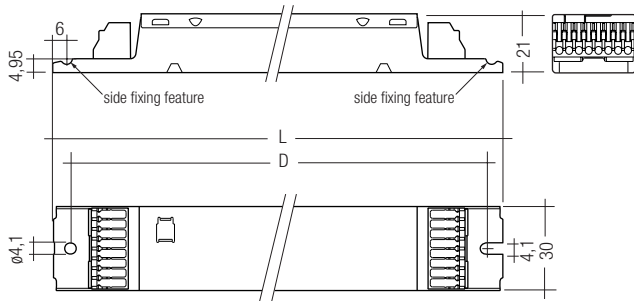


PC T5 COMBO Ip 220–240 V 50/60 Hz



Description:

Warm start fixed output, combined electronic high frequency ballasts and emergency lighting modules for T5 fluorescent lamps.

Features:

Operation

- Latest ballast technology
- Intelligent voltage guard (IVG)
- Preheat start in normal operation
- Cathode heating during emergency operation
- AC operation of all lamps
- Automatic restart after lamp change in normal operation
- 3 hour and 1 hour duration
- 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
- Low profile cross section (21x30mm)
- Simplified wiring
- No compatibility issues
- IDC terminals for automatic and manual wiring
- Emergency testing by isolating only the unswitched supply
- Optional test switch

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 50172 (Emergency escape lighting systems)
- In accordance with EN 60598-2-22
- Mains ballast complies with end of lam life (EOL) test 2
- ENEC approved. CE marked

Note: The PC T5 COMBO Ip is not intended to be used for high risk task area lighting

Lamp		Ballast															
type	watt-age W	type	article number	length L mm	fixing centres mm	weight kg	lamp power W	lamp current A ③	circuit power W	mains current A	power factor (ca.)	max. case temperature tc point °C	emergency operation BLF	emergency operation EBLF ②	normal operation BLF	duration h	number of cells ①
T5	1x14	PC 1x14 – 3 T5 COMBO Ip	89899875	425	415	0.43	14.4	0.027	19.4	0.090	0.95	70	0.17	0.170	1.00	3 / 1	3
T5	2x14	PC 2x14 – 3 T5 COMBO Ip	89899876	425	415	0.45	28.8	0.027	35.0	0.160	0.97	70	0.17	0.170	1.00	3 / 1	3
T5	3/4x14	PC 3/4x14 – 3 T5 COMBO	89899877	see separate datasheet													
T5	1x21	PC 1x21/28 – 5 T5 COMBO Ip	89899881	425	415	0.43	20.5	0.017	28.8	0.130	0.95	70	0.12	0.115	1.00	3 / 1	5
T5	2x21	PC 2x21/28 – 5 T5 COMBO Ip	89899882	425	415	0.45	40.9	0.017	50.0	0.225	0.96	70	0.12	0.110	1.00	3 / 1	5
T5	1x24	PC 1x24 – 4 T5 COMBO Ip	89899879	425	415	0.43	22.2	0.027	29.9	0.135	0.95	70	0.13	0.127	1.00	3/1	4
T5	2x24	PC 2x24 – 4 T5 COMBO Ip	89899880	425	415	0.45	43.0	0.027	54.7	0.245	0.97	70	0.13	0.127	1.00	3/1	4
T5	3/4x24	PC 3/4x24 – 4 T5 COMBO	89899878	see separate datasheet													
T5	1x28	PC 1x21/28 – 5 T5 COMBO Ip	89899881	425	415	0.43	27.9	0.016	35.9	0.160	0.97	70	0.12	0.095	1.00	3 / 1	5
T5	2x28	PC 2x21/28 – 5 T5 COMBO Ip	89899882	425	415	0.45	55.8	0.016	66.5	0.295	0.98	70	0.12	0.095	1.00	3 / 1	5
T5	1x35	PC 1x35 – 6 T5 COMBO Ip	89899885	425	415	0.43	35.7	0.016	44.5	0.200	0.97	70	0.13	0.075	1.00	3 / 1	6
T5	2x35	PC 2x35 – 6 T5 COMBO Ip	89899886	425	415	0.45	71.4	0.016	84.4	0.370	0.98	70	0.13	0.075	1.00	3 / 1	6
T5	1x39	PC 1x39 – 5 T5 COMBO Ip	89899883	425	415	0.33	40.0	0.015	47.0	0.210	0.97	70	0.07	0.065	1.00	3 / 1	5
T5	2x39	PC 2x39 – 5 T5 COMBO Ip	89899884	425	415	0.33	77.0	0.015	88.0	0.390	0.98	70	0.07	0.065	1.00	3 / 1	5
T5	1x49	PC 1x49 – 5 T5 COMBO Ip	89899887	425	415	0.43	50.0	0.011	58.2	0.260	0.98	70	0.06	0.05	1.00	3/1	5
T5	2x49	PC 2x49 – 5 T5 COMBO Ip	89899888	425	415	0.45	101.4	0.013	112.0	0.500	0.99	70	0.07	0.05	1.00	3/1	5
T5	1x54	PC 1x54 – 6 T5 COMBO Ip	89899889	425	415	0.43	54.8	0.014	66.9	0.300	0.97	70	0.06	0.040	1.00	3/1	6
T5	2x54	PC 2x54 – 6 T5 COMBO Ip	89899890	425	415	0.45	105.0	0.014	120.3	0.530	0.99	75	0.06	0.040	1.00	3/1	6
T5	1x80	PC 1x80 – 6 T5 COMBO Ip	89899891	425	415	0.43	79.5	0.012	87.3	0.385	0.98	70	0.048	0.043	1.00	3/1	6

① For 3 h duration: NiCd 4.0 Ah D cells

NiMH 4.0 Ah Cs Cells

For 1 h duration: NiCd 1.5 Ah Cs Cells or

NiMH 2.0 Ah Cs Cells

② According to EN 61347-2-7: 2006

③ in emergency operation

Accu – 3 h duration

NiCd 4.0 Ah D cells	type of cells	number of cells	article number
Accu-NiCd 3A	stick	3	89895960
Accu-NiCd 4A	stick	4	89895961
Accu-NiCd 5A	stick	5	89895973
Accu-NiCd 5B	stick + stick	3 + 2	89895962
Accu-NiCd 6A	stick + stick	3 + 3	89895963

Accu – 1 h duration

NiCd 1.5 Ah Cs cells	type of cells	number of cells	article number
Accu-NiCd C 3A	stick	3	89899743
Accu-NiCd C 4A	stick	4	89899692
Accu-NiCd C 5A	stick	5	89899695
Accu-NiCd C 6A	stick	6	89899698
Accu-NiCd C 6C	stick + stick	3 + 3	89899699

Other batteries are available

See catalogue or separate datasheet for further information

Technical data PC T5 COMBO Ip

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	

NiMH 4.0 Ah Cs cells	type of cells	number of cells	article number
Accu-NiMH 4Ah C 3A	stick	3	89899854
Accu-NiMH 4Ah C 4A	stick	4	89899850
Accu-NiMH 4Ah C 5A	stick	5	89899851
Accu-NiMH 4Ah C 6A	stick	6	89899852
Accu-NiMH 4Ah C 6C	stick + stick	3 + 3	89899853

NiMH 2.0 Ah Cs cells	type of cells	number of cells	article number
Accu-NiMH C 3A	stick	3	89899744
Accu-NiMH C 4A	stick	4	89899700
Accu-NiMH C 5A	stick	5	89899703
Accu-NiMH C 6A	stick	6	89899706
Accu-NiMH C 6C	stick + stick	3 + 3	89899707

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

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 PC T5 COMBO Ip. This can be used to check local operation of the luminaire.

type	article number
Test switch EM 3 ①	89899956

① new plug-in version

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 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
min. lamp starting temperature	-15°C
starting time	ca. 1.6 s
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)	210 mA
NiCd 1.5 Ah Cs, NiMH 2 Ah Cs (1 h)	105 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

Technical data Accu-NiCd:

case temperature range
to ensure 4 years life 0 °C → +55 °C
storage life in temperate conditions 4 years
battery voltage per cell 1,2 V

Capacity:

Accu-NiCd D 4.0 Ah
Accu-NiCd Cs 1.5 Ah

Note:

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



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 T5 COMBO Ip 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.

Technical data Accu-NiMh 2.0 Ah:

case temperature range
to ensure 4 years life 0 °C → +55 °C
storage life in temperate conditions 4 years
battery voltage per cell 1.2 V
capacity 2.0 Ah

Technical data Accu-NiMh 4.0 Ah:

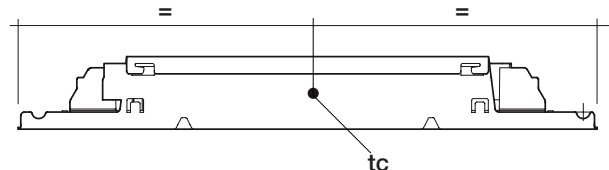
case temperature range
to ensure 4 years life 0 °C → +45 °C
storage life in temperate conditions 4 years
battery voltage per cell 1.2 V
capacity 4.0 Ah

Working Voltage

type	lamp type	wattage w	U _{out}
PC 1x14 – 3 T5 COMBO Ip	T5	1x14	400 V
PC 2x14 – 3 T5 COMBO Ip	T5	2x14	300 V
PC 1x21/28 – 5 T5 COMBO Ip	T5	1x21/28	300 V
PC 2x21/28 – 5 T5 COMBO Ip	T5	2x21/28	300 V
PC 1x24 – 4 T5 COMBO Ip	T5	1x24	250 V
PC 2x24 – 4 T5 COMBO Ip	T5	2x24	400 V
PC 1x35 – 6 T5 COMBO Ip	T5	1x35	400 V
PC 2x35 – 6 T5 COMBO Ip	T5	2x35	300 V
PC 1x39 – 5 T5 COMBO Ip	T5	1x39	250 V
PC 2x39 – 5 T5 COMBO Ip	T5	2x39	250 V
PC 1x49 – 5 T5 COMBO Ip	T5	1x49	360 V
PC 2x49 – 5 T5 COMBO Ip	T5	2x49	300 V
PC 1x54 – 6 T5 COMBO Ip	T5	1x54	260 V
PC 2x54 – 6 T5 COMBO Ip	T5	2x54	260 V
PC 1x80 – 6 T5 COMBO Ip	T5	1x80	310 V

Ambient Temperature

PC T5 COMBO Ip



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.

Service life

PC T5 COMBO Ip 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 T5 COMBO Ip 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:

Channel and Cover manufactured from 0.4 mm white pre-coated 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

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


Jumper selection:

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.

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.

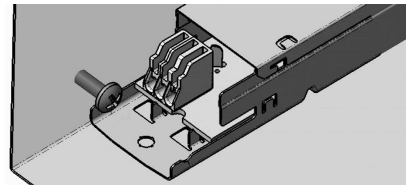
The combined unit is intended to be earthed by the  marked terminal connection.

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

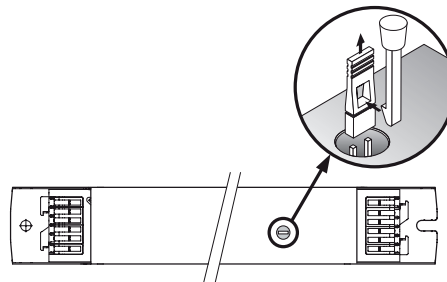
Side fixing feature



Screw M4, screw head diameter 8–10 mm

Packing quantities:

PC T5 COMBO Ip:	Accu NiCd / NiMH:
25 pieces/carton	25 pieces/carton
33 cartons/pallet	
825 pieces/pallet	Test switch:
	25 pieces/bag
LED green:	200 pieces/carton
25 pieces/bag	
200 pieces/carton	



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 T5 Combo Ip 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.
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.

Type	Terminal		Maximum lead capacitance allowed	
	Cold	Hot	Cold	Hot
PC 1/xx T5 COMBO Ip	3,4	1,2	200 pF	100 pF
PC 2/xx T5 COMBO Ip	3,4,5,6	1,2,7,8	200 pF	100 pF
PC 2/35 T5 COMBO Ip	3,4,5,6	1,2,7,8	100 pF	50 pF
PC 2/49 T5 COMBO Ip	3,4,5,6	1,2,7,8	100 pF	50 pF

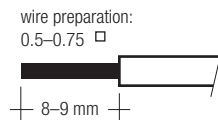
With standard solid wire 0.5/0.75 mm² the capacitance of the lead is 30–80 pF/m. This value is influenced by the way the wiring is made.

- keep lamp wires short
- lamp connection with multi-lamp ballasts should be made with symmetrical wiring
- for 1 and 2 lamp ballasts: hot leads 1,2,7,8 and cold leads 3,4,5,6 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.



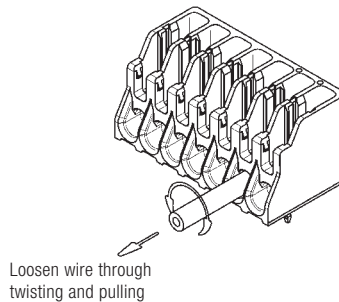
IDC interface

- Solid wire with a cross section of 0.5 mm² according to the specification from WAGO
- Alternatively a flexible lead with a cross section of 0.75 mm²



Horizontal interface

- Solid wire with a cross section of 0.5–0.75 mm² according to the specification from WAGO
- Solid wire with a cross section of 1.0 mm² with an insulation diameter up to 2.5 mm
- Strip 9 mm of insulation from the cables to ensure perfect operation of the terminals
- Loosen wire through twisting and pulling

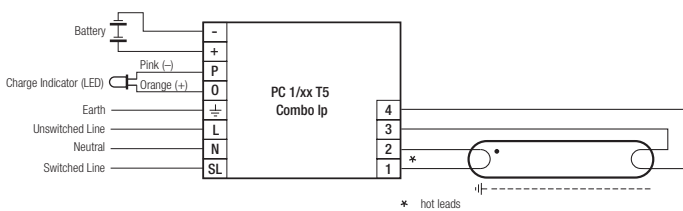


RFI

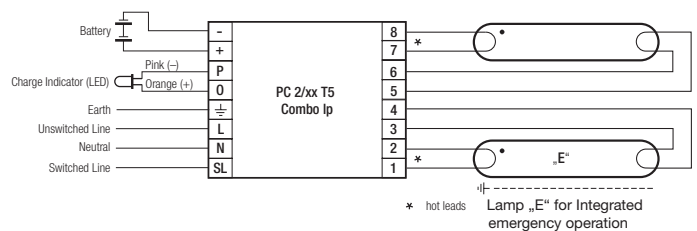
TridonicAtco ballasts are RFI protected in accordance with EN 55015: 2006 + A1: 2007. To operate the luminaire correctly and to minimise RFI we recommend the following instructions:

- 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, over the terminal.
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

PC T5 COMBO Ip wiring diagrams



Wiring diagram PC T5 COMBO Ip with single T5 lamp



Wiring diagram PC T5 COMBO Ip with twin T5 lamp

For further technical information please visit www.tridonicatco.com