Electronic ballasts for dimming to 1 %  
Linear lamps T5, 16 mm high output

PCA T5 ECO Ip 24–80 W 220–240 V 50/60/0 Hz, dimmable

- 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 switchDIM  
- 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 switchDIM operation (3 s or 6 s)  
- NEW: with switchDIM memory and corridor FUNCTION

Packaging:  
- 360 mm housing  
- box of 10  
- 76 boxes/pallet  
- 760 pieces/pallet

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

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

Lamp  
<table>
<thead>
<tr>
<th>watt-age W</th>
<th>length L</th>
<th>Ballast</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>360</td>
<td>PCA 1/24 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>2x24</td>
<td>360</td>
<td>PCA 2/24 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>39</td>
<td>360</td>
<td>PCA 1/39 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>2x39</td>
<td>360</td>
<td>PCA 2/39 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>48</td>
<td>360</td>
<td>PCA 1/48 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>2x49</td>
<td>360</td>
<td>PCA 2/49 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>54</td>
<td>360</td>
<td>PCA 1/54 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>2x54</td>
<td>360</td>
<td>PCA 2/54 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>80</td>
<td>360</td>
<td>PCA 1/80 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
<tr>
<td>2x80</td>
<td>360</td>
<td>PCA 2/80 T5 ECO Ip 220–240V 50/60/0 Hz</td>
</tr>
</tbody>
</table>

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

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

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 or falls below certain thresholds, the ITG automatically protects the luminaire from thermal failure by reducing output.
- The Intelligent Temperature Guard protects the luminaire from automatic temperature reduction when the luminaire is on or off.
- If the mains voltage rises above a certain value, the ITG automatically stops the luminaire and protects it from overheating.
- When the mains voltage falls below a certain value, the ITG automatically starts the luminaire and prevents it from overheating.

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 Ta temperature.

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

Light output level in DC operation:
Programmable from 1 % to 70 %
Programming by extended DSI-Signal (16 Bit)
Default value 70 %
In DC operation dimming mode can be activated.

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

<table>
<thead>
<tr>
<th>Ballast</th>
<th>AC-BLF at U = 230 VAC</th>
<th>Mains current at Un = 220 VDC</th>
<th>Mains current at Un = 240 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/24 T5 ECO</td>
<td>1.00</td>
<td>0.10 A</td>
<td>0.09 A</td>
</tr>
<tr>
<td>PCA 1/39 T5 ECO</td>
<td>1.01</td>
<td>0.15 A</td>
<td>0.14 A</td>
</tr>
<tr>
<td>PCA 1/49 T5 ECO</td>
<td>0.97</td>
<td>0.20 A</td>
<td>0.18 A</td>
</tr>
<tr>
<td>PCA 1/54 T5 ECO</td>
<td>0.99</td>
<td>0.28 A</td>
<td>0.25 A</td>
</tr>
<tr>
<td>PCA 1/60 T5 ECO</td>
<td>1.04</td>
<td>0.40 A</td>
<td>0.37 A</td>
</tr>
<tr>
<td>PCA 2/24 T5 ECO</td>
<td>1.01</td>
<td>0.20 A</td>
<td>0.19 A</td>
</tr>
<tr>
<td>PCA 2/39 T5 ECO</td>
<td>0.79</td>
<td>0.28 A</td>
<td>0.27 A</td>
</tr>
<tr>
<td>PCA 2/49 T5 ECO</td>
<td>0.38</td>
<td>0.38 A</td>
<td>0.35 A</td>
</tr>
<tr>
<td>PCA 2/54 T5 ECO</td>
<td>0.55</td>
<td>0.55 A</td>
<td>0.50 A</td>
</tr>
<tr>
<td>PCA 2/80 T5 ECO</td>
<td>0.79</td>
<td>0.79 A</td>
<td>0.72 A</td>
</tr>
</tbody>
</table>

Harmonic distortion in the mains supply (at 220 V / 50 Hz):

<table>
<thead>
<tr>
<th>Ballast</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 1/24 T5 ECO</td>
<td>6.7</td>
<td>4.5</td>
<td>1.8</td>
<td>1.9</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>PCA 1/39 T5 ECO</td>
<td>8.2</td>
<td>6.2</td>
<td>2.9</td>
<td>1.7</td>
<td>1.5</td>
<td>1.2</td>
</tr>
<tr>
<td>PCA 1/49 T5 ECO</td>
<td>6.5</td>
<td>4.8</td>
<td>1.8</td>
<td>1.4</td>
<td>1.1</td>
<td>1.4</td>
</tr>
<tr>
<td>PCA 1/54 T5 ECO</td>
<td>8.6</td>
<td>5.9</td>
<td>3.2</td>
<td>1.6</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>PCA 1/60 T5 ECO</td>
<td>8.2</td>
<td>6.7</td>
<td>1.4</td>
<td>2.2</td>
<td>1.1</td>
<td>1.3</td>
</tr>
<tr>
<td>PCA 2/24 T5 ECO</td>
<td>5.5</td>
<td>2.8</td>
<td>1.1</td>
<td>2.1</td>
<td>1.5</td>
<td>1.7</td>
</tr>
<tr>
<td>PCA 2/39 T5 ECO</td>
<td>5.5</td>
<td>3.3</td>
<td>1.5</td>
<td>2.2</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>PCA 2/49 T5 ECO</td>
<td>5.4</td>
<td>3.9</td>
<td>1.0</td>
<td>1.5</td>
<td>1.0</td>
<td>1.3</td>
</tr>
<tr>
<td>PCA 2/54 T5 ECO</td>
<td>7.5</td>
<td>6.1</td>
<td>0.8</td>
<td>1.8</td>
<td>1.1</td>
<td>1.3</td>
</tr>
<tr>
<td>PCA 2/80 T5 ECO</td>
<td>6.8</td>
<td>5.4</td>
<td>4.1</td>
<td>0.8</td>
<td>0.8</td>
<td>0.7</td>
</tr>
</tbody>
</table>
Dimming:
Dimming curve that is friendly to the eye
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 should 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 ECO lp 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 lp will start at the preset value determined by the SMART-LS II lp\(^2\). This preset can be set mechanically directly on the SMART-LS II lp\(^3\).
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.

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.
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.

Backwards compatibility:
With a simple key combination a PCA ECO lp 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.

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\(^1\) SMART-LS II lp: article number 86458258

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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 cutout 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>Cold</th>
<th>Hot</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/24 T5 ECO lp</td>
<td>11, 12</td>
<td>9, 10</td>
</tr>
<tr>
<td>PCA 1/39 T5 ECO lp</td>
<td>11, 12, 13, 14</td>
<td>9, 10, 15, 16</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. 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.

Dimmable ballasts from TridonicAtco 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 electron 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.
- Mains wiring to be twisted when through wiring.
- Keep the mains leads inside the luminaire as short 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

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