



TALEXmodule STARK SLE GEN2 SELECT STARK SLE

Product description

- For spotlights and downlights
- High colour rendering index CRI > 90
- High efficiency up to 116 lm/W for the LED module
- High system efficiency up to 90 lm/W at $t_p = 65^\circ\text{C}$
- High colour consistency (MacAdams 3)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- NTC for temperature control for type LES23 and LES26
- Uniform radiation with Dam&Fill technology
- Fixing holes for M3 screws
- Built-in LED module
- Cooling required
- Long life time: up to 80 % luminous flux after 50,000 operating hours
- Flexible operating modes

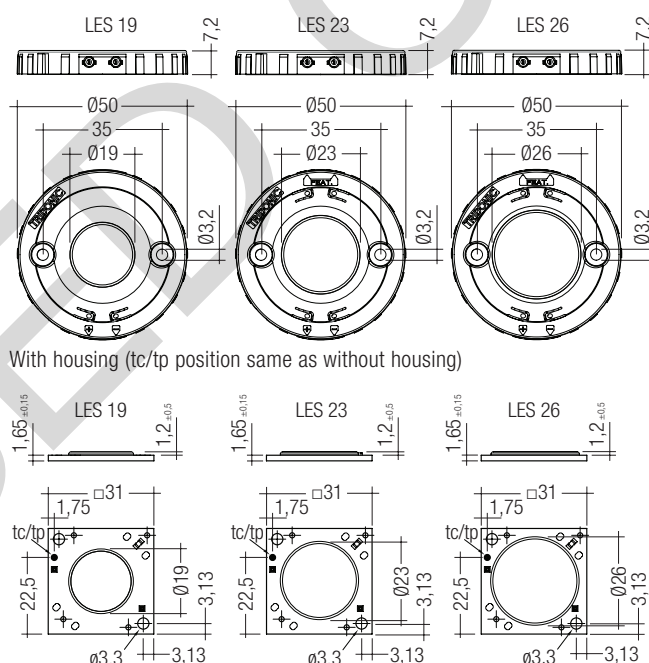
Technical data

Beam characteristic	140°
Ambient temperature t_a	-25 ... +55 °C
t_p _rated temperature ^①	65 °C
Max. t_c point temperature ^②	75 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00



Standards, page 5

Colour temperatures and tolerances, page 11



PURE (without housing)

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
STARK SLE G2 LES19 930 SEL	89601660	3,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES19 940 SEL	89601661	4,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES23 930 SEL	89601663	3,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES23 940 SEL	89601664	4,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES26 930 SEL	89601666	3,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES26 940 SEL	89601667	4,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE PURE G2 LES19 930 SEL	89601669	3,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES19 940 SEL	89601670	4,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES23 930 SEL	89601672	3,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES23 940 SEL	89601673	4,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES26 930 SEL	89601675	3,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES26 940 SEL	89601676	4,000 K	no	yes	20 pc(s).	0.010 kg

Specific technical data

Type [Ⓓ]	Photometric code	Forward current ^{Ⓓ ④ ⑤}	Luminous flux at tp = 25 °C ^②	Luminous flux at tp = 65 °C ^②	Power consumption module ^⑥	Forward voltage module ^{⑥ ⑦}	Luminous efficacy module at tp = 25 °C	Luminous efficacy module at tp = 65 °C	Luminous efficacy system at tp = 65 °C	Colour rendering index CRI	Energy classification
STARK SLE LES19 – Operating mode HE at 350 mA											
STARK SLE G2 LES19 930 SEL	930/3x9	350 mA	1,200 lm	1,050 lm	11.6 W	33.2 V	112 lm/W	91 lm/W	82 lm/W	90	A+
STARK SLE G2 LES19 940 SEL	940/3x9	350 mA	1,300 lm	1,100 lm	11.6 W	33.2 V	112 lm/W	95 lm/W	86 lm/W	90	A+
STARK SLE LES19 – Operating mode NM at 500 mA											
STARK SLE G2 LES19 930 SEL	930/3x9	500 mA	1,650 lm	1,450 lm	17.1 W	34.2 V	102 lm/W	85 lm/W	77 lm/W	90	A
STARK SLE G2 LES19 940 SEL	940/3x9	500 mA	1,800 lm	1,550 lm	17.1 W	34.2 V	102 lm/W	91 lm/W	82 lm/W	90	A+
STARK SLE LES19 – Operating mode HO at 700 mA											
STARK SLE G2 LES19 930 SEL	930/3x9	700 mA	2,200 lm	1,900 lm	24.7 W	35.3 V	89 lm/W	77 lm/W	69 lm/W	90	A
STARK SLE G2 LES19 940 SEL	940/3x9	700 mA	2,350 lm	2,050 lm	24.7 W	35.3 V	95 lm/W	83 lm/W	75 lm/W	90	A
STARK SLE LES23 – Operating mode HE at 500 mA											
STARK SLE G2 LES23 930 SEL	930/3x9	500 mA	1,800 lm	1,550 lm	16.5 W	33.1 V	109 lm/W	94 lm/W	85 lm/W	90	A+
STARK SLE G2 LES23 940 SEL	940/3x9	500 mA	1,900 lm	1,650 lm	16.5 W	33.1 V	115 lm/W	100 lm/W	90 lm/W	90	A+
STARK SLE LES23 – Operating mode NM at 700 mA											
STARK SLE G2 LES23 930 SEL	930/3x9	700 mA	2,450 lm	2,100 lm	23.8 W	33.9 V	105 lm/W	88 lm/W	79 lm/W	90	A+
STARK SLE G2 LES23 940 SEL	940/3x9	700 mA	2,600 lm	2,250 lm	23.8 W	33.9 V	109 lm/W	95 lm/W	86 lm/W	90	A+
STARK SLE LES23 – Operating mode HO at 1,050 mA											
STARK SLE G2 LES23 930 SEL	930/3x9	1,050 mA	3,400 lm	2,900 lm	37.1 W	35.3 V	92 lm/W	78 lm/W	70 lm/W	90	A
STARK SLE G2 LES23 940 SEL	940/3x9	1,050 mA	3,600 lm	3,100 lm	37.1 W	35.3 V	97 lm/W	84 lm/W	76 lm/W	90	A
STARK SLE LES26 – Operating mode HE at 700 mA											
STARK SLE G2 LES26 930 SEL	930/3x9	700 mA	2,450 lm	2,100 lm	23.2 W	33.2 V	110 lm/W	91 lm/W	82 lm/W	90	A+
STARK SLE G2 LES26 940 SEL	940/3x9	700 mA	2,600 lm	2,250 lm	23.2 W	33.2 V	116 lm/W	97 lm/W	87 lm/W	90	A+
STARK SLE LES26 – Operating mode NM at 1,050 mA											
STARK SLE G2 LES26 930 SEL	930/3x9	1,050 mA	3,650 lm	3,000 lm	36.0 W	34.3 V	103 lm/W	83 lm/W	75 lm/W	90	A
STARK SLE G2 LES26 940 SEL	940/3x9	1,050 mA	3,750 lm	3,250 lm	36.0 W	34.3 V	108 lm/W	89 lm/W	80 lm/W	90	A+
STARK SLE LES26 – Operating mode HO at 1,400 mA											
STARK SLE G2 LES26 930 SEL	930/3x9	1,400 mA	4,500 lm	3,850 lm	49.5 W	35.3 V	91 lm/W	78 lm/W	70 lm/W	90	A
STARK SLE G2 LES26 940 SEL	940/3x9	1,400 mA	4,750 lm	4,100 lm	49.5 W	35.3 V	96 lm/W	83 lm/W	75 lm/W	90	A

[Ⓓ] 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 TALEXmodule at the tp-point is to be measured in the thermally stable state with a temperature sensor 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 %.

^④ Exceeding the max. operating current leads to an overload on the TALEXmodule. This may in turn result in a significant reduction in lifetime or even destruction of the TALEXmodule.

^⑤ Max. permissible surge current: 3 A, duration max. 10 µs.

^⑥ Ripple max. 50 % of typ. forward current.

^⑦ Tolerance range voltage: ±10 %.

^⑧ HE ... high efficiency, NM ... nominal mode, HO ... high output.

^⑨ All values at tp = 65 °C.

LED control gear matrix – TALEX module STARK SLE G2

Type	REMOTE					IN-BUILT	
	LCAI 015/0350 A020	LCI 015/0350 E020	LCI 016/0350 B020	LCI 015/0350 M020	LCI 20W 350mA TEC SR	LCI 016/0350 Q010	LCI 20W 350mA TEC C
Article no.	86458899	24166312	86459210	86459179	87500187	86459213	87500079
Type	assignable LED control gear						
Operating mode at 350 mA							
STARK SLE G2	✓	✓	✓	✓	✓	✓	✓

LED control gear matrix – TALEX module STARK SLE G2

Type	REMOTE		IN-BUILT
	LCAI 020/0500 A120 one4all	LCI 20W 500mA TEC SR	LCI 20W 500mA TEC C
Article no.	86459107	87500189	87500188
Type	assignable LED control gear		
Operating mode at 500 mA			
STARK SLE G2	✓	✓	✓

LED control gear matrix – TALEX module STARK SLE G2

Type	REMOTE					
	LCI 030/0700 A120	LCI 030/0700 A120 one4all	LCI 030/0700 E020	LCI 033/0700 U010	LCI 35W 700mA TEC SR	LCI 030/0700 M120
Article no.	86458901	86458900	24166314	25000669	87500197	86459178
Type	assignable LED control gear					
Operating mode at 700 mA						
STARK SLE G2	✓	✓	✓	✓	✓	✓

LED control gear matrix – TALEX module STARK SLE G2

Type	REMOTE		IN-BUILT
	LCAI 050/1050 N020 DALI	LCI 050/1050 N020	LCI 35W 700mA TEC C
Article no.	24166469*	24166468*	87500196
Type	assignable LED control gear		
Operating mode at 700 mA			
STARK SLE G2	✓	✓	✓

* Configuratet for 700 mA, see LED control gear data sheet.

LED control gear matrix – TALEX module STARK SLE G2

Type	REMOTE					IN-BUILT		
	LCAI 050/1050 N020 DALI	LCI 050/1050 N020	LCI 050/1050 R010	LCI 050/1050 T020	LCI 60W 1050mA TEC SR	LCAI 055/1400 0010 DALI	LCI 055/1400 0010	LCI 60W 1050mA TEC C
	Article no.	24166469	24166468	86459216	86459218	87500203	24166471*	24166470*
assignable LED control gear								
Operating mode at 1,050 mA								
STARK SLE G2	✓	✓	✓	✓	✓	✓	✓	✓

* Configured for 1,050 mA, see LED control gear data sheet.

LED control gear matrix – TALEX module STARK SLE G2

REMOTE			IN-BUILT		
Type	LCI 055/1400 T020	LCI 65W 1400mA TEC SR	LCI 055/1400 0010 DALI	LCI 055/1400 0010	LCI 055/1400 R010
Article no.	86459219	87500205	24166471	24166470	86459217
Type	assignable LED control gear				
Operating mode at 1,400 mA					
STARK SLE G2	✓	✓	✓	✓	✓

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. 930 / 349

1 st digit	2 nd + 3 rd digit	4 th digit	5 th digit	6 th digit
Code CRI	Colour temperature in Kelvin x 100	McAdams initial	McAdams after 25% of the lifetime (max.6000h)	Lumen maintenance after 25% of the lifetime (max.6000h)
7 67 – 76				Code Remaining lumen
8 77 – 86				7 ≥ 70 %
9 87 – ≥90				8 ≥ 80 %
				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 TALEX module STARK SLE G2 will be greatly reduced or the TALEX module STARK SLE G2 may be destroyed.

Therefore the TALEX module STARK SLE G2 needs to be mounted onto a heat sink.

Tridonic's excellent thermal design for the TALEX module STARK SLE G2 products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life time.

tp point, ambient temperature and lifetime

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

For TALEX module STARK SLE G2 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

TALEX module STARK SLE G2 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 TALEX module STARK SLE G2 (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 the brochure entitled "Technical Design-In-Guide SLE GEN2".



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.

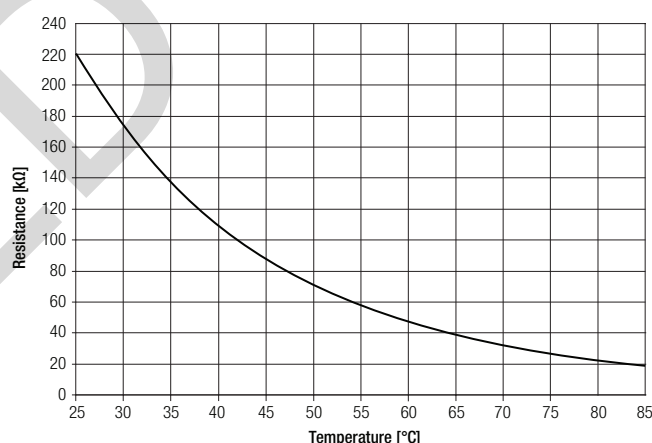
Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate. Avoid corrosive atmosphere during usage and storage.

**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/com/en/technical-data.asp>

Temperature control for LES23 and LES26

An NTC resistor is on the board of the TALEX module STARK SLE G2 to control the tp temperature during the operation with a resistor value of 220 kΩ NTC.

**Electrical supply/choice of LED control gear**

TALEX module STARK SLE G2 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 TALEX module STARK SLE G2 guarantees the necessary protection for safe and reliable operation.

If a LED control gear other than Tridonic TALEX converter is used, it must provide the following protection:

- Short-circuit protection
- Overload protection
- Overtemperature protection



TALEX module STARK SLE G2 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 TALEX module STARK SLE G2.

Heat sink values

TALEXmodule STARK SLE G2 LES19 SELECT

ta	tp	If	R _{th, hs-a}
25 °C	65 °C	350 mA	4.23 K/W
30 °C	65 °C	350 mA	3.69 K/W
40 °C	65 °C	350 mA	2.63 K/W
50 °C	65 °C	350 mA	1.56 K/W
25 °C	65 °C	500 mA	2.75 K/W
30 °C	65 °C	500 mA	2.40 K/W
40 °C	65 °C	500 mA	1.70 K/W
50 °C	65 °C	500 mA	1.00 K/W
25 °C	65 °C	700 mA	1.80 K/W
30 °C	65 °C	700 mA	1.57 K/W
40 °C	65 °C	700 mA	1.11 K/W
50 °C	65 °C	700 mA	0.65 K/W

TALEXmodule STARK SLE G2 LES23 SELECT

ta	tp	If	R _{th, hs-a}
25 °C	65 °C	500 mA	3.02 K/W
30 °C	65 °C	500 mA	2.63 K/W
40 °C	65 °C	500 mA	1.87 K/W
50 °C	65 °C	500 mA	1.10 K/W
25 °C	65 °C	700 mA	2.01 K/W
30 °C	65 °C	700 mA	1.79 K/W
40 °C	65 °C	700 mA	1.24 K/W
50 °C	65 °C	700 mA	0.73 K/W
25 °C	65 °C	1050 mA	1.21 K/W
30 °C	65 °C	1050 mA	1.05 K/W
40 °C	65 °C	1050 mA	0.74 K/W
50 °C	65 °C	1050 mA	0.43 K/W

TALEXmodule STARK SLE G2 LES26 SELECT

ta	tp	If	R _{th, hs-a}
25 °C	65 °C	700 mA	2.22 K/W
30 °C	65 °C	700 mA	1.94 K/W
40 °C	65 °C	700 mA	1.37 K/W
50 °C	65 °C	700 mA	0.81 K/W
25 °C	65 °C	1050 mA	1.35 K/W
30 °C	65 °C	1050 mA	1.18 K/W
40 °C	65 °C	1050 mA	0.83 K/W
50 °C	65 °C	1050 mA	0.48 K/W
25 °C	65 °C	1400 mA	0.94 K/W
30 °C	65 °C	1400 mA	0.82 K/W
40 °C	65 °C	1400 mA	0.57 K/W
50 °C	65 °C	1400 mA	0.32 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 G2 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.

Additionally the TALEXmodule STARK SLE G2 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 $\lambda > 1 \text{ W/mK}$ and layer thickness of interface material with max. 50 µm or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50 \text{ µmmK/W}$.

Thermal behaviour

storage temperature	-30 ... +80 °C
operating temperature t_a	+25 ... +55 °C
t_p (at typ. current)	65 °C
t_c max. (at typ. current)	75 °C
max. humidity	0 ... 80 %

Condensation on the module is not allowed. During the processing of the LED modules in the lamp the humidity has to be between 30 and 70%.

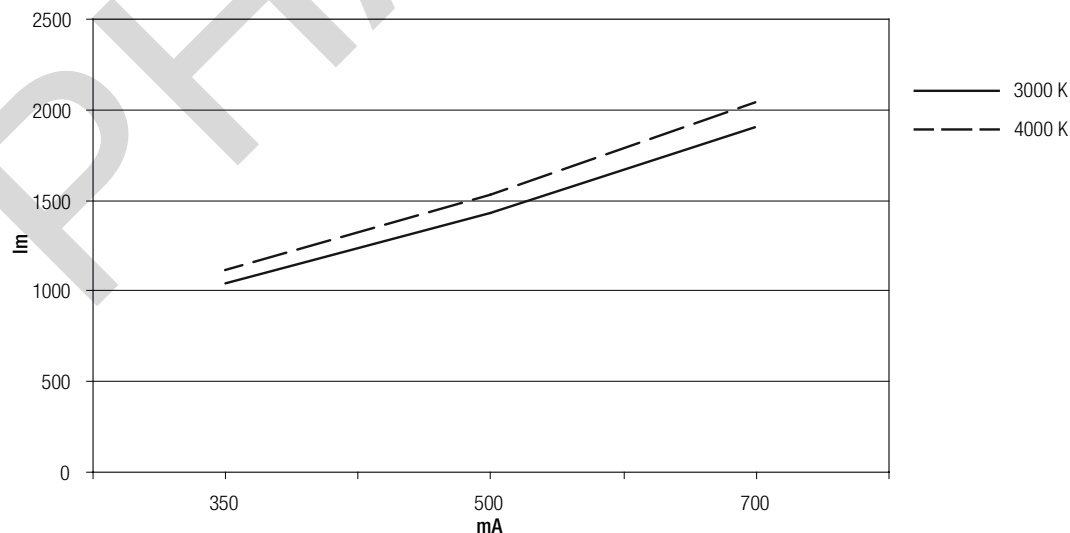
Lumen maintenance for HE operation

t_c temperature in °C	luminous flux in %	operating time in h
25	80	> 50,000
	70	> 50,000
	50	> 50,000
55	80	> 50,000
	70	> 50,000
	50	> 50,000
65	80	50,000
	70	> 50,000
	50	> 50,000
75	80	42,000
	70	> 50,000
	50	> 50,000

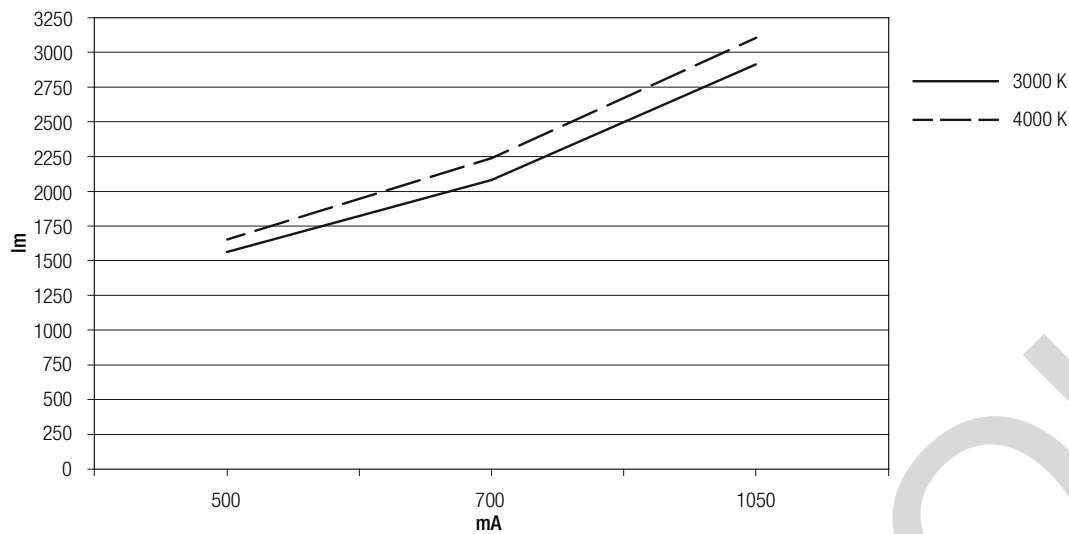
Lumen maintenance for HO operation

t_c temperature in °C	luminous flux in %	operating time in h
25	80	> 50,000
	70	> 50,000
	50	> 50,000
55	80	43,000
	70	> 50,000
	50	> 50,000
65	80	37,000
	70	> 50,000
	50	> 50,000
75	80	31,000
	70	50,000
	50	> 50,000

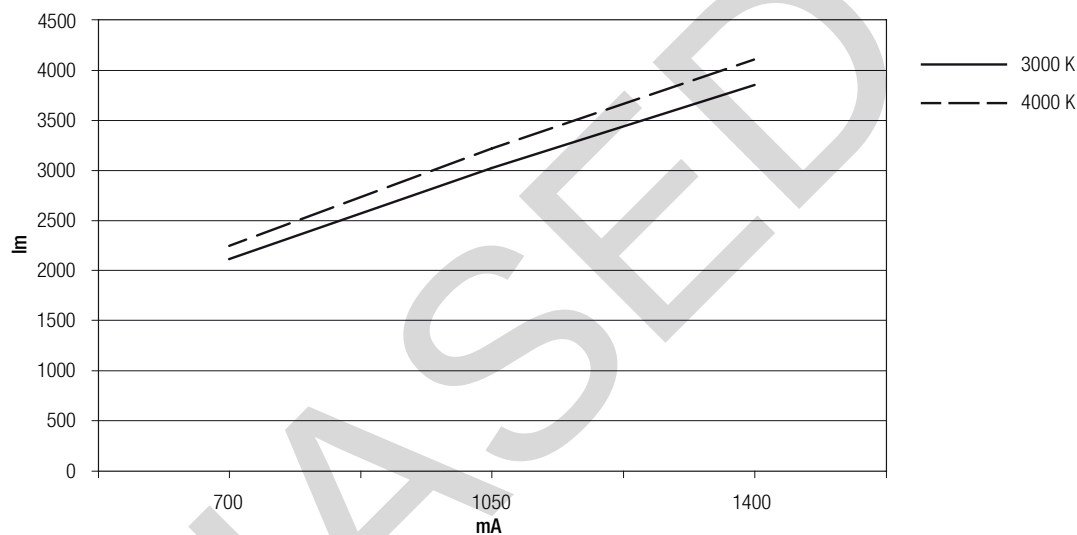
Luminous flux and operating current for LES19 at $t_p = 65$ °C



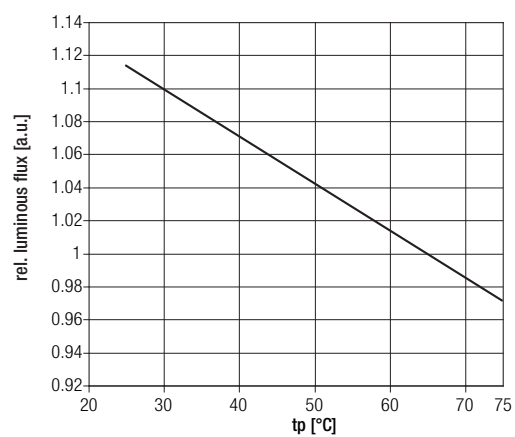
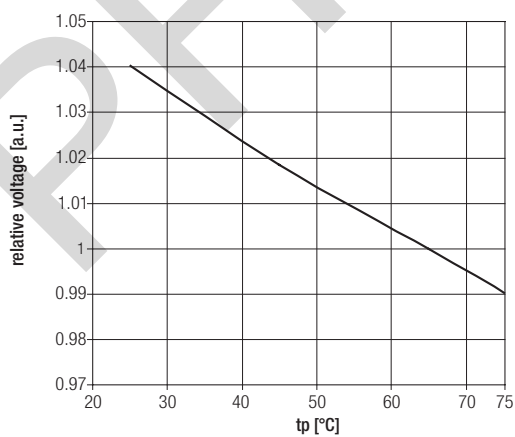
Luminous flux and operating current for LES23 at $t_p = 65^\circ\text{C}$



Luminous flux and operating current for LES26 at $t_p = 65^\circ\text{C}$

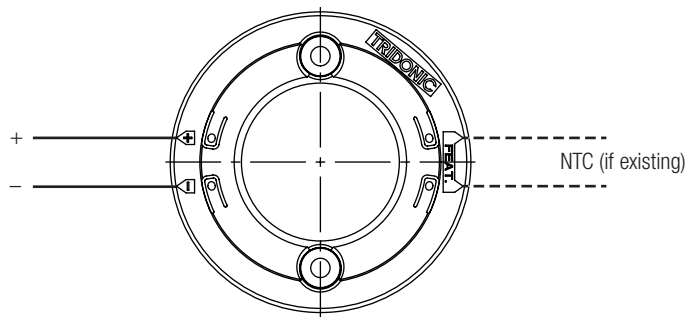


Relative forward voltage and relative luminous flux

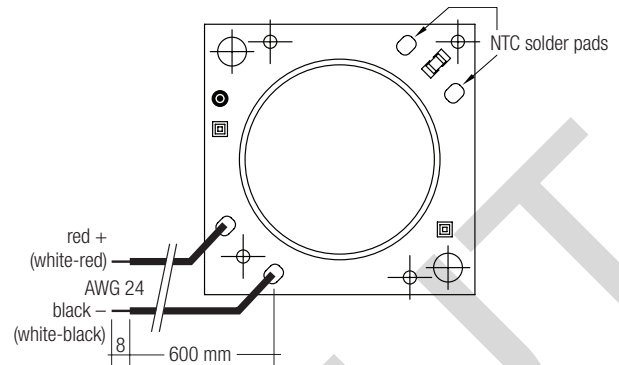


The diagrams based on statistic values.
The real values can be different.

Wiring with housing



Wiring without housing

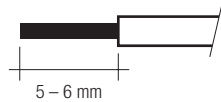


Wiring type and cross section

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.

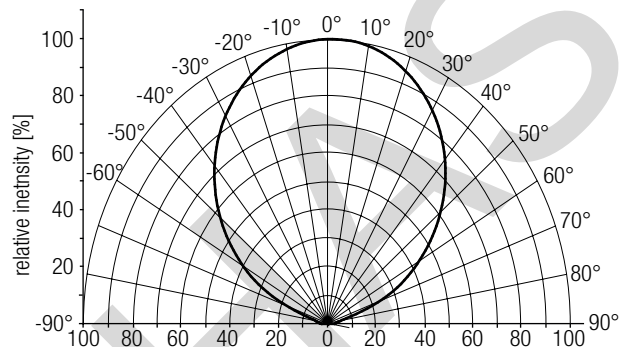
wire preparation:



Optical characteristics TALEXmodule STARK SLE G2

The optical design of the TALEXmodule STARK SLE G2 product line ensures optimum homogeneity for the light distribution.

Light distribution



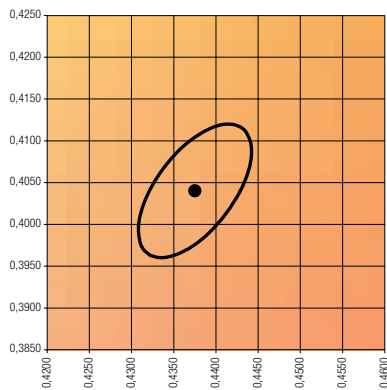
For further information see Design-in Guide, 3D data and photometric data on www.tridonic.com or on request.

Coordinates and tolerances according to CIE 1931

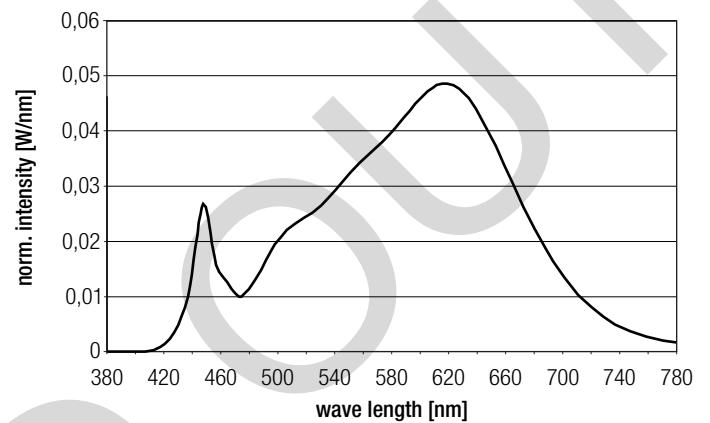
The specified colour coordinates are measured integral by a current impulse with nominal values of module after a settling time of 100 ms.
The ambient temperature of the measurement is $t_a = 25^\circ\text{C}$.
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0.4369	0.4041

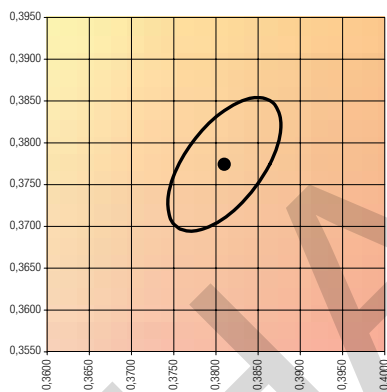


MacAdam ellipse: 3SDCM



4,000 K

	x0	y0
Centre	0.3804	0.3767



MacAdam ellipse: 3SDCM

