**Product description**

- Processor-controlled ballast with xtec inside
- Highest possible energy class CELMA EEI = A1 BAT
- Noise-free precise control via DALI or DSI signal, switchDIM or corridorFUNCTION
- 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 (individually programmable)

**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, can be set between 1 and 100 %
- For emergency lighting systems as per EN 50172
- Automatic start after replacement of defective lamps
- Automatic shutdown if the lamp is faulty
- Dimming possible in DC mode
- Backwards compatible

**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 EXCEL one4all lp xtec</td>
<td>22176209</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 EXCEL one4all lp xtec</td>
<td>22176210</td>
<td>20 pc(s).</td>
<td>0.340 kg</td>
</tr>
</tbody>
</table>

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**Standards**, page 3

**Wiring diagrams and installation examples**, page 6
## Specific technical data

<table>
<thead>
<tr>
<th>Lamp wattage</th>
<th>Lamp type</th>
<th>Lamp type</th>
<th>Article number</th>
<th>Dimensions</th>
<th>Hole spacing</th>
<th>Lamp power</th>
<th>EEI</th>
<th>Circuit power</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°</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 14 W T5</td>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</td>
<td>22176209</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>
<td>-25 ... 60 °C</td>
<td></td>
</tr>
<tr>
<td>3 x 24 W T5</td>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</td>
<td>22176209</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>
<td>-25 ... 55 °C</td>
<td></td>
</tr>
<tr>
<td>4 x 14 W T5</td>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</td>
<td>22176210</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>
<td>-25 ... 60 °C</td>
<td></td>
</tr>
<tr>
<td>4 x 24 W T5</td>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</td>
<td>22176210</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>
<td>-25 ... 50 °C</td>
<td></td>
</tr>
</tbody>
</table>

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 %.
4. -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

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.

Light output level in DC operation
Programmable from 1 % to 100 %
Programming by extended DSI or DALI signal (16 bit).
Default value is 15 %
In DC operation dimming mode can be activated.
EBLF = 0.5 x adjusted DC dimming level
(e.g. 0.5 x 0.7).

Emergency units
The “PCA T5 EXCEL lp xtec” 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 ta 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.

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 EXCEL one4all lp xtec</td>
<td>3x14 W</td>
<td>0.17 A</td>
<td>0.16 A</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</td>
<td>3x24 W</td>
<td>0.28 A</td>
<td>0.26 A</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</td>
<td>4x14 W</td>
<td>0.22 A</td>
<td>0.21 A</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</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 8.1

<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 EXCEL one4all lp xtec</td>
<td>3x14 W</td>
<td>0.99</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</td>
<td>3x24 W</td>
<td>0.99</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</td>
<td>4x14 W</td>
<td>0.99</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</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 VAC to Un = 254 VAC.
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 VDC).

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>THD</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>9</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</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>
<td>1.36</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</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>
<td>1.04</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</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>
<td>1.19</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</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>
<td>1.08</td>
</tr>
</tbody>
</table>

Lamp type recognition
Each of teh 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.
**Digital 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-LS II lp 1 light sensor. The sensor registers actual ambient light and maintains the individually defined lux level.

After every mains reset the SMART interface automatically checks for an installed sensor. With the sensor installed the PCA T5 EXCEL one4all lp automatically runs in the constant lux level mode.

**switchDIM**

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

**Backwards compatibility:**

With a simple key combination a PCA T5 EXCEL lp xtec can be reset as a normal PCA EXCEL from the previous generation. Synchronisation simply has to take place three times within one minute (3 x 10 s). To activate the “xtec” settings again, synchronisation has to take place four times within one minute.

**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>
<th>Inrush Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation E</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>
<td>Imax</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtec</td>
<td>16</td>
<td>22</td>
<td>32</td>
<td>36</td>
<td>6</td>
<td>11</td>
<td>16</td>
<td>18</td>
<td>36 A</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtec</td>
<td>14</td>
<td>22</td>
<td>32</td>
<td>34</td>
<td>7</td>
<td>11</td>
<td>16</td>
<td>17</td>
<td>38 A</td>
</tr>
</tbody>
</table>

Continuous operation: to calculate the protective safety switch see main current, page 1
corridorFUNCTION
Activation: To activate the corridorFUNCTION a voltage of 230V 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.
The corridorFUNCTION V2 offers the added benefit of a second and third preprogrammed profile. Application and functionality of profiles see user manual corridorFUNCTION.

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.

Operating voltage

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>U_{out}</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtetc</td>
<td>3x14 W</td>
<td>430 V</td>
</tr>
<tr>
<td>PCA 3x14/24 T5 EXCEL one4all lp xtetc</td>
<td>3x24 W</td>
<td>430 V</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtetc</td>
<td>4x14 W</td>
<td>430 V</td>
</tr>
<tr>
<td>PCA 4x14/24 T5 EXCEL one4all lp xtetc</td>
<td>4x24 W</td>
<td>430 V</td>
</tr>
</tbody>
</table>

Intelligent Temperature Guard
The intelligent temperature guard protects the PCA T5 EXCEL lp xtetc 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.

plugging ADDRESSING – simple handling, commissioning and wiring
The new plug&play solution simplifies handling. By attaching different colored marked plugs to the SMART-Interface, group addresses are assigned to the PCA T5 EXCEL one4all lp xtetc. This supersedes a single addressing and the devices can be put into operation without any additional programming. Another significant advantage of this concept is in case of exchange and no limits to 64 DALI addresses. Ideal for RGB applications and cost-effective system solutions with simple controllers. Simple – Quick – Plug&Play!

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.
• The 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.

Data sheet 12/19-854-8
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www.tridonic.com
FL ballasts
Electronic dimming

Programming
With appropriate software and a USB interface different functions can be activated and various parameters can be configured in the new PCA T5 EXCEL one4all lp xtec. All that is needed is a DALI-USB and the software.

configTOOL
Full version for programming all the functions and parameters.

pcaCONFIGURATOR
For programming the corridorFUNCTION, device configuration (fade time, ePowerOnLevel, etc.) DC level, compatibility settings, and startup date and for resetting.

corridorFUNCTION CONFIGURATOR
For activating and deactivating the corridorFUNCTION and for project-specific programming of the PCA T5 EXCEL one4all lp xtec units.

Insulation 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 insulation 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 insulation 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

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

Data sheet 12/19-854-8
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