

EM powerLED SELFTEST 1 – 2 W

Combined emergency lighting LED Driver 1 – 4 W

Product description

- Emergency lighting LED Driver with self-test function
- SELV for output voltage < 60 V DC
- Low profile casing (21 x 30 mm cross-section)
- 5-year guarantee

Properties

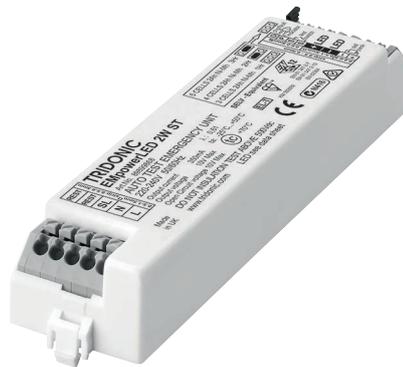
- Mains and emergency operation
- Self-test as per IEC 62034
- Constant current mode
- With either screw or clip fastening (clip-fix)
- 1, 2 or 3 h rated duration
- Selectable operating time (jumper)
- Output power limitation
- Two-colour status display LED
- „Rest mode“ function
- Simple set-up
- Automatic restart after LED replacement
- Electronic multi-level charge system
- Pulse current charging to optimize battery life
- SELV (outputs powerLED, battery, status LED, test switch)
- Polarity reversal protection for battery
- Deep discharge protection
- Very low energy consumption from the battery after activation of the deep discharge protection
- Short-circuit-proof battery connection
- Emergency lighting LEDs available
- Self-test:
 - Status of the battery
 - Status of the LED
 - Charge condition
 - Function test
 - Life-time test

Batteries

- High-temperature cells: 2 Ah
- NiMH batteries
- Cs cells
- 4-year design life
- 1-year guarantee
- For battery compatibility refer to table „Battery selection“



Screw-fix



Clip-fix



Standards, page 5

For wiring diagrams and installation examples, page 8

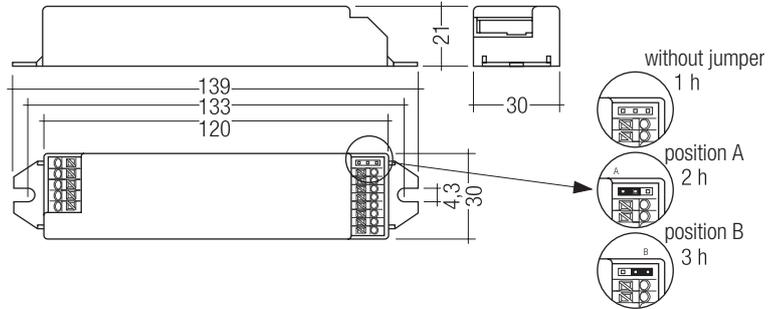


EM powerLED SELFTEST 1 – 2 W

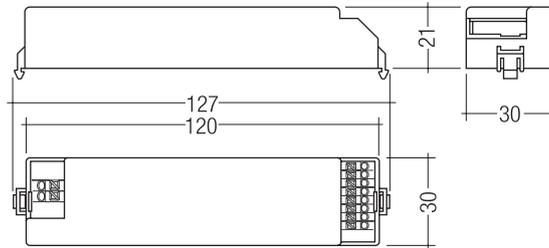
Combined emergency lighting LED Driver 1 – 4 W

Technical data

| | |
|--|--|
| Rated supply voltage | 220 – 240 V |
| Mains frequency | 50 / 60 Hz |
| Forward voltage range LED module (1 x LED) | 2.8 – 3.4 V |
| Forward voltage range LED module (2 x LED) | 5.6 – 6.8 V |
| Max. open circuit voltage | 10 V |
| Time to light | 0.31 s from detection of emergency event |
| Overvoltage protection | 320 V (for 1 h) |
| Battery discharge current | See page 4 |
| Max. casing temperature t_c | 70 °C |
| Ambient temperature t_a | -25 ... +50 °C |
| Mains voltage changeover threshold | according to EN 60598-2-22 |
| Type of protection | IP20 |



Screw-fix



Clip-fix

Ordering data

| Type | Article number | Packaging, carton | Packaging, pallet | Weight per pc. | Max. number of LED | Power |
|--------------------------------|----------------|-------------------|-------------------|----------------|--------------------|-------|
| Screw fastening version | | | | | | |
| EM powerLED 1 W ST | 89899860 | 25 pc(s). | 1,200 pc(s). | 0.056 kg | 1 | 1.2 W |
| EM powerLED 2 W ST | 89899861 | 25 pc(s). | 1,200 pc(s). | 0.056 kg | 2 | 2.0 W |
| Clip fastening version | | | | | | |
| EM powerLED 1 W ST | 89899867 | 25 pc(s). | 1,200 pc(s). | 0.056 kg | 1 | 1.2 W |
| EM powerLED 2 W ST | 89899868 | 25 pc(s). | 1,200 pc(s). | 0.056 kg | 2 | 2.0 W |

Specific technical data

| Typ | Rated duration | Typ. λ (at 230 V, 50 Hz) [®] | Non-maintained operation: Mains current | | | Non-maintained operation: Mains power | | | Maintained operation: Mains current | | | Maintained operation: Mains power | | |
|--------------------------|----------------|---|---|---------------|----------------|---------------------------------------|---------------|----------------|-------------------------------------|---------------|----------------|-----------------------------------|---------------|----------------|
| | | | Initial charge | Fast recharge | Trickle charge | Initial charge | Fast recharge | Trickle charge | Initial charge | Fast recharge | Trickle charge | Initial charge | Fast recharge | Trickle charge |
| EM powerLED 1 W PRO EZ-3 | 1 h | 0.52c | 14 mA | 16 mA | 13 mA | 1.1 W | 1.4 W | 1.0 W | 28 mA | 30 mA | 25 mA | 3.2 W | 3.6 W | 2.8 W |
| EM powerLED 1 W PRO EZ-3 | 2 h | 0.52c | 14 mA | 16 mA | 13 mA | 1.1 W | 1.4 W | 1.0 W | 28 mA | 30 mA | 25 mA | 3.2 W | 3.6 W | 2.8 W |
| EM powerLED 1 W PRO EZ-3 | 3 h | 0.52c | 15 mA | 18 mA | 13 mA | 1.1 W | 1.6 W | 1.0 W | 28 mA | 30 mA | 25 mA | 3.2 W | 3.6 W | 2.8 W |
| EM powerLED 2 W PRO EZ-3 | 1 h | 0.55c | 15 mA | 18 mA | 13 mA | 1.2 W | 1.7 W | 1.0 W | 40 mA | 45 mA | 33 mA | 4.8 W | 5.2 W | 4.0 W |
| EM powerLED 2 W PRO EZ-3 | 2 h | 0.55c | 18 mA | 21 mA | 13 mA | 1.6 W | 2.1 W | 1.0 W | 40 mA | 45 mA | 33 mA | 5.0 W | 5.5 W | 4.0 W |
| EM powerLED 2 W PRO EZ-3 | 3 h | 0.55c | 20 mA | 24 mA | 13 mA | 1.9 W | 2.5 W | 1.0 W | 40 mA | 45 mA | 33 mA | 5.2 W | 5.8 W | 4.0 W |

[®] Maintained operation

Test switch EM2

Product description

- For connection to the emergency lighting unit
- For checking the device function



Ordering data

| Type | Article number | Packaging, bag | Packaging, carton | Weight per pc. |
|------------------|----------------|----------------|-------------------|----------------|
| Test switch EM 2 | 89805277 | 25 pc(s). | 600 pc(s). | 0.011 kg |

Status indication bi-colour LED

Product description

- Two-colour status display LED
- Green: system OK, red: fault



Ordering data

| Type | Article number | Packaging, bag | Packaging, carton | Weight per pc. |
|-----------------------------------|----------------|----------------|-------------------|----------------|
| LED EM bi-colour | 89899720 | 25 pc(s). | 200 pc(s). | 0.017 kg |
| LED EM bi-colour, high brightness | 89899753 | 25 pc(s). | 800 pc(s). | 0.013 kg |

Battery selection

EM powerLED 1-2 W ST, 1 / 2 / 3 h

| | | Type | EM powerLED 1 W ST | | | EM powerLED 2 W ST | | |
|-------------------------|--------------|-----------------|--------------------|-------------|----------------------|--------------------|---------|---------|
| | | Article no. | 89899860, 89899867 | | | 89899861, 89899868 | | |
| | | Duration | 1 h | 2 h | 3 h | 1 h | 2 h | 3 h |
| | | Cells | 2 cells | 3 cells | 3 cells | 3 cells | 4 cells | 5 cells |
| Technology and capacity | Design | Number of cells | Type | Article no. | Assignable batteries | | | |
| NiMH 2 Ah Cs cells | stick | 1 x 2 | Accu-NiMH C 2A | 89899755 | • | | | |
| | stick | 1 x 3 | Accu-NiMH C 3A | 89899744 | | • | • | • |
| | stick | 1 x 4 | Accu-NiMH C 4A | 89899700 | | | | • |
| | stick | 1 x 5 | Accu-NiMH C 5A | 89899703 | | | | • |
| | side by side | 5 x 1 | Accu-NiMH C 5B | 89899704 | | | | • |

Battery charge / discharge data

EM powerLED 1-2 W ST, 1 / 2 / 3 h

| | | Type | EM powerLED 1 W ST | | | EM powerLED 2 W ST | | |
|---------------------|----------------|----------------------------------|--------------------|---------|---------|--------------------|---------|---------|
| | | Article no. | 89899860, 89899867 | | | 89899861, 89899868 | | |
| | | Duration | 1 h | 2 h | 3 h | 1 h | 2 h | 3 h |
| | | Cells | 2 cells | 3 cells | 3 cells | 3 cells | 4 cells | 5 cells |
| Battery charge time | Initial charge | 20 h | | | | | | |
| | Fast recharge | 12 h | | | | | | |
| | Trickle charge | continuously (pulse charge) | | | | | | |
| Charge current | Initial charge | 130 mA | | | | | | |
| | Fast recharge | 210 mA | | | | | | |
| | Trickle charge | 130 mA / 0 mA (4 min. / 16 min.) | | | | | | |
| Discharge current | 1 x LED | 770 mA | 460 mA | 460 mA | 900 mA | 640 mA | 500 mA | |
| | 2 x LED | – | – | – | 870 mA | 630 mA | 500 mA | |

LED current

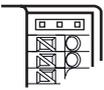
EM powerLED 1-2 W ST, 1 / 2 / 3 h

| | | Type | EM powerLED 1 W ST | | | EM powerLED 2 W ST | | |
|------------------------------------|---------|-------------|--------------------|--|--------|--------------------|--|--|
| | | Article no. | 89899860, 89899867 | | | 89899861, 89899868 | | |
| LED current in emergency operation | 1 x LED | 350 mA | | | 600 mA | | | |
| | 2 x LED | – | | | 350 mA | | | |
| LED current in mains operation | 1 x LED | 350 mA | | | 350 mA | | | |
| | 2 x LED | – | | | 350 mA | | | |

Standards

- according to EN 50172
- according to EN 60598-2-22
- EN 61347-2-7
- EN 61347-2-13
- EN 62384
- EN 62034
- EN 55015
- EN 61000-3-2
- EN 61547
- EN 60068-2-64
- EN 60068-2-29
- EN 60068-2-30

Duration link selection

| Duration | Link Position |
|----------|---|
| 1 hr |  without jumper |
| 2 hr |  position A |
| 3 hr |  position B |

Jumper selection

Module supplied with jumper in 3 hours position (position B).

The position of the link will only be read on first power up. If it is changed afterwards both the battery and mains supply must be disconnected for 10 seconds to enable the EM powerLED to read the new link position on reconnection of the battery and mains. It will lead to a false battery failure indication if the link is changed after installation without this reset.

Technical data Accu-NiMH

2.0 Ah

| | |
|--|---|
| Battery voltage/cell | 1.2 V |
| Cell type | Cs |
| Case temperature range to ensure 4 years design life | +5 °C to +55 °C |
| Max. short term temperature (reduced life-time) | 70 °C |
| Max. number discharge cycles | 4 cycles per year plus 30 cycles during commissioning |
| Max. storage time | 6 months |

Batteries

Connection method: 4.8 x 0.5 mm spade tag welded to end of cell

For stick packs this connection is accessible after the battery caps have been fitted.

To inhibit inverter operation disconnect the batteries by removing the connector from the battery spade tag.

For further information refer to corresponding battery datasheet.

Storage, installation and commissioning

Relevant information about storage conditions, installation and commissioning are provided in the battery datasheets.

Further technical data

The EM powerLED has a unique power regulation circuit; this is designed to limit the total power drawn from the battery in the event of using LED's with a forward voltage (V_f) higher than 3.4 V.

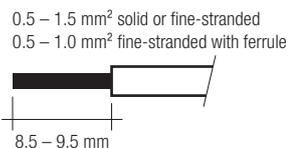
In such cases the unit will reduce the LED current in order to maintain an acceptable drain current from the battery and hence meet the required duration time. This feature enables the EM powerLED to have minimum battery count for a given range of LED's.

At a low charge state of the battery (<1.5V at the 1W driver and <3V at the 2W driver) the LED will not be driven in maintained mode via the switched line until the rated battery voltage levels are exceeded.

Wiring type and cross section

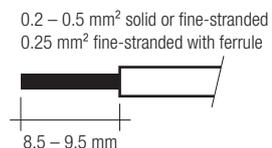
Wiring

mains (SL, N, L)
LED (LED +, LED -)



Wiring

batteries (Bat +, Bat -)
test switch (switch)
status indication LED (status K, A)



Use one wire for each terminal connector only.

Max. lead insulation diameter

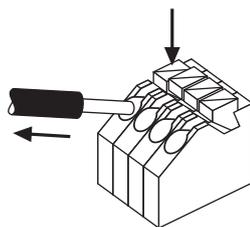
| | |
|---------------|--------|
| Battery | 2.1 mm |
| Test switch | 2.1 mm |
| Indicator LED | 2.1 mm |

Maximum lead length

| | |
|-----------------------|-----|
| LED | 3 m |
| status indication LED | 1 m |
| batteries | 1 m |

Release of the wiring

Press down the "push button" and remove the cable from front.

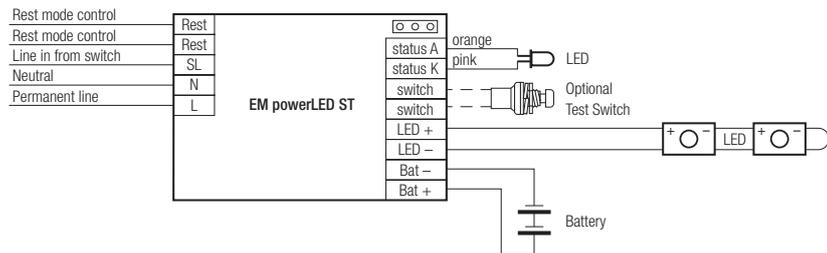


Maximum loading of automatic circuit breakers

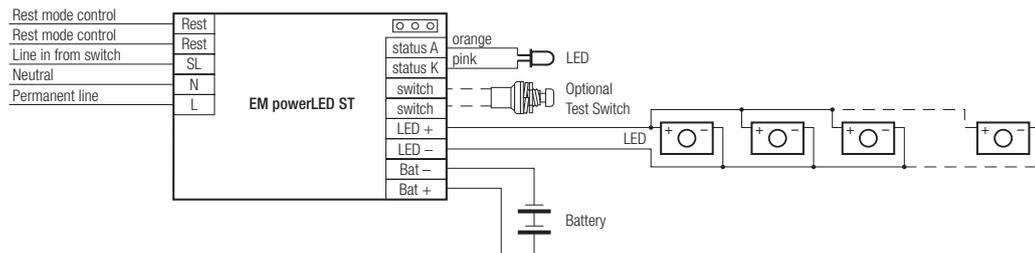
| Automatic circuit breaker type | B10 | C10 | B13 | C13 | B16 | C16 | B20 | C20 | Inrush current | |
|--------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------|--------|
| | | | | | | | | | I_{max} | time |
| Installation Ø | 1.5 mm ² | 1.5 mm ² | 1.5 mm ² | 1.5 mm ² | 2.5 mm ² | 2.5 mm ² | 2.5 mm ² | 2.5 mm ² | | |
| EM powerLED 1 W ST | 90 | 180 | 130 | 260 | 130 | 260 | 130 | 260 | 10 A | 120 µs |
| EM powerLED 2 W ST | 90 | 180 | 130 | 260 | 130 | 260 | 130 | 260 | 10 A | 120 µs |

Wiring diagram

Wiring diagram for one LED or two LED in series



Wiring diagram for multiple LED (3–12) in parallel



Take care that the LED is connected with the right polarity. LED that are connected to the EM powerLED devices should have a reverse polarity protection device such as a schottky diodes fitted, otherwise irreversible damage could occur if the LED is connected in reverse polarity. Any protection device must be capable of handling in excess of 700 mA.

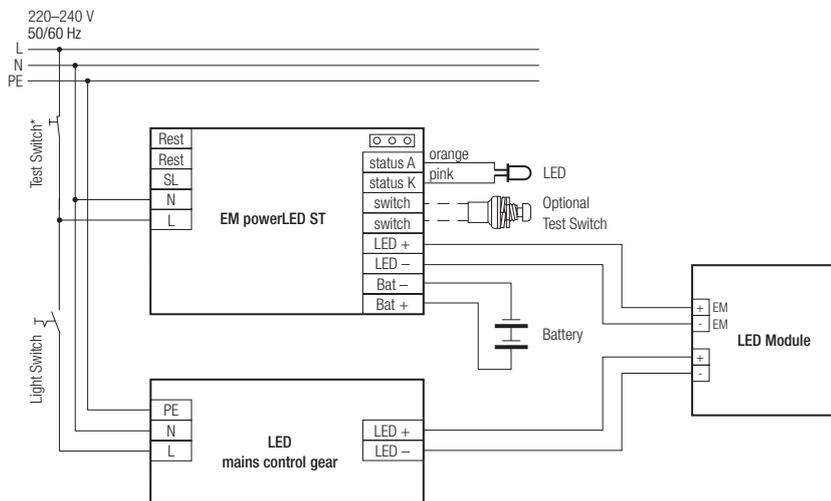
Note: Please ensure that at the terminal of the EM powerLED module the battery negative is not connected to the negative of the LED load.

Manually tested emergency lighting with combined LED modules for general and emergency lighting (e.g. STARK QLE CLASSIC EM, STARK LLE 24-280-1250 EM, STARK CLE CLASSIC EM, STARK SLE CLASSIC EM):

Due to the fact that independent circuits are used for general and emergency lighting it is important that the normal supply of the mains LED Driver is switched off together with the permanent emergency supply prior to checking the operation of the emergency LEDs.

If this is not done then it may not be possible to see that the emergency LEDs are operating.

Use a circuit similar to that shown next.



* Use 230 V Test switch

