



#### PC TC-L COMBO, 220 – 240 V 50/60 Hz

Compact fluorescent lamps

#### 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

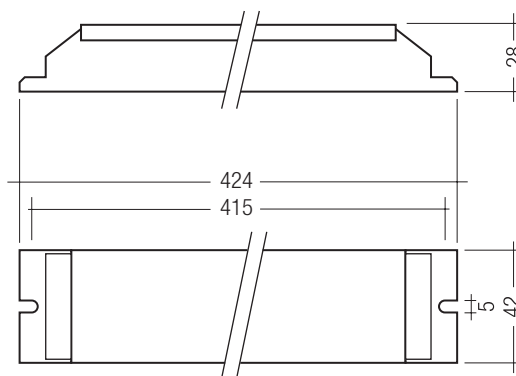


### PC TC-L COMBO, 220 – 240 V 50/60 Hz

Compact fluorescent lamps

#### 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



#### Ordering data

Type	Article number	Number of cells	Packaging carton	Packaging pallet	Weight per pc.
<b>Rated operating time 3 h</b>					
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

#### 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 <sup>①</sup>
<b>Rated operating time 3 h</b>												
TC-L	1 x 36 W	PC 1x36-33 TC-L COMBO	89899920	424 x 42 x 28 mm	415 mm	32 W	38.5 W	0.17 A	0.97	1	0.051	0.040
TC-L	2 x 36 W	PC 2x36-33 TC-L COMBO	89899921	424 x 42 x 28 mm	415 mm	32 W	74.0 W	0.33 A	0.98	1	0.051	0.040
TC-L	1 x 40 W	PC 1x40-34 TC-L COMBO	89899922	424 x 42 x 28 mm	415 mm	40 W	46.0 W	0.20 A	0.97	1	0.061	0.040
TC-L	2 x 40 W	PC 2x40-34 TC-L COMBO	89899923	424 x 42 x 28 mm	415 mm	40 W	90.6 W	0.40 A	0.98	1	0.061	0.040
TC-L	1 x 55 W	PC 1x55-35 TC-L COMBO	89899924	424 x 42 x 28 mm	415 mm	55 W	65.0 W	0.29 A	0.97	1	0.085	0.075
TC-L	2 x 55 W	PC 2x55-35 TC-L COMBO	89899925	424 x 42 x 28 mm	415 mm	55 W	127.0 W	0.56 A	0.98	1	0.085	0.075

<sup>①</sup> According to EN 61347-2-7

RoHS

ACCES-  
SORIES

Test switch EM2

**Product description**

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



**Ordering data**

Type	Article number	Packaging, bag	Packaging, carton	Weight per pc.
Test switch EM 2	89805277	25 pc(s).	600 pc(s).	0.011 kg

RoHS

ACCES-  
SORIES

Status indication green LED

**Product description**

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



**Ordering data**

Type	Article number	Packaging, bag	Packaging, carton	Weight per pc.
LED EM green	89899605	25 pc(s).	200 pc(s).	0.011 kg
LED EM green, ultra high brightness	89899756	25 pc(s).	800 pc(s).	0.012 kg

**Ballast lumen factor (BLF) in %**

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

Duration	3 h					
	3 cells	3 cells	4 cells	4 cells	5 cells	5 cells
Type	PC 1x36-33 TC-L COMBO	PC 2x36-33 TC-L COMBO	PC 1x40-34 TC-L COMBO	PC 2x40-34 TC-L COMBO	PC 1x55-35 TC-L COMBO	PC 2x55-35 TC-L COMBO
Article no.	89899920	89899921	89899922	89899923	89899924	89899925

Lamp type	Wattage	BLF in emergency lighting mode in % for rated operating time					
TC-L	36W	5.1	5.1				
	40W			6.1	6.1		
	55W					8.5	8.5

Technology and capacity	Design	Number of cells	Type	Article number	Assignable batteries					
NiCd 4 Ah D cells	Stick	3	Accu-NiCd 3A	89895960	•	•				
	Stick	4	Accu-NiCd 4A 55	89800089			•	•		
	Stick	5	Accu-NiCd 5A	89895973					•	•
	Stick + Stick	2 + 3	Accu-NiCd 5C 55	89800090					•	•
NiMH 4 Ah LA cells	Stick	3	Accu-NiMH 4Ah 3A CON	89800441	•	•				
	Stick	4	Accu-NiMH 4Ah 4A CON	89800442			•	•		
	Stick + Stick	2 + 2	Accu-NiMH 4Ah 4C CON	89800438			•	•		
	Stick + Stick	2 + 3	Accu-NiMH 4Ah 5C CON	89800439					•	•

**Standards**

- according to EN 50172
- according to EN 60598-2-22
- EN 61347-2-3
- EN 61347-2-7
- EN 60929
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61547
- EN 60068-2-64
- EN 60068-2-29
- EN 60068-2-30
- Mains ballast complies with end of lamp life (EOL) test 2



**Note:**

The PC T5 COMBO Ip 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	1.2 V
Cell type	D
Case temperature range	
to ensure 4 years design life	+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

**Accu-NiMh**

**4.0 Ah**

Battery voltage/cell	1.2 V
Cell type	LA
Case temperature range	
to ensure 4 years design life	+5 °C to +40 °C
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	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.

**Working Voltage, lamp current**

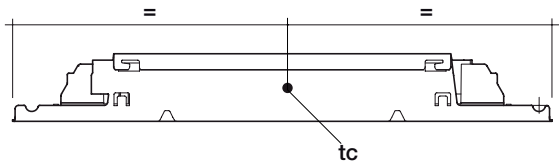
Type	Lamp type	Wattage	Uout <sup>®</sup>	Lamp current <sup>®</sup>
PC 1x36-3 TCL COMBO	T5	1x36 W	300 / 300 V	0.016 A
PC 2x36-3 TCL COMBO	T5	2x36 W	300 / 300 V	0.016 A
PC 1x40-4 TCL COMBO	T5	1x40 W	300 / 300 V	0.017 A
PC 2x40-4 TCL COMBO	T5	2x40 W	300 / 300 V	0.017 A
PC 1x55-5 TCL COMBO	T5	1x55 W	300 / 360 V	0.023 A
PC 2x55-5 TCL COMBO	T5	2x55 W	300 / 360 V	0.023 A

<sup>®</sup> In emergency operation

<sup>®</sup> Max. voltage between output terminals / Max. voltage between output terminal to earth

**Ambient Temperature**

PC TCL COMBO



The nominal  $t_a$  and  $t_c$  point are related to the ballast life duration.

The relation of  $t_c$  to  $t_a$  temperature depends also on the luminaire design. If the measured  $t_c$  temperature is approx. 5 K below  $t_c$  max.,  $t_a$  temperature should be checked and eventually critical components (e.g. ELCAP) measured. Detailed information on request.

**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 mm<sup>2</sup> 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.

### Mechanical details

Channel and Cover manufactured from 0.4 mm white precoated steel.

LED charge indicator

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

Test switch

- Mounting hole 7 mm dia
- 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 Ip 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.

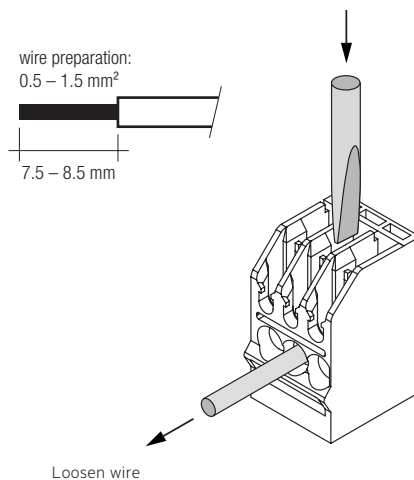
Ballast	Terminal		Maximum lead capacitance allowed	
	Cold	Hot	Cold	Hot
PC 1/xx TCL COMBO	3, 4	1, 2	100 pF	100 pF
PC 2/xx TCL COMBO	1, 2, 5, 6	3, 4	100 pF	100 pF

### IDC interface

- solid wire with a cross section of 0.5 mm<sup>2</sup> according to the specification from WAGO

### Horizontal interface

- solid wire with a cross section of 0.5–1.5 mm<sup>2</sup> according to the specification from WAGO
- strip 7.5–8.5 mm of insulation from the cables to ensure perfect operation of the terminals



### RFI

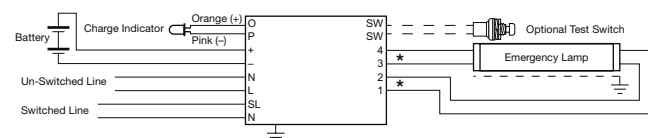
Tridonic ballasts are RFI protected in accordance with EN 55015. To operate the luminaire correctly and to minimise RFI we recommend the following instructions:

- 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

With standard solid wire 0.5/0.75 mm<sup>2</sup> the capacitance of the lead is 30–80 pF/m. This value is influenced by the way the wiring is made.

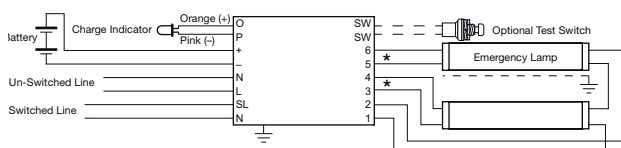
- keep lamp wires short
- lamp connection with multi-lamp ballasts should be made with symmetrical wiring
- for 1 and 2 lamp ballasts: hot leads and cold leads should be separated as much as possible
- The LED, test switch and battery wiring should be routed separately and kept as far away as possible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

### PC TCL COMBO wiring diagrams



\* Hot lead length to be kept as short as possible

Wiring diagram PC TCL COMBO with single TC-L lamp



\* Hot lead length to be kept as short as possible

Wiring diagram PC TCL COMBO with twin TC-L lamp

### 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.