadrant 401mm 2500lm 840 ADV4 | 4,000 K | 450 mA | B | 13 kWh / 1,000 h |
| CLE Quadrant 541mm 1000lm 830 ADV4 | 3,000 K | 250 mA | B | 6 kWh / 1,000 h |
| CLE Quadrant 541mm 1000lm 840 ADV4 | 4,000 K | 250 mA | B | 6 kWh / 1,000 h |

Energy label and further information at www.tridonic.com in the certificates tab of the corresponding product page and at the EPREL data base https://eprel.ec.europa.eu/

## 2. Thermal details

### 2.1 tc point, ambient temperature and lifetime

The temperature at tp reference point is crucial for the light output and lifetime of a LED product.

For CLE a tp temperature of 45 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and lifetime.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

The tc and tp temperature of LED modules from Tridonic are measured at the same reference point.

### 2.2 Storage and humidity

| | |
|---|---|
| Storage temperature | -30 … +80 °C |

Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

### 2.3 Thermal design and heat sink

The rated life of LED products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the CLE will be greatly reduced or the CLE may be destroyed.

## 3. Installation / wiring

### 3.1 Electrical supply/choice of LED driver

CLE from Tridonic are not protected against overvoltages, overcurrents, overloads or short-circuit currents. Safe and reliable operation can only be guaranteed in conjunction with a LED driver which complies with the relevant standards. The use of LED driver from Tridonic in combination with CLE guarantees the necessary protection for safe and reliable operation.

If a LED driver other than Tridonic is used, it must provide the following protection:
- Short-circuit protection
- Overload protection
- Overtemperature protection

CLE must be supplied by a constant current LED driver. Operation with a constant voltage LED driver will lead to an irreversible damage of the module.

Wrong polarity can damage the CLE.

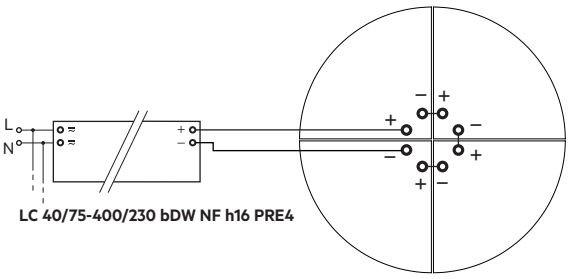
The CLE module is designed for serial wiring.

CLE can be operated either from SELV LED drivers or from LED drivers with LV output voltage.

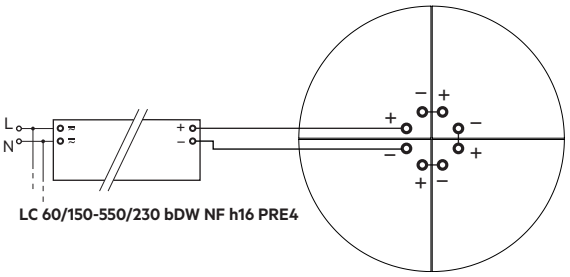
CLE are basic insulated up to 400 V (if mounted with M4 screws with head diameter 8 mm) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led Driver (also against earth) is above 400 V, an additional insulation between LED module and heat sink is required (for example by insulated thermal pads) or by a suitable luminaire construction.
At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

### 3.2 Wiring

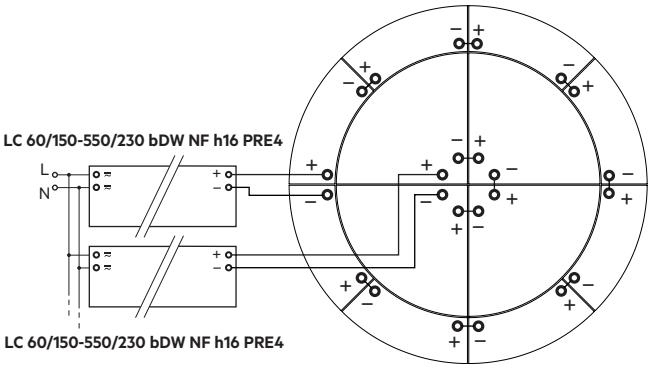
CLE Quadrant 261mm 1200 lm ADV4




CLE Quadrant 401mm 2500lm ADV4

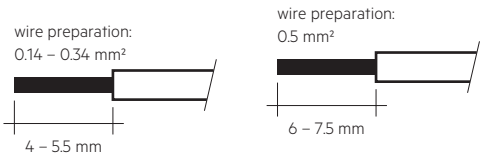



CLE Quadrant 401mm 2500lm ADV4 +
CLE Quadrant 541mm 1000lm ADV4




### 3.3 Wiring type and cross section

For wiring use solid wire from 0.14 to 0.5 mm².
No reconnection with smaller diameters possible if used with >0.34 mm².




To remove the wires use a suitabel tool (Wago 206-859) or through twist and pull.

### 3.4 Mounting instruction

None of the components of the CLE (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

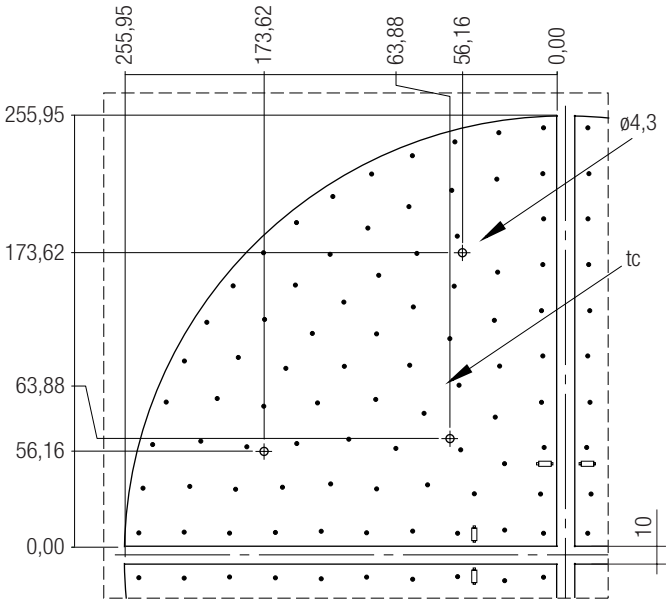
Max. torque for fixing: 0.5 Nm.

The LED modules are mounted with M4 screws or ACL CLIP 4.3mm.

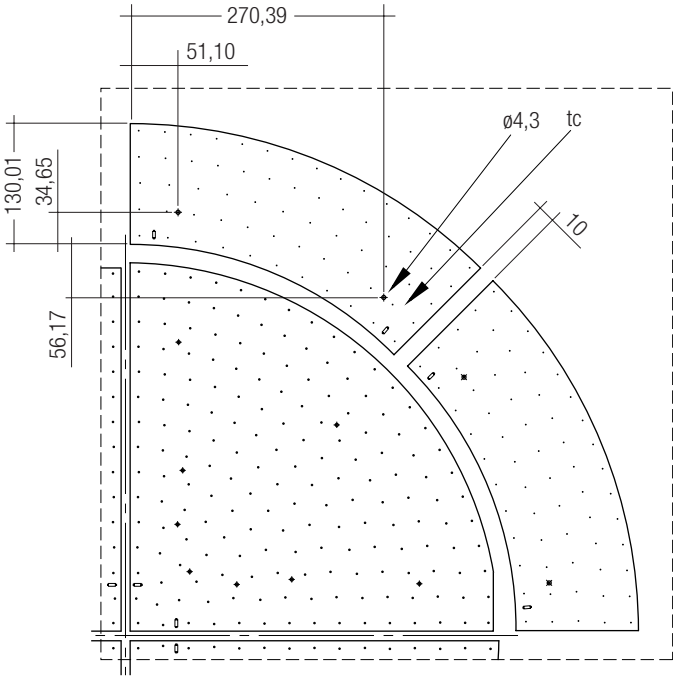
Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate.
Avoid corrosive atmosphere during usage and storage.

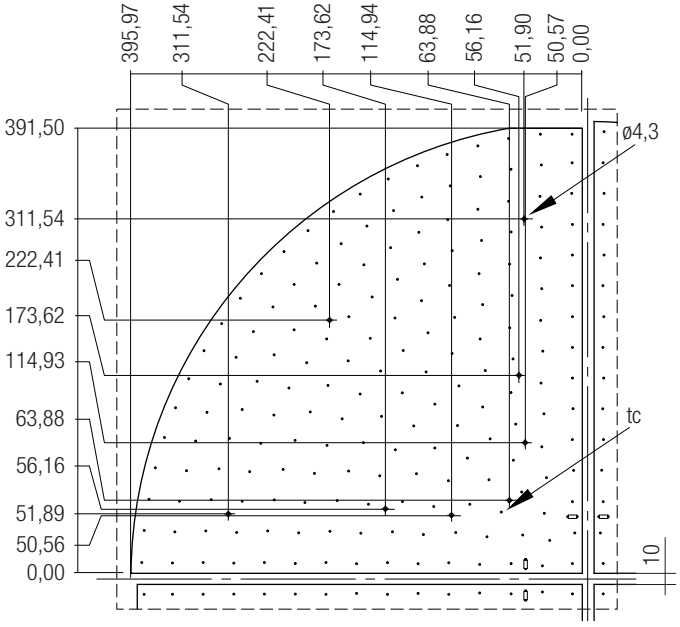
CLE Quadrant 261mm 1200 lm ADV4




CLE Quadrant 541mm 1000lm ADV4




CLE Quadrant 401mm 2500lm ADV4




### 3.5 EOS/ESD safety guidelines

The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at: http://www.tridonic.com/esd-protection

## 4. Lifetime

### 4.1 Lifetime, lumen maintenance and failure rate

The light output of an LED module decreases over the lifetime, this is characterized with the L value.
L70 means that the LED module will give 70 % of its initial luminous flux. This value is always related to the number of operation hours and therefore defines the lifetime of an LED module.

As the L value is a statistical value and the lumen maintenance may vary over the delivered LED modules.
The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the initial luminous flux, respectively 90 % will be above 70 % of the initial value. In addition the percentage of failed modules (fatal failure) is characterized by the C value.

### 4.2 Lumen maintenance for CLE

CLE Quadrant 261mm 1200lm 8x0 ADV4

| Forward current | tp temperature | L90 / B10 | L90 / B50 | L80 / B10 | L80 / B50 | L70 / B10 | L70 / B50 |
|---|---|---|---|---|---|---|---|
| 200 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| 225 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| 325 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |

CLE Quadrant 401mm 2500lm 8x0 ADV4

| Forward current | tp temperature | L90 / B10 | L90 / B50 | L80 / B10 | L80 / B50 | L70 / B10 | L70 / B50 |
|---|---|---|---|---|---|---|---|
| 350 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| 450 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| 700 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |

CLE Quadrant 541mm 1000lm 8x0 ADV4

| Forward current | tp temperature | L90 / B10 | L90 / B50 | L80 / B10 | L80 / B50 | L70 / B10 | L70 / B50 |
|---|---|---|---|---|---|---|---|
| 200 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| 250 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| 350 mA | 45 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 55 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |
| | 65 °C | 52k h | 52k h | >102k h | >102k h | >102k h | >102k h |

L00C03 >102k h. At tp rated, based on 10 swichting cycles per day.

### 4.3 Switching capability

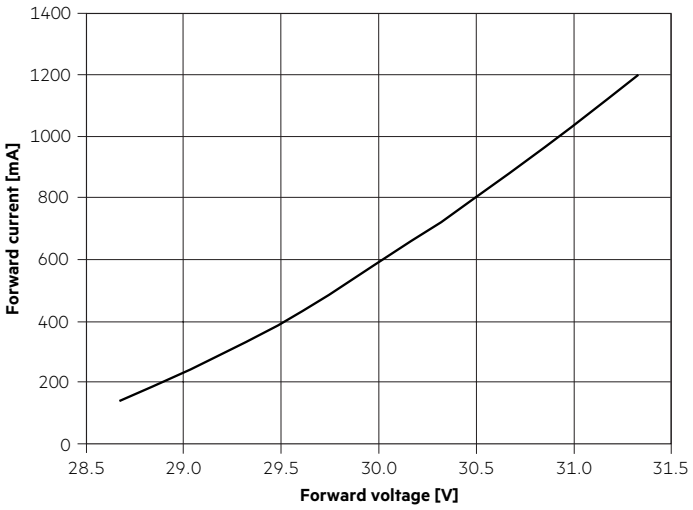
100,000 cycles

Tridonic test according to IEC 62717 Cl 10.3.3
30 s on / 30 s off at Imax

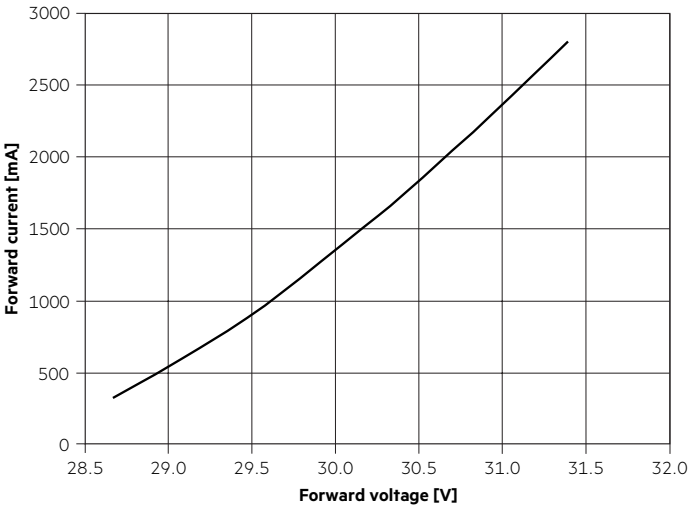
## 5. Electrical values

### 5.1 Typ. forward voltage vs. forward current

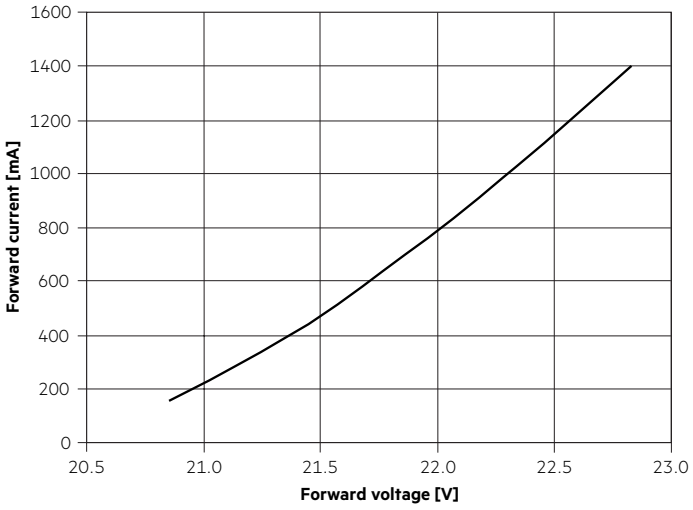
CLE Quadrant 261mm 1200lm



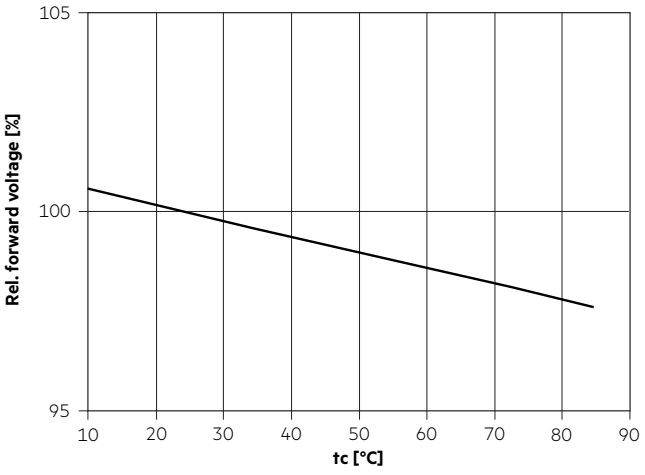

CLE Quadrant 401mm 2500lm




CLE Quadrant 541mm 1000lm




### 5.2 Forward voltage vs. tp temperature




The diagrams are based on statistic values.
The real values can be different.

## 6. Photometric characteristics

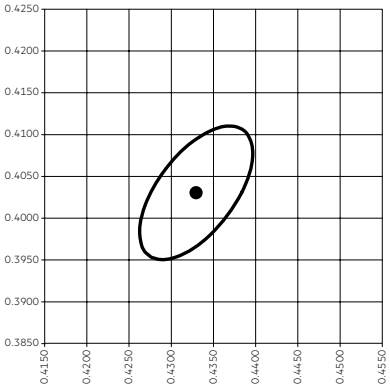
### 6.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are measured integral after a settling time of 100 ms. The current impuls depends on the module type.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

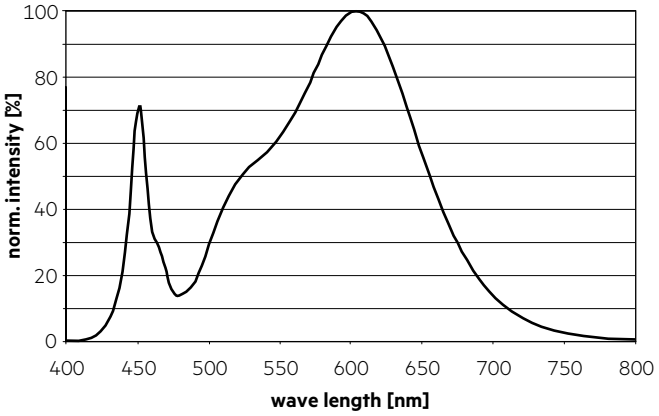
| Module type | Current impulse |
|---|---|
| CLE Quadrant 261mm 1200lm 8x0 ADV4 | 455 mA |
| CLE Quadrant 401mm 2500lm 8x0 ADV4 | 1,040 mA |
| CLE Quadrant 541mm 1000lm 8x0 ADV4 | 520 mA |

**3,000 K**

| | x0 | y0 |
|---|---|---|
| Centre | 0.4338 | 0.4030 |

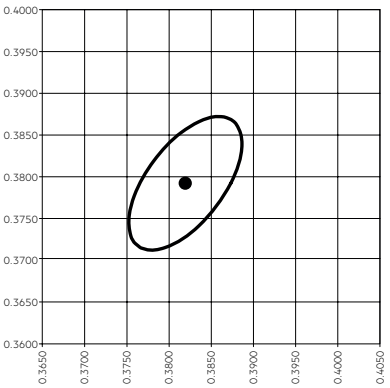



MacAdam Ellipse: 3SDCM

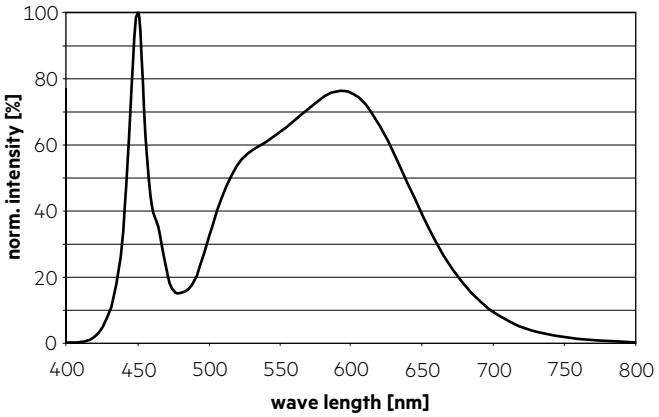



**4,000 K**

| | x0 | y0 |
|---|---|---|
| Center | 0.3818 | 0.3797 |

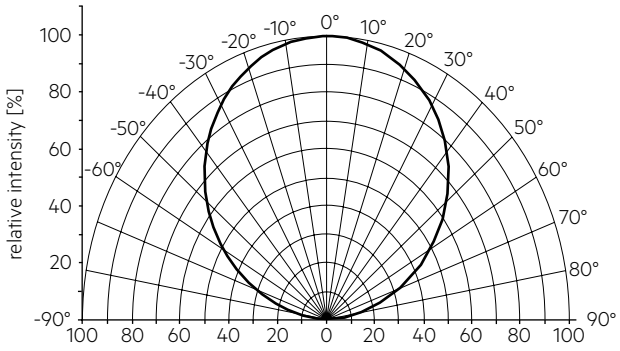



MacAdam Ellipse: 3SDCM



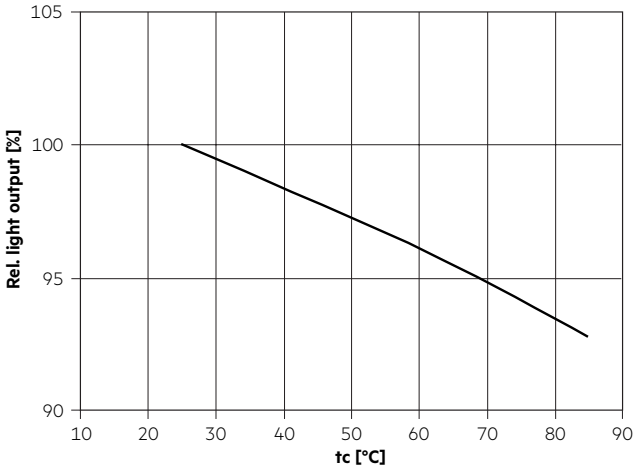
### 6.2 Light distribution

The optical design of the CLE product line ensures optimum homogeneity for the light distribution.



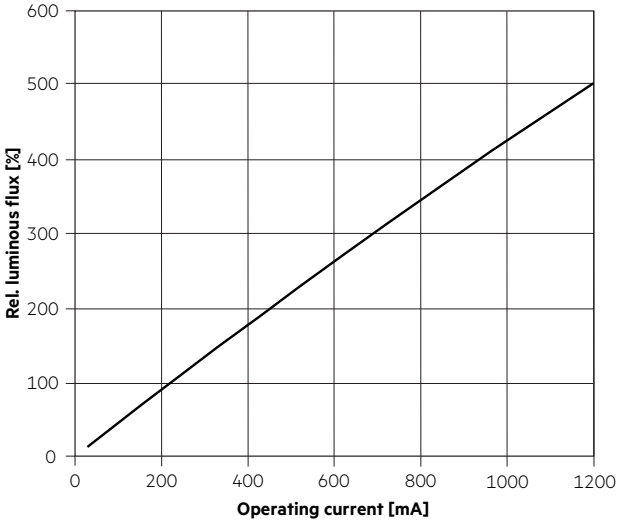

The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 3.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 4 cm) should be used.

### 6.3 Relative luminous flux vs. tc temperature

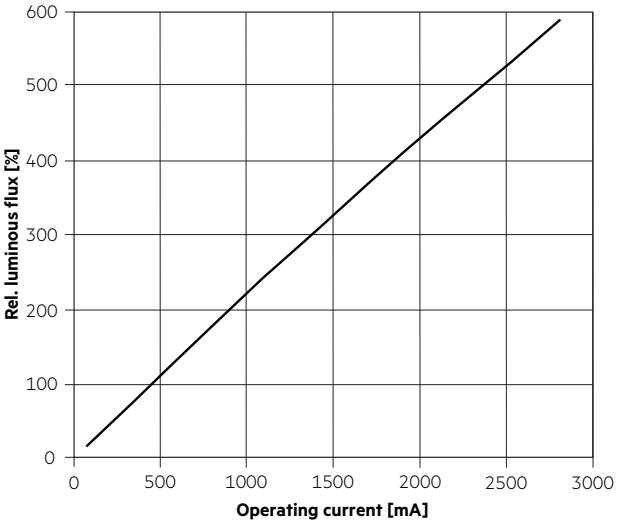



### 6.4 Relative luminous flux vs. operating current

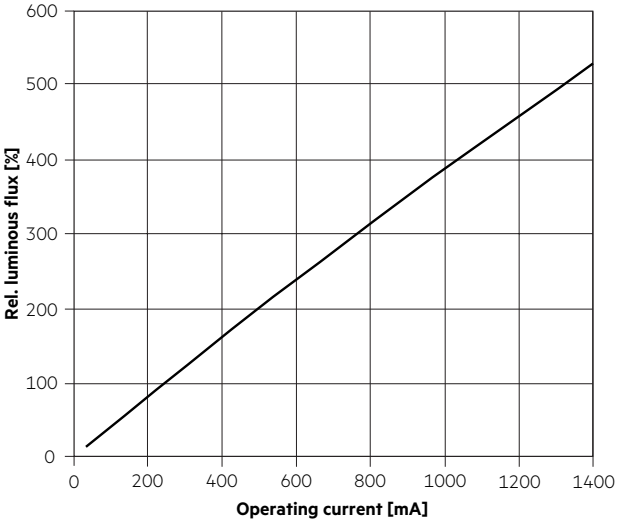
CLE Quadrant 261mm 1200lm 8x0 ADV4




CLE Quadrant 401mm 2500lm 8x0 ADV4




CLE Quadrant 541mm 1000lm 8x0 ADV4




## 7. Miscellaneous

### 7.1 Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim.