Product description

• Combination of electronic ballast and emergency lighting unit
• For TC-L 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
• Lamp warm start in normal operation
• 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
• IDC terminals for automatic and manual wiring
• Optional test switch
• Electronically controlled battery charging
• Deep discharge protection
• Short-circuit-proof battery connection
• Polarity reversal protection for battery

Batteries

• High-temperature cells
• NiCd or NiMH batteries
• D or LA cells
• Blade terminals for simple connection
• 4-year design life
• 1-year guarantee
• For battery compatibility refer to chapter „Ballast-Lumen-Factor (BLF)“

Standards, page 5
Wiring diagrams and installation examples, page 7
Technical data
Rated supply voltage 220 – 240 V
Mains frequency 50 / 60 Hz
Mains voltage changeover threshold according to EN 60598-2-22
Lamp starting time (normal operation) < 1.5 s
tc point max. 70 °C
Ambient temperature ta 0 – 50 °C
Operating frequency (normal operation) 40 – 50 kHz
Operating frequency (emergency mode) 20 – 30 kHz
Overvoltage protection 320 V (for 1 h)
Battery charging time 24 h
Charge current 3 h 210 mA
Discharge current 3 h 11 A
Leakage current (PE) < 0.5 mA
Min. lamp starting temperature (normal operation) -15 °C
Min. 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 mm Hole spacing D mm Lamp power W Circuit power Circuit mains current λ Normal operation normal operation (BLF) Emergency (BLF) Emergency (EBLF)

<table>
<thead>
<tr>
<th>Lamp type</th>
<th>Lamp wattage</th>
<th>Type</th>
<th>Article number</th>
<th>Dimensions L x W x H mm</th>
<th>Hole spacing D mm</th>
<th>Lamp power W</th>
<th>Circuit power</th>
<th>Circuit mains current λ</th>
<th>Normal operation BLF</th>
<th>Emergency operation BLF</th>
<th>Emergency operation EBLF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-L</td>
<td>1 x 36 W</td>
<td>PC TC-L COMBO</td>
<td>89899920</td>
<td>424 x 42 x 28</td>
<td>415</td>
<td>32</td>
<td>38.5</td>
<td>0.071</td>
<td>1</td>
<td>0.051</td>
<td>0.040</td>
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<td>PC TC-L COMBO</td>
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<td>424 x 42 x 28</td>
<td>415</td>
<td>32</td>
<td>74.0</td>
<td>0.331</td>
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<tr>
<td>TC-L</td>
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<td>PC TC-L COMBO</td>
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<td>415</td>
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<td>0.202</td>
<td>1</td>
<td>0.061</td>
<td>0.040</td>
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<tr>
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<td>PC TC-L COMBO</td>
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<td>415</td>
<td>55</td>
<td>65.0</td>
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<td>1</td>
<td>0.085</td>
<td>0.075</td>
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<tr>
<td>TC-L</td>
<td>2 x 55 W</td>
<td>PC TC-L COMBO</td>
<td>89899925</td>
<td>424 x 42 x 28</td>
<td>415</td>
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<td>0.566</td>
<td>1</td>
<td>0.085</td>
<td>0.075</td>
</tr>
</tbody>
</table>

Ordering data
Type Article number Number of cells Packaging, carton Packaging, pallet Weight per pc.
PC 1x36-33 TC-L COMBO 89899920 3 25 pc(s) 475 pc(s) 0.397 kg
PC 2x36-33 TC-L COMBO 89899921 3 25 pc(s) 475 pc(s) 0.414 kg
PC 1x40-34 TC-L COMBO 89899922 4 25 pc(s) 475 pc(s) 0.399 kg
PC 2x40-34 TC-L COMBO 89899923 4 25 pc(s) 475 pc(s) 0.419 kg
PC 1x55-35 TC-L COMBO 89899924 5 25 pc(s) 475 pc(s) 0.401 kg
PC 2x55-35 TC-L COMBO 89899925 5 25 pc(s) 475 pc(s) 0.424 kg

1 According to EN 60598-2-7
Emergency lighting units
PC COMBO

Test switch EM2

Product description
- For connection to the emergency lighting unit
- For checking the device function

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>Test switch EM 2</td>
<td>89805277</td>
<td>25 pc(s)</td>
<td>600 pc(s)</td>
<td>0.011 kg</td>
</tr>
</tbody>
</table>

Status indication green LED

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>800 pc(s)</td>
<td>0.012 kg</td>
</tr>
</tbody>
</table>
Emergency lighting units

**PC COMBO**

Subject to change without notice.

<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>
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</thead>
<tbody>
<tr>
<td>NiCd 4 Ah D cells</td>
<td>Stick 3</td>
<td></td>
<td>Accu-NiCd 3A 55</td>
<td>289002773</td>
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<tr>
<td></td>
<td>Stick 4</td>
<td></td>
<td>Accu-NiCd 4A 55</td>
<td>898000089</td>
<td>*</td>
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<tr>
<td></td>
<td>Stick 5</td>
<td></td>
<td>Accu-NiCd 5A 55</td>
<td>289002774</td>
<td>*</td>
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<tr>
<td></td>
<td>Stick + Stick 2 + 3</td>
<td></td>
<td>Accu-NiCd 5C 55</td>
<td>898000090</td>
<td>*</td>
</tr>
<tr>
<td>NiMH 4 Ah LA cells</td>
<td>Stick 3</td>
<td></td>
<td>Accu-NiMH 4Ah 3A CON</td>
<td>89800441</td>
<td>*</td>
</tr>
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<td></td>
<td>Stick 4</td>
<td></td>
<td>Accu-NiMH 4Ah 4A CON</td>
<td>89800442</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Stick + Stick 2 + 2</td>
<td></td>
<td>Accu-NiMH 4Ah 4C CON</td>
<td>89800438</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Stick + Stick 2 + 3</td>
<td></td>
<td>Accu-NiMH 4Ah 5C CON</td>
<td>89800439</td>
<td>*</td>
</tr>
</tbody>
</table>

Ballast lumen factor (BLF) in %

**PC TC-L COMBO for compact fluorescent lamps, 3 h**

<table>
<thead>
<tr>
<th>Lamp type</th>
<th>Wattage</th>
<th>BLF in emergency lighting mode in % for rated operating time</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-L</td>
<td>36 W</td>
<td>51</td>
</tr>
<tr>
<td>TC-L</td>
<td>40 W</td>
<td>61</td>
</tr>
<tr>
<td>TC-L</td>
<td>55 W</td>
<td>85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC 1x36-33 TC-L COMBO</td>
<td>89899920</td>
</tr>
<tr>
<td>PC 2x36-33 TC-L COMBO</td>
<td>89899921</td>
</tr>
<tr>
<td>PC 1x40-34 TC-L COMBO</td>
<td>89899922</td>
</tr>
<tr>
<td>PC 2x40-34 TC-L COMBO</td>
<td>89899923</td>
</tr>
<tr>
<td>PC 1x55-35 TC-L COMBO</td>
<td>89899924</td>
</tr>
<tr>
<td>PC 2x55-35 TC-L COMBO</td>
<td>89899925</td>
</tr>
</tbody>
</table>
Emergency lighting units
PC COMBO

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 T5 COMBO lp is not intended to be used for high risk task area lighting.

Insulation testing (no flashover or breakdown must occur)
Up to 500 V DC between the phase and neutral conductors connected together and the earth.

High voltage insulation testing (1500 V AC) not recommended

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.

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
to ensure 4 years design life
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

Accu-NiMh
4.0 Ah
Battery voltage/cell 12 V
Cell type LA
Case temperature range
+5°C to +40°C
to ensure 4 years design life
Max. short term temperature (reduced life-time) 70°C
Max. number discharge cycles 4 cycles per year plus 30 cycles during commissioning
Max. storage time 12 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.

Working Voltage, 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 1x36-3 TLC COMBO</td>
<td>T5</td>
<td>1x36 W</td>
<td>300 / 300 V</td>
<td>0.016 A</td>
</tr>
<tr>
<td>PC 2x36-3 TLC COMBO</td>
<td>T5</td>
<td>2x36 W</td>
<td>300 / 300 V</td>
<td>0.016 A</td>
</tr>
<tr>
<td>PC 1x40-4 TLC COMBO</td>
<td>T5</td>
<td>1x40 W</td>
<td>300 / 300 V</td>
<td>0.017 A</td>
</tr>
<tr>
<td>PC 2x40-4 TLC COMBO</td>
<td>T5</td>
<td>2x40 W</td>
<td>300 / 300 V</td>
<td>0.017 A</td>
</tr>
<tr>
<td>PC 1x55-5 TLC COMBO</td>
<td>T5</td>
<td>1x55 W</td>
<td>300 / 360 V</td>
<td>0.023 A</td>
</tr>
<tr>
<td>PC 2x55-5 TLC COMBO</td>
<td>T5</td>
<td>2x55 W</td>
<td>300 / 360 V</td>
<td>0.023 A</td>
</tr>
</tbody>
</table>

1 In emergency operation
2 Max. voltage between output terminals / Max. voltage between output terminal to earth
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.

Energy class CELMA EEI = A2

PC TCL 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.

Life-time

PC TCL 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 TCL 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.

Electrical connections

In low temperature applications a 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 fixings used to attach it to the luminaire. It may also be earthed by a wire attached to the holes positioned in the sides at each end of the case channel.

Two different 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.

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 TCL 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.

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

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.

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.
Mechanical details
Channel and Cover manufactured from 0.4 mm white precoated steel.

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)

Test switch
- Mounting hole 7.0 mm diameter
- Length of test switch lead 550 mm

Wiring advice
The lead length is dependant on the capacitance of the cable. For safety reasons, the PC T5 COMBO lp must only be earthed in the case of a safety class 1 luminaire. Earthing is not required for the device to operate. Connection to earth reduces radio interference.

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 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 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.
- 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.)

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:
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Terminal</th>
<th>Maximum lead capacitance allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cold</td>
</tr>
<tr>
<td>PC T5xx TCL COMBO</td>
<td>3, 4</td>
<td>100 pF</td>
</tr>
<tr>
<td>PC 2/xx TCL COMBO</td>
<td>1, 2, 5, 6</td>
<td>3, 4</td>
</tr>
</tbody>
</table>

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 0.5–15 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

Additional information
Additional technical information at [www.tridonic.com](http://www.tridonic.com) → Technical Data
Guarantee conditions at [www.tridonic.com](http://www.tridonic.com) → Services

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