Product description

- Processor-controlled ballast with xtect II inside
- Highest possible energy class CELMA EEI = A1 BAT
- Noise-free precise control via DALI or DSI signal, switchDIM or corridorFUNCTION
- Nominal life up to 100,000 h (at ta 50 °C with a failure rate max. 0.2 % per 1,000 h)
- Multi-lamp management
- OEM-specific reserved memory areas
- 5-year guarantee

Interfaces

- DALI
- DSI
- switchDIM (with memory function + selectable dimming rate)
- corridorFUNCTION (3 preprogrammed profiles)
- Integrated SMART interface for function with SMART Sensor 5D 19f and corridorFUNCTION plugs

Functions

- Intelligent Temperature Guard (overtemperature protection)
- Intelligent Voltage Guard (overvoltage indication and undervoltage shutdown)
- Optimum filament heating in any dimmer setting
- Disconnection of filament heating from a dimming level of approx. 90 % for maximum energy efficiency (SMART-Heating concept)
- corridorFUNCTION with ambient light control
- Automatically triggered emergency lighting value in DC mode, 15 %
- For emergency lighting systems as per EN 50172
- Automatic start after replacement of defective lamps
- Automatic shutdown if the lamp is faulty

Technical data

- Mains voltage range 220 – 240 V
- AC voltage range 196 – 264 V
- DC voltage range 176 – 280 V (lamp start ≥ 198 V DC)
- Mains frequency 0 / 50 / 60 Hz
- Overvoltage protection 320 V AC, 1 h
- Typ. power input on standby < 0.2 W
- Protective hot restart 0.5 s for AC / 0.2 s for DC
- Dimming range 1 – 100 %
- Lamp start possible from 1 %
- Operating frequency ~ 40 – 130 kHz
- Type of protection IP20

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Packaging, carton</th>
<th>Packaging, pallet</th>
<th>Weight per pc.</th>
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<tbody>
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<td>For luminaires with 1 lamp</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>PCA 1x18 T8 ECO lp xtect II</td>
<td>22185240</td>
<td>10 pc(s). 760 pc(s).</td>
<td>0.231 kg</td>
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<td>0.234 kg</td>
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<td>For luminaires with 2 lamps</td>
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<td></td>
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</tr>
<tr>
<td>PCA 2x18 T8 ECO lp xtect II</td>
<td>22185243</td>
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<td>0.256 kg</td>
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<tr>
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<tr>
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<td>10 pc(s). 640 pc(s).</td>
<td>0.330 kg</td>
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Standards, page 3
Wiring diagrams and installation examples, page 8
### Specific technical data

<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>Hole spacing D</th>
<th>Lamp power</th>
<th>Circuit power</th>
<th>EEI</th>
<th>Current at 50 Hz 230 V</th>
<th>λ at 50 Hz 230 V</th>
<th>tc point max.</th>
<th>Ambient temperature ta[a]</th>
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<td><strong>For luminaires with 1 lamp</strong></td>
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<td></td>
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<tr>
<td>1 x 18 W T8</td>
<td>PCA 1x18 T8 ECO lp xtetc II</td>
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<td>360 x 30 x 21 mm</td>
<td>350 mm</td>
<td>16 W</td>
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<td>A1 BAT</td>
<td>0.08 A</td>
<td>0.96</td>
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<td>-25 ... 70 °C</td>
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<td>350 mm</td>
<td>32 W</td>
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<td>A1 BAT</td>
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<td>0.98</td>
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<td>-25 ... 70 °C</td>
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<td>360 x 30 x 21 mm</td>
<td>350 mm</td>
<td>50 W</td>
<td>54.0 W</td>
<td>A1 BAT</td>
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<td>0.98</td>
<td>85 °C</td>
<td>-25 ... 70 °C</td>
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</tr>
<tr>
<td><strong>For luminaires with 2 lamps</strong></td>
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<td></td>
</tr>
<tr>
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<td>PCA 2x18 T8 ECO lp xtetc II</td>
<td>22185243</td>
<td>360 x 30 x 21 mm</td>
<td>350 mm</td>
<td>32 W</td>
<td>37.5 W</td>
<td>A1 BAT</td>
<td>0.16 A</td>
<td>0.98</td>
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<td>360 x 30 x 21 mm</td>
<td>350 mm</td>
<td>64 W</td>
<td>70.0 W</td>
<td>A1 BAT</td>
<td>0.31 A</td>
<td>0.97</td>
<td>80 °C</td>
<td>-25 ... 60 °C</td>
<td></td>
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<tr>
<td>2 x 58 W T8</td>
<td>PCA 2x58 T8 ECO lp xtetc II</td>
<td>28000041</td>
<td>425 x 30 x 21 mm</td>
<td>415 mm</td>
<td>100 W</td>
<td>107.5 W</td>
<td>A1 BAT</td>
<td>0.48 A</td>
<td>0.99</td>
<td>80 °C</td>
<td>-25 ... 55 °C</td>
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</tr>
</tbody>
</table>

[b] Valid at 100 % dimming level.
- +10 °C to ta max: unrestricted dimming.
- -25 °C to +10 °C: unrestricted dimming from 100 % to 30 %.
- -25 °C to +10 °C, dimming below 30 %: malfunction possible, but no damage to ECG. This applies to AC and DC operation.
FL ballasts
Electronic dimming

The ballast lumen factor for AC operation (AC-BLF) does not alter from \( U_n = 198 \text{ V AC} \) to \( U_n = 254 \text{ V AC} \).

The ballast lumen factor for DC operation (DC-BLF) on the basis of an automatic power reduction of the ballasts (default value is 15%) will be smaller than AC. It does not alter in the DC operating range (198–264 V DC).

### Lamp starting characteristics
- **Warm start**
- Starting time 0.5 s with AC
- Starting time 0.2 s with DC
- Start at any dimming level

### AC operation
- **Mains voltage**
  - 220–240 V 50/60 Hz
  - 198–264 V 50/60 Hz including safety tolerance (±10%)  
  - 198–254 V 50/60 Hz including performance tolerance (+6% / -8%)

### DC operation
- **Mains voltage**
  - 220–240 V 0 Hz
  - 198–254 V 0 Hz certain lamp start
  - 176–280 V 0 Hz operating range
- Use in emergency lighting installations according to EN 50172 or for emergency luminaires according to EN 61347-2-3 appendix J.
- Mains current for defective or missing lamps at DC operation < 35 mA.

### Light output level in DC operation
- Default value is 15%

### Emergency units
- The "PCA T8 ECO lp xtnc II" ballasts are compatible with all emergency units from Tridonic. See the table in the data sheet. Also all "5-pole" emergency units can be used. When used with other emergency units tests are necessary.

### Temperature range
- Unlimited dimming range from 10 °C to \( t_a \) max.
- -25 °C to 10 °C: dimming operation from 100% to 30%. If dimm level goes below 30% malfunction possible, but no electronic ballast damage.
- This applies to AC and DC operation.
Dimming

Dimming curve is adapted to the eye sensitiveness.

Dimming range 1 % to 100 %

Digital control with:
- DSI signal: 8 bit Manchester Code
  Speed 1 % to 100 % in 1.4 s
- DALI signal: 16 bit Manchester Code
  Maximum speed 1 % to 100 % in 550 ms
  (adjustable between 100 ms and 90 s)

Programmable parameter:
- Minimum dimming level
- Minimum dimming level
- Default minimum = 1 %
- Default maximum = 100 %

Control input (DA/D1, DA/D2)

Digital DALI/DSI signal or a push-to-make switch
(switchDIM) or a motion detector (corridorFUNCTION)
can be wired on the same terminals (DA/D1 and DA/ D2).

Digital signal DALI/DSI

The control input is non-polar and protected against accidental connection with a mains voltage up to 264 V. The control signal is not SELV. Control cable has to be installed in accordance to the requirements of low voltage installations. Different functions depending on each module.

SMART interface

An additional interface for the direct connection of the SMART-Sensor 5D 19f or corridorFUNCTION plugs. Application and functionality see corridorFUNCTION user manual.

SMART-Sensor 5D 19f(1) light sensor operating mode: The sensor registers actual ambient light and maintains the individually defined constant lux level. After every mains reset the SMART interface automatically checks for an installed sensor. With the sensor installed the PCA T8 ECO lp xtec II automatically runs in the constant lux level mode. ON/OFF switch via mains, switchDIM or DSI signal.

DSI signal = 0 switches off,
DSI signal ≥ 1 switches on.

With switchDIM signals it is possible to change the controlled light level temporarily. Temporarily means that after a switching cycle OFF/ON command the ballast will start at the preset value determined by the SMART-Sensor 5D 19f. The installation of the two wire bus is according to the appropriate low voltage regulations.

switchDIM

Integrated switchDIM function allows a direct connection of a push to make switch for dimming and switching.

Brief push (< 0.6 s) switches ballast ON and OFF. The ballasts switch-ON at light level set at switch-OFF. After switch ON the last set lower dimming level will be activated again.

When the push to make switch is held, PCA ballasts are dimmed. After repush the PCA is dimmed in the opposite direction.

The switchDIM fade time is set to 3 s from min. to max. in the factory settings. With a 20 s push to the push to make switch this fade time can be changed to 6 s. In this instance the switchDIM application will be synchronized to 50 % light level after 10 s and after 20 s the light level rises to 100 % with the new fade time.

At every synchronization (10 s keystroke) the device will reset to 3 s (factory setting)

In installations with PCAs with different dimming levels or opposite dimming directions (e.g. after a system extension), all PCAs can be synchronized to 50 % dimming level by a 10 s push.

Use of push to make switch with indicator lamp is not permitted.

switchDIM and corridorFUNCTION are very simple tools for controlling ballasts with conventional momentary-action switches or motion sensors. To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the control input. Special attention must be paid to achieving clear zero crossings. Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.

corridorFUNCTION

To activate the corridorFUNCTION a voltage of 230 V simply has to be applied for five minutes at switchDIM connection. The unit will then switch automatically to the corridorFUNCTION.

Note: If the corridorFUNCTION is wrongly activated in a switchDIM system (for example a switch is used instead of pushbutton), there is the option of installing a pushbutton and deactivating the corridorFUNCTION mode by five short pushes of the button within three seconds.

The corridorFUNCTION offers the added benefit of a second and third preprogrammed profile, which can be activated by the corridorFUNCTION plugs. It is also possible to combine the corridorFUNCTION with the SMART-Sensor 5D 19f light sensor. Application and functionality of profiles see user manual of the corridorFUNCTION.
Intelligent Voltage Guard
Intelligent Voltage Guard is the name of the electronic monitor from Tridonic. This innovative feature of the PCA family of control gear from Tridonic immediately shows if the mains voltage rises above certain thresholds. Measures can then be taken quickly to prevent damage to the control gear.

- If the mains voltage rises above approx. 318 Vrms (voltage depends on the ballast type), the lamp starts flashing on and off.
- To avoid a damage of the device the mains supply has to be switched off at this signal.

Intelligent Temperature Guard
The intelligent temperature guard protects the PCA T8 ECO lp xtec II from thermal overheating by reducing the output power or switching off in case of operation above the thermal limits of the luminaire or ballast. Depending on the luminaire design, the ITG operates at about 5 to 10 °C above tc temperature.

Expected lifetime

<table>
<thead>
<tr>
<th>Type</th>
<th>Lamp type</th>
<th>Wattage</th>
<th>ta = 40 °C</th>
<th>ta = 50 °C</th>
<th>ta = 60 °C</th>
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<tbody>
<tr>
<td>PCA 1x18 T8 ECO lp xtec II</td>
<td>T8 1x18 W</td>
<td>1 x 18 W</td>
<td>70 °C</td>
<td>70 °C</td>
<td>70 °C</td>
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<td>Life-time</td>
<td>≥ 100,000 h</td>
<td>≥ 100,000 h</td>
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<tr>
<td>PCA 1x36 T8 ECO lp xtec II</td>
<td>T8 1x36 W</td>
<td>1 x 36 W</td>
<td>70 °C</td>
<td>70 °C</td>
<td>70 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Life-time</td>
<td>≥ 100,000 h</td>
<td>≥ 100,000 h</td>
</tr>
<tr>
<td>PCA 1x58 T8 ECO lp xtec II</td>
<td>T8 1x58 W</td>
<td>1 x 58 W</td>
<td>70 °C</td>
<td>70 °C</td>
<td>70 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Life-time</td>
<td>≥ 100,000 h</td>
<td>≥ 100,000 h</td>
</tr>
<tr>
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<td>2 x 18 W</td>
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<td>80 °C</td>
<td>80 °C</td>
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<tr>
<td></td>
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<td></td>
<td>Life-time</td>
<td>≥ 50,000 h</td>
<td>≥ 50,000 h</td>
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<td>2 x 36 W</td>
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<td></td>
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<td></td>
<td>Life-time</td>
<td>≥ 50,000 h</td>
<td>≥ 50,000 h</td>
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</table>

x = not permitted

Data sheet 05/18-FD012-11
Subject to change without notice.
Installation instructions

Wiring type and cross section
The wiring can be solid cable with a cross section of 0.5 to 0.75 mm² for push terminal and 0.5 mm² for IDC terminal. For the push-wire connection you have to strip the insulation (8–9 mm).

Wiring advice
The lead length is dependent on the capacitance of the cable.

<table>
<thead>
<tr>
<th>Ballast Type</th>
<th>Terminal</th>
<th>Maximum capacitance allowed</th>
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<td>13, 14</td>
<td>15, 16</td>
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<tr>
<td>PCA 2xx T8 ECO lp xtec II</td>
<td>12, 13, 14</td>
<td>10, 11, 15, 16</td>
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</table>

With standard solid wire 0.5/0.75 mm² the capacitance of the lead is 30–80 pF/m. This value is influenced by the way the wiring is made.

Lamp connection should be made with symmetrical wiring. Hot leads (10, 11, 15, 16) and cold leads (12, 13, 14) should be separated as much as possible. When using two or more dimmable ballasts in one luminaire with separate dimming controls, the lamp leads must be kept separate.

Sensor wires
Sensor wires must be routed separately from the lamp wires and mains cables otherwise the lighting control system may malfunction. If separate routing is not possible (for reasons of space) shielded lamp wires and mains cables must be used.

Dimmable ballasts from Tridonic have to be earthed.

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.).

Operation on DC voltage
Our ballasts are construed to operate DC voltage and pulsed DC voltage. To operate ballasts with pulsed DC voltage the polarity is absolute mandatory.

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 VDC). To avoid damage to the electronic devices this test must not be conducted.

RFI
- Connection to the lamps of the hot leads must be kept as short as possible
- Mains leads should be kept apart from lamp leads (ideally 5–10 cm distance)
- Do not run mains leads adjacent to the electronic ballast
- Twist the lamp leads
- Keep the distance of lamp leads from the metal work as large as possible
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

General advise
Electronic ballasts are virtually noise free. Magnetic fields generated during the ignition cycle can cause some background noise but only for a few milliseconds.

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.