Non-dimmable constant current electronic control gear for multi-channel LED module applications

**Performance characteristics**

- Multiple output channels for high power solid state lighting applications
- Asymmetrical load of output channels possible
- Cross-connection of separated output channels for additional current levels
- Max. output voltage is limited to 60 VDC SELV equiv.
- Very high energy efficiency of up to 93 %
- 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/J
- High design flexibility thanks to flat housing for build in luminaires
- 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 d-luminaires
- Conformance with international regulations regarding safety and operation, electromagnetic compatibility and immunity to interference

**ECG model**

<table>
<thead>
<tr>
<th>Version</th>
<th>Order no.</th>
<th>Type of LED modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS235-35LS-01/220-240</td>
<td>10078966</td>
<td>2 x 350mA, max. 50V</td>
</tr>
<tr>
<td>CCS270-70LS-01/220-240</td>
<td>10078973</td>
<td>2 x 700mA, max. 50V</td>
</tr>
<tr>
<td>CCS435-70LS-01/220-240</td>
<td>10078975</td>
<td>4 x 350mA, max. 50V</td>
</tr>
<tr>
<td>CCS470-140LS-01/220-240</td>
<td>10078977</td>
<td>4 x 700mA, max. 50V</td>
</tr>
</tbody>
</table>

**Usable for**

- High Power LEDs (LED modules) with an operation current of constant 350 mA resp. 700 mA
- Multi-Chip LEDs (LED modules) with an operation current of constant 1,050 mA, 1,400 mA, 2,100 mA resp. 2,800 mA

**Targeted lighting applications**

- Office & education
- Public buildings
- Industry
- Shop

**Markings**

Errors excepted. We reserve the right to make alternations in the interest of improving our products.

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Technical data

Mains voltage supply
Rated voltage range 220 V – 240 V
Max. admissible voltage range (continuous) 198 V – 264 V

Frequency 0 / 50 Hz – 60 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
Total harmonic distortion (THD) < 10 %
Output current tolerance ± 5 %
Max. ripple output current < ± 10 %
Starting time < 0.5 s
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

Behaviour in case of overload operation
protected – limitation of output voltage

Behaviour in case of output short circuit operation
protected – reduced operation current

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 90°-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 (tₐ)</th>
<th>Case (tₐ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS2...</td>
<td>–25 °C + 50 °C</td>
<td>max. + 75 °C</td>
</tr>
<tr>
<td>CCS4...</td>
<td>–25 °C + 50 °C</td>
<td>max. + 75 °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>CCS2...</td>
<td>50,000 h (operation at tₐ = 75 °C)</td>
<td>100,000 h (operation at tₐ = 65 °C)</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>CCS4...</td>
<td>50,000 h (operation at tₐ = 75 °C)</td>
<td>100,000 h (operation at tₐ = 65 °C)</td>
<td>&lt; 10 %</td>
</tr>
</tbody>
</table>

Inrush current / Circuit breaker

<table>
<thead>
<tr>
<th>Version</th>
<th>typ. Iₚₚₑᵃᵏ / 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 16 A 20 A 25 A</td>
</tr>
<tr>
<td>CCS2...</td>
<td>6 A / 140 µs</td>
<td>B  14  23  29  36</td>
</tr>
<tr>
<td>CCS4...</td>
<td>62 A / 220 µs</td>
<td>B  5  9  11  14</td>
</tr>
</tbody>
</table>

All data for Usupply = 230 VAC, mains impedance = 1.0
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.
 Basically CB with C-characteristics are recommended to be used in lightning groups.

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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>CCS235-35..</td>
<td>0.18</td>
<td>0.98</td>
<td>38</td>
<td>90</td>
<td>350</td>
<td>10</td>
<td>50</td>
<td>7</td>
<td>35</td>
<td>a, b</td>
</tr>
<tr>
<td>CCS270-70..</td>
<td>0.36</td>
<td>0.98</td>
<td>77</td>
<td>91</td>
<td>700</td>
<td>10</td>
<td>50</td>
<td>14</td>
<td>70</td>
<td>a, b</td>
</tr>
<tr>
<td>CCS435-70..</td>
<td>0.36</td>
<td>0.98</td>
<td>76</td>
<td>92</td>
<td>350</td>
<td>10</td>
<td>50</td>
<td>7</td>
<td>70</td>
<td>a, b</td>
</tr>
<tr>
<td>CCS470-140..</td>
<td>0.72</td>
<td>0.98</td>
<td>150</td>
<td>93</td>
<td>700</td>
<td>10</td>
<td>50</td>
<td>14</td>
<td>140</td>
<td>a, b</td>
</tr>
</tbody>
</table>

* Nominal operation: 230 VAC, 100% load

Efficiency vs. relative load

- 140 W types
- 70 W types
- 35 W types

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Dimensions

Wiring diagrams

Cross-connection

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 61347-2-13 Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules
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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

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

Cross-connection (external) of output channels for additional current levels, e.g.
2 x 700 mA → 2 x 1,400 mA (1)
4 x 700 mA → 2 x 1,400 mA (2), 1 x 2,100 mA (3), 1 x 2,800 mA (4), ...

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