RoHS

TALEX(module STARK SLE GEN3 FASHION

STARK SLE

Product description

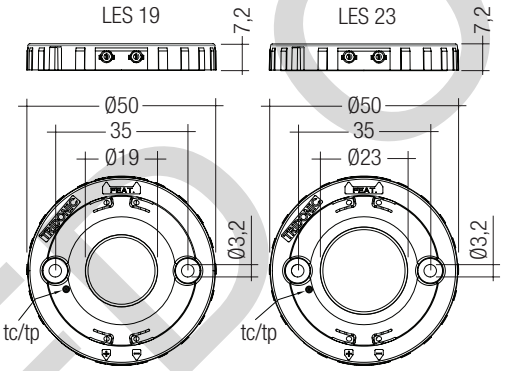
- Optimized light spectrum for perfect fashion presentation
- LED-solution with uniquely brilliant colour impression
- Warm, thrilling colours with a high saturation combined with a pure and shiny white
- Luminous flux range from 850 – 4,700 lm
- For spotlights and downlights
- BLO operation mode: Best LED Operation for optimum operation and constant luminous flux at all colour temperatures in combination with Tridonic LED control gear of TOP and ECO series
- High colour consistency (MacAdam 3)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- Uniform radiation with Dam&Fill technology
- Fixing holes for M3 screws
- Integrated LED module
- Cooling required
- Flexible operating modes
- 5-year guarantee

Technical data

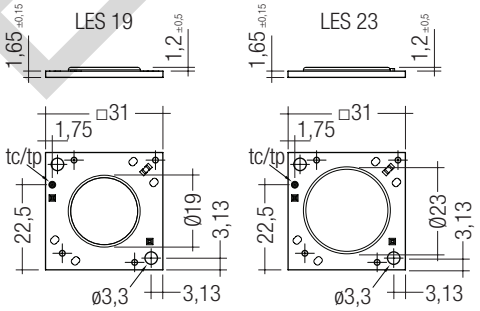
Beam characteristic	140°
Ambient temperature ta	-25 ... +50 °C
tp_rated temperature①	65 °C
Max. tc point temperature①	up to 90 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00

Standards, page 3

Colour temperatures and tolerances, page 10



With housing (tc/tp position same as without housing) – Dimensions in mm



Without housing – Dimensions in mm

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
STARK-SLE-G3-19-FASHION	89601902	3,250 K	yes	no	15 pc(s).	0.009 kg
STARK-SLE-G3-23-FASHION	89601903	3,250 K	yes	no	15 pc(s).	0.009 kg
STARK-SLE-PURE-G3-19-FASHION	89601904	3,250 K	no	yes	20 pc(s).	0.004 kg
STARK-SLE-PURE-G3-23-FASHION	89601905	3,250 K	no	yes	20 pc(s).	0.004 kg

Specific technical data

Type[6]	Photometric code	Forward current[3] [4] [5]	Luminous flux at tp = 25 °C[2]	Luminous flux at tp = 65 °C[2]	Power consumption[7]	Min. forward voltage at tp = 65 °C	Max. forward voltage at tp = 25 °C	Colour rendering index CRI	Energy classification
STARK-SLE-19 – Operating mode HE at 350 mA									
STARK-SLE-PURE-G3-19-FASHION	932/349	350 mA	1,000 lm	850 lm	11.7 W	32.2 V	36.5 V	90	A
STARK-SLE-19 – Operating mode BLO									
STARK-SLE-PURE-G3-19-FASHION	932/349	–	2,400 lm	2,000 lm	32.5 W	34.9 V	39.2 V	90	B
STARK-SLE-19 – Operating mode HO at 1.400 mA									
STARK-SLE-PURE-G3-19-FASHION	932/349	1.400 mA	3,450 lm	2,950 lm	54.0 W	37.4 V	41.8 V	90	B
STARK-SLE-23 – Operating mode HE at 700 mA									
STARK-SLE-PURE-G3-23-FASHION	932/349	700 mA	2,100 lm	1,800 lm	23.8 W	32.9 V	37.2 V	90	A
STARK-SLE-23 – Operating mode BLO									
STARK-SLE-PURE-G3-23-FASHION	932/349	–	3,550 lm	3,000 lm	45.0 W	34.8 V	39.1 V	90	A
STARK-SLE-23 – Operating mode HO at 1.750 mA									
STARK-SLE-PURE-G3-23-FASHION	932/349	1.750 mA	4,700 lm	4,050 lm	66.0 W	36.5 V	40.9 V	90	B

[1] If the max. temperature limits are exceeded, the life of the system will be greatly reduced or the system may be damaged. The temperature of the TALEX module at the tp-point is to be measured in the thermally stable state with a temperature sensor or or temperature-sensitive sticker as per EN 60598-1. For the precise position of the tp point see the drawing above.

[2] Tolerance range for optical data: ±10 %.

[3] Exceeding the max. operating current leads to an overload on the TALEX module. This may in turn result in a significant reduction in life-time or even destruction of the TALEX module.

[4] Max. permissible surge current: 3 A, duration max. 10 µs.

[5] Max. permissible repetitive peak current for STARK-SLE-G3-19-FASHION: 1,680 mA. Max. permissible repetitive peak current for STARK-SLE-G3-23-FASHION: 2,400 mA.

[6] HE ... high efficiency, BLO ... best LED operation (see page 4), HO ... high output.

[7] All values at tp = 65 °C.

Standards
EN 62031
EN 62471
EN 61547
EN 55015
IEC 62717

Glow wire test
according to EN 62031 with increased temperature of 960 °C passed.

Photometric code

Key for photometric code, e. g. 830 / 349

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

Thermal design and heat sink
The rated life of TALEX products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the TALEXmodule STARK SLE G3 will be greatly reduced or the TALEXmodule STARK SLE G3 may be destroyed.

Therefore the TALEXmodule STARK SLE G3 needs to be mounted onto a heat sink heat sink which does not exceed the value for $R_{th,max}$.

Tridonic's excellent thermal design for the TALEXmodule STARK SLE G3 products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life-time.

tp point, ambient temperature and life-time
The temperature at tp reference point is crucial for the light output and life-time of a TALEX product.
The opeating temperature of a Talex 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 and at tr.
On page 6 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 othe Zhaga products, $t_{r,max}$ is specified directly at the thermal interface to the heatsink of the luminaire.

For TALEXmodule STARK SLE G3 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.

Mounting instruction

TALEXmodule STARK SLE G3 from Tridonic which have to be installed on a heat sink have to be connected with heat-conducting paste or heat conducting adhesive film and fixed with M3 screws.

The fixing/cooling surface must be cleaned before installing the TALEX modules to remove all dirt, dust and grease.

None of the components of the TALEXmodule STARK SLE G3 (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

The PURE modules are mounted with 2 screws per module.
In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

For further information please refer to to the brochure entitled "Technical Design-In-Guide SLE GEN3".

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.

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

Electrical supply/choice of LED control gear
TALEXmodule STARK SLE G3 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 control gear which complies with the relevant standards. The use of TALEX LED control gears from Tridonic in combination with TALEXmodule STARK SLE G3 guarantees the necessary protection for safe and reliable operation.

TALEXmodule STARK SLE G3 are basic isolated up to 110 V against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led control gear (also against earth) is above 110 V, an additional isolation between LED module and heat sink is required (for example by isolated 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.

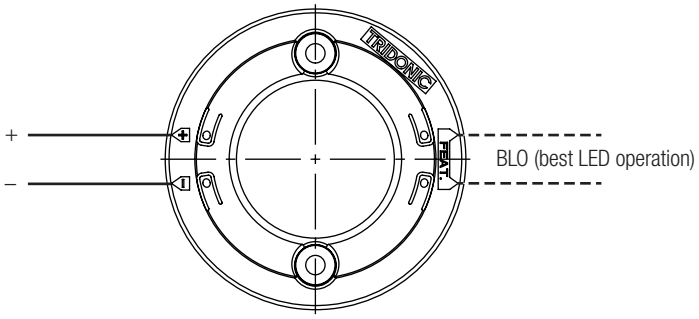
If a LED control gear other than Tridonic TALEXconverter is used, it must provide the following protection:
- Short-circuit protection
- Overload protection
- Overtemperature protection

TALEXmodule STARK SLE G3 must be supplied by a constant current LED control gear.
Operation with a constant voltage LED control gear will lead to an irreversible damage of the module.

Wrong polarity can damage the TALEXmodule STARK SLE G3.

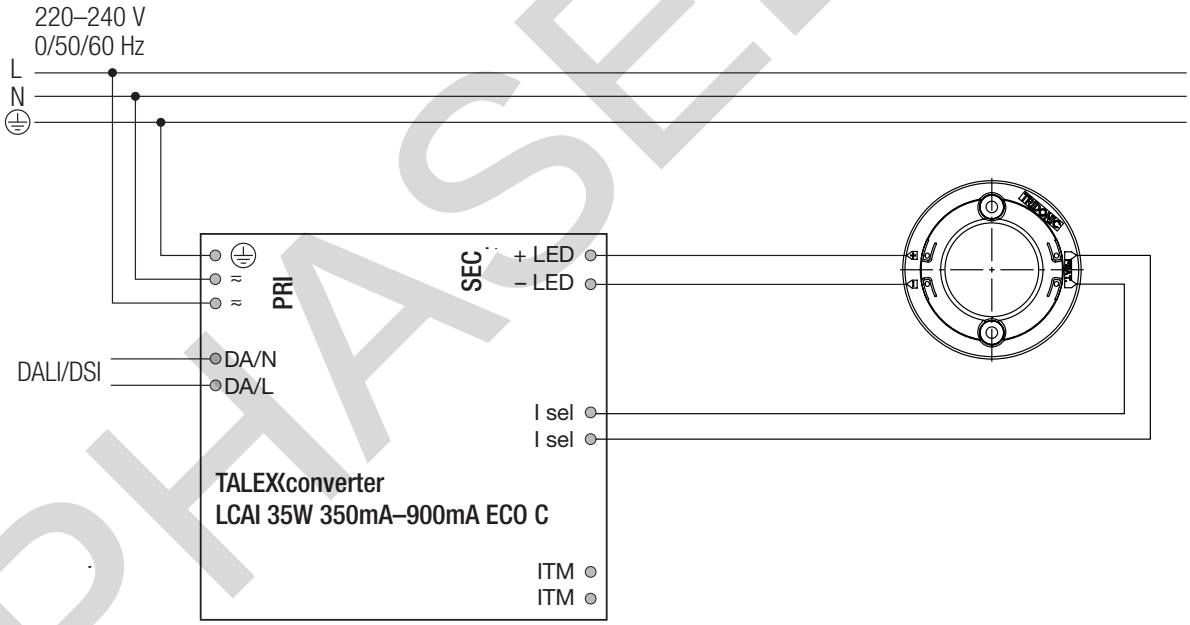
BLO function (Best LED Operation)

The BLO function is available for Tridonic LED control gear of ECO and TOP series in use together with SLE GEN3 modules of type LES19 and LES23.
The function ensures that the LED light module is operated with an optimal balance between luminous flux, efficiency and power.
To achieve this the I-select terminal of the LED control gear is connected to the FEAT terminal of the LED light module. The current is set via the resistor which is integrated at the FEAT terminal. Connecting a resistor to the I-select terminal of the LED control gear is not necessary anymore.



TALEXmodule STARK SLE G3 has no temperature monitoring (NTC). The temperature monitoring is available with Tridonic LED control gear series TOP (up to 35 W) and ECO with the ITM feature in combination with the thermal sensor KTY82/210.

Wiring diagram: Example with TALEXconverter LCAI 35W 350mA–900mA ECO C



Control gears for BLO function

Module	Forward current	Power consumption module	Min. forward voltage module	Max. forward voltage module	Dimmable LED control gear	Non-dimmable LED control gear
LES19-FASHION	900 mA	32.5 W	34.9 V	39.2 V	LCAI 35W 350-900mA ECO	LCI 35W 350-900mA TOP
LES23-FASHION	1,250 mA	45.0 W	34.8 V	39.1 V	LCAI 55W 900-1750mA ECO LCAI 65W 900-1750mA ECO	LCI 55W 900-1750mA TOP

Heat sink values

TALEXmodule STARK-SLE-G3-19-FASHION

ta	tp	Operation mode	$R_{th, hs-a}$
25 °C	65 °C	HE	4.72 K/W
30 °C	65 °C	HE	4.13 K/W
40 °C	65 °C	HE	2.93 K/W
50 °C	65 °C	HE	1.74 K/W
25 °C	65 °C	BLO	1.57 K/W
30 °C	65 °C	BLO	1.36 K/W
40 °C	65 °C	BLO	0.96 K/W
50 °C	65 °C	BLO	0.56 K/W
25 °C	65 °C	HO	0.88 K/W
30 °C	65 °C	HO	0.77 K/W
40 °C	65 °C	HO	0.53 K/W
50 °C	65 °C	HO	0.30 K/W

TALEXmodule STARK-SLE-G3-23-FASHION

ta	tp	Operation mode	$R_{th, hs-a}$
25 °C	65 °C	HE	2.29 K/W
30 °C	65 °C	HE	2.00 K/W
40 °C	65 °C	HE	1.41 K/W
50 °C	65 °C	HE	0.83 K/W
25 °C	65 °C	BLO	1.14 K/W
30 °C	65 °C	BLO	1.00 K/W
40 °C	65 °C	BLO	0.69 K/W
50 °C	65 °C	BLO	0.39 K/W
25 °C	65 °C	HO	0.73 K/W
30 °C	65 °C	HO	0.64 K/W
40 °C	65 °C	HO	0.44 K/W
50 °C	65 °C	HO	0.24 K/W

Notes

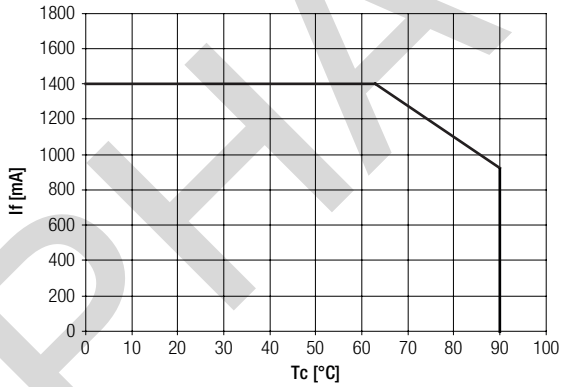
The actual cooling can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule STARK SLE G3 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the TALEXmodule STARK SLE G3 has to be fixed on the heat sink with M3 screws to optimise the thermal connection.
Use of thermal interface material with thermal conductivity of $l > 1$ W/mK and layer thickness of interface material with max. 50 µm or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50$ µmmK/W.

Thermal behaviour

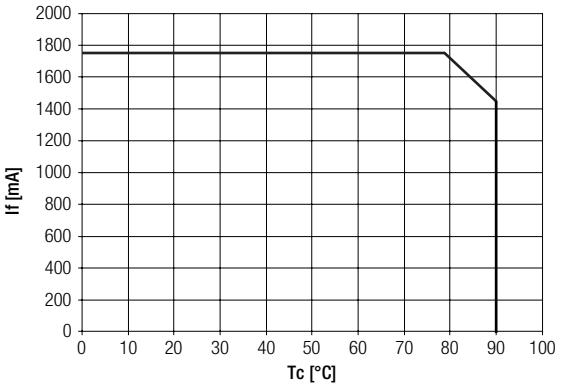
storage temperature	-30 ... +80 °C
operating temperature ta	-25 ... +50 °C
tp (at typ. current)	65 °C
tc max. (at typ. current)	acc. to the derating curves
max. humidity*	0 ... 70 %

* not condensed

Derating curve for TALEXmodule STARK SLE G3 LES19 FASHION



Derating curve for TALEXmodule STARK SLE G3 LES23 FASHION



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.

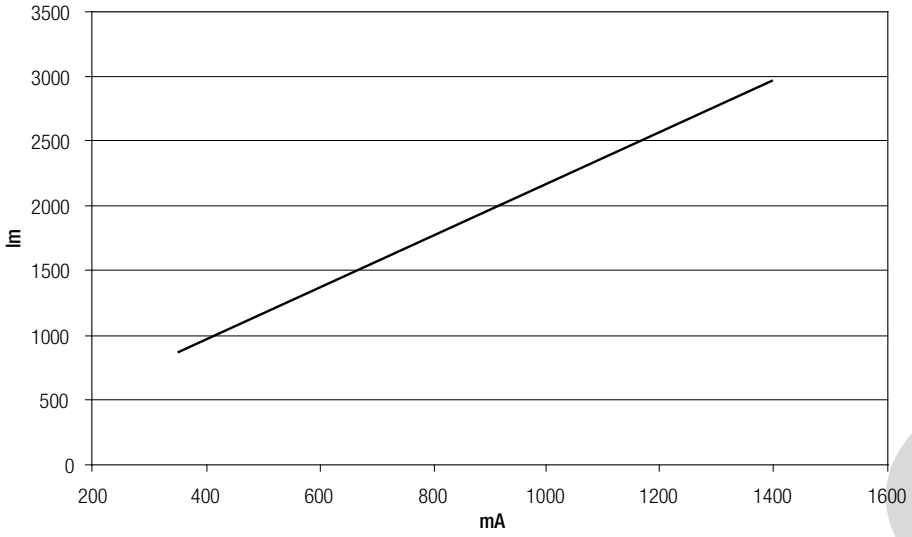
Lumen maintenance for TALEXmodule STARK-SLE-G3-19-FASHION

Operating mode	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
HE	65 °C	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	44,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	33,000 h	50,000 h	60,000 h	60,000 h	60,000 h	60,000 h
BLO	65 °C	42,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	31,000 h	47,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	24,000 h	36,000 h	50,000 h	60,000 h	60,000 h	60,000 h
HO	65 °C	26,000 h	40,000 h	56,000 h	60,000 h	60,000 h	60,000 h
	75 °C	20,000 h	30,000 h	42,000 h	60,000 h	60,000 h	60,000 h
	85 °C	15,000 h	22,000 h	32,000 h	47,000 h	50,000 h	60,000 h

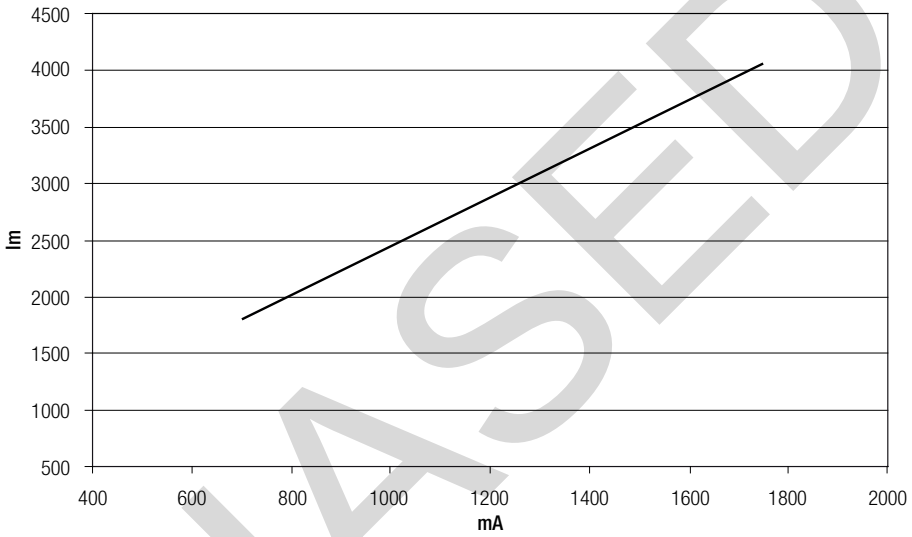
Lumen maintenance for TALEXmodule STARK-SLE-G3-23-FASHION

Operating mode	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
HE	65 °C	55,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	41,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	31,000 h	47,000 h	60,000 h	60,000 h	60,000 h	60,000 h
BLO	65 °C	45,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	34,000 h	50,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	25,000 h	38,000 h	54,000 h	60,000 h	60,000 h	60,000 h
HO	65 °C	32,000 h	48,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	24,000 h	36,000 h	50,000 h	60,000 h	60,000 h	60,000 h
	85 °C	18,000 h	27,000 h	38,000 h	57,000 h	60,000 h	60,000 h

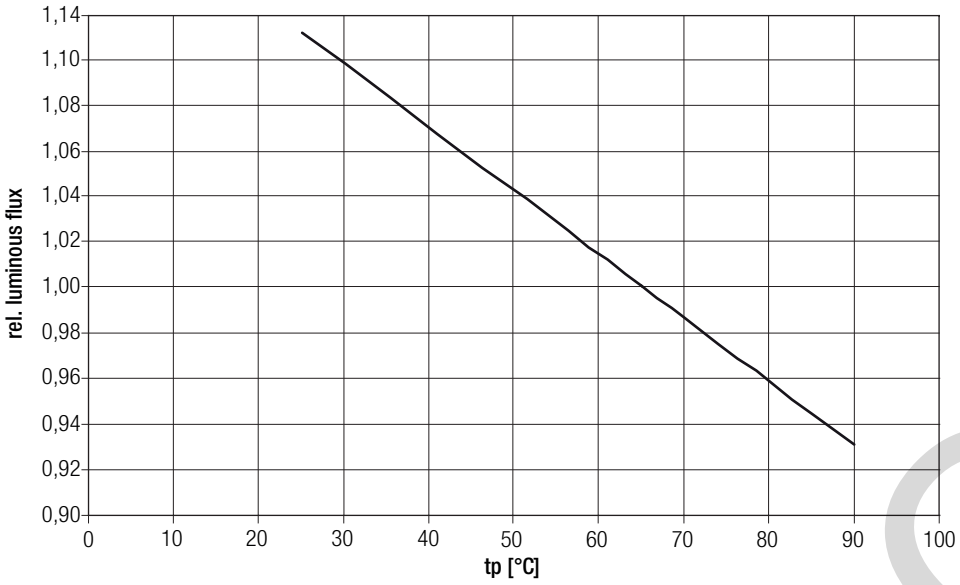
Luminous flux and operating current for TALEX(module STARK-SLE-G3-19-FASHION at tp = 65 °C



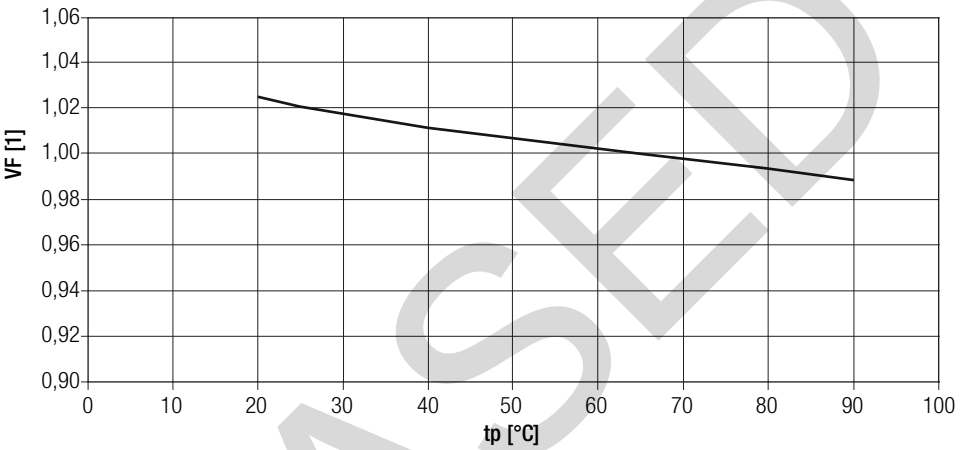
Luminous flux and operating current for TALEX(module STARK-SLE-G3-23-FASHION at tp = 65 °C



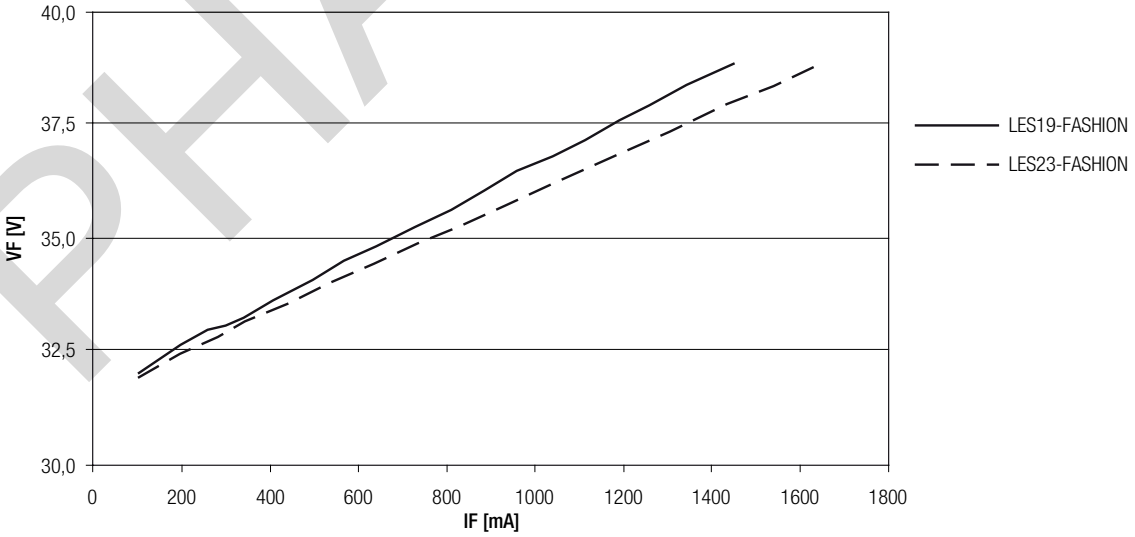
Relative luminous flux



tp temperature vs. forward voltage

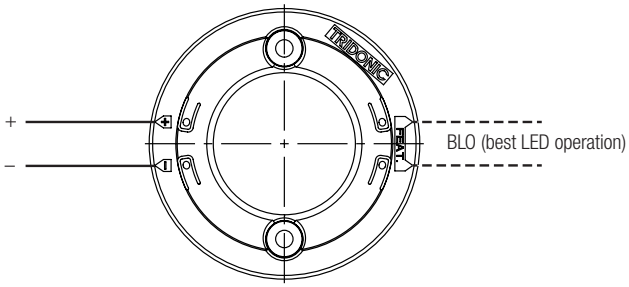


Forward current vs. forward voltage

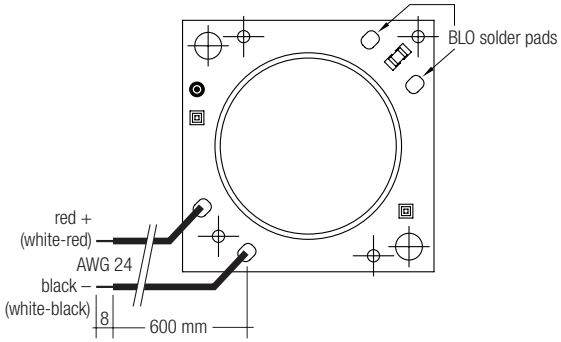


The diagrams based on statistic values.
The real values can be different.

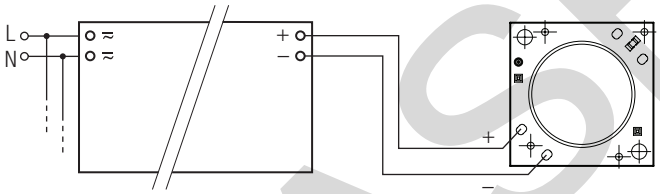
Wiring with housing



Wiring without housing



Wiring example



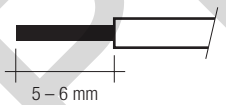
TALEXconverter LC...

Wiring type and cross section for LED module

The wiring has to be solid cable with a cross section of 0.5 to 0.75 mm² or with stranded wire with soldered ends with a cross section of 0.5 mm².
For the push-wire connection you have to strip the insulation (5 – 6 mm).

Removing wires by lightly pressing on the push button.

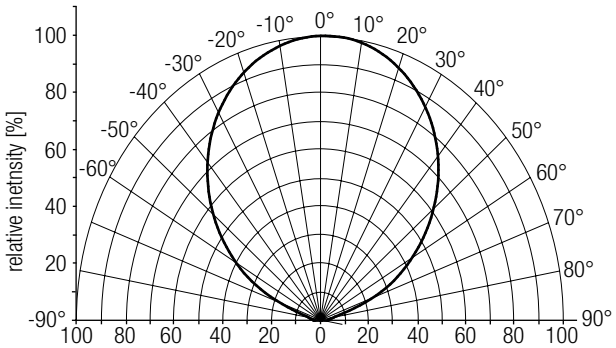
wire preparation:



Optical characteristics TALEXmodule STARK SLE G3

The optical design of the TALEXmodule STARK SLE G3 product line ensures optimum homogenity for the light distribution.

Light distribution



Coordinates and tolerances according to CIE 1931

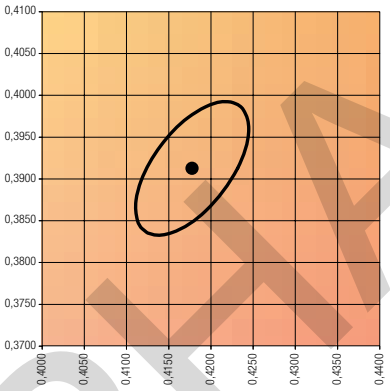
The specified colour coordinates are measured integral after a settling time of 100 ms. The current impuls depends on the module type.

Module type	Current impulse
TALEXmodule STARK-SLE-G3-19-FASHION	1,050 mA
TALEXmodule STARK-SLE-G3-23-FASHION	1,400 mA

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

3,250 K

	x0	y0
Centre	0.4177	0.3918



MacAdam ellipse: 3SDCM