Product description

- LED Driver for mains operation with integrated Simple CORRIDOR FUNCTION (CF) and emergency lighting function for manual testing
- For self-contained emergency lighting
- For luminaire installation
- For the use with CLE 1500lm EM
- 5 years guarantee

Properties

- Constant current LED Driver with 350 or 470 mA output current
- Simple CORRIDOR FUNCTION (CF) with 10 % light level
- Integrated 1 W emergency lighting unit for non-maintained operation
- 3 h rated duration
- Constant current mode
- Green charge status display LED
- Electronic charge system
- Polarity reversal protection for battery
- Deep discharge protection
- Short-circuit-proof battery connection
- SELV
- Emergency lighting LEDs available
- LED module and sensor available

Batteries

- High-temperature cells
- NiMH batteries
- Cs cells
- Blade terminals for simple connection
- 4-year design life
- 1-year guarantee
- For battery compatibility refer to table „Battery selection”

Standards, page 5
Wiring diagrams and installation examples, page 7
Emergency lighting units
EM powerLED

Technical data
Rated supply voltage 220 – 240 V
Mains frequency 50 / 60 Hz
U-OUT 48 V
Overvoltage protection 320 V (for 1 h)
Battery charging time 24 h
Battery charge current 120 mA
Battery discharge current see page 4
Rated duration 3 h
Number of cells 3
Turn on time (at 230 V, 50 Hz, full load) 100 ms
Ambient temperature ta 0 – 55 °C
Max. casing temperature tc 75 °C
Dimensions LxBxH 123 x 79 x 31 mm
Mains voltage changeover threshold according to EN 60598-2-22
Type of protection IP20
Lifetime up to 50,000 h
Guarantee 5 years

Specific technical data
Type  EM = Emergency
Output current Min. output voltage Typ. output power Input power (at 230 V, 50 Hz, full load) Input current (at 230 V, 50 Hz, full load) λ (at 230 V, 50 Hz) Efficiency Efficiency under normal operation Output voltage range defined in normal operation. LED forward voltage will decrease in CF operation

Normal operation
EM powerLED 12W BASIC CLE NiMH 350 mA 22 V 33 V 10.61 W 15 W 85 mA 71 % 0.8c – 5 – 55 °C 85 / 55 °C
EM powerLED 12W BASIC CLE NiCd 350 mA 22 V 33 V 10.61 W 15 W 85 mA 71 % 0.8c – 5 – 55 °C 85 / 55 °C
EM powerLED 15W BASIC CLE NiMH 470 mA 22 V 33 V 14.25 W 18 W 110 mA 82 % 0.8c – 5 – 55 °C 85 / 55 °C
EM powerLED 15W BASIC CLE NiCd 470 mA 22 V 33 V 14.25 W 18 W 110 mA 82 % 0.8c – 5 – 55 °C 85 / 55 °C

CF operation
EM powerLED 12W BASIC CLE NiMH 29 mA 15 % 22 V 33 V 0.75 W 3.1 W 26 mA 23 % 0.5c – – –
EM powerLED 12W BASIC CLE NiCd 29 mA 15 % 22 V 33 V 0.75 W 3.1 W 26 mA 23 % 0.5c – – –
EM powerLED 15W BASIC CLE NiMH 43 mA 15 % 22 V 33 V 112 W 3.9 W 30 mA 49 % 0.5c – – –
EM powerLED 15W BASIC CLE NiCd 43 mA 15 % 22 V 33 V 112 W 3.9 W 30 mA 49 % 0.5c – – –

Emergency operation
EM powerLED 12W BASIC CLE NiMH 400 mA 5 % 2.5 V 3.4 V 1.32 W – – – – –
EM powerLED 12W BASIC CLE NiCd 320 mA 5 % 2.5 V 3.4 V 1.06 W – – – – –
EM powerLED 15W BASIC CLE NiMH 400 mA 5 % 2.5 V 3.4 V 1.32 W – – – – –
EM powerLED 15W BASIC CLE NiCd 320 mA 5 % 2.5 V 3.4 V 1.06 W – – – – –

Ordering data
Type Article number Packaging, carton Packaging, pallet Weight per pc.
EM powerLED 12W BASIC CLE NiMH 89800526 10 pc(s) 560 pc(s) 0.126 kg
EM powerLED 12W BASIC CLE NiCd 89800525 10 pc(s) 560 pc(s) 0.125 kg
EM powerLED 15W BASIC CLE NiMH 89800174 10 pc(s) 560 pc(s) 0.126 kg
EM powerLED 15W BASIC CLE NiCd 89800176 10 pc(s) 560 pc(s) 0.125 kg

1) Ambient temperature range ta defined in normal operation
2) Output voltage range defined in normal operation. LED forward voltage will decrease in CF operation
3) EM = Emergency
Product description

- A green LED indicates that charging current is flowing into the battery

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Packaging, bag</th>
<th>Packaging, carton</th>
<th>Weight per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED EM green</td>
<td>89899605</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.011 kg</td>
</tr>
<tr>
<td>LED EM green, ultra high brightness</td>
<td>89899756</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.012 kg</td>
</tr>
</tbody>
</table>
Product description

- Motion detector for luminaire installation
- Motion detection through glass and thin materials (except metal)
- For automatic on/off switching of electronic ballasts
- Bright-out function: luminaire is not switched on if there is adequate brightness
- Delay time, detection range and light value for the bright-out function can be set via 9 dip switches
- Max. installation height 5 m
- Two housing options allowing flexible installation
- Variable detection area (100 – 10 %)
- Zero cross switching supported
- 5 years guarantee

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Dimensions L x W x H</th>
<th>Packaging, carton</th>
<th>Weight per pc</th>
</tr>
</thead>
<tbody>
<tr>
<td>smartSWITCH HF SDP f</td>
<td>28002214</td>
<td>70 x 36.5 x 24.5 mm</td>
<td>5 pc(s)</td>
<td>0.040 kg</td>
</tr>
<tr>
<td>smartSWITCH HF SDP S f</td>
<td>28002235</td>
<td>58 x 48.5 x 24.5 mm</td>
<td>5 pc(s)</td>
<td>0.040 kg</td>
</tr>
</tbody>
</table>
**Emergency lighting units**

**EM powerLED**

**Standards**
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 62384
- according to EN 50172
- according to EN 60598-2-22

**Battery discharge current**

<table>
<thead>
<tr>
<th>Type</th>
<th>Max. LED forward voltage (3,40 V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12W CLE NiMH</td>
<td>500 mA</td>
</tr>
<tr>
<td>12W CLE NiCd</td>
<td>375 mA</td>
</tr>
<tr>
<td>15W CLE NiMH</td>
<td>500 mA</td>
</tr>
<tr>
<td>15W CLE NiCd</td>
<td>375 mA</td>
</tr>
</tbody>
</table>

**Technical data batteries**

**Accu-NiMh 2.2 Ah**
- Battery voltage/cell: 1.2 V
- Cell type: Cs
- Case temperature range:
  - to ensure 4 years design life: +5 °C to +50 °C
  - Max. short term battery case temperature (shorter than 1 month over the battery lifetime): 70 °C
  - Max. number discharge cycles:
    - 30 cycles during commissioning
    - 4 cycles per year plus
  - Max. storage time: 12 months

**Accupack-NiMH 2.2 Ah**
- Battery voltage/cell: 1.2 V
- Cell type: Cs
- Ambient temperature range:
  - to ensure 4 years design life: +5 °C to +35 °C
  - tc point: +40 °C
  - Max. short term battery case temperature (shorter than 1 month over the battery lifetime): 70 °C
  - Max. number discharge cycles:
    - 4 cycles per year plus
    - 4 cycles during commissioning
  - Max. storage time: 12 months

**Battery selection**

**EM powerLED BASIC CLE**

<table>
<thead>
<tr>
<th>Type</th>
<th>EM powerLED 12W BASIC CLE NiMH</th>
<th>EM powerLED 12W BASIC CLE NiCd</th>
<th>EM powerLED 15W BASIC CLE NiMH</th>
<th>EM powerLED 15W BASIC CLE NiCd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article no.</td>
<td>89800526</td>
<td>89800525</td>
<td>89800174</td>
<td>89800176</td>
</tr>
<tr>
<td>Duration</td>
<td>3 h</td>
<td>3 h</td>
<td>3 h</td>
<td>3 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology and capacity</th>
<th>Design</th>
<th>Number of cells</th>
<th>Type</th>
<th>Article no.</th>
<th>Assignable batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>NiMh 2.2 Ah</td>
<td>stick</td>
<td>1 x 3</td>
<td>Accu-NiMh 3A</td>
<td>28002088</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pack-NiMh 2.2Ah 3 CON</td>
<td>28001898</td>
<td>•</td>
</tr>
</tbody>
</table>

**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 of batteries**

- Store batteries within the specified temperature range in low humidity conditions. Optimal storage conditions are:
  - temperature: ±5 °C ±25 °C
  - humidity: 65 % ±5 %
- Avoid atmosphere with corrosive gas
- Disconnect batteries before store or delivery
- Avoid storage of discharged batteries
- A long term storage in open circuit leads to battery self discharge and deactivation of chemical components. It could be required to charge and discharge the batteries a few times to recover the initial performance.

**Mechanical details**

Case manufactured from polycarbonate.

Glow-wire test according to EN 60598-1

650 °C and 850 °C passed

LED status indicator
- Green
- Mounting hole: 6.5 mm diameter, 1 – 1.6 mm thickness
- Lead length: 1,000 mm

Battery leads
- Quantity: 1 red and 1 black
- Length: 1,000 mm
- Wire type: 0.5 mm² solid conductor
- Insulation rating: 90°C

Battery end termination
- Push on 4.8 mm receptacle to suit battery spade fitted with insulating cover

Module end termination
- 8.0 mm stripped insulation
Emergency lighting units
EM powerLED

Short-circuit behaviour
In case of a short circuit on the secondary side (LED) the LED output is switched off. After elimination of the short circuit the nominal operation is restored automatically.

No-load operation
The LED Driver is not damaged in the no-load operation. The max. output voltage can be obtained during no-load operation.

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

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

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

Maximum loading of automatic circuit breakers

<table>
<thead>
<tr>
<th>Automatic circuit breaker type</th>
<th>B10</th>
<th>B13</th>
<th>B16</th>
<th>B20</th>
<th>I_{\text{max}}</th>
<th>t_{\text{on}}</th>
<th>t_{\text{off}}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Ø</td>
<td>15 mm²</td>
<td>15 mm²</td>
<td>15 mm²</td>
<td>2.5 mm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EM powerLED 12W BASIC CLE NiMH</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>10 A</td>
<td>120 μs</td>
<td></td>
</tr>
<tr>
<td>EM powerLED 12W BASIC CLE NiCd</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>10 A</td>
<td>120 μs</td>
<td></td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiMH</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>10 A</td>
<td>120 μs</td>
<td></td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiCd</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>10 A</td>
<td>120 μs</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>THD</th>
<th>3</th>
<th>5</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM powerLED 12W BASIC CLE NiMH</td>
<td>4.5</td>
<td>32</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>EM powerLED 12W BASIC CLE NiCd</td>
<td>4.5</td>
<td>32</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiMH</td>
<td>3.9</td>
<td>33</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiCd</td>
<td>3.9</td>
<td>33</td>
<td>20</td>
<td>12</td>
</tr>
</tbody>
</table>

Ballast lumen factor in %

<table>
<thead>
<tr>
<th>Type</th>
<th>Emergency BLF</th>
<th>EBLF</th>
<th>Corridor mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM powerLED 12W BASIC CLE NiMH</td>
<td>1.0</td>
<td>2.0</td>
<td>10</td>
</tr>
<tr>
<td>EM powerLED 12W BASIC CLE NiCd</td>
<td>1.0</td>
<td>2.0</td>
<td>10</td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiMH</td>
<td>1.0</td>
<td>2.0</td>
<td>10</td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiCd</td>
<td>1.0</td>
<td>2.0</td>
<td>10</td>
</tr>
</tbody>
</table>

Insulation matrix

<table>
<thead>
<tr>
<th>Mains</th>
<th>Switched Live</th>
<th>C/F</th>
<th>Battery, LED, Test switch, Indicator LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains</td>
<td>–</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Switched Live</td>
<td>•</td>
<td>–</td>
<td>•</td>
</tr>
<tr>
<td>C/F</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

• Represents basic insulation
• • Represents double or reinforced insulation

Expected lifetime

<table>
<thead>
<tr>
<th>Type</th>
<th>ta = 45 °C</th>
<th>ta = 55 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM powerLED 12W BASIC CLE NiMH</td>
<td>Lifetime 100,000 h</td>
<td>50,000 h</td>
</tr>
<tr>
<td>EM powerLED 12W BASIC CLE NiCd</td>
<td>Lifetime 100,000 h</td>
<td>50,000 h</td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiMH</td>
<td>Lifetime 100,000 h</td>
<td>50,000 h</td>
</tr>
<tr>
<td>EM powerLED 15W BASIC CLE NiCd</td>
<td>Lifetime 100,000 h</td>
<td>50,000 h</td>
</tr>
</tbody>
</table>

The relation of tc to ta temperature depends also on the luminaire design. If the measured tc temperature is approx. 5 K below tc max., ta temperature should be checked and eventually critical components (e.g. ELCAP) measured. Detailed information on request.
The mains power must be removed before changing the LED load.

Secondary switching of LEDs is not allowed and may cause damage to the LEDs.

The hot plug-in of LEDs during normal operation may result in current peaks of up to 50% above the typical output current.

Note for manually tested emergency lighting with combined LED modules:
For manually tested emergency applications when used with combined LED light modules for general and emergency lighting (e.g., Tridonic modules QLE, LLE 24, CLE and SLE), it is important that the normal supply of the mains LED Driver together with the permanent emergency supply is switched off prior to checking the operation of the emergency LEDs. These combined LED modules use independent circuits for general and emergency lighting.

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

Use a similar circuit to that shown above.
Wiring instructions

- Secondary leads should be separated from the mains connections and wiring for good EMC performance.
- The EM powerLED terminals, battery and indicator LED terminals are classified as SELV. Keep the wiring of the input terminals separated from the wiring of the SELV equivalent terminals or consider special wiring (double insulation, 6 mm creepage and clearance) when these connections should be kept SELV.
- Maximum lead length on the EM powerLED terminals is 3 m. For a good EMC performance keep the LED wiring as short as possible.
- The secondary wires (LED module) should be routed in parallel to ensure good EMC performance.
- Maximum lead length for the indicator LED connection is 1 m. The indicator LED wiring should be separated from the EM powerLED leads to prevent noise coupling.
- Battery leads are specified with 0.8 mm cross section and a length of < 1 m.
- Switched live and unswitched live supplies must be off the same phase.
- To avoid the damage of the control gear, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

Wiring type and cross section

Solid wire with a cross section of 0.5 – 1.5 mm². Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals.

Installation instruction

Max. torque for the mounting screws: 0.5 Nm / M4.

You must make sure that the LED is connected with the correct polarity. LEDs that are connected to EM powerLED should have polarity reversal protection such as a Schottky diode. There may be irreversible damage if the LED is connected with the wrong polarity. The protection device must be capable of handling a load of more than 700 mA.

Maximum number of switching cycles

All LED Drivers are tested with 50,000 switching cycles. The actually achieved number of switching cycles is significantly higher.

Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim. No warranty if device was opened.