Electronic ballasts for dimming to 3 %
Compact lamps

PCA TC-DD ECO 55 W 220–240 V 50/60/0 Hz, dimmable

- dimming range from 3–100%
- lamp start at 3%
- lamp friendly warm start within 1.5 s with AC and 0.6 s with DC
- switch via the mains or with digital control signal
- dimming which is comfortable to the eye
- disturbance free precise control with a digital signal (DSI) or switch DIM
- integrated SMART interface
- fully electronic lamp management and digital communication with ASIC and µC

- constant light output independent of fluctuating supply voltage
- DC operation in emergency lighting installations to VDE 0108
- safe shutdown of defective lamps
- safe shutdown of lamps at end of life (rectifying effect)
- automatic restart after lamp replacement
- operating frequency ~40–100 kHz

Packaging:
- box of 10
- 50 boxes/pallet
- 500 pieces/pallet

Certified:
- EN 55015
- EN 55022
- EN 60929
- EN 61000-3-2
- EN 61347-2-3
- EN 61547

PHASED OUT

| Lamp | Ballast type | Ballast type | Article number | L x W x H | mm | D mm | kg | W | β | W | θ | W | θ | θ | W | θ | W | θ |
|------|--------------|--------------|----------------|----------|-----|------|----|----|----|----|----|----|----|----|----|----|----|
| 55   | TC-DD        | PCA 1/55 TC-DD ECO | 22086642 | 123x102x31 | 89.5 | 0.22 | 59.6 | 1x55 | 0.26 | 0.98 | 85 | -25 → +50 |

1. dimming to 3% between 10 °C to ta max.
2. valid at 100% light output.
Lamp starting characteristics:
Warm start
Starting time 1.5 s with AC
Starting time 0.6 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 VDE 0108 or for emergency
luminaires according to EN 61347-2-3 appendix J.

Temperature range:
Dimming range 100 % to 3 % from 10 °C to
maximum permissible ambient temperature ta.
100 % operation from -25 °C to maximum
permissible ambient temperature ta.

Mains currents in DC operation:

<table>
<thead>
<tr>
<th>Ballast Type</th>
<th>Mains current at U&lt;sub&gt;m&lt;/sub&gt; = 220 VDC</th>
<th>Mains current at U&lt;sub&gt;m&lt;/sub&gt; = 240 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/55 TC-DD ECO 220–240/50/60/0Hz</td>
<td>0.21 A</td>
<td>0.20 A</td>
</tr>
</tbody>
</table>

Light output level in DC operation:
Default value is 70 %
In DC operation dimming is not possible

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

<table>
<thead>
<tr>
<th>Ballast Type</th>
<th>AC-BLF at U&lt;sub&gt;m&lt;/sub&gt; = 230 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/55 TC-DD ECO 220–240/50/60/0Hz</td>
<td>1.04</td>
</tr>
</tbody>
</table>

The ballast lumen factor for AC operation (AC-BLF) does not alter from U<sub>m</sub> = 198 VAC to U<sub>m</sub> = 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 3</th>
<th>THD 5</th>
<th>THD 7</th>
<th>THD 9</th>
<th>THD 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1/55 TC-DD ECO 220–240/50/60/0Hz</td>
<td>13.1</td>
<td>12.1</td>
<td>4.4</td>
<td>2.6</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Dimming:
Dimming range 3 % to 100 %
Digital control with DSI signal:
8 bit Manchester Code
Maximum speed 3 % to 100 % in 1.4 s
Dimming curve that is friendly to the eye.

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 with the requirements of low voltage installations.
Different functions depending on each DSI module.

SMART interface:
An additional interface for the direct connection of the SMART-LS 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 ECO 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.
Dimming with a DSI signal with the SMART-LS installed is not possible.
switchDIM enables a temporary change of light level.
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. (Not in case of reset after mains failure – start at 100 %).
When the push to make switch is held, PCA ballasts are dimmed. After repush the PCA is dimmed in the opposite direction.
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 1.0 s push.
Use of push to make switch with indicator lamp is not permitted.
switchDIM is a very simple tool for controlling ballasts with conventional momentary-action switches or motion sensors.
To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the control input.

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 of</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 1/55 TC-DD ECO</td>
<td>22</td>
<td>32</td>
<td>44</td>
<td>50</td>
<td>11</td>
<td>16</td>
<td>22</td>
<td>25</td>
</tr>
</tbody>
</table>
Installation instructions:

Wiring type and cross section:
The wiring can be in flexible cable with ferules or solid with a cross section of 0.5–1.5 mm². For perfect function of the simple to use push-wire terminals the strip length should be 9 mm.

\[
U_{\text{out}} = 250 \text{ V}
\]

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 1/55 TC-DD ECO</td>
<td>3, 4</td>
<td>1, 2</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 and cold leads should be separated as much as possible.

Important advise:
- When using two or more dimmable ballasts in one luminaire with separate dimming controls, the lamp leads must be kept separate.
- All lamps must have the same length lead.