• cross section 21 x 30 mm
• dimming range from 1–100%
• lamp start at 1 % possible
• lamp friendly warm start within 0.5 s with AC and 0.2 s with DC
• low power consumption in standby mode 0.8 W
• powerless switching through digital interface
• dimming which is comfortable to the eye
• disturbance free precise control with a digital signal (DSI) or switch DIM
• integrated SMART interface
• fully digital lamp management and digital communication

• Intelligent Voltage Guard (over voltage indication and under voltage protection)
• Intelligent Temperature Guard (Protection against thermal failure)
• DC operation in emergency lighting installations according to EN 50172

Programmable features:
• backwards compatibility adjustable
• adjustable dimming speed in switch DIM operation (3 s or 6 s)
• NEW: with switch DIM memory and corridor FUNCTION

Certified:
EN 55015
EN 55022
EN 60929
EN 61000-3-2
EN 61347-2-3
EN 61547
Suitable for emergency installations according to EN 50172

Packaging:
360 mm housing
box of 25
76 boxes/pallet
760 pieces/pallet

425 mm housing
box of 25
33 boxes/pallet
825 pieces/pallet

Lamp | Ballast | article | weight | circuit power at 230V/50Hz | lamp power at 230V/50Hz | λ at 230V/50Hz | λ point | temperature range (°C)
--- | --- | --- | --- | --- | --- | --- | --- | ---
14 | 549 | PCA 1/14 T5 ECO lp 220/240V 50/60/0Hz | 22089436 | 360 350 | 0.27 16.8 | 14 | 0.07 0.97 | 75 | -25 ↔ +60
2x14 | 549 | PCA 2/14 T5 ECO lp 220/240V 50/60/0Hz | 2208442 | 360 350 | 0.27 33.4 | 2x14 | 0.15 0.98 | 85 | -25 ↔ +60
21 | 849 | PCA 1/21 T5 ECO lp 220/240V 50/60/0Hz | 22089414 | 360 350 | 0.27 23.4 | 21 | 0.11 0.96 | 80 | -25 ↔ +60
2x21 | 849 | PCA 2/21 T5 ECO lp 220/240V 50/60/0Hz | 22089420 | 360 350 | 0.29 46.0 | 2x21 | 0.21 0.97 | 80 | -25 ↔ +60
28 | 1149 | PCA 1/28 T5 ECO lp 220/240V 50/60/0Hz | 22089392 | 360 350 | 0.27 31.4 | 28 | 0.14 0.99 | 80 | -25 ↔ +60
2x28 | 1149 | PCA 2/28 T5 ECO lp 220/240V 50/60/0Hz | 22089405 | 360 350 | 0.28 61.3 | 2x28 | 0.27 0.99 | 80 | -25 ↔ +50
35 | 1449 | PCA 1/35 T5 ECO lp 220/240V 50/60/0Hz | 22089370 | 360 350 | 0.27 38.6 | 35 | 0.17 0.99 | 80 | -25 ↔ +60
2x35 | 1449 | PCA 2/35 T5 ECO lp 220/240V 50/60/0Hz | 22089386 | 425 415 | 0.33 75.5 | 2x35 | 0.33 0.99 | 85 | -25 ↔ +50

1. 10 °C to ta max: normal dimming operation
2. -25 °C to +10 °C: dimming operation from 100 % to 30 %.
3. -25 °C to +10 °C, dimming below 30 %: Ballast could shut down but will not cause failure. This relates to AC and DC operation.
4. valid at 100 % light output
**Lamp starting characteristics:**

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

**Intelligent Voltage Guard**

Intelligent Voltage Guard is the name of the new electronic monitor from TridonicAtco. This innovative feature of the PCA family of control gear from TridonicAtco 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 ≥ 305 V the lamps start 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.

**Intelligent Temperature Guard**

The intelligent temperature guard protects the ballast from thermal failure by reducing 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.

**corridorFUNCTION**

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

**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 %)

**Emergency devices:**

Ballasts from the “low profile” series are compatible with all emergency units from TridonicAtco and all “5 pole” emergency units. See the table in the data sheet. When used with other emergency units tests are necessary.

**DC operation:**

- **Mains voltage**
  - 220–240 V 0 Hz
  - 198–260 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.

**Temperature range:**

- Unlimited dimming range from 10 °C to ta max.
- Limited dimming range from -25 °C to +10 °C.

**Mains currents in DC operation:**

<table>
<thead>
<tr>
<th>Ballast Type</th>
<th>Mains current at Un = 220 V DC</th>
<th>Mains current at Un = 240 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/14 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.07 A</td>
<td>0.06 A</td>
</tr>
<tr>
<td>PCA 1/21 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.09 A</td>
<td>0.08 A</td>
</tr>
<tr>
<td>PCA 1/28 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.11 A</td>
<td>0.11 A</td>
</tr>
<tr>
<td>PCA 1/35 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.14 A</td>
<td>0.14 A</td>
</tr>
<tr>
<td>PCA 2/14 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.12 A</td>
<td>0.12 A</td>
</tr>
<tr>
<td>PCA 2/21 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.17 A</td>
<td>0.15 A</td>
</tr>
<tr>
<td>PCA 2/28 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.29 A</td>
<td>0.26 A</td>
</tr>
<tr>
<td>PCA 2/35 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.36 A</td>
<td>0.33 A</td>
</tr>
</tbody>
</table>

**Light output level in DC operation (emergency mode):**

Programmable from 1 % to 70 %

If ballasts are supplied with a DC voltage from a battery or another voltage source (ripple factor < 60 %) the light output level will change automatically to the value set for emergency operation (default value 70 %), independent of the value at the controls input.

**Ballast lumen factor AC operation (AC-BLF) EN 60929 8.1:**

<table>
<thead>
<tr>
<th>Ballast Type</th>
<th>AC-BLF at Un = 230 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/14 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.00</td>
</tr>
<tr>
<td>PCA 1/21 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.01</td>
</tr>
<tr>
<td>PCA 1/28 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.01</td>
</tr>
<tr>
<td>PCA 1/35 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.02</td>
</tr>
<tr>
<td>PCA 2/14 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.01</td>
</tr>
<tr>
<td>PCA 2/21 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>0.98</td>
</tr>
<tr>
<td>PCA 2/28 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.00</td>
</tr>
<tr>
<td>PCA 2/35 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>1.00</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 220 V/50 Hz):**

<table>
<thead>
<tr>
<th>Ballast Type</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 1/14 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>11.6</td>
<td>8.1</td>
<td>5.4</td>
<td>4.2</td>
<td>3.8</td>
<td>1.3</td>
</tr>
<tr>
<td>PCA 1/21 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>7.0</td>
<td>3.9</td>
<td>2.0</td>
<td>2.3</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>PCA 1/28 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>6.8</td>
<td>3.3</td>
<td>2.0</td>
<td>1.9</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>PCA 1/35 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>6.6</td>
<td>4.1</td>
<td>2.5</td>
<td>1.8</td>
<td>1.3</td>
<td>1.6</td>
</tr>
<tr>
<td>PCA 2/14 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>6.5</td>
<td>4.1</td>
<td>2.3</td>
<td>1.8</td>
<td>1.5</td>
<td>1.3</td>
</tr>
<tr>
<td>PCA 2/21 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>7.6</td>
<td>5.3</td>
<td>2.9</td>
<td>1.6</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>PCA 2/28 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>7.6</td>
<td>5.7</td>
<td>1.5</td>
<td>1.4</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>PCA 2/35 T5 ECO lp 220–240 V 50/60/0Hz</td>
<td>6.6</td>
<td>5.8</td>
<td>0.8</td>
<td>1.5</td>
<td>0.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Data sheet 09/11-585-7  We reserve the right to make technical changes without prior notice.
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

Control input (D1, D2):
Digital DSI signal or switchDIM can be wired on the same terminals (D1 and D2).

Digital signal 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 dp1 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 ECO dp 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 PCA T5 ECO dp will start at the preset value determined by the SMART-LS II dp1. This preset can be set mechanically directly on the SMART-LS II dp1.
The installation of the two wire bus is according to the appropriate low voltage regulations.

Dimming characteristics PCA ECO
Digital dimming value

Energy Savings PCA ECO
Mains power in %

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>Installation 2:</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>PCA 1/14 TS ECO dp1</td>
<td>50</td>
<td>80</td>
<td>120</td>
<td>150</td>
<td>100</td>
<td>80</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>PCA 1/21 TS ECO dp1</td>
<td>50</td>
<td>80</td>
<td>120</td>
<td>150</td>
<td>100</td>
<td>80</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>PCA 1/28 TS ECO dp1</td>
<td>38</td>
<td>54</td>
<td>78</td>
<td>92</td>
<td>70</td>
<td>56</td>
<td>44</td>
<td>56</td>
</tr>
<tr>
<td>PCA 1/35 TS ECO dp1</td>
<td>34</td>
<td>50</td>
<td>76</td>
<td>86</td>
<td>60</td>
<td>50</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>PCA 2/14 TS ECO dp1</td>
<td>38</td>
<td>54</td>
<td>78</td>
<td>92</td>
<td>70</td>
<td>56</td>
<td>44</td>
<td>56</td>
</tr>
<tr>
<td>PCA 2/21 TS ECO dp1</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>70</td>
<td>50</td>
<td>36</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>PCA 2/28 TS ECO dp1</td>
<td>24</td>
<td>34</td>
<td>48</td>
<td>52</td>
<td>35</td>
<td>25</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>PCA 2/35 TS ECO dp1</td>
<td>16</td>
<td>22</td>
<td>30</td>
<td>32</td>
<td>20</td>
<td>14</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

Special attention must be paid to achieving clear zero crossings.
Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.

Backwards compatibility:
With a simple key combination a PCA ECO dp can be reset as a normal PCA ECO from the previous generation. Synchronisation simply has to take place three times within one minute (3x10 s).
To activate the “lp” settings again, synchronisation has to take place four times within one minute.

Data sheet 09/11-585-7  We reserve the right to make technical changes without prior notice.
Electronic ballasts for dimming to 1%
Linear lamps T5, 16 mm high efficiency

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>Uout</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/14 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>300 V</td>
</tr>
<tr>
<td>PCA 1/21 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>420 V</td>
</tr>
<tr>
<td>PCA 1/28 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>460 V</td>
</tr>
<tr>
<td>PCA 1/35 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>480 V</td>
</tr>
<tr>
<td>PCA 2/14 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>300 V</td>
</tr>
<tr>
<td>PCA 2/21 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>420 V</td>
</tr>
<tr>
<td>PCA 2/28 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>460 V</td>
</tr>
<tr>
<td>PCA 2/35 T5 ECO lp 220–240V 50/60/0Hz</td>
<td>480 V</td>
</tr>
</tbody>
</table>

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.

For further technical information
please visit www.tridonicatco.com

PHASED OUT