Combined electronic ballast and emergency lighting module
for compact fluorescent lamps

PC CFL COMBO 220–240 V 50/60 Hz

Description:
- Warm start fixed output, combined electronic high frequency ballasts and emergency lighting modules for compact fluorescent lamps.

Features:
- Operation
  - Latest ballast technology
  - Intelligent voltage guard (IVG)
  - Preheat start in normal operation
  - Cathode heating during emergency operation with TC-D/T lamps
  - Automatic restart after lamp change in normal operation
  - 3 hour duration for TC-DD lamp variants
  - 3 hour and 1 hour duration for TC-D/T lamp variants
  - Duration selected by jumper plug
  - No compatibility issues

- Safety
  - Reverse battery polarity protected
  - Battery short circuit protected
  - Deep discharge protection
  - Intelligent voltage guard (IVG)

- Standard brightness and ultra high brightness

- Easy to Use
  - Lightweight one piece unit
  - Small size
  - Simplified wiring
  - No compatibility issues
  - IDC terminals for automatic and normal wiring
  - Emergency testing by isolating only the unswitched supply
  - Manual battery pack units

- Weight
  - Lightweight one piece unit
  - Easy to use

- Emergency lights
  - BLM: 1 hour
  - EBL: 1 hour
  - EBFL: 1 hour
  - EBLF: 1 hour

- Mains ballast complies with end of lamp life (EOL) test 2
- ENEC and BSI approved. CE marked

Note: The PC CFL COMBO is not intended to be used for high risk task area lighting

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Ballast</th>
<th>Voltage type</th>
<th>Weight (kg)</th>
<th>Power (W)</th>
<th>Current (A)</th>
<th>TC point °C</th>
<th>Number of cells</th>
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</table>
**Lamp**

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage (W)</th>
<th>Article number</th>
<th>L x W x H (mm)</th>
<th>Weight (kg)</th>
<th>Lamp power (W)</th>
<th>Lamp current (A)</th>
<th>Circuit power factor (ca.)</th>
<th>Tc point (°C)</th>
<th>Emergency operation (EBUF)</th>
<th>Emergency operation (BUF)</th>
<th>Normal operation</th>
<th>Duration (h)</th>
<th>Number of cells</th>
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<td>0.16</td>
<td>0.09</td>
<td>0.75</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

* Biax non amalgam only

1. For 3 h duration: NiCd 4.0 Ah D cells (55 °C)
   NiMH 4.0 Ah Cs cells (45 °C)

2. According to EN 61347-2-7: 2006

3. in emergency operation

4. at 230 V, 50 Hz

**Ballast**

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>for 1 h duration: NiCd 1.5 Ah Cs cells (55 °C)</th>
<th>NiMH 2.0 Ah Cs cells (55 °C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-DD-28</td>
<td>89805277</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Status indication**

A green LED indicates that charging current is flowing into the battery.

**Technical data PC CFL COMBO**

- Ambient temperature range: 0 °C to +55 °C
- Maximum case temperature Tc: see table on page 1
- Ingress protection: IP 20
- Safety class: Class 1
- Vibration test EICO 60068-2-64 Fh
- Bump test EICO 60068-2-29 Eb
- Humidity IEC 60068-2-30

**Restarting after lamp replacement:**

If faulty lamps are changed with the mains connected they can be made to restart automatically provided an interval of 2 seconds is left after removal.

**Technical data for normal operation**

- Rated mains supply voltage: 220-240 V
- Mains frequency: 50/60 Hz
- Earth leakage current: < 0.5 mA

**Lamp starting**

- Type of start: pre-heat
- Starting time: ca. 1.6 s
- Min. lamp starting temperature: 10°C
- Average lamp life (acc. to IEC 60081): 13,000 to 15,000 h
- Lamp operating frequency: > 42 kHz
- Overvoltage protection: 320 V for 1 h with IVG
- Overvoltage indication (IVG): starting at input voltage ≥ 306 V AC
- Ballast lumen factor (BLF): see table on page 1
- Recharge period: 24 h

**Nominal charge current**

- NiCd 4.0 Ah D, NiMH 4.0 Ah Cs (3 h)
- 200 mA
- NiCd 1.5 Ah Cs, NiMH 2.0 Ah Cs (1 h)
- 100 mA
- Mains change over voltage in accordance with EN 60598-2-22

**Technical data for emergency operation**

- Min. lamp starting temperature: 0°C
- Emergency light output factor (BLF): see table on page 1
- Battery design voltage: 1.2 V per cell
- Nominal discharge current (3 h, 1 h): 1.1 A
- Lamp operating frequency typ.: 17 kHz

__Note:__ The stated temperature in brackets is the max. battery case temperature!

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Ambient Temperature

**PC CFL COMBO**
The nominal ta and tc point are related to the ballast life duration. The relation of tc to ta temperature depends also on the luminaire design. If the measured tc temperature is approx. 5 K below tc max., ta temperature should be checked and eventually critical components (e.g. ELCAP) measured. Detailed information on request.

**Mechanical details**

**PC CFL COMBO:**
Case manufactured from polycarbonate.

**LED charge indicator:**
- Green
- Mounting hole 6.5 mm dia
- Length of LED lead 750 mm (Bezel supplied fitted to LED)

**Batteries**

**Accu NiCd Remote pack (High temperature)**

```
<table>
<thead>
<tr>
<th>Accu NiCd (Remote pack)</th>
<th>type</th>
<th>number of cells</th>
<th>article number</th>
<th>L x W x H mm</th>
<th>weight g</th>
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</thead>
<tbody>
<tr>
<td>Pack-NiCd 3D</td>
<td>Remote pack 4.0 Ah</td>
<td>3</td>
<td>8999672</td>
<td>216 x 70 x 35.5</td>
<td>570</td>
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<tr>
<td>Pack-NiCd 4D</td>
<td>Remote pack 4.0 Ah</td>
<td>4</td>
<td>8999673</td>
<td>216 x 70 x 35.5</td>
<td>700</td>
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<tr>
<td>Pack-NiCd 5D</td>
<td>Remote pack 4.0 Ah</td>
<td>5</td>
<td>8999674</td>
<td>216 x 70 x 35.5</td>
<td>840</td>
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<tr>
<td>Pack-NiCd 6D</td>
<td>Remote pack 4.0 Ah</td>
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<td>Pack-NiCd 3C</td>
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<td>320</td>
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<td>Pack-NiCd 4C</td>
<td>Remote pack 1.5 Ah</td>
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<td>Pack-NiCd 5C</td>
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<td>Pack-NiCd 6C</td>
<td>Remote pack 1.5 Ah</td>
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<td>8999679</td>
<td>216 x 70 x 35.5</td>
<td>470</td>
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</table>
```

**Technical data Accu-NiCd Remote pack:**
- battery case temperature range (to ensure 4 years life) 0 °C → +55 °C
- temperature range of Accu-NiCd Remote pack 0 °C → +40 °C at tc point
- storage life in temperate conditions 4 years
- battery voltage per cell 1.2 V
- capacity D-NiCd 4.0 Ah
- capacity Cs-NiCd 1.5 Ah

**Note:** Care should be taken to ensure batteries and emergency units don’t exceed their maximum temperatures (See table at page 1).

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Intelligent Voltage Guard
Intelligent Voltage Guard is the name of the new electronic monitor from TridonicAtco. This innovative feature of the new PC COMBO family of combined electronic ballasts and emergency lighting modules from TridonicAtco immediately shows if the mains voltage rises above a certain threshold. Measures can then be taken quickly to prevent damage to the control gear. If the mains voltage rises above 306 V the lamps start flashing on and off. This signal “demands” disconnection of the power supply to the lighting system.

Intelligent Voltage Guard is the name of the new electronic monitor from TridonicAtco. This innovative feature of the new PC COMBO family of combined electronic ballasts and emergency lighting modules from TridonicAtco immediately shows if the mains voltage rises above a certain threshold. Measures can then be taken quickly to prevent damage to the control gear. If the mains voltage rises above 306 V the lamps start flashing on and off. This signal “demands” disconnection of the power supply to the lighting system.

New PC COMBO with xitec processor
Is the very latest in lighting management design technology. The lamp friendly warm start is delivering maximum lamp life and enables high switching frequency applications. Smallest power loss and new freedom in the lamp design thanks to convincing thermal management.

Energy class CELMA EEI = A2
PC CFL COMBO ignition technology (smart heating) optimises lamp start and ensures no energy is wasted. After the lamp has struck the filament heating is reduced automatically to a defined minimum value. This reduction in filament heating, saves energy, yet maintains the proper operating conditions for the lamp. The lamp is always operated within specification.

Smart Heating (normal operation)
Innovative heating circuit. Reduced filament heating after lamp has struck.

Jumper selection (for TC-D/T lamp variants):
3 hours operation as supplied for use with 4 Ah NiCd D or 4 Ah NiMH Cs cells. Remove the jumper for 1 hour operation and use with Cs 1.5 Ah NiCd or 2.0 Ah NiMH cells.

Important note:
Jumper selection for 1 hour duration:
When 1 hour use is required it is very important to remove the jumper before connection of the battery or mains supply. The TC-D/T modules with selectors are supplied with the jumper set for 3 hour operation.

Miniature circuit breakers (MCBs):
The maximum number of these electronic ballasts that may be used with miniature circuit breakers (MCBs). These quantities are based on single pole MCBs. For multi-pole MCBs derate by 20 %.

<table>
<thead>
<tr>
<th>Number of electronic ballasts</th>
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<th>type B MCB rating</th>
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<td>10 A 13 A 16 A 20 A</td>
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<td>42</td>
<td>60 72 102</td>
<td>21 30 36 51</td>
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<td>PC 1x18-4 TC COMBO</td>
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<td>21 30 36 51</td>
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<td>PC 2x18-3 TC COMBO</td>
<td>34</td>
<td>48 58 70</td>
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<tr>
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<td>48 58 (U)</td>
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<td>36</td>
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<td>50 60 72</td>
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<td>42 50 60</td>
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<tr>
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Working Voltage

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<td>250</td>
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<tr>
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</tbody>
</table>

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Electrical connections:
A functional earth can be connected for improved EMC performance.

Note:
All electrical connections to the unit must be made when both permanent and switched mains supplies are disconnected.

Packaging quantities:
PC CFL COMBO:
- 25 pieces/carton

LED green:
- 25 pieces/bag
- 200 pieces/carton

Pack-Nicd:
- 10 pieces per carton

Wiring advice
The lead length is dependant on the capacitance of the cable. Earthing is not required for the device to operate. Connection to earth reduces radio interference.

<table>
<thead>
<tr>
<th>Type</th>
<th>Terminal</th>
<th>Maximum lead capacitance allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC 1/xx CFL COMBO</td>
<td>3,4 1,2</td>
<td>50 pF 50 pF</td>
</tr>
<tr>
<td>PC 2/xx CFL COMBO</td>
<td>1,2,5,6 3,4</td>
<td>50 pF 50 pF</td>
</tr>
</tbody>
</table>

Installation instructions

IDC interface
- solid wire with a cross section of 0.5 mm² according to the specification from WAGO

Horizontal interface
- solid wire with a cross section of 0.5–1.5 mm² according to the specification from WAGO
- strip 7.5–8.5 mm of insulation from the cables to ensure perfect operation of the terminals

Note:
To avoid the damage of the control gear, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, lower, etc.).

Batteries:
Batteries must be disconnected for servicing. Facility must be provided in the luminaire. It is recommended that battery leads are not cut as this could result in a hazardous condition due to short circuit batteries. If shorter leads are required great care should be taken that no shorting occurs.

Note:
The battery charger of the PC CFL Combo is short circuit protected. After a battery short circuit the protection device will be resetted after a short while.

Battery must not be connected to earth.

Storage:
It is recommended to disconnect the battery before store or delivery. A long term storage in open circuit leads to battery self discharge and deactivation of chemical components. It could be required to charge and discharge the batteries a few times to recover the initial performance.

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.
- Keep all leads as short as possible
- Maximum length 0.5 m
- lamp connection with multi-lamp ballasts should be made with symmetrical wiring
- for 1 and 2 lamp ballasts: hot leads and cold leads should be separated as much as possible
- The LED, test switch and battery wiring should be routed separately and kept as far away as possible from the high frequency lamp leads to avoid coupling.

RFI
TridonicAtco ballasts are RFI protected in accordance with EN 55015: 2006 + A1: 2007. To operate the luminaire correctly and to minimise RFI we recommend the following instructions:

- Connection to the lamps of the “hot leads” must be kept as short as possible (marked with *)
- 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
- Ballast should be earthed.
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

Data sheet 11/09-818-3  We reserve the right to make technical changes without prior notice.
Wiring diagram PC CFL COMBO with single TC-DD lamp

Wiring diagram PC CFL COMBO with single TC-DE/TE lamp

Wiring diagram PC CFL COMBO with twin TC-DE/TE lamps

For further technical information please visit www.tridonicatco.com

PHASED OUT