• 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 2.2 s with DC
• low power consumption in standby mode < 0.5 W (0.8 W in DSI or switchDIM mode)
• powerless switching through digital interface
• dimming which is comfortable to the eye
• disturbance free precise control with a digital signal (DSI), switchDIM or DALI (digital addressable lighting interface)
• error feedback and programmable features in both DALI and DSI mode
• integrated SMART interface
• fully digital lamp management and digital communication

Digital dimming:
• 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
• error feedback and programmable features in both DALI and DSI mode
• adjustable dimming speed in switchDIM operation (3 s or 6 s)
• smart heating concept enables fastest fade times (50 ms from min → max or reverse)
• NEW: with DALI memory and corridorFUNCTION

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

- Low power consumption in standby mode < 0.5 W (0.8 W in DSI or switchDIM mode)
- Powerless switching through digital interface
- Dimming which is comfortable to the eye
- Disturbance free precise control with a digital signal (DSI), switchDIM or DALI (digital addressable lighting interface)
- Error feedback and programmable features in both DALI and DSI mode
- Integrated SMART interface
- Fully digital lamp management and digital communication

Programming:
- DC level programmable
- Dimming in DC mode can be chosen
- Backwards compatibility adjustable
- Adjustable dimming speed in switchDIM operation (3 s or 6 s)
- Smart heating concept enables fastest fade times (50 ms from min → max or reverse)
- NEW: with DALI memory and corridorFUNCTION

Data sheet 09/11-572-9  We reserve the right to make technical changes without prior notice.
Electronic ballasts for dimming to 1 %
Linear lamps T5, 16 mm high efficiency

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.

Mains currents in DC operation:

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Mains current at Un = 220 VDC</th>
<th>Mains current at Un = 240 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/14 T5 EXCEL lp</td>
<td>0.07 A</td>
<td>0.06 A</td>
</tr>
<tr>
<td>PCA 1/21 T5 EXCEL lp</td>
<td>0.09 A</td>
<td>0.08 A</td>
</tr>
<tr>
<td>PCA 1/28 T5 EXCEL lp</td>
<td>0.11 A</td>
<td>0.11 A</td>
</tr>
<tr>
<td>PCA 1/35 T5 EXCEL lp</td>
<td>0.14 A</td>
<td>0.14 A</td>
</tr>
<tr>
<td>PCA 2/14 T5 EXCEL lp</td>
<td>0.12 A</td>
<td>0.12 A</td>
</tr>
<tr>
<td>PCA 2/21 T5 EXCEL lp</td>
<td>0.17 A</td>
<td>0.15 A</td>
</tr>
<tr>
<td>PCA 2/28 T5 EXCEL lp</td>
<td>0.29 A</td>
<td>0.26 A</td>
</tr>
<tr>
<td>PCA 2/35 T5 EXCEL lp</td>
<td>0.36 A</td>
<td>0.33 A</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Ballast</th>
<th>AC-BLF at Un = 198 VAC</th>
<th>Ballast</th>
<th>AC-BLF at Un = 254 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/14 T5 EXCEL lp</td>
<td>1.00</td>
<td>PCA 1/28 T5 EXCEL lp</td>
<td>1.00</td>
</tr>
<tr>
<td>PCA 1/21 T5 EXCEL lp</td>
<td>1.01</td>
<td>PCA 1/35 T5 EXCEL lp</td>
<td>1.03</td>
</tr>
<tr>
<td>PCA 2/14 T5 EXCEL lp</td>
<td>1.01</td>
<td>PCA 2/21 T5 EXCEL lp</td>
<td>1.04</td>
</tr>
<tr>
<td>PCA 2/28 T5 EXCEL lp</td>
<td>0.98</td>
<td>PCA 2/35 T5 EXCEL lp</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</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 EXCEL lp</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 EXCEL lp</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 EXCEL lp</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 EXCEL lp</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 EXCEL lp</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 EXCEL lp</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 EXCEL lp</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 EXCEL lp</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>

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 3.05 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.

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

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
The corridorFUNCTION can be programmed in two different ways.
To program the corridorFUNCTION by means of software a DALLI-USB interface is needed in combination with a DALLIPS. The software can be the configTOOL, the pcaCONFIGURATOR or the corridorFUNCTION CONFIGURATOR.

To activate the corridorFUNCTION without using software 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.

In DC operation dimming mode can be activated.

Harmonic distortion in the mains supply (at 220 V/50 Hz):
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
- DALI signal: 16 bit Manchester Code
  Speed 1 % to 100 % in 550 ms (adjustable between 50 ms and 90 s)
Programmable parameter:
Minimum dimming level
Maximum dimming level
Default minimum = 1 %
Programmable range 1 % ≤ MIN ≤ 49 %
Default maximum = 100 %
Programmable range 100 % ≥ MAX ≥ 50 %

Control input (DA/D1, DA/D2):
Digital DALI/DSI signal or switchDIM 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 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 lp1) 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. 

ON/OFF-Switch via mains, switchDIM or DALI/DSI automatically runs in the constant lux level mode.

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 of 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.

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 (Ø)</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 T5 EXCEL lp</td>
<td>50</td>
<td>80</td>
<td>150</td>
<td>180</td>
<td>25</td>
<td>40</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>PCA 1/21 T5 EXCEL lp</td>
<td>50</td>
<td>80</td>
<td>120</td>
<td>150</td>
<td>25</td>
<td>40</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>PCA 1/28 T5 EXCEL lp</td>
<td>38</td>
<td>54</td>
<td>78</td>
<td>92</td>
<td>19</td>
<td>27</td>
<td>39</td>
<td>46</td>
</tr>
<tr>
<td>PCA 1/35 T5 EXCEL lp</td>
<td>34</td>
<td>50</td>
<td>76</td>
<td>86</td>
<td>17</td>
<td>25</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>PCA 2/14 T5 EXCEL lp</td>
<td>38</td>
<td>54</td>
<td>78</td>
<td>92</td>
<td>19</td>
<td>27</td>
<td>39</td>
<td>46</td>
</tr>
<tr>
<td>PCA 2/21 T5 EXCEL lp</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>64</td>
<td>15</td>
<td>20</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>PCA 2/28 T5 EXCEL lp</td>
<td>24</td>
<td>34</td>
<td>48</td>
<td>52</td>
<td>12</td>
<td>17</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>PCA 2/35 T5 EXCEL lp</td>
<td>16</td>
<td>22</td>
<td>30</td>
<td>32</td>
<td>8</td>
<td>11</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

Data sheet 09/11-572-9 We reserve the right to make technical changes without prior 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 concut 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>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/14 T5 EXCEL lp</td>
<td>11, 12</td>
<td>200 pF</td>
</tr>
<tr>
<td>PCA 2/21 T5 EXCEL lp</td>
<td>11, 12, 13, 14</td>
<td>200 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. 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 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