Performance characteristics

• Single output channels for high power solid state lighting applications
• Max. output voltage is limited to 60 VDC SELV equiv.
• Very high energy efficiency of up to 90 %
• Soft start and low output current ripple for extended LED lifetime
• For use with IEC protection class I luminaires
• Total protected ECG against abnormal operations e.g. short circuit, open circuit, over load
• Suitable for direct current operation and application in emergency lighting installations referring to EN 61347-2-3/1
• DALI and 1-10V interfaces with advanced overvoltage protection of up to 264 V
• Push-Dim (additional feature of DALI version): Easy and reliable dimming and switching via standard push-button
• Dimming range 1...100 % luminous flux
• 500 Hz PWM for flicker-free dimming (no beads effect) without colour shift of the light
• High design flexibility thanks to flat housing for build in luminaires, alternative housing version for remote operation
• Identical dimensions and connection to DALI, 1-10 V and the non-dimmable electronic control gear units
• Easy installation due to push-in terminals with release button for wiring and standard M4 screws for fixing
• Certified as thermally protected device, e.g. for application in ▲-luminaires
• Conformance with international regulations regarding safety and operation, electromagnetic compatibility and immunity to interference

Usable for

• High Power LEDs (LED modules) with an operation current of constant 350 mA resp. 700 mA

Targeted lighting applications

• Shop
• Office & education
• Public buildings
• Hospitality

Markings
Dimmable constant current electronic control gear for single-channel LED module applications

Technical data

- Mains voltage supply
  - Rated voltage range: 220 V – 240 V
  - Max. admissible voltage range (continuous): 198 V – 264 V
  - Frequency: 50 Hz
- Battery operation
  - Voltage range for continuous operation: 198 VDC – 278 VDC
  - Lowest limiting value for temporary operation: 176 VDC
- Behaviour at mains overvoltage
  - Switch-off of the LEDs at approx. 320 VAC
  - Overvoltage protection: 350 VAC / 2 h
- Leakage current: < 0.5 mA / ECG
- Stand-by power: < 0.3 W
- Total harmonic distortion (THD): < 10 %
- Output current tolerance: ± 5 %
- Max. ripple output current: < ± 10 %
- Starting time: < 0.5 s
- Dimming interface: 2 different types of interfaces
  - 1-10V
  - DALI in combination with Push-Dim
- 1-10V control current: < 0.6 mA
- Dimming range: 100 % luminous flux
- Dimming technology: PWM (500 Hz)
- Degree of protection: IP 20
- Output voltage limitation: 60 VDC, SELV equivalent
- Behaviour in case of output open circuit operation: protected – limitation of output voltage; no current flow
- Behavior in case of overload operation: protected – limitation of output voltage
- Behaviour in case of output short circuit operation: protected – reduced operation current
- Behaviour in case of mains failure: see “Extended memory function”
- Max. temperature at housing surface in case of failure: + 110 °C (acc. EN 61 347-2-13 / C)
- Terminals for solid or stranded wire
  - Type: 45 °-connector with push button
  - Wire cross section: 0.5 mm² – 1.5 mm²
  - Wire stripping length: 7.5 mm – 8.5 mm
  - Wire lengths to LED modules: < 2 m

Admissible temperatures

<table>
<thead>
<tr>
<th>Version</th>
<th>Ambient (t_a)</th>
<th>Case (t_c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD1...</td>
<td>– 25 °C ... + 50 °C</td>
<td>max. + 75 °C</td>
</tr>
<tr>
<td>CCD1...</td>
<td>– 25 °C ... + 50 °C</td>
<td>max. + 70 °C</td>
</tr>
</tbody>
</table>

Service life

<table>
<thead>
<tr>
<th>Version</th>
<th>Nominal service life</th>
<th>Extended service life</th>
<th>Failure rate during service life</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD1...</td>
<td>50,000 h (operation at t_c = 75 °C)</td>
<td>100,000 h (operation at t_c = 65 °C)</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>CCD1...</td>
<td>50,000 h (operation at t_c = 75 °C)</td>
<td>100,000 h (operation at t_c = 65 °C)</td>
<td>&lt; 10 %</td>
</tr>
</tbody>
</table>

Inrush current / Circuit breaker

<table>
<thead>
<tr>
<th>Version</th>
<th>typ. I_{peak} / Δt</th>
<th>No. of ECG at single-pole circuit breakers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LS-Typ 10 A</td>
</tr>
<tr>
<td>CCD1...</td>
<td>36 A / 155 μs</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

All data for Usupply = 230 VAC, mains impedance = 1 Ohm.
In case of multipolar CB the max. no. is reduced by 20 %.
The max. number may differ depending on CB manufacturer. Please consider the specifications of the manufacturer.
Basicallly CB with C-characteristics are recommended to be used in lighting groups.

Errors excepted. We reserve the right to make alterations in the interest of improving our products.
Dimmable constant current electronic control gear for single-channel LED module applications

Operating data

<table>
<thead>
<tr>
<th>Version</th>
<th>Input current *</th>
<th>Power factor *</th>
<th>Max. system power *</th>
<th>ECG efficiency *</th>
<th>Constant output current</th>
<th>Min. output voltage</th>
<th>Max. output voltage</th>
<th>Min. total output power</th>
<th>Max. total output power</th>
<th>Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td></td>
<td>W</td>
<td>%</td>
<td>mA</td>
<td>V</td>
<td>V</td>
<td>W</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>CCD135-</td>
<td>0.19</td>
<td>0.95</td>
<td>20</td>
<td>88</td>
<td>350</td>
<td>10</td>
<td>50</td>
<td>3.5</td>
<td>18</td>
<td>a, b **</td>
</tr>
<tr>
<td>CCD170-</td>
<td>0.38</td>
<td>0.95</td>
<td>40</td>
<td>90</td>
<td>700</td>
<td>10</td>
<td>50</td>
<td>7.0</td>
<td>35</td>
<td>a, b **</td>
</tr>
</tbody>
</table>

* Nominal operation: 230 VAC, 100% load
** EMC approval only for build-in (QS) version

Push-Dim operation

A momentary push-button can alternatively be used for dimming and switching instead of DALI interface.

<table>
<thead>
<tr>
<th>Key press</th>
<th>Status: ECG switched off (stand-by)</th>
<th>Status: ECG switched on (lamp operation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short key press:</td>
<td>Switch-on the light at previous dimming level (memory function)</td>
<td>Switch-off the light and store dimming level</td>
</tr>
<tr>
<td>Long key press:</td>
<td>Switch-on the light at previous dimming level (memory function) and dim up resp. down</td>
<td>Dimming up and down, every new key press inverts the dimming direction</td>
</tr>
<tr>
<td>Long key press (10 s):</td>
<td>–</td>
<td>Synchronisation mode: all ECGs increase to 100 % of output</td>
</tr>
<tr>
<td>Long key press (20 s):</td>
<td>–</td>
<td>ECG changes to 1 % of output. If the button is released “extended memory function” will be enabled</td>
</tr>
<tr>
<td>Long key press (&gt; 25 s):</td>
<td>–</td>
<td>ECG changes to 100 % of output. If the button is released “extended memory function” will be disabled</td>
</tr>
</tbody>
</table>

* Extended memory function

In the factory setting the extended memory function is disabled. After a mains voltage interruption, the device starts at 100 %.

The extended memory function can be enabled via push-button programming. After mains voltage interruption the ECG will start at last set state (standby or last dimming level).

Efficiency over load

![Graph showing electrical efficiency over relative load for different power types](graph.png)

- 35 W types
- 18 W types

Errors excepted. We reserve the right to make alternations in the interest of improving our products.
Dimmable constant current electronic control gear
for single-channel LED module applications

Dimensions

CCD1...QS...

<table>
<thead>
<tr>
<th>Version</th>
<th>X (mm)</th>
<th>XM (mm)</th>
<th>Y (mm)</th>
<th>YM (mm)</th>
<th>Z (mm)</th>
<th>Weight (kg)</th>
<th>Pieces per box</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD1...QS</td>
<td>123</td>
<td>111</td>
<td>79</td>
<td>67</td>
<td>22</td>
<td>0.2</td>
<td>30</td>
</tr>
<tr>
<td>CCD1...QL</td>
<td>180</td>
<td>191</td>
<td>86</td>
<td>-</td>
<td>33</td>
<td>0.25</td>
<td>20</td>
</tr>
</tbody>
</table>

Wiring diagrams

1 channel

Conformance with regulations

EN 61347-1 General and safety requirements
EN 61347-2-13 Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules
EN 62384 Performance characteristics: DC or AC supplied electronic control gear for LED modules
EN 61547 Equipment for general lighting purposes EMC immunity requirements
EN 55015 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 62386-102 Digital addressable lighting interface – Part 102 General requirements – Control gear

Environmental tests for mechanical capacity:
IEC 60068-2-6 Test F, vibrations (sinusoidal)
IEC 60068-2-27 Test E, shock and bump
IEC 60068-2-29 Test E, shock and bump

Quality management certified according to ISO 9001