Electronic ballasts for high-intensity discharge lamps

Indoor HI

Product description
• For metal halide lamps
• Also for mobile luminaires with connectors
• Pulse packets for increased ignition energy (pulseCONTROL technology)
• With patented circuit elements
• Flicker-free light
• Colour stability thanks to constant power
• Guaranteed long life
• No acoustic resonance
• Safety shutdown if a lamp is faulty or missing
• Greatly reduced reignition time
• Hardly any EMC interference in the ignition phase
• Automatic shutdown on overheating
• Through wiring possible
• No tools required for installing the terminal cover and cable clamps
• Push-in terminals up to 2.5 mm²
• 3 separate strain reliefs
• Casing: polycarbonate, black

Technical data
Mains voltage range 220 – 240 V
AC voltage range 198 – 254 V
DC voltage range 198 – 320 V
Mains frequency 0 / 50 / 60 Hz
Max. ignition voltage 5 kVp (2 kVp at 22 W)
Operating frequency 145 Hz
Type of protection IP20

Standards
page 2

Wiring diagrams and installation examples
page 2

Ordering data
Type Article number Packaging, carton Packaging, pallet Weight per pcs.
For luminaires with 1 lamp
PCI 20 PRO C021 86459018 15 pieces 720 pieces 0.25 kg
PCI 22 PRO C021 86459021 15 pieces 720 pieces 0.25 kg
PCI 35 PRO C021 86458606 15 pieces 720 pieces 0.25 kg
PCI 50 PRO C021 86458608 15 pieces 720 pieces 0.26 kg
PCI 70 PRO C021 86458607 15 pieces 720 pieces 0.26 kg
PCI 150 PRO C021 86458608 15 pieces 720 pieces 0.48 kg

Specific technical data

For luminaires with 1 lamp

<table>
<thead>
<tr>
<th>Lamp wattage</th>
<th>Lamp type</th>
<th>Type</th>
<th>Article number</th>
<th>Dimensions L x W x H</th>
<th>Lamp power</th>
<th>Circuit power</th>
<th>EII</th>
<th>Efficiency</th>
<th>Current at 50 Hz 230 V</th>
<th>λ at 50 Hz 230 V</th>
<th>Max. cable length to lamp</th>
<th>tc point max.</th>
<th>Ambient temperature ta tc/ta for ≥ 50,000 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 20 W HI</td>
<td>PCI 20 PRO C021</td>
<td>86459018</td>
<td>159.4 x 82 x 34 mm</td>
<td>20 W</td>
<td>23.0 W</td>
<td>2 &gt; 88 %</td>
<td>0.10 A</td>
<td>0.95</td>
<td>2 m / 160 pF</td>
<td>70 °C</td>
<td>-25 ... +65 °C</td>
<td>70/65 °C</td>
<td></td>
</tr>
<tr>
<td>1 x 22 W HI</td>
<td>PCI 22 PRO C021</td>
<td>86459021</td>
<td>159.4 x 82 x 34 mm</td>
<td>22 W</td>
<td>25.5 W</td>
<td>2 &gt; 88 %</td>
<td>0.11 A</td>
<td>0.95</td>
<td>2 m / 160 pF</td>
<td>70 °C</td>
<td>-25 ... +65 °C</td>
<td>70/65 °C</td>
<td></td>
</tr>
<tr>
<td>1 x 35 W HI</td>
<td>PCI 35 PRO C021</td>
<td>86459006</td>
<td>159.4 x 82 x 34 mm</td>
<td>39 W</td>
<td>43.5 W</td>
<td>2 &gt; 89 %</td>
<td>0.20 A</td>
<td>0.97</td>
<td>5 m / 400 pF</td>
<td>80 °C</td>
<td>-25 ... +65 °C</td>
<td>80/65 °C</td>
<td></td>
</tr>
<tr>
<td>1 x 50 W HI</td>
<td>PCI 50 PRO C021</td>
<td>86459030</td>
<td>159.4 x 82 x 34 mm</td>
<td>50 W</td>
<td>55.0 W</td>
<td>2 &gt; 90 %</td>
<td>0.25 A</td>
<td>0.96</td>
<td>5 m / 400 pF</td>
<td>75 °C</td>
<td>-25 ... +60 °C</td>
<td>75/60 °C</td>
<td></td>
</tr>
<tr>
<td>1 x 70 W HI</td>
<td>PCI 70 PRO C021</td>
<td>86459067</td>
<td>159.4 x 82 x 34 mm</td>
<td>73 W</td>
<td>79.0 W</td>
<td>2 &gt; 90 %</td>
<td>0.35 A</td>
<td>0.97</td>
<td>5 m / 400 pF</td>
<td>75 °C</td>
<td>-25 ... +50 °C</td>
<td>75/50 °C</td>
<td></td>
</tr>
<tr>
<td>1 x 150 W HI</td>
<td>PCI 150 PRO C021</td>
<td>86459008</td>
<td>209.4 x 82 x 34 mm</td>
<td>147 W</td>
<td>158.5 W</td>
<td>2 &gt; 91 %</td>
<td>0.70 A</td>
<td>0.97</td>
<td>5 m / 400 pF</td>
<td>80 °C</td>
<td>-25 ... +45 °C</td>
<td>80/45 °C</td>
<td></td>
</tr>
</tbody>
</table>

At ta = 25 °C.
Installation instructions

Wiring type and cross section
Stranded wire or solid wire up to 2.5 mm² may be used for wiring. Strip 10–11 mm of insulation from the cables to ensure perfect operation of the push-in terminals.

Circuit diagram PCI class 1 application

Use one wire for each terminal connector only.
Use each strain relief channel for one cable only.

Fixing conditions
Dry, acidfree, oilfree, fatfree. The maximum ambient temperature must not be exceeded. Is not suitable for fixing in corner. Whenever possible keep the ballast away from hot parts. It helps increasing the lifetime of the ballast.

Circuit diagram PCI class 2 application

If several ballasts are installed in masts, boxes, etc., measures must be taken to avoid overheating of individual components.
To prevent the use of a wrong lamp type we recommend to mark the luminaire with the correct lamp type that fits to the ballast.

Note on wiring
The length of the lamp wires is limited by the value of cable capacitance. The maximum of 160/400 pF would enable connection of approximately 2/5 metres of lamp wire.

In class 1 luminaires it is necessary to earth the ballast and the luminaire, in class 2 luminaires not.

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 can be operated.

Safety switch off

End of life of the lamps
At the end of their useful life, lamps often cycle on/off. The PCI ballast recognises this condition and switches off the lamp, after three complete on/off cycles and whilst the supply has been unswitched. Complete lamp switch off enables easy identification of a defective lamp in the application. After a change of the faulty lamp and an interruption of the mains supply (mains reset) the ballast will strike the lamp. When there is no lamp in circuit or a defective lamp is connected to the ballast, the ballast will switch off after apr. 25 minutes.

Overtemperature shutdown
The units shut down at ΔT approx. +12 °C compared with tc. A mains reset must be carried out so that the units switch on again.

Overload strength
320 Vac/1 h
280 Vac/10 h

Standards
EN 55015 (radio interference)
EN 61000-3-2 (mains harmonics)
EN 61347-2-12
EN 61547 (interference immunity)
EN 61167

Glow-wire test according to EN 60598-1
850 °C passed

Harmonic distortion in the mains supply

<table>
<thead>
<tr>
<th>Type</th>
<th>THD at 230V/50Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI 20 PRO C021</td>
<td>&lt; 12 %</td>
</tr>
<tr>
<td>PCI 22 PRO C021</td>
<td>&lt; 12 %</td>
</tr>
<tr>
<td>PCI 35 PRO C021</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>PCI 50 PRO C021</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>PCI 70 PRO C021</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>PCI 150 PRO C021</td>
<td>&lt; 10 %</td>
</tr>
</tbody>
</table>

Ballast lumen factor EN 60929 8.1

<table>
<thead>
<tr>
<th>Type</th>
<th>AC/DC-BLF at U = 198–254 V, 25 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI 20 PRO C021</td>
<td>1.00</td>
</tr>
<tr>
<td>PCI 22 PRO C021</td>
<td>1.00</td>
</tr>
<tr>
<td>PCI 35 PRO C021</td>
<td>1.00</td>
</tr>
<tr>
<td>PCI 50 PRO C021</td>
<td>1.00</td>
</tr>
<tr>
<td>PCI 70 PRO C021</td>
<td>1.00</td>
</tr>
<tr>
<td>PCI 150 PRO C021</td>
<td>1.00</td>
</tr>
</tbody>
</table>
**Loading of automatic circuit breakers**

<table>
<thead>
<tr>
<th>Automatic circuit breaker type</th>
<th>C10</th>
<th>C13</th>
<th>C16</th>
<th>C20</th>
<th>B10</th>
<th>B13</th>
<th>B16</th>
<th>B20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Installation Ø</strong></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>
</tr>
<tr>
<td>PCI 20 PRO C021</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>PCI 22 PRO C021</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>PCI 35 PRO C021</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>PCI 50 PRO C021</td>
<td>14</td>
<td>25</td>
<td>36</td>
<td>42</td>
<td>8</td>
<td>14</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>PCI 70 PRO C021</td>
<td>14</td>
<td>25</td>
<td>36</td>
<td>42</td>
<td>8</td>
<td>14</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>PCI 150 PRO C021</td>
<td>7</td>
<td>14</td>
<td>20</td>
<td>20</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

**Temperature range**

The ta temperature value is the basis for specifying the rated life. The relationship between the tc temperature and the ta temperature depends on the design of the luminaire. If the measured tc temperature is approximately 5 K under the tc max. temperature, the ta temperature should be checked and, if necessary, measurements should be taken on the critical components (e.g., electrolytic capacitor).

Detailed information is available on request.

PCI PRO C021 is designed for an average life of 50,000 hours under rated conditions, with a failure probability of less than 10%. This corresponds to an average failure rate of 0.2% per 1,000 hours of operation.

The specified tc temperature is the maximum permitted value (rated temperature according to EN 61347-1). Above this safety-related value the thermal cutout protects the device against damage.

The expected lifetime values are shown in the following table. The tc values are the relevant values here.

**Isolation and electric strength testing of luminaires**

Electronic devices 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 1500 V ac (or 1.414 x 1500 V dc). To avoid damage to the electronic devices this test must not be conducted.

**Additional information**

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

Guarantee conditions at www.tridonic.com → Services

No warranty if device was opened.