

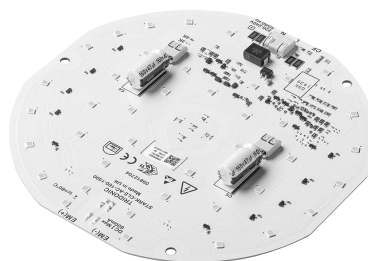


#### Engine STARK CLE-AC-160-1500

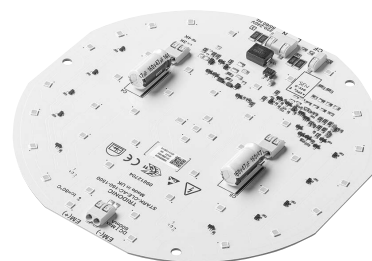
Module CLE

#### Product description

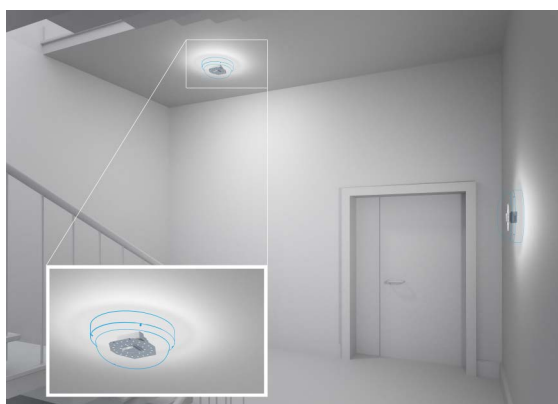
- Module with integrated electronic
- Economic one-piece solution
- Easy Refitting of existing luminaires
- Ideal for ceiling-mounted and wallmounted luminaires
- Enables thin designs of luminaires
- High colour rendering index CRI > 80
- Small colour tolerance MacAdam 3
- System efficacy of the module up to 100 lm/W
- Integrated separate emergency LED modules, controlled via EM powerLED
- Simple CORRIDOR FUNCTION in combination with any sensor
- Touch cover: Protection against direct touch of active parts in transparent or diffuse finish, see accessories
- Life-time 50,000 h L80F10
- 5-year guarantee



CLE-AC-160



CLE-AC-160 EM



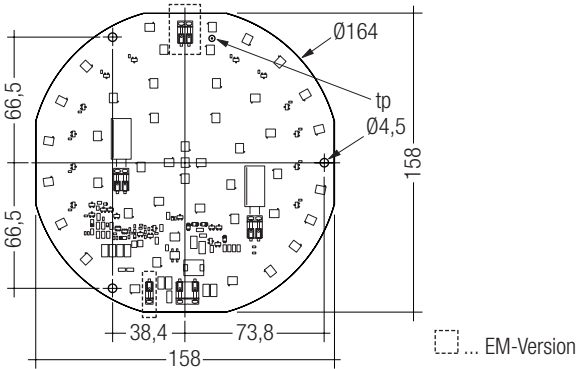
ACC COVER 160mm TRANSP



Engine STARK CLE-AC-160-1500  
Module CLE

Technical data

Rated supply voltage	220 – 240 V
Input voltage, AC	198 – 264 V
Mains frequency	50 / 60 Hz
Typ. λ	0.97
THD	20 %
Beam characteristic	120°
Ambient temperature ta	-25 ... +55 °C
Typ. tp point	65 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00



Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
STARK CLE-AC-160-1500-830-CLA	89800421	3.000 K	10 pc(s).	0.065 kg
STARK CLE-AC-160-1500-840-CLA	89800422	4.000 K	10 pc(s).	0.065 kg
STARK CLE-AC-160-1500-830-CLA EM-CF	89800423	3.000 K	10 pc(s).	0.065 kg
STARK CLE-AC-160-1500-840-CLA EM-CF	89800424	4.000 K	10 pc(s).	0.065 kg

Specific technical data

Type	Photometric code	Typ. luminous flux at tp = 25 °C <sup>①</sup>	Typ. luminous flux at tp = 65 °C <sup>①</sup>	Input current <sup>①</sup>	Input power <sup>①</sup>	Efficacy of the system at tp = 65 °C	Colour rendering index CRI	Energy classification
<b>Normal operation</b>								
STARK CLE-AC-160-1500-830-CLA	830/339	1,600 lm	1,450 lm	65 mA	14.5 W	100 lm/W	> 80	A+
STARK CLE-AC-160-1500-840-CLA	840/339	1,600 lm	1,450 lm	65 mA	14.5 W	100 lm/W	> 80	A+
<b>Emergency operation</b>								
STARK CLE-AC-160-1500-830-CLA EM-CF	830/339	130 lm	120 lm	–	–	–	> 80	–
STARK CLE-AC-160-1500-840-CLA EM-CF	840/339	130 lm	120 lm	–	–	–	> 80	–

<sup>①</sup> Tolerance range for optical and electrical data: ±10 %.

## ACC COVER 160mm TRANSP/DIFFUSE

**Product description**

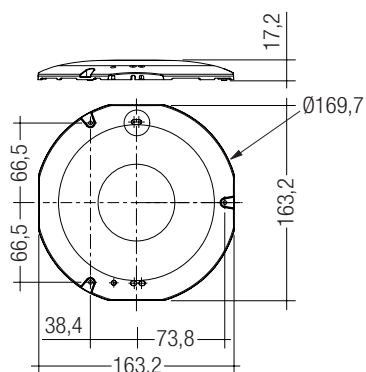
- Cover for CLE-AC-160
- Protection against direct touch of active parts
- Fixation with non-removable fasteners
- High transmission: 92 % for transparent version, 68 % for diffuse version
- Touch cover made of Polycarbonat



ACC COVER 160mm TRANSP



ACC COVER 160mm DIFFUSE

**Ordering data**

Type	Article number	Colour	Packaging carton	Weight per pc.
ACC COVER 160mm TRANSP	28001033	Transparent	10 pc(s).	0.048 kg
ACC COVER 160mm DIFFUSE	28001759	Diffuse	10 pc(s).	0.048 kg

- EN 55015
- EN 61000-3-2
- EN 61547
- EN 62031
- EN 62471

Key for photometric code, e. g. 830 / 559

### 2.1 tc point, ambient temperature and life-time

### 3.1 Wiring

### 3.2 Wiring type and cross section

### 3.3 Mounting instruction

None of the components of the STARK 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 onto a heat sink with 3 screws per module. In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

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.

### 3.4 Safety instructions



A protection against direct touch (test finger) to the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

E.g. ACC COVER 160mm in combination with non removable plastic clips.

### 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. Life-time

### 4.1 Life-time, lumen maintenance and failure rate

The light output of an LED Module decreases over the life-time, 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 life-time 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.

The F value is the combination of the B and C value. That means for F degradation and complete failures are considered, e.g. L70F10 means 10 % of the LED modules may fail or be below 70 % of the initial luminous flux.

### 4.2 Lumen maintenance for STARK CLE-AC-160-1500

tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
65 °C	25,000 h	50,000 h	50,000 h	50,000 h	50,000 h	50,000 h

## 5. Electrical values

### 5.1 Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	I <sub>max</sub>	time
<b>STARK CLE-AC-160-1500</b>	90	130	130	130	90	130	130	130	4.8 A	0.55 µs

### 5.2 Isolation and electric strength testing of luminaires

Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 V<sub>DC</sub> for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal.

The isolation resistance must be at least 2 MΩ.

As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1500 V<sub>AC</sub> (or 1.414 x 1500 V<sub>DC</sub>). To avoid damage to the electronic devices this test must not be conducted.

### 5.3 AC operation

Mains voltage:

220–240 V 50/60 Hz

198–264 V 50/60 Hz for safety

207–254 V 50/60 Hz for performance

## 6. Photometric characteristics

### 6.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are integral measured by a current impulse with typical values of module and a duration of 200 ms.

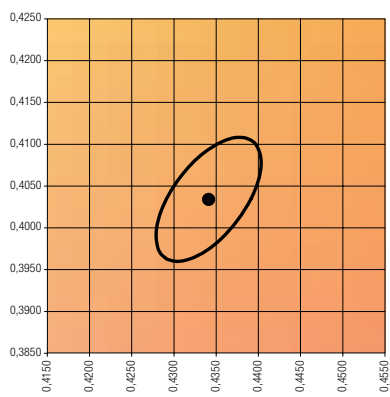
The ambient temperature of the measurement is  $t_a = 25^\circ\text{C}$ .

The measurement tolerance of the colour coordinates are  $\pm 0.01$ .

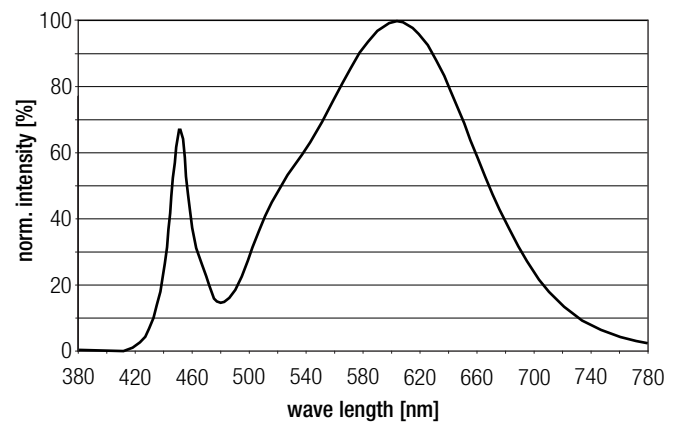
### 6.2 Colour coordinates for LED module without housing

#### 3,000 K

	x0	y0
Centre	0,4344	0,4032

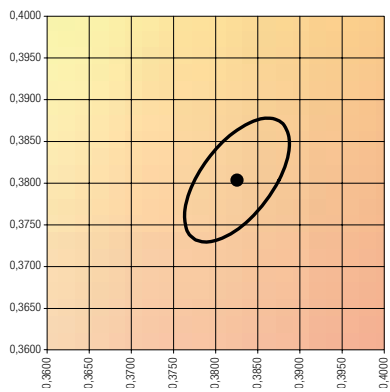


— MacAdam Ellipse: 3SDCM

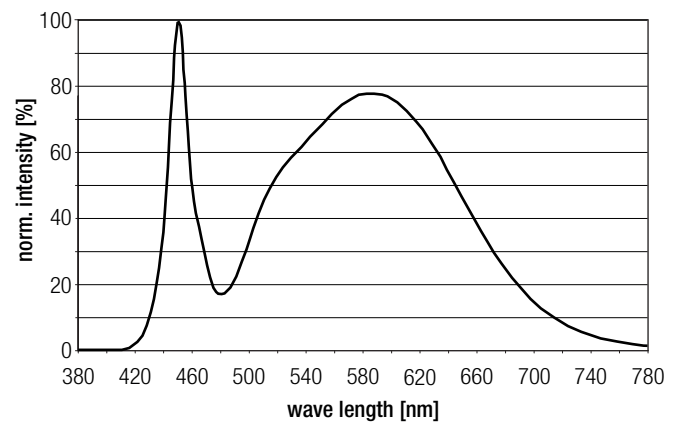


#### 4,000 K

	x0	y0
Mittelpunkt	0,3828	0,3803

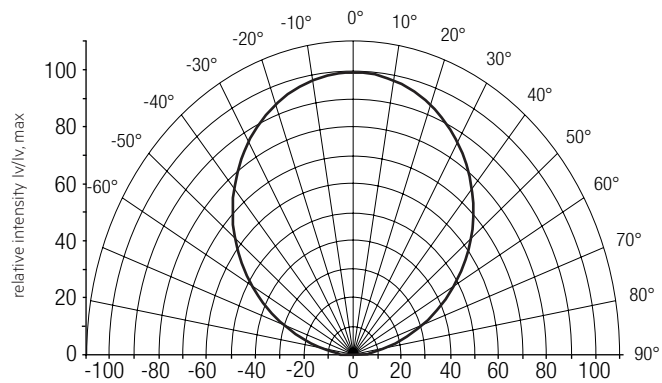


— MacAdam Ellipse: 3SDCM



### 6.3 Light distribution

The optical design of the STARK LLE 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 7.

To ensure an ideal mixture of colours and a homogenous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 4 cm) should be used.

For further information see Design-in Guide, 3D data and photometric data on [www.tridonic.com](http://www.tridonic.com) or on request.