Product description
• Combination of electronic ballast and emergency lighting unit
• For TC-DD compact fluorescent lamps
• For manual testing of the emergency lighting function
• 5-year guarantee

Properties
• Lightweight one-part emergency lighting unit
• Simple wiring
• No compatibility problems
• 3 h rated duration
• AC operation of the lamp
• Automatic restart after relamping in normal operation
• Green charge status display LED
• Intelligent Voltage Guard (overvoltage indication and undervoltage shutdown)
• Checking the emergency lighting function by interrupting the unswitched phase
• Small dimensions
• Push-in terminals
• Deep discharge protection
• Short-circuit-proof battery connection
• Polarity reversal protection for battery

Batteries
• Separate battery pack
• High-temperature cells
• NiCd batteries
• D cells
• 4-year design life
• 1-year guarantee
• For battery compatibility refer to chapter „Ballast-Lumen-Factor (BLF)“

Standards, page 5
For wiring diagrams and installation examples, page 8
Emergency lighting units
PC COMBO

Technical data
Rated supply voltage 230 – 240 V
Mains frequency 50 / 60 Hz
Mains voltage changeover threshold according to EN 60598-2-22
tc point max. 75 °C
ambient temperature ta 0 ... 55 °C
Operating frequency (normal operation) > 42 kHz
Operation frequency (emergency mode) typ. 17 kHz
Lamp warm start 16 s
Battery charging time 24 h
Charge current 200 mA
Discharge current 11 A
Leakage current (PE) < 0.5 mA
Minimum lamp starting temperature (normal operation) -15 °C
Minimum lamp starting temperature (emergency mode) 0 °C
Type of protection IP20

Specific technical data
Lamp type Lamp wattage Type Article number Dimensions L x W x H Hole spacing D Lamp power Circuit power Mains current λ° Normal operation BLF Emergency operation BLF Emergency operation EBLF° Rated duration
Rated operating time 3 h, Low Output BLF
TC-DD 1 x 28 W PC 1x28-33 LO E DD COMBO 89899980 123 x 79 x 31 mm 66.5 mm 16 W 23.4 W 0.16 A 0.63 0.7 0.105 0.090 3 h
TC-DD 1 x 28 W PC 1x28-34 LO E DD COMBO 89800028 123 x 79 x 31 mm 66.5 mm 16 W 25.0 W 0.17 A 0.64 0.7 0.145 0.135 3 h

° For 230 V, 50 Hz.
° According to EN 61347-2-7:2006.

Ordering data
<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Number of cells</th>
<th>Packaging carton</th>
<th>Packaging pallet</th>
<th>Weight per pc</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC 1x28-33 LO E DD COMBO</td>
<td>89899980</td>
<td>3</td>
<td>25 pc(s)</td>
<td>700 pc(s)</td>
<td>0.220 kg</td>
</tr>
<tr>
<td>PC 1x28-34 LO E DD COMBO</td>
<td>89800028</td>
<td>4</td>
<td>25 pc(s)</td>
<td>700 pc(s)</td>
<td>0.245 kg</td>
</tr>
</tbody>
</table>

Data sheet 04/19-867-15
Subject to change without notice.
www.tridonic.com
Product description

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

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Packaging, bag</th>
<th>Packaging, carton</th>
<th>Weight, per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED EM green</td>
<td>89899605</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.011 kg</td>
</tr>
<tr>
<td>LED EM green, ultra high brightness</td>
<td>89899756</td>
<td>25 pc(s)</td>
<td>#500 pc(s)</td>
<td>0.012 kg</td>
</tr>
</tbody>
</table>
## Ballast lumen factor (BLF) in %

**PC CFL E COMBO for TC-DD compact lamps, 3 h**

<table>
<thead>
<tr>
<th>Duration</th>
<th>Cells</th>
<th>3 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cells</td>
<td>3 cells</td>
<td>4 cells</td>
</tr>
<tr>
<td>Type</td>
<td>PC 1x28-33 LO E DD COMBO</td>
<td>PC 1x28-34 LO E DD COMBO</td>
</tr>
<tr>
<td>Article no.</td>
<td>89899980</td>
<td>89800028</td>
</tr>
</tbody>
</table>

**Lamp type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>BLF in emergency lighting mode in % for rated operating time</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-DD</td>
<td>28 W</td>
<td>10.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology and capacity</th>
<th>Design</th>
<th>Number of cells</th>
<th>Type</th>
<th>Article number</th>
<th>Assignable batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>NiCd 4 Ah D-cells</td>
<td>Stick</td>
<td>3</td>
<td>Accu-NiCd 3A 55</td>
<td>28002773</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>Stick</td>
<td>4</td>
<td>Accu-NiCd 4A 55</td>
<td>89800089</td>
<td>•</td>
</tr>
<tr>
<td>Accupack NiCd (high temperature)</td>
<td>Accupack 4 Ah</td>
<td>3</td>
<td>Pack-NiCd 3D CON</td>
<td>89800389</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>Accupack 4 Ah</td>
<td>4</td>
<td>Pack-NiCd 4D CON</td>
<td>89800390</td>
<td>•</td>
</tr>
</tbody>
</table>
Standards
- EN 61347-2-3
- EN 61347-2-7
- EN 60929
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61547
- EN 60608-2-29
- EN 60608-2-30
- EN 60608-2-64
- according to EN 50172
- according to EN 60598-2-22
- Mains ballast complies with end of lamp life (EOL) test 2

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

Isolation and electric strength testing of luminaires
Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 VDC for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal. The isolation resistance must be at least 2 MΩ.

As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1,500 VAC (or 1,414 x 1,500 VDC). To avoid damage to the electronic devices this test must not be conducted.

Basic insulation between supply and battery circuit

Restarting after lamp replacement
Note: Before servicing luminaires the mains supply should always be disconnected.

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.

- Single lamp combined units always restart automatically.
- Twin lamp combined units that do not restart automatically will do so if the first lamp that was inserted is removed and re-inserted.

Technical data batteries

**Accu-NiCd 4.2 / 4.5 Ah**
- Battery voltage/cell: 12 V
- Cell type: D
- Case temperature range: +5°C to +55°C
- Max. short term temperature (reduced life-time): 70°C
- Max. number discharge cycles: 4 cycles per year plus 4 cycles during commissioning

Max. storage time: 6 months

**Accupack-NiCd 4.5 Ah**
- Battery voltage/cell: 12 V
- Cell type: D
- Case temperature range: +5°C to +55°C
- Max. short term temperature (reduced life-time): 70°C
- Max. number discharge cycles: 4 cycles per year plus 4 cycles during commissioning

Max. storage time: 6 months

For further information refer to corresponding battery datasheet.

Storage, installation and commissioning
Relevant information about storage conditions, installation and commissioning are provided in the battery datasheets.

Care should be taken to ensure batteries and emergency units don’t exceed their maximum temperatures.

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**Working Voltage (Uout), lamp current**

<table>
<thead>
<tr>
<th>Type</th>
<th>Lamp type</th>
<th>Wattage</th>
<th>Uout</th>
<th>Lamp current</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC 1x28-33 LO E DD COMBO</td>
<td>TC-DD</td>
<td>28 W</td>
<td>300 V</td>
<td>0.014 A</td>
</tr>
<tr>
<td>PC 1x28-34 LO E DD COMBO</td>
<td>TC-DD</td>
<td>28 W</td>
<td>300 V</td>
<td>0.014 A</td>
</tr>
</tbody>
</table>

* In emergency mode
Intelligent Voltage Guard
Intelligent Voltage Guard is the name of the new electronic monitor from Tridonic. This innovative feature of the new PC COMBO family of combined electronic ballasts and emergency lighting modules from Tridonic 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.

Ambient Temperature
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.

Life-time
PC CFL E COMBO is designed for an average life-time of 50,000 hours under reference conditions and with a failure probability of less than 10 %. This corresponds to an average failure rate of 0.2 % for every 1,000 hours of operation.

CE marking
The PC CFL E COMBO units are CE marked for compliance with the low voltage directive. Certificates of compliance are available to allow luminaires to be CE marked for compliance with the EMC directive.

Mechanical details
Housing
Glow-wire test according to EN 61347-1 with increased temperature of 850 °C passed.

LED charge indicator
• Green
• Mounting hole 6.5 mm diameter, 1 – 1.6 mm thickness
• Length of LED lead 750 mm (Bezel supplied fitted to LED)
• Insulation temperature rating: 90 °C

Battery leads
• Quantity: 1 red and 1 black
• Length: 1300 mm
• Wire type: 0.5 mm² solid conductor
• Insulation temperature rating: 90 °C

Termination 1
Push on 4.8 mm receptacle to suit battery spade fitted with insulating cover

Termination 2
9 mm stripped insulation

Electrical connections
In low temperature applications an starting aid is required for the emergency lamp which is referenced to the metal case of the unit. This starting aid does not need to be earthed.

The combined unit is intended to be earthed by the marked terminal connection.

Two phases can be used as switched and unswitched line.

Note:
All electrical connections to the unit must be made when both permanent and switched mains supplies are disconnected.
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>
<th>Type C - MCB rating</th>
<th>Type B - MCB rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 A</td>
<td>13 A</td>
</tr>
<tr>
<td>PC 1x28-33 LO E DD COMBO</td>
<td>42</td>
<td>74</td>
</tr>
<tr>
<td>PC 1x28-34 LO E DD COMBO</td>
<td>42</td>
<td>74</td>
</tr>
</tbody>
</table>

Batteries
Connection method: 4.8 x 0.5 mm spade welded to end of cell

For the stick batteries this connection is accessible after the battery end caps have been fitted.

To inhibit inverter operation, only disconnect the batteries by removing the connector from the battery spade tags.

Note: The battery charger of the PC CFL E 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.

Wiring advice
The lead length is dependant on the capacitance of the cable. Connection to earth reduces radio interference.

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

RFI
Tridonic ballasts are RFI protected in accordance with EN 55015. 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, over the terminal
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

Installation instructions
Wiring type and cross section
The wiring can be in stranded wires with ferrules or solid with a cross section of 0.5–1.5 mm². Strip 9.5 mm of insulation from the cables to ensure perfect operation of the push-wire terminals.

Release of the wiring
Press down the “push button” and remove the cable from front.

With standard solid wire 0.5/15 mm² the capacitance of the lead is 30–80 pF/m. This value is influenced by the way the wiring is made.
- keep lamp wires short
- 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 and battery wiring should be routed separately and kept as far away as possible from the high frequency lamp leads to avoid coupling.
- 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, louver, etc.)
PC CFL E COMBO wiring diagrams

Wiring diagram PC CFL E COMBO with single TC-DD lamp

Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.