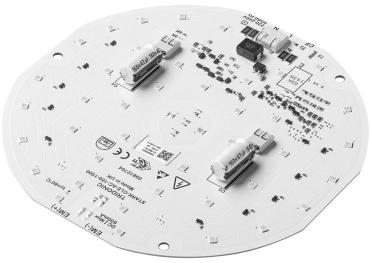
Engine STARK CLE-AC-160-1500

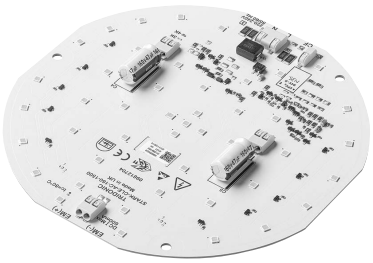
Modules CLE

Product description

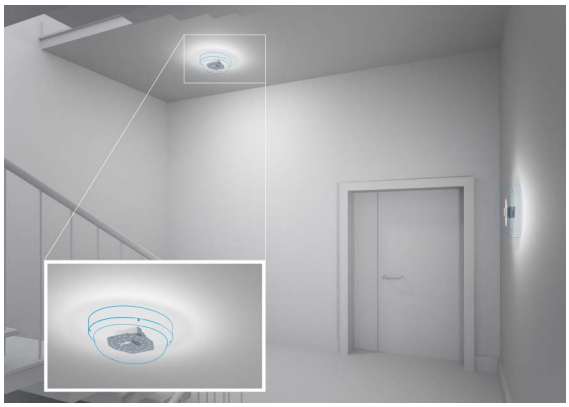
- Module with integrated electronic
- Economic one-piece solution
- Easy Refitting of existing luminaries
- Ideal for ceiling-mounted and wallmounted luminaires
- Enables thin designs of luminaries
- High colour rendering index CRI > 80
- Small colour tolerance MacAdam 3
- System efficacy of the module up to 100 lm/W
- Integrated seperate 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

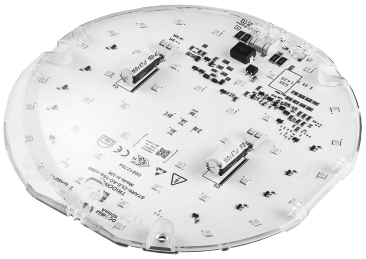


CLE-AC-160



CLE-AC-160 EM





ACC COVER 160mm TRANSP

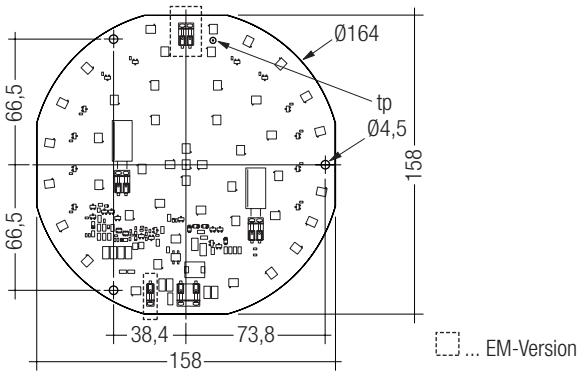
CE RoHS

Engine STARK CLE-AC-160-1500

Modules 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 °C①	Typ. luminous flux at tp = 65 °C①	Input current①	Input power①	Efficacy of the system at tp = 65 °C	Colour rendering index CRI	Energy classification
Normal operation								
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+
Emergency operation								
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	–

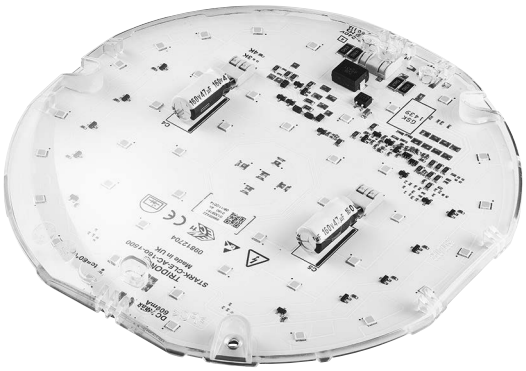
① Tolerance range for optical and electrical data: ±10 %.

ACCES-SORIES

ACC COVER 160mm TRANSP/DIFFUSE

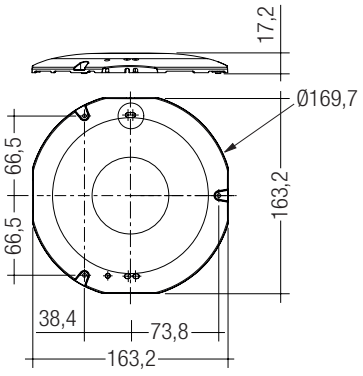
Product description

- 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

1. Standards

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

1.1 Photometric code

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

1st digit		2nd + 3rd digit	4th digit	5th digit	6th digit	
Code	CRI	Colour temperature in Kelvin x 100	McAdam initial	McAdam after 25% of the life-time (max.6000h)	Lumen maintanance after 25% of the life-time (max.6000h)	
					Code	Remaining lumen
7	67 – 76				7	≥ 70 %
8	77 – 86				8	≥ 80 %
9	87 – ≥90				9	≥ 90 %

2. Thermical details

2.1 tc point, ambient temperature and life-time

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

For STARK CLE a tp temperature of 65 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and life-time.

Compliance with the maximum permissible reference temperature at the tp 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 Thermal behaviour

storage temperature	-40 … +85 °C
operating temperature ta	-25 … +55 °C
tp (at typ. current)	65 °C
tc max. (at typ. current)	80 °C
max. humidity	0 … 80 %

* not condensating

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 STARK CLE will be greatly reduced or the STARK CLE may be destroyed.

2.4 Heat sink values

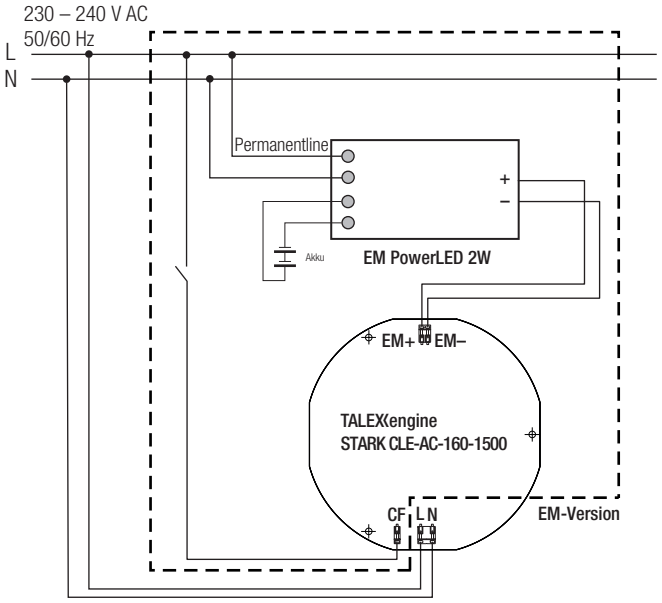
STARK CLE-AC-160-1500

ta	tp	$R_{th, hs-a}$	Cooling area
25 °C	65 °C	3.80 K/W	261 cm²
35 °C	65 °C	2.80 K/W	352 cm²
45 °C	65 °C	1.80 K/W	539 cm²
55 °C	65 °C	0.85 K/W	1,156 cm²

Notes
The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation. Depending on the heat sink a heat conducting paste or heat conducting film might be necessary to keep the specified tp temperature.

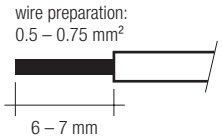
3. Installation / wiring

3.1 Wiring



3.2 Wiring type and cross section

The wiring can be solid or flexible wire with a cross section of 0.5 to 0.75 mm². For the push-wire connection you have to strip the insulation (6–7 mm).



Inserting stranded wires / removing wires by lightly pressing on the push button.

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 maintenace 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 inital luminous flux, respectivly 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 mm²	1.5 mm²	1.5 mm²	2.5 mm²	1.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	I_{max}	time
STARK CLE-AC-160-1500	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 DC 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 AC (or 1.414 x 1500 V DC). 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 charcteristics

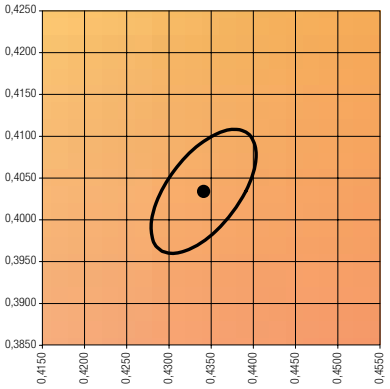
6.1 Coordinates and tolerances according to CIE 1931

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 ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

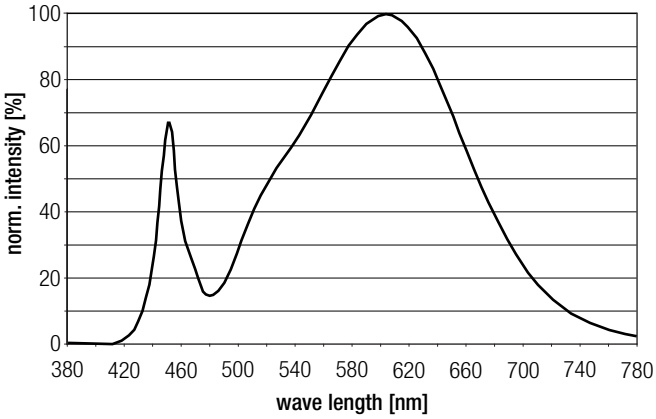
6.2 Colour coordinates for LED module without housing

3,000 K

	x0	y0
Centre	0,4344	0,4032

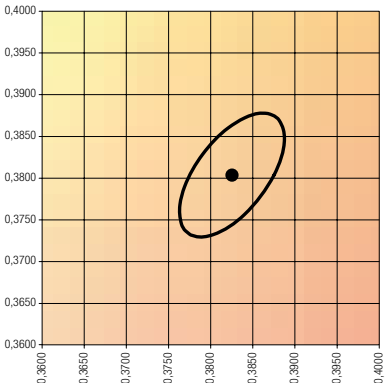


MacAdam Ellipse: 3SDCM

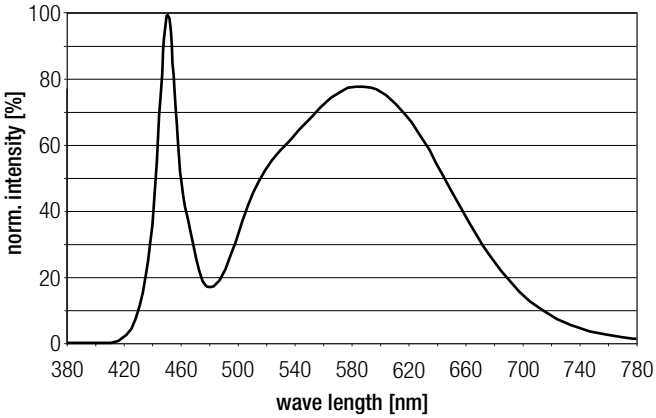


4,000 K

	x0	y0
Mittelpunkt	0,3828	0,3803

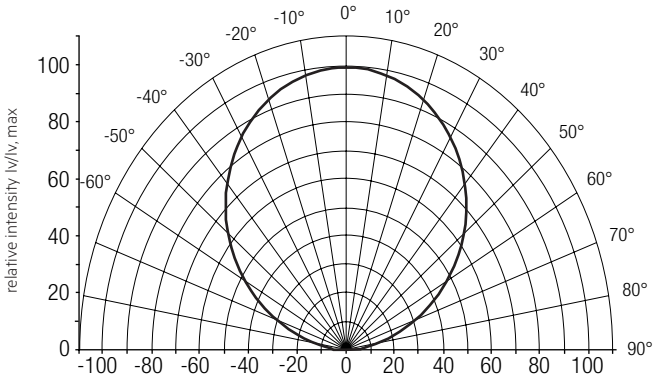


MacAdam Ellipse: 3SDCM



6.3 Light distribution

The optical design of the STARK LLE product line ensures optimum homogenity 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 homogenious 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 or on request.