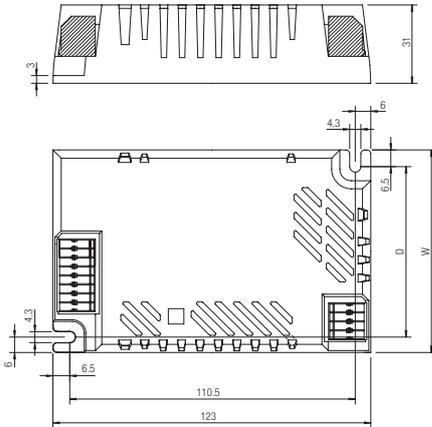


PC CFL COMBO 220–240 V 50/60 Hz



**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
- NiCd or NiMH battery options

- Reverse battery polarity protected
- Battery short circuit protected
- Deep discharge protection
- Regulated electronic charging circuit
- Standard brightness and ultra high brightness (UHB) charge indicator LED available

**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
- Remote battery pack units

**Safe and Reliable**

- Automated manufacture
- Designed and manufactured to ISO 9001
- Complies with European Standards:  
EN 55015: 2006 + A1: 2007 (EMC/Emitted RFI)  
EN 61547 (EMC/Immunity)  
EN 61000.3.2 (EMC/Supply Harmonics)  
EN 61347-2-7 (Safety)  
EN 61347-2-3 (Safety)  
EN 60925 (Performance)  
EN 60929 (Performance)  
in accordance with EN 60598-2-22  
in accordance with EN 50172
- 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

Lamp	Ballast																
type	watt- age W	type	article number	L x W x H mm	fixing centres D mm	weight kg	lamp power W	lamp current A ③	circuit power W	mains current A ④	power factor (ca.) ④	max. case temperature tc point °C	emergency operation BLF	emergency operation EBLF ②	normal operation BLF	dura- tion h	number of cells ①
TC-DEL/TEL	18	PC 1x18-3 TC COMBO	89899990	123x79x31	66.5	0.17	16.5	0.025/0.030	22	0.10	0.96	75	0.11/0.09	0.09/0.08	1.00	3/1	3
TC-DEL/TEL	18	PC 1x18-4 TC COMBO	89899927	123x79x31	66.5	0.17	16.5	0.026	24	0.11	0.96	75	0.190/0.150	0.175/0.150	1.00	3/1	4
TC-DEL/TEL	2x18	PC 2x18-3 TC COMBO	89899982	123x102x31	89.5	0.22	2x17	0.026/0.030	40	0.18	0.97	75	0.110/0.090	0.090/0.080	1.00	3/1	3
TC-DEL/TEL	2x18	PC 2x18-4 TC COMBO	89899928	123x102x31	89.5	0.22	2x16.5	0.026	43	0.19	0.97	75	0.190/0.150	0.175/0.150	1.00	3/1	4
TC-DEL/TEL	26	PC 1x26-3 TC COMBO	89899983	123x79x31	66.5	0.17	24	0.024	28	0.13	0.95	75	0.095/0.065	0.080/0.055	1.00	3/1	3
TC-DEL/TEL	26	PC 1x26-4 TC COMBO	89899976	123x79x31	66.5	0.17	24	0.017/0.019	30	0.14	0.95	75	0.085	0.095/0.085	1.00	3/1	4
TC-DEL/TEL	26	PC 1x26/32-5 TC COMBO	89899929	123x79x31	66.5	0.17	24	0.023	30	0.14	0.95	75	0.140/0.120	0.105/0.075	1.00	3/1	5
TC-DEL/TEL	26	PC 1x26/32/42-6 TC COMBO	89899931	123x79x31	66.5	0.17	24	0.018	30	0.14	0.95	75	0.110/0.080	0.095/0.080	1.00	3/1	6
TC-DEL/TEL	2x26	PC 2x26-3 TC COMBO	89899984	123x102x31	89.5	0.22	2x24	0.024	52	0.23	0.95	75	0.095/0.065	0.080/0.055	1.00	3/1	3
TC-DEL/TEL	2x26	PC 2x26-4 TC COMBO	89899930	123x102x31	89.5	0.22	2x24	0.022/0.024	56	0.25	0.95	75	0.085	0.095/0.085	1.00	3/1	4
TC-DEL/TEL	2x26	PC 2x26/32-5 TC COMBO	89899998	123x102x31	89.5	0.22	2x24/25	0.023	56/57	0.26	0.97	75	0.14/0.12	0.105/0.100	1.00	3/1	5
TC-DEL/TEL	2x26	PC 2x26/32/42-6 TC COMBO	89899989	123x102x31	89.5	0.22	2x24.5	0.018	58	0.26	0.98	75	0.11/0.08	0.095/0.08	1.00	3/1	6
TC-TEL	32	PC 1x26/32-5 TC COMBO	89899929	123x79x31	66.5	0.17	32	0.022	38	0.17	0.97	75	0.070	0.035	1.00	3/1	5
TC-TEL	2x32	PC 2x26/32-5 TC COMBO	89899998	123x102x31	89.5	0.22	2x31/30	0.024	71	0.33	0.98	75	0.100	0.085	1.00	3/1	5
TC-TEL	32	PC 1x26/32/42-6 TC COMBO	89899931	123x79x31	66.5	0.17	32	0.018	40	0.18	0.95	75	0.090	0.085	1.00	3/1	6
TC-TEL	2x32	PC 2x26/32/42-6 TC COMBO	89899989	123x102x31	89.5	0.22	2x31	0.018	75	0.33	0.98	75	0.09	0.085	1.00	3/1	6
TC-TEL	42	PC 1x26/32/42-6 TC COMBO	89899931	123x79x31	66.5	0.17	42	0.018	52	0.23	0.95	75	0.065	0.060	1.00	3/1	6
TC-TEL	2x42	PC 2x26/32/42-6 TC COMBO	89899989	123x102x31	89.5	0.22	2x41	0.018	98	0.44	0.98	75	0.065	0.06	1.00	3/1	6

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

For 1 h duration: NiCd 1.5 Ah Cs cells (55 °C)  
NiMH 2.0 Ah Cs cells (55 °C)

② According to EN 61347-2-7: 2006

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

③ in emergency operation

④ at 230 V, 50 Hz

Lamp		Ballast															
type	wattage W	type	article number	L x W x H mm	fixing centres D mm	weight kg	lamp power W	lamp current A ③	circuit power W	mains current A ④	power factor (ca.) ④	max. case temperature tc point °C	emergency operation BLF	emergency operation EBLF ②	normal operation BLF	duration h	number of cells ①
TC-DD	16	PC 1x16-33 HO DD COMBO	89899926	123x79x31	66.5	0.17	13	0.015	18	0.084	0.95	75	0.09	0.085	1.00	3	3
TC-DD*	28	PC 1x28-33 LO DD COMBO	89899943	123x79x31	66.5	0.17	17	0.020	24	0.11	0.96	75	0.110	0.100	0.75	3	3
TC-DD*	28	PC 1x28-33 HO DD COMBO	89899957	123x79x31	66.5	0.17	25	0.020	31	0.14	0.96	75	0.110	0.100	1.00	3	3
TC-DD	28	PC 1x28-34 LO DD COMBO	89899955	123x79x31	66.5	0.17	17	0.026	24	0.11	0.96	75	0.150	0.115	0.75	3	4
TC-DD	28	PC 1x28-34 HO DD COMBO	89899958	123x79x31	66.5	0.17	25	0.026	31	0.14	0.96	75	0.150	0.115	1.00	3	4
TC-DD*	38	PC 1x38-34 LO DD COMBO	89899981	123x79x31	66.5	0.17	26	0.013	35	0.16	0.96	75	0.060	0.055	0.85	3	4
TC-DD*	38	PC 1x38-34 HO DD COMBO	89899933	123x79x31	66.5	0.17	34	0.013	41	0.18	0.96	75	0.060	0.055	1.00	3	4
TC-DD	38	PC 1x38-35 HO DD COMBO	89899975	123x79x31	66.5	0.17	34	0.020	41	0.18	0.96	75	0.100	0.085	1.00	3	5

\* 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)

For 1 h duration: NiCd 1.5 Ah Cs cells (55 °C)  
 NiMH 2.0 Ah Cs cells (55 °C)  
 Note: The stated temperature in brackets is the max. battery case temperature!

② According to EN 61347-2-7: 2006  
 ③ in emergency operation  
 ④ at 230 V, 50 Hz

#### Status indication

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

type	article number
LED EM green	89899605
LED EM green, high brightness	89899756

#### Test switch

An optional test switch can be wired to the twin lamp versions of the PC CFL COMBO. This can be used to check local operation of the luminaire.

type	article number
Test switch EM 2	89805277

#### 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 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 IEC 60068-2-64 Fh  
 Bump test EIC 60068-2-29 Eb  
 Humidity IEC 60068-2-30

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

#### 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	-15 °C
number of starts per lamp	ca. 20.000
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 Ah D, NiMH 4 Ah Cs (3 h)	200 mA
NiCd 1.5 Ah Cs, NiMH 2 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

## Ambient Temperature

### PC CFL 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.

### Mechanical details

#### PC CFL COMBO:

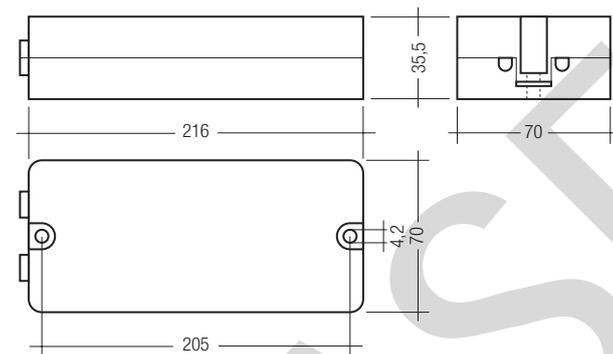
Case manufactured from polycarbonate.

#### 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)



#### Mechanical data Accu NiCd Remote pack:

- Polycarbonate case
- 1.0 m integral double insulated lead
- 1.0 mm<sup>2</sup> solid cable

To be connected to suitable strain relieved terminal block in luminaire or suitable polarised plug/socket for connection to luminaire.

#### Termination

9 mm semi-stripped insulation with protective tape.

Accu NiCd (Remote pack)	type	number of cells	article number	L x W x H mm	weight g
Pack-NiCd 3D	Remote pack 4.0 Ah	3	89899672	216 x 70 x 35.5	570
Pack-NiCd 4D	Remote pack 4.0 Ah	4	89899673	216 x 70 x 35.5	700
Pack-NiCd 5D	Remote pack 4.0 Ah	5	89899674	216 x 70 x 35.5	840
Pack-NiCd 6D	Remote pack 4.0 Ah	6	89899675	216 x 70 x 35.5	980
Pack-NiCd 3C	Remote pack 1.5 Ah	3	89899676	216 x 70 x 35.5	320
Pack-NiCd 4C	Remote pack 1.5 Ah	4	89899677	216 x 70 x 35.5	370
Pack-NiCd 5C	Remote pack 1.5 Ah	5	89899678	216 x 70 x 35.5	420
Pack-NiCd 6C	Remote pack 1.5 Ah	6	89899679	216 x 70 x 35.5	470

### Service life

PC CFL COMBO is designed for an average service life 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 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.

### Accu NiCd (Remote pack):



#### 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 $t_c$ 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).



### 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.



### 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.

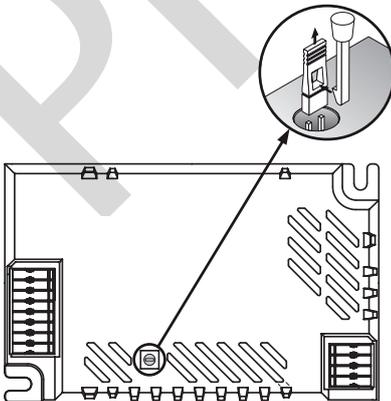
### Jumper selection (for TC-D/T lamp variants):

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 %.

#### Number of electronic ballasts

type	type C MCB rating				type B MCB rating			
	10 A	13 A	16 A	20 A	10 A	13 A	16 A	20 A
PC 1x18-3 TC COMBO	42	60	72	102	21	30	36	51
PC 1x18-4 TC COMBO	42	60	72	102	21	30	36	51
PC 2x18-3 TC COMBO	34	48	58	70	17	24	29	35
PC 2x18-4 TC COMBO	34	48	58	70	17	24	29	35
PC 1x26-3 TC COMBO	36	50	60	72	18	25	30	36
PC 1x26-4 TC COMBO	36	50	60	72	18	25	30	36
PC 1x26/32-5 TC COMBO	36	50	60	72	18	25	30	36
PC 1x26/32/42-6 TC COMBO	34	46	58	70	17	23	29	35
PC 2x26-3 TC COMBO	30	42	56	68	15	21	28	34
PC 2x26-4 TC COMBO	30	42	56	68	15	21	28	34
PC 2x26/32-5 TC COMBO	8	14	18	20	4	7	9	10
PC 2x26/32/42-6 TC COMBO	8	14	18	20	4	7	9	10
PC 1x16-33 HO DD COMBO	40	70	74	94	20	35	37	47
PC 1x28-33 LO DD COMBO	42	74	78	98	21	37	39	49
PC 1x28-33 HO DD COMBO	40	70	74	94	20	35	37	47
PC 1x28-34 LO DD COMBO	42	74	78	98	21	37	39	49
PC 1x28-34 HO DD COMBO	38	68	72	92	19	34	36	46
PC 1x38-34 LO DD COMBO	34	50	60	70	17	25	30	35
PC 1x38-34 HO DD COMBO	34	50	60	70	17	25	30	35
PC 1x38-35 HO DD COMBO	34	50	60	70	17	25	30	35

#### Working Voltage

type	lamp type	wattage W	U <sub>out</sub>
PC 1x18-3 TC COMBO	TC-DEL/TEL	18	250
PC 1x18-4 TC COMBO	TC-DEL/TEL	18	250
PC 2x18-3 TC COMBO	TC-DEL/TEL	2x18	250
PC 2x18-4 TC COMBO	TC-DEL/TEL	2x18	250
PC 1x26-3 TC COMBO	TC-DEL/TEL	26	250
PC 1x26-4 TC COMBO	TC-DEL/TEL	26	250
PC 1x26/32-5 TC COMBO	TC-DEL/TEL	26/32	250
PC 1x26/32/42-6 TC COMBO	TC-DEL/TEL	26/32/42	250
PC 2x26-3 TC COMBO	TC-DEL/TEL	2x26	250
PC 2x26-4 TC COMBO	TC-DEL/TEL	2x26	250
PC 2x26/32-5 TC COMBO	TC-DEL/TEL	2x26	250
PC 2x26/32/42-6 TC COMBO	TC-DEL/TEL	2x26/32/42	250
PC 1x16-33 HO DD COMBO	TC-DD		250
PC 1x28-33 LO DD COMBO	TC-DD	28	300
PC 1x28-33 HO DD COMBO	TC-DD	28	250
PC 1x28-34 LO DD COMBO	TC-DD	28	300
PC 1x28-34 HO DD COMBO	TC-DD	28	250
PC 1x38-34 LO DD COMBO	TC-DD	38	250
PC 1x38-34 HO DD COMBO	TC-DD	38	250
PC 1x38-35 HO DD COMBO	TC-DD	38	250
PC 1x26/32/42-6 TC COMBO	TC-TEL	42	250

### 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

### Packing 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.

Type	Terminal		Maximum lead capacitance allowed	
	Cold	Hot	Cold	Hot
PC 1/xx CFL COMBO	3,4	1,2	50 pF	50 pF
PC 2/xx CFL COMBO	1,2,5,6	3,4	50 pF	50 pF



### Installation instructions

#### IDC interface

- solid wire with a cross section of  $0.5 \text{ mm}^2$  according to the specification from WAGO

#### Horizontal interface

- solid wire with a cross section of  $0.5\text{--}1.5 \text{ mm}^2$  according to the specification from WAGO
- strip  $7.5\text{--}8.5 \text{ mm}$  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, louver, 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.

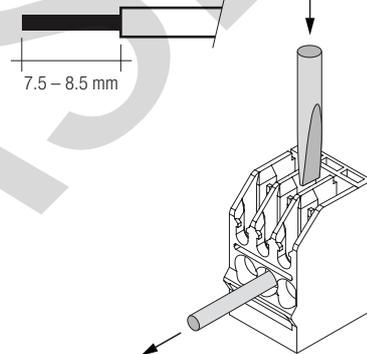
### Storage:

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  $0.5/0.75 \text{ mm}^2$  the capacitance of the lead is  $30\text{--}80 \text{ pF/m}$ . This value is influenced by the way the wiring is made.

- Keep all leads as short as possible, maximum length  $0.5 \text{ m}$
- 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.

wire preparation:  
 $0.5\text{--}1.5 \text{ mm}^2$

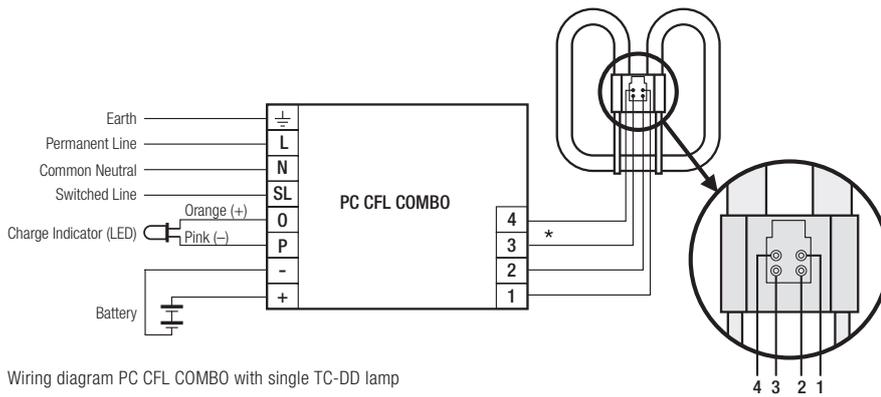


### RFI

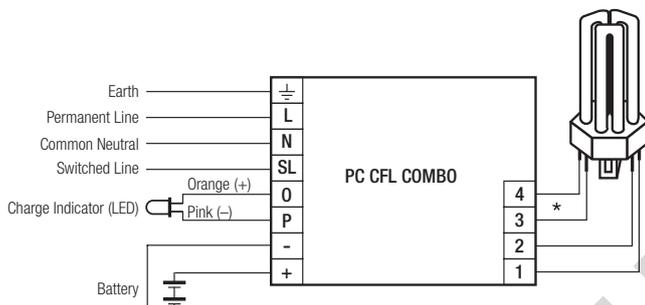
TridonicAtco ballasts are RFI protected in accordance with EN 55015: 2006 + A1: 2007. To operate the luminaire correctly and to minimise RFI we recommend the following instructions:

- 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  $5\text{--}10 \text{ cm}$  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

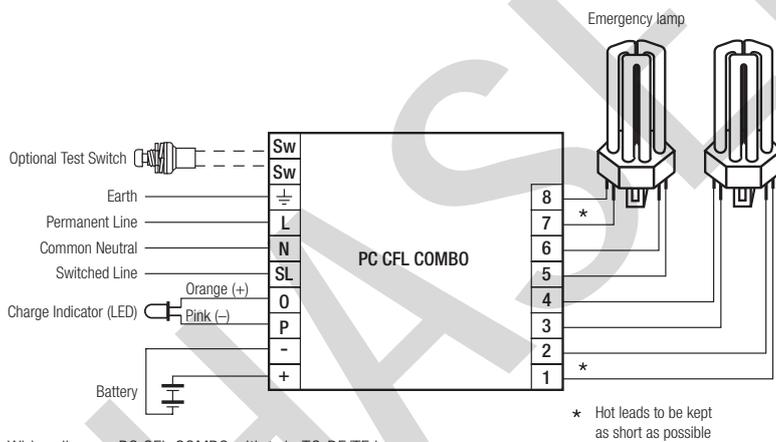
PC CFL COMBO wiring diagrams:



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

① For further technical information  
please visit [www.tridonicatco.com](http://www.tridonicatco.com)