**Product description**

- Processor-controlled ballast with xtect 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 50,000 h (at ta max. with a failure rate max. 0.2 % per 1,000 h)
- Multi-lamp management
- OEM-specific reserved memory areas
- Extended DALI commands
- 5-year guarantee

**Interfaces**

- DALI
- DSI
- switchDIM (with memory function + selectable dimming rate)
- corridorFUNCTION

**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)
- Fade rates between 50 ms and 90 s (min-max.)
- Automatically triggered emergency lighting value in DC mode 70 %
- 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: 198 – 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: < 0.5 W
- Protective hot restart: 0.5 s for AC / 0.2 s for DC
- Dimming range, 3 lamps: 5 – 100 %
- Dimming range, 4 lamps: 1 – 100 %
- Lamp start possible from: 5 % (3 lamps), 1 % (4 lamps)
- Operating frequency: ~40 – 100 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>
</tr>
</thead>
<tbody>
<tr>
<td>For luminaires with 3 lamps</td>
<td>PCA 3x14/24 T5 EXCITE lp xtect</td>
<td>28000307</td>
<td>20 pc(s)</td>
<td>0.298 kg</td>
</tr>
<tr>
<td>For luminaires with 4 lamps</td>
<td>PCA 4x14/24 T5 EXCITE lp xtect</td>
<td>28000308</td>
<td>20 pc(s)</td>
<td>0.340 kg</td>
</tr>
</tbody>
</table>

**Standards**, page 2

**Wiring diagrams and installation examples**, page 6
<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 wattage (400V)</th>
<th>Circuit power (400V)</th>
<th>EII</th>
<th>Current at 50 Hz / 230 V</th>
<th>A at 50 Hz / 230 V</th>
<th>tc point max.</th>
<th>Ambient temperature ta (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For luminaires with 3 lamps</td>
<td>3 x 14 W</td>
<td>T5</td>
<td>PCA 3x14//24 T5 EXCITE lp xtce</td>
<td>28000307</td>
<td>360 x 40 x 21 mm</td>
<td>350 mm</td>
<td>42 W</td>
<td>46.5 W</td>
<td>A1 BAT</td>
<td>0.21 A</td>
<td>0.97</td>
<td>75 °C</td>
</tr>
<tr>
<td></td>
<td>3 x 24 W</td>
<td>T5</td>
<td>PCA 3x14//24 T5 EXCITE lp xtce</td>
<td>28000307</td>
<td>360 x 40 x 21 mm</td>
<td>350 mm</td>
<td>72 W</td>
<td>73.0 W</td>
<td>A1 BAT</td>
<td>0.32 A</td>
<td>0.97</td>
<td>75 °C</td>
</tr>
<tr>
<td>For luminaires with 4 lamps</td>
<td>4 x 14 W</td>
<td>T5</td>
<td>PCA 4x14//24 T5 EXCITE lp xtce</td>
<td>28000308</td>
<td>360 x 40 x 21 mm</td>
<td>350 mm</td>
<td>56 W</td>
<td>60.5 W</td>
<td>A1 BAT</td>
<td>0.27 A</td>
<td>0.97</td>
<td>75 °C</td>
</tr>
<tr>
<td></td>
<td>4 x 24 W</td>
<td>T5</td>
<td>PCA 4x14//24 T5 EXCITE lp xtce</td>
<td>28000308</td>
<td>360 x 40 x 21 mm</td>
<td>350 mm</td>
<td>96 W</td>
<td>97.5 W</td>
<td>A1 BAT</td>
<td>0.43 A</td>
<td>0.97</td>
<td>75 °C</td>
</tr>
</tbody>
</table>

\(^{1}\) According to the EU directives on ecodesign requirements (EC) No. 245/2009 and (EC) No. 347/2010.

\(^{2}\) Valid at 100 % dimming level.

\(^{3}\) +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.

PHASED OUT
Standards
EN 55015
EN 60929
EN 61000-3-2
EN 61347-2-3
EN 61547
Suitable for emergency installations according to
EN 50172
CISPR 15
CISPR 22
IEC 60929
IEC 61000-3-2
IEC 61347-2-3
IEC 61547
IEC 62386 (according to DALI standard V1)

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\%)
202–254 V 50/60 Hz including performance
tolerance (+6\% / -8\%)

DC operation
220–240 V 0 Hz
198–280 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.

Emergency units
The “PCA T5 EXCITE lp x tec” 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 60 °C
-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.

Lamp type recognition
Each of the lamps for which the control gear is designed
will be operated correctly according the lamp
specification. The currently used lamp is recognised
during the start up process.
To avoid an incorrect lamp recognition due to fast
multiple ON/OFF switches, new lamp data are only
restored if the lamp has operated for at least 5
seconds.

Mains currents in DC operation (at 70% light output)

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>Mains current at Un = 220 Vdc</th>
<th>Mains current at Un = 240 Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp x tec</td>
<td>3x14 W</td>
<td>0.17 A</td>
<td>0.16 A</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp x tec</td>
<td>3x24 W</td>
<td>0.28 A</td>
<td>0.26 A</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp x tec</td>
<td>4x14 W</td>
<td>0.22 A</td>
<td>0.21 A</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp x tec</td>
<td>4x24 W</td>
<td>0.37 A</td>
<td>0.34 A</td>
</tr>
</tbody>
</table>

Ballast lumen factor AC operation (AC-BLF) EN 60929 6.1

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>AC-BLF at Un = 230 Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp x tec</td>
<td>3x14 W</td>
<td>0.99</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp x tec</td>
<td>3x24 W</td>
<td>0.99</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp x tec</td>
<td>4x14 W</td>
<td>0.99</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp x tec</td>
<td>4x24 W</td>
<td>0.99</td>
</tr>
</tbody>
</table>

The ballast lumen factor for AC operation (AC-BLF) does not alter from Un = 198 V ac to Un = 254 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 70%) will be smaller than AC. It does not alter in the DC operating range (198–280 V dc).

Harmonic distortion in the mains supply (at 230 V/50 Hz)

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>THD 3</th>
<th>THD 5</th>
<th>THD 7</th>
<th>THD 9</th>
<th>THD 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp x tec</td>
<td>3x14 W</td>
<td>8.40</td>
<td>6.65</td>
<td>1.97</td>
<td>2.17</td>
<td>2.09</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp x tec</td>
<td>3x24 W</td>
<td>7.98</td>
<td>6.23</td>
<td>1.76</td>
<td>1.75</td>
<td>2.31</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp x tec</td>
<td>4x14 W</td>
<td>8.67</td>
<td>6.97</td>
<td>2.85</td>
<td>1.86</td>
<td>1.49</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp x tec</td>
<td>4x24 W</td>
<td>7.52</td>
<td>6.37</td>
<td>1.53</td>
<td>1.94</td>
<td>1.04</td>
</tr>
</tbody>
</table>

The ballast lumen factor for AC operation (AC-BLF) does not alter from Un = 198 V ac to Un = 254 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 70%) will be smaller than AC. It does not alter in the DC operating range (198–280 V dc).
Dimming
Dimming curve is adapted to the eye sensitiveness.
Dimming range:
4-lamp: 1% to 100%, 3-lamp: 5% to 100%
Digital control with:
- DALI signal: 16 bit Manchester Code
  Maximum speed 1% to 100% in 550 ms
  (adjustable between 50 ms and 90 s)
Programmable parameter:
  Minimum dimming level
  Maximum dimming level
Defaults 3-lamp minimum = 5%
  maximum = 100%
Defaults 4-lamp minimum = 1%
  maximum = 100%

Control input (DA/D1, DA/D2)
Digital DALI signal or a push-to-make switch (switchDIM) can be wired on the same terminals (DA and DA).

Digital signal DALI
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.

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. 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.

Deactivation: 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.

switchDIM and corridorFUNCTION are very simple tools for controlling ballasts with conventional momentary-action switches or motion sensors.

Continuous operation: to calculate the protective safety switch see main current, page 1

<table>
<thead>
<tr>
<th>Loading of automatic circuit breakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic circuit breaker type</td>
</tr>
<tr>
<td>Installation Ø</td>
</tr>
<tr>
<td>1.5 mm²</td>
</tr>
<tr>
<td>1.5 mm²</td>
</tr>
<tr>
<td>2.5 mm²</td>
</tr>
<tr>
<td>1.5 mm²</td>
</tr>
<tr>
<td>1.5 mm²</td>
</tr>
<tr>
<td>1.5 mm²</td>
</tr>
<tr>
<td>2.5 mm²</td>
</tr>
</tbody>
</table>

DALI PCA T5 EXCITE lp xtec

Dimmable ballasts from Tridonic have to be earthed.
corridorFUNCTION

Activation: To activate the corridorFUNCTION a voltage of 230 V simply has to be applied for five minutes at D1, D2. The unit will then switch automatically to the corridorFUNCTION.

Deactivation: 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.

Intelligent Temperature Guard

The intelligent temperature guard protects the PCA T5 EXCITE lp xtec 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.

Intelligent Voltage Guard

Intelligent Voltage Guard is the name of the new electronic monitor from Tridonic. This innovative feature of the PCA family of control gear from Tridonic immediately shows if the mains voltage rises above or falls below certain thresholds. Measures can then be taken quickly to prevent damage to the control gear.

- If the mains voltage rises above approx. 305 V (voltage depends on the ballast type), the lamp starts flashing on and off.
- This signal “demands” disconnection of the power supply to the lighting system.
- The active-current-control of these control gears is protected against failure caused by the high mains currents generated as a result of mains undervoltage. The switch off level depends on lamp wattage and is typically < 140 V.

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).

Wire preparation:

0.5 – 0.75 mm²

8 – 9 mm

Loosen wire through twisting and pulling

Operating voltage

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>Uout</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp xtec</td>
<td>3x14 W</td>
<td>430 V</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp xtec</td>
<td>3x24 W</td>
<td>430 V</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp xtec</td>
<td>4x14 W</td>
<td>430 V</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp xtec</td>
<td>4x24 W</td>
<td>430 V</td>
</tr>
</tbody>
</table>

Wiring advice

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

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Terminal</th>
<th>Maximum capacitance allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCITE lp xtec</td>
<td>Cold</td>
<td>7, 8, 9, 10, 12, 13, 18, 19</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>9, 10, 14, 15, 16, 17</td>
</tr>
<tr>
<td></td>
<td>Hot</td>
<td>100 pF, 50 pF, 100 pF</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCITE lp xtec</td>
<td>Cold</td>
<td>7, 8, 9, 10</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>12, 13, 18, 19</td>
</tr>
<tr>
<td></td>
<td>Hot</td>
<td>200 pF, 50 pF, 100 pF</td>
</tr>
</tbody>
</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.

3-lamp devices: Hot and cold leads should be separated as much as possible.

4-lamp devices: Middle and hot leads should be separated as much as possible.

Hot leads (9, 10, 15, 16) and cold leads (11, 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.

Distance to plate: 5 – 10 mm

(ideal distance for optimal symmetrical light)

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.).
FL ballasts
Electronic dimming

**PCA T5 EXCITE lp xtec 3x14/24 W**

Dimmable ballasts from Tridonic have to be earthed.

**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.

**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.

**Programming**
With appropriate software and a USB interface different functions can be activated and various parameters can be configured in the new PCA T5 EXCITE lp xtec. All that is needed is a DALI-USB and the software.

**Master Configurator**
For programming the corridor FUNCTION, device configuration (fade time, ePowerOnLevel, etc.) DC level, compatibility settings, and startup date and for resetting.
**Maximum amount of ballast see DALI/DSI specification.**

**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 MO.

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
Life-time declarations are informative and represent no warranty claim.
No warranty if device was opened.