Engine SLA ready2apply phase-cut SNC

Engine SLA ESSENCE

Product description

- LED replacement for MR 16 halogen spotlights
- Complete set with module and driver
- 10 W LED Equivalent to 50 W MR16 halogen
- Semi-finished spot with low height (55 mm)
- Integrated Heatsink; Integrated Optics
- Eye-catching reflector lens optic which mirrors the halogen facettes
- Higher Lumen Output than with traditional MR16 GU10 230V lamp
- 10 W, 2,700 K, 600 lm, CRI90
- MacAdam 3
- Beam Angle: spot degree (21°) or downlight (38°)
- Lifetime: 30,000 h (L80/F10)
- 3-year guarantee
- Compatible with main trailing edge market dimmers

Standards LED Driver, page 3
Standards LED module, page 5
Colour temperatures and tolerances, page 8

IP20 RoHS

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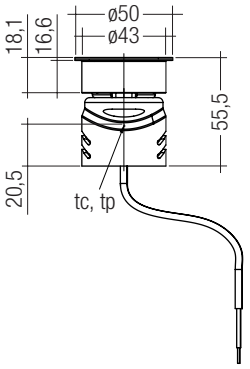
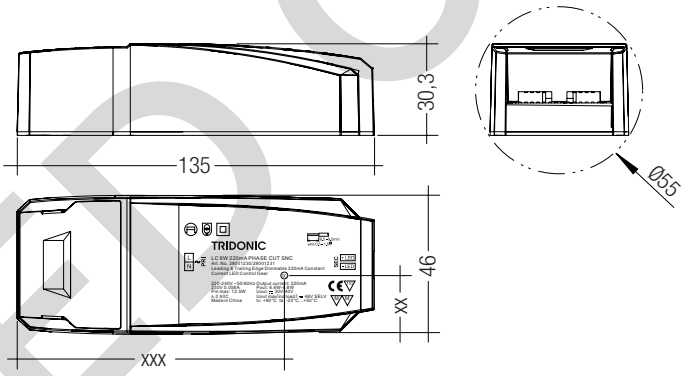
Technical data

Rated supply voltage	220 – 240 V
Input voltage, AC	198 – 264 V
Mains frequency	50 / 60 Hz
Typ. current (at 230 V, 50 Hz, full load)②	52 mA
Leakage current (PE)	0.5 mA
Max. input power	12.5 W
Typ. efficiency (at 230 V / 50 Hz / full load)	79 %
λ (at 230 V, 50 Hz, full load)②	0.9
Typ. power input on standby	1.5 W
THD (at 230 V, 50 Hz, full load)	< 30 %
Time to light (at 230 V, 50 Hz, full load)	< 0.5 s
Output current tolerance②	± 7.5 %
Output LF current ripple (< 300 Hz)	± 30 %
In-rush current (peak/duration)	52 A / 10 µs
Dimming range	10 – 100 %
Max. output voltage	47 V
Dimensions of LED Driver L x W x H	135 x 46 x 30.3 mm
Beam characteristic	21° / 38°
Ambient temperature range of LED module	-20 … +50 °C
tp rated of spotlight	65 °C
tc of spotlight	85 °C
Risk group (EN 62471:2008) of LED module	1
ESD classification of LED module	severity level 4
Type of protection of LED module	IP20
Dimensions of LED module L x W x H	ø50 x 56 mm



Module



Driver

Ordering data

Type	Article number	Colour temperature	Packaging	Weight per pc.
SLA Set pc G1 50mm 600lm 927 38° SNC	**28001230**	2,700 K	50 pc(s).	0.17 kg
SLA Set pc G1 50mm 600lm 927 21° SNC	**28001231**	2,700 K	50 pc(s).	0.17 kg

Specific technical data

Type	Forward current①	Typ. luminous flux at tp rated①	Typ. power consumption at tp rated①	Typ. forward voltage①	Typ. efficacy at tp rated	Colour rendering index CRI	Energy classification
SLA Set pc G1 50mm 600lm 927 38° SNC	220 mA	610 lm	10.1 W	36.1 V	60 lm/W	90	A
SLA Set pc G1 50mm 600lm 927 21° SNC	220 mA	610 lm	10.1 W	36.1 V	60 lm/W	90	A

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

② Valid at 100 % dimming level.

LED Driver
Product description

Standards
EN 55015
EN 61000-3-2 (table 3, column 2)
EN 61000-3-3
EN 61547
EN 61347-1
EN 61347-2-13
EN 62384

Glow wire test
according to EN 61347-1 with a temperature of 750 °C passed.

Overload protection
If the output voltage range is exceeded the LED Driver turns off the LED output. After restart of the LED Driver the output will be activated again. The restart can be done via mains reset.

Short-circuit behaviour
In case of a short circuit at the LED output the LED output is switched off. After restart of the LED Driver the output will be activated again. The restart can done via mains reset.

No-load operation
The LED Driver will not be damaged in the no-load operation. The output will be deactivated and therefore free of voltage. If a LED load is connected the device has to be restarted before the output will be activated again.

Hot plug-in
Hot plug-in is not allowed due to output voltage of > 0 V.
If a LED load is connected the device has to be restarted before the output will be activated again.
This can be done with mains reset.

Conditions of use and storage

Humidity: 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Operating temperature range: -20 up to +50 °C

Storage temperature: -40 °C up to max. +80 °C

The devices have to be within the specified temperature range (ta) before they can be operated.

Expected life-time

Type	ta	40 °C	50 °C
LCBI 10W 220mA pc	tc	70 °C	80 °C
	Life-time	50,000 h	25,000 h

The LED Driver is designed for a life-time stated above under reference conditions and with a failure probability of less than 10 %.

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20
Installation Ø	1.5 mm²	1.5 mm²	2.5 mm²	2.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	2.5 mm²
LCBI 10W 220mA pc	60	90	120	140	30	45	60	70

Note: No considerable inrush current, therfore the amount of devices per circuit breaker is restricted by max. input current.

Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

	THD	3.	5.	7.	9.	11.
LCBI 10W 220mA pc	27	24	10	6	3	2

Installation instructions

Wiring guidelines

- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit).
- Secondary switching is not permitted.
- The LED Driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.

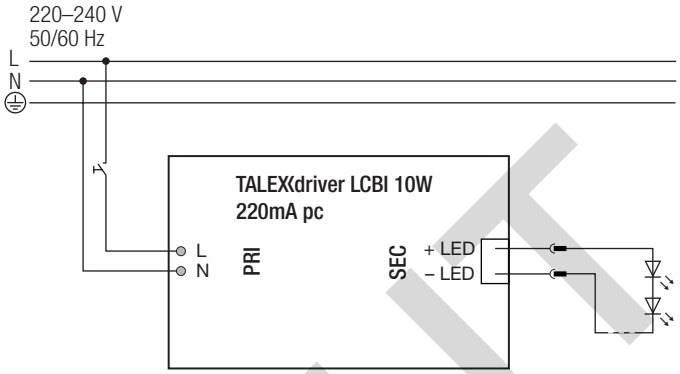
Isolation and electric strength testing of luminaires

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.

Circuit diagram



1. Standards

EN 62031
EN 62471
EN 61547
EN 55015
IEC 62717

1.1 Photometric code

Key for photometric code, e. g. 830 / 369

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)	Luminous flux after 25% of the life-time (max.6000h)	
					Code	Luminous flux
7	70 – 79				7	≥ 70 %
8	80 – 89				8	≥ 80 %
9	≥90				9	≥ 90 %

2. Thermal details

2.1 tp point, ambient temperature and life-time

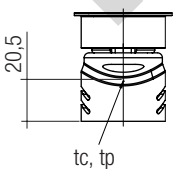
The temperature at tp reference point is crucial for the light output and life-time of a LED product.
The operating temperature of a LED product is crucial for the light output, the product life-time but also for the product safety.
The thermal limits can be checked at the tp/tc point.
On page 10 the lumen maintenance is shown in relation to the temperature at tp. tp,rated shows the temperature at which the rated values are reached.
tc shows the thermal limit for safety reason und must never be exceeded under normal conditions.
For the interchangeablity with other Zhaga products, $t_{r,max}$ is specified directly at the thermal interface to the heatsink of the luminaire.

For the SLA 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.

To check the tc / tp temperature, the temperature sensor has to be mounted on the marked position as stated in the drawing.



2.2 Storage and humidity

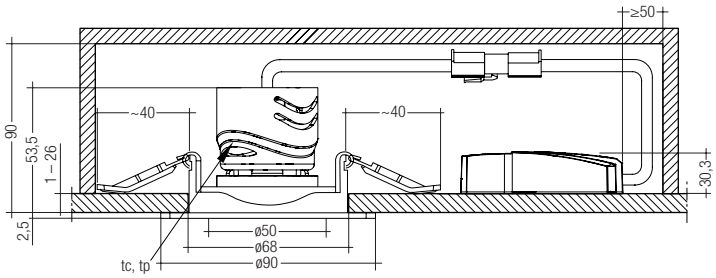
storage temperature	-30 … +80 °C

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

3.4 Mounting instruction

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.



For mounting the SLAready2apply products it is necessary to have a assemble ring which is not provided.

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.
For further information for EOS/ESD safety guidlines and the ESD classification please refer to the brochure entitled 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.
n 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.

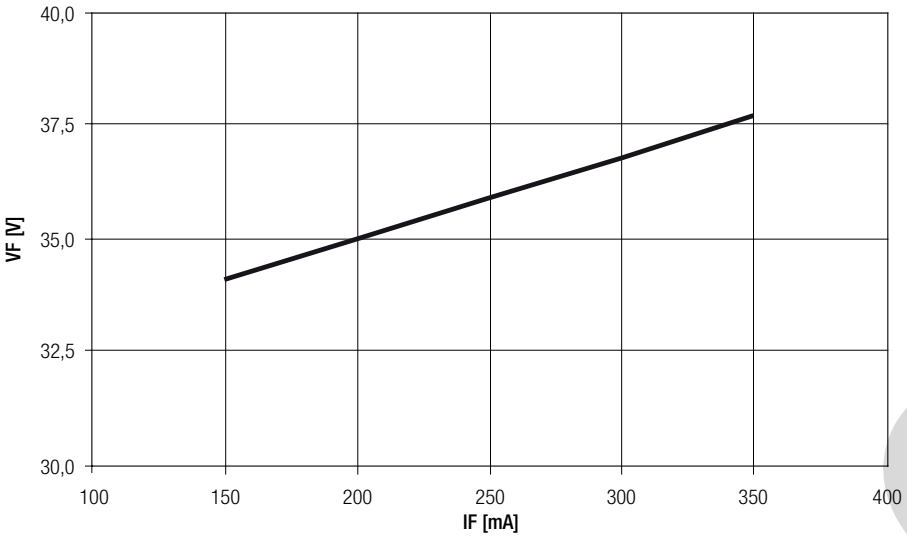
4.2 Lumen maintenance

Life-time declarations are informative and represent no warranty claim.

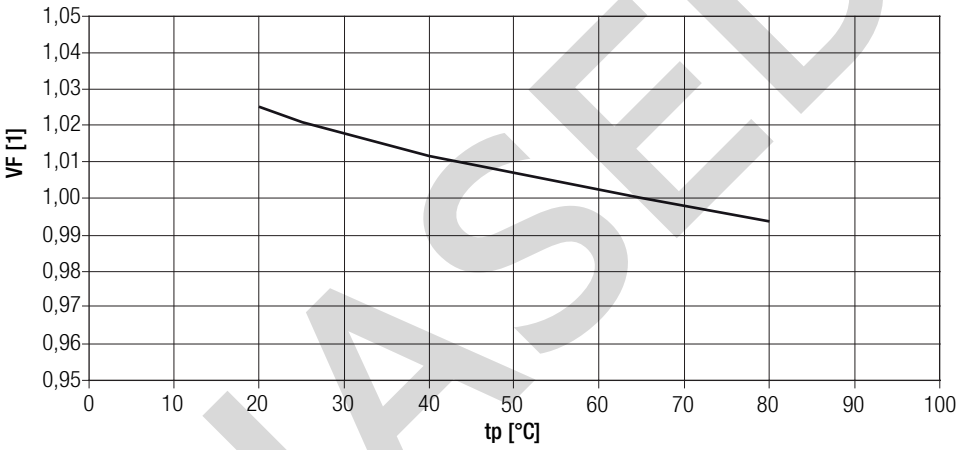
Operating current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50
220 mA	65 °C	21,000 h	> 30,000 h	> 30,000 h	> 30,000 h
	75 °C	18,000 h	27,000 h	> 30,000 h	> 30,000 h

5. Electrical values

5.1 Typ. forward voltage vs. forward current at tp = 65 °C



5.2 Forward voltage vs. tp temperature



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

6. Photometric charcteristics

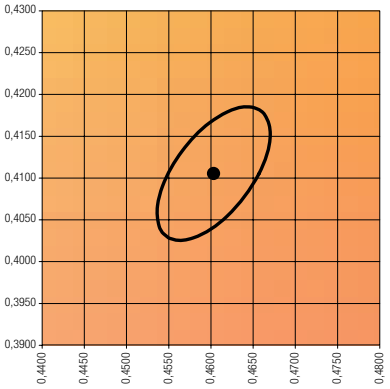
6.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are measured integral after a settling time of 100 ms. The current impuls is 220 mA.

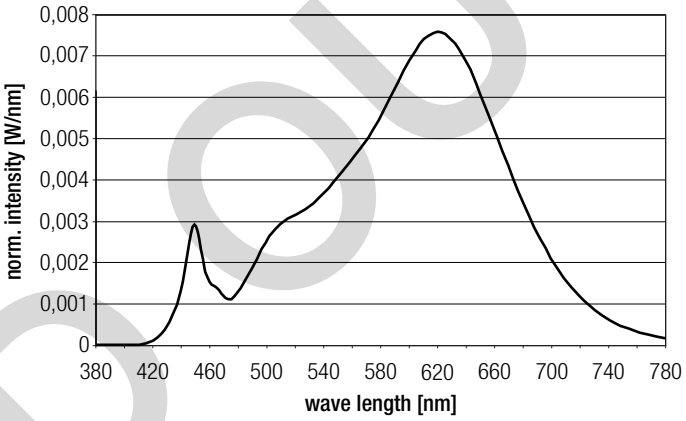
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

2,700 K

	x0	y0
Centre	0.4609	0.4108

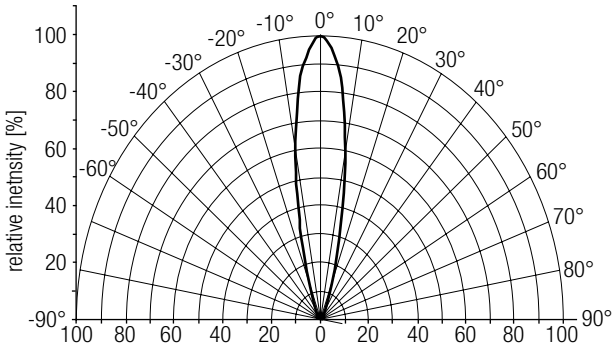


MacAdam ellipse: 3SDCM

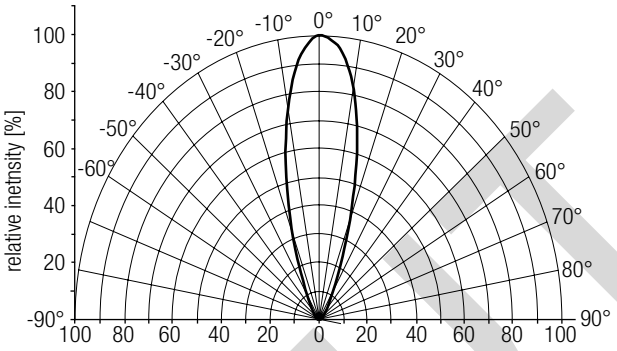


6.2 Light distribution

Light distribution for 21°



Light distribution for 38°



6.3 Relative luminous flux vs. tp temperature