Product description
• Emergency lighting LED Driver for manual testing
• For self-contained emergency lighting
• For LED modules with a forward voltage of 50 – 200 V
• Low profile casing (21 x 30 mm cross-section)
• For luminaire installation
• 5-year guarantee

Properties
• Non maintained operation
• 1 or 3 h rated duration
• Operating time selectable with plug (duration link)
• Compatible with all dimmable and non-dimmable constant current LED Drivers (see 5.3, LED Driver compatibility)
• 3-pole technology: 2-pole LED module changeover and delayed power switching for the LED Driver
• Automatic shutdown of output if LED load is out of range
• Constant power output
• Maximum light output for all LED modules
• Electronic charge system
• Deep discharge protection
• Short-circuit-proof battery connection
• Polarity reversal protection for battery

Batteries
• High-temperature cells
• NiCd or NiMH batteries
• D, Cs or LA cells
• 4-year design life
• 1-year guarantee
• For battery compatibility refer to chapter „Battery selection“

Standards, page 4
Wiring diagrams and installation examples, page 5
EM converterLED BASIC 200 V
BASIC series

Note: LED Driver supplied with duration link in 3 hours position. Remove duration link for 1 hour duration. Duration link must be set before battery and mains connection.

Technical data
- Rated supply voltage: 220 – 240 V
- Mains frequency: 50 / 60 Hz
- Typ. λ (at 230 V, 50 Hz): 0.55
- LED module forward voltage range: 50 – 200 V
- Output current: see page 5
- Time to light: < 0.25 s from detection of emergency event
- Overvoltage protection: 320 V (for 1 h)
- Maximum output voltage: 250 V
- Battery charging time: 20 h
- Ambient temperature range ta: -5 ... + 55 °C
- Max. casing temperature tc: 70 °C
- Mains voltage changeover threshold according to EN 60598-2-22
- Type of protection: IP20

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Rated duration</th>
<th>Number of cells</th>
<th>Packaging, carton</th>
<th>Packaging, pallet</th>
<th>Weight per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM converterLED BASIC 104 200V</td>
<td>89800308</td>
<td>1/3 h</td>
<td>4</td>
<td>10 pc(s)</td>
<td>1600 pc(s)</td>
<td>0.078 kg</td>
</tr>
<tr>
<td>EM converterLED BASIC 105 200V</td>
<td>89800309</td>
<td>1/3 h</td>
<td>5</td>
<td>10 pc(s)</td>
<td>1600 pc(s)</td>
<td>0.078 kg</td>
</tr>
</tbody>
</table>

Specific technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated duration</th>
<th>Typ. output power</th>
<th>Mains current in charging operation</th>
<th>Rated power in charging operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM converterLED BASIC 104 200V</td>
<td>1 h</td>
<td>3.85 W</td>
<td>25 mA</td>
<td>3.0 W</td>
</tr>
<tr>
<td></td>
<td>3 h</td>
<td>3.85 W</td>
<td>30 mA</td>
<td>4.0 W</td>
</tr>
<tr>
<td>EM converterLED BASIC 105 200V</td>
<td>1 h</td>
<td>4.85 W</td>
<td>25 mA</td>
<td>3.0 W</td>
</tr>
<tr>
<td></td>
<td>3 h</td>
<td>4.85 W</td>
<td>30 mA</td>
<td>4.5 W</td>
</tr>
</tbody>
</table>

<sup>1</sup> 16 h battery charging time for 2 h emergency lighting function according to AS 2293.
<sup>2</sup> EM = Emergency
Product description
- For connection to the emergency lighting unit
- For checking the device function
- Plug connection

Ordering data

<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>Test switch EM 3</td>
<td>89899956</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.013 kg</td>
</tr>
</tbody>
</table>

Product description
- A green LED indicates that charging current is flowing into the battery
- Plug connection

Ordering data

<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, 1.0 m</td>
<td>89800269</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.015 kg</td>
</tr>
<tr>
<td>LED EM green, 0.6  m</td>
<td>89800472</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.009 kg</td>
</tr>
<tr>
<td>LED EM green, HO 0.3 m</td>
<td>89800270</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.005 kg</td>
</tr>
<tr>
<td>LED EM green, HO 0.6 m</td>
<td>89800473</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.009 kg</td>
</tr>
</tbody>
</table>
1. Standards

- according to EN 50172
- according to EN 60598-2-22
- EN 61347-1
- EN 61347-2-13
- EN 61347-2-7
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61547
- EN 60068-2-64
- EN 60068-2-29
- EN 60068-2-30
- EN 62384

1.1 Glow-wire test

according to EN 61347-1 with increased temperature of 850 °C passed.

1.2 Isolation and electric strength testing of luminaires

Electronic LED-Drivers 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 1,500 V AC (or 1,414 x 1,500 V DC). To avoid damage to the electronic devices this test must not be conducted.

2. Thermal details and life-time

2.1 Life-time

Average life-time 50,000 hours under rated conditions with a failure rate of less than 10 %. Average failure rate of 0.2 % per 1000 operating hours.

3. Installation / Wiring

3.1 Wiring diagram

One or more LED modules with a total forward voltage of 50 to 200 V can be connected to the EM converterLED 200V module. These LED module(s), marked with “Emergency” are operated in emergency mode from the associated battery. In normal mains mode all LED modules are operated by the mains LED Driver.

Use of the test switch:
For checking the device function press the test switch for a minimum of 3 seconds.
EM converterLED BASIC with one LED module for non-maintained emergency operation

Not connected
Not connected
Neutral
Un-Switched Line

EM ConverterLED BASIC
Control gear +
LED +
LED –
Battery –
Battery +

LED Module Emergency

Test switch
Indicator
LED

EM converterLED BASIC with a standard LED Driver and one LED module for mains and emergency operation

Switched Line out
Switched Line in
Neutral
Un-Switched Line

EM ConverterLED BASIC
Control gear +
LED +
LED –
Battery –
Battery +

LED Module Emergency

Test switch
Indicator
LED

Neutral
L
N

LED control gear
max. 150 W in operation

EM converterLED BASIC with a standard LED Driver and series operation of LED modules

Switched Line out
Switched Line in
Neutral
Un-Switched Line

EM ConverterLED BASIC
Control gear +
LED +
LED –
Battery –
Battery +

LED Module Emergency

Test switch
Indicator
LED

Neutral
L
N

LED control gear
max. 150 W in operation

One LED module is operated in emergency mode.
All LED modules are operated in mains mode.
EM converterLED BASIC with a standard LED Driver and **series** operation of LED modules

Two or more LED modules are operated in emergency mode.
All LED modules are operated in mains mode.

EM converterLED BASIC with a standard LED Driver and **parallel** operation of LED modules

One LED module is operated in emergency mode.
All LED modules are operated in mains mode.
EM converterLED BASIC with a standard LED Driver and parallel operation of LED modules

Two or more LED modules are operated in emergency mode. All LED modules are operated in mains mode.

3.2 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.

Wiring: LED module/LED Driver/supply

Wire preparation:

- 0.5 – 1.5 mm²
- 8 – 9 mm

3.3 Loose wiring

Loosen wire through twisting and pulling or using a Ø 1 mm release tool.

3.4 Wiring guidelines

- The LED terminals, battery, indicator LED and test switch terminals are classified as SELV (output voltage < 120 V DC). 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.
- The output to the LED is DC but has high frequency content, which should be considered for good EMC compliance.
- LED leads should be separated from the mains connections and wiring for good EMC performance.
- Maximum lead length on the LED terminals is 3 m. For a good EMC performance keep the LED wiring as short as possible.
- Maximum lead length for the Test switch and Indicator LED connection is 1 m. The test switch and Indicator LED wiring should be separated from the LED leads to prevent noise coupling.
- Battery leads are specified with 0.5 mm² cross section and a length of 1.3 m.
- 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, louvers, etc.).

To ensure that a luminaire containing LED emergency units complies with EN 55015 for radio frequency conducted interference in both normal and emergency mode it is essential to follow good practice in the wiring layout.

Within the luminaire the switched and unswitched 50 Hz supply wiring must be routed as short as possible and be kept as far away as possible from the LED leads. Through wiring may affect the EMC performance of the luminaire.

The length of LED leads must not be exceeded. Note that the length of the EM converterLED leads is added to the length of the leads from the LED Driver to the EM converterLED module when considering max. permitted lead length of the LED Driver.
3.5 Maximum lead length

LED: 3 m
Status indication LED: 1 m
Batteries: 1.3 m

Note: The length of LED leads to the LED module must not be exceeded. Note that the length of the EM converterLED leads is added to the length of the leads from the LED Driver to the EM converterLED module when considering max. permitted lead length of the LED Driver. Leads should always be kept as short as possible.

3.6 Use of different phases

The use of different phases for switched line and unswitched line is allowed. When using different phases, the unswitched line must fail if the switched line fails. This is required to assure correct switching into emergency mode. It can be realised with a relay.

4. Mechanical values

4.1 Housing properties

Casing manufactured from polycarbonate.

4.2 Mechanical data accessories

LED status indicator
- Green
- Mounting hole: 6.5 mm dia
- Lead length: 0.3 m / 1.0 m
- Insulation rating: 90 °C
- Plug connection

Test switch
- Mounting hole: 7.0 mm dia
- Lead length: 0.55 m
- Plug connection

Battery leads
- Quantity: 1 red and 1 black
- Length: 1.3 m
- 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

Two-piece batteries are supplied with a 200 mm lead with 4.8 mm receptacle at each end and insulating covers to connect the separate sticks together.
5. Electrical values

5.1 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>C10</th>
<th>C13</th>
<th>C16</th>
<th>C20</th>
<th>Inrush current</th>
<th>Lmax time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Ø</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>2.5 mm²</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>2.5 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EM converterLED 104 BASIC 200V</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>160</td>
<td>260</td>
<td>260</td>
<td>260</td>
<td>10 A</td>
<td>120 μs</td>
</tr>
<tr>
<td>EM converterLED 105 BASIC 200V</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>160</td>
<td>260</td>
<td>260</td>
<td>260</td>
<td>10 A</td>
<td>120 μs</td>
</tr>
</tbody>
</table>

5.2 Typ. LED current/voltage characteristics

The LED current in emergency mode is automatically adjusted by the EM converterLED module based on the total forward voltage of the LED modules connected and the associated battery.

EM converterLED BASIC 104 200V
Article number: 89800308
4.8 V battery voltage
750 – 960 mA battery discharge current (tolerance)

EM converterLED BASIC 105 200V
Article number: 89800309
6.0 V battery voltage
750 – 960 mA battery discharge current (tolerance)

![LED current/voltage characteristic graph](image-url)

**LED peak current at start in emergency mode – 4 cells**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>Inrush current (mA)</th>
<th>Duration (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.3 V</td>
<td>65 mA</td>
<td>6.7 ms</td>
</tr>
<tr>
<td>52.5 V</td>
<td>67 mA</td>
<td>6.9 ms</td>
</tr>
<tr>
<td>75.1 V</td>
<td>108 mA</td>
<td>6.9 ms</td>
</tr>
<tr>
<td>85.4 V</td>
<td>127 mA</td>
<td>7.7 ms</td>
</tr>
<tr>
<td>100.7 V</td>
<td>150 mA</td>
<td>8.9 ms</td>
</tr>
<tr>
<td>110.8 V</td>
<td>177 mA</td>
<td>10.2 ms</td>
</tr>
<tr>
<td>135.9 V</td>
<td>230 mA</td>
<td>13.0 ms</td>
</tr>
<tr>
<td>145.0 V</td>
<td>277 mA</td>
<td>16.7 ms</td>
</tr>
<tr>
<td>155.9 V</td>
<td>333 mA</td>
<td>20.5 ms</td>
</tr>
<tr>
<td>180.8 V</td>
<td>388 mA</td>
<td>30.9 ms</td>
</tr>
<tr>
<td>200.6 V</td>
<td>456 mA</td>
<td>50.9 ms</td>
</tr>
</tbody>
</table>

**LED peak current at start in emergency mode – 5 cells**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>Inrush current (mA)</th>
<th>Duration (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.3 V</td>
<td>136 mA</td>
<td>25.7 ms</td>
</tr>
<tr>
<td>52.5 V</td>
<td>127 mA</td>
<td>31.9 ms</td>
</tr>
<tr>
<td>75.1 V</td>
<td>128 mA</td>
<td>44.9 ms</td>
</tr>
<tr>
<td>85.4 V</td>
<td>111 mA</td>
<td>52.7 ms</td>
</tr>
<tr>
<td>100.7 V</td>
<td>102 mA</td>
<td>6.6 ms</td>
</tr>
<tr>
<td>110.8 V</td>
<td>97 mA</td>
<td>9.4 ms</td>
</tr>
<tr>
<td>135.9 V</td>
<td>86 mA</td>
<td>9.7 ms</td>
</tr>
<tr>
<td>145.0 V</td>
<td>81 mA</td>
<td>12.8 ms</td>
</tr>
<tr>
<td>155.9 V</td>
<td>80 mA</td>
<td>13.3 ms</td>
</tr>
<tr>
<td>171.0 V</td>
<td>73 mA</td>
<td>16.4 ms</td>
</tr>
<tr>
<td>181.0 V</td>
<td>69 mA</td>
<td>19.1 ms</td>
</tr>
<tr>
<td>191.1 V</td>
<td>67 mA</td>
<td>21.2 ms</td>
</tr>
<tr>
<td>201.1 V</td>
<td>65 mA</td>
<td>30.0 ms</td>
</tr>
</tbody>
</table>

Note: LED peak current measured at the max. battery discharge current and at a max. battery voltage of 6 V (4 cells) or 7.5 V (5 cells).
5.3 LED Driver compatibility

The EM converterLED emergency unit use 3 pole technology and is compatible with most LED Drivers on the market, however it is important to check that the rating of the LED Driver does not exceed the values specified below:

- The max. allowed output current rating of the associated LED Driver is 2.4 A peak (current rating of switching relays of EM converterLED)
- The max. allowed inrush current rating of the associated LED Driver is 60 A peak for 1 ms or 84 A for 255 μs (inrush current rating of switching relay of EM converterLED)
- The max. allowed output voltage of the associated LED Driver applied to the EM converterLED output is 450V (voltage withstand between adjacent contact of the single switching relay of the EM converterLED)
- The max. allowed LED load of the associated LED Driver is 150 W in operation. The load must be an LED module.

6. Functions

6.1 Duration link selection

<table>
<thead>
<tr>
<th>Duration</th>
<th>Usage duration link</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 h</td>
<td>With link</td>
</tr>
<tr>
<td>1 h</td>
<td>Without link</td>
</tr>
</tbody>
</table>

Emergency lighting LED Driver supplied with duration link in 3 hours position.

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 converterLED 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.
7. Battery data

7.1 Battery selection

### EM converterLED BASIC, 1 / 3 h

<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>NiCd 1.6 Ah Cs cells</td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiCd C 4A</td>
<td>89899692</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 5</td>
<td>Accu-NiCd C 5A</td>
<td>89899695</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>2 + 2</td>
<td>Accu-NiCd C 4C</td>
<td>89899694</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>3 + 2</td>
<td>Accu-NiCd C 5C</td>
<td>89899697</td>
<td></td>
</tr>
<tr>
<td></td>
<td>side by side</td>
<td>4 x 1</td>
<td>Accu-NiCd C 4B</td>
<td>89899693</td>
<td></td>
</tr>
<tr>
<td></td>
<td>side by side</td>
<td>5 x 1</td>
<td>Accu-NiCd C 5B</td>
<td>89899696</td>
<td></td>
</tr>
<tr>
<td>NiCd 4 Ah D cells</td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiCd 4A S5</td>
<td>89800089</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 5</td>
<td>Accu-NiCd 5A S5</td>
<td>89895973</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>2 + 2</td>
<td>Accu-NiCd 4C</td>
<td>89895978</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>3 + 2</td>
<td>Accu-NiCd 5C S5</td>
<td>89800090</td>
<td></td>
</tr>
<tr>
<td></td>
<td>side by side</td>
<td>4 x 1</td>
<td>Accu-NiCd 4B S5</td>
<td>89800385</td>
<td></td>
</tr>
<tr>
<td>NiMH 2.2 Ah Cs cells</td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiMH 4A</td>
<td>28002089</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 5</td>
<td>Accu-NiMH 5A</td>
<td>28002090</td>
<td></td>
</tr>
<tr>
<td></td>
<td>side by side</td>
<td>5 x 1</td>
<td>Accu-NiMH 5B</td>
<td>28002093</td>
<td></td>
</tr>
<tr>
<td>NiMH 4 Ah LA cells</td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiMH 4Ah 4A CON</td>
<td>89800442</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>2 + 2</td>
<td>Accu-NiMH 4Ah 4C CON</td>
<td>89800438</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>3 + 2</td>
<td>Accu-NiMH 4Ah 5C CON</td>
<td>89800439</td>
<td></td>
</tr>
</tbody>
</table>

7.2 Battery charge / discharge data

<table>
<thead>
<tr>
<th>Type</th>
<th>EM converterLED BASIC 104 200V</th>
<th>EM converterLED BASIC 105 200V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article no.</td>
<td>89800308</td>
<td>89800309</td>
</tr>
<tr>
<td>Cells</td>
<td>4 cells</td>
<td>5 cells</td>
</tr>
<tr>
<td>Duration</td>
<td>1 h</td>
<td>3 h</td>
</tr>
<tr>
<td>Charging current</td>
<td>105 mA</td>
<td>210 mA</td>
</tr>
<tr>
<td>Discharge current</td>
<td>750 – 960 mA</td>
<td>750 – 960 mA</td>
</tr>
</tbody>
</table>
7.3 Accu-NiCd

1.6 Ah
Battery voltage/cell: 12 V
Cell type: Cs
Case temperature range: +5 °C to +50 °C
to ensure 4 years design life
Max. short term temperature (reduced life-time): 70 °C
4 cycles per year plus 4 cycles during commissioning
Max. number discharge cycles: 6 months
Max. storage time

4.2 / 4.5 Ah
Battery voltage/cell: 12 V
Cell type: D
Case temperature range: +5 °C to +55 °C
to ensure 4 years design life
Max. short term temperature (reduced life-time): 70 °C
4 cycles per year plus 4 cycles during commissioning
Max. number discharge cycles: 6 months
Max. storage time

7.4 Accu-NiMH

2.2 Ah
Battery voltage/cell: 12 V
Cell type: Cs
Case temperature range: +5 °C to +50 °C
to ensure 4 years design life
Max. short term temperature (reduced life-time): 70 °C
4 cycles per year plus 30 cycles during commissioning
Max. number discharge cycles: 6 months
Max. storage time

4.0 Ah
Battery voltage/cell: 12 V
Cell type: LA
Case temperature range: +5 °C to +60 °C
to ensure 4 years design life
Max. short term temperature (reduced life-time): 70 °C
4 cycles per year plus 30 cycles during commissioning
Max. number discharge cycles: 6 months
Max. storage time

7.5 Wiring 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.

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

8. Miscellaneous

8.1 Additional information
Additional technical information at www.tridonic.com → Technical Data
Guarantee conditions at www.tridonic.com → Services
Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.