

PC T5 PRO Ip, 14 – 35 W

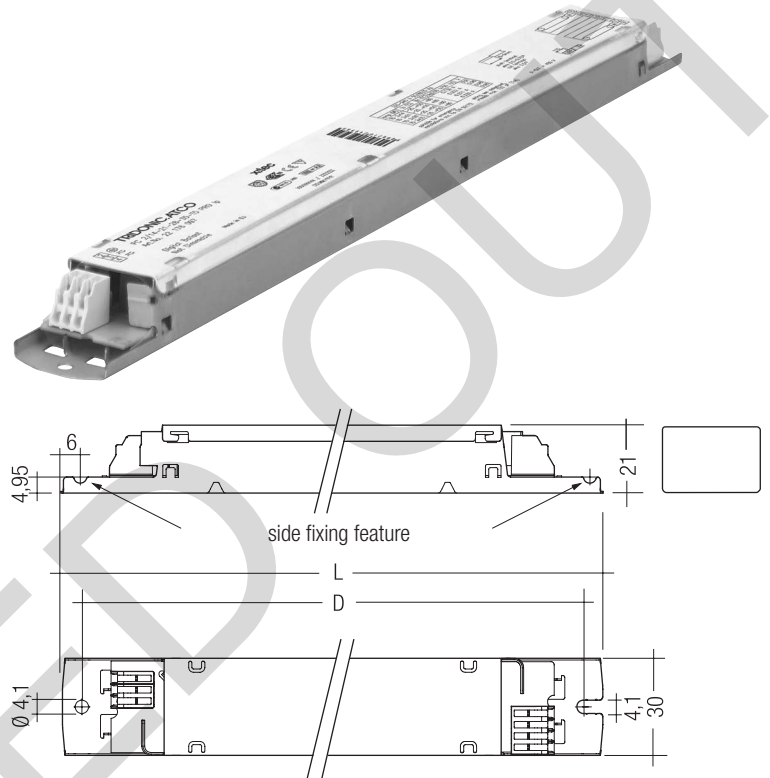
T5 high efficiency and TC-L compact fluorescent lamps (CFL)

Product description

- Average life = 50,000 hours (at max ta.
with a failure rate $\leq 0.2\%$ per 1,000 hours)
- Large temperature range (for values see table)
- Safety shutdown at end of life
- Automatic start after replacement of defective lamps
- For emergency lighting systems as per EN 50172
- Constant luminous flux irrespective of fluctuations in mains voltage
- For luminaires of protection class 1 and protection class 2
- Insulation Displacement Connection (IDC) terminal for rapid automatic or manual wiring
- Temperature protection as per EN 61347-2-3 C5e

Technical data

AC voltage range	198 – 264 V
DC voltage range	176 – 280 V (Lamp start ≥ 198 V DC)
Overvoltage protection	320 V AC, 1 h
Defined warm start	≤ 1.5 s
Operating frequency	≥ 40 kHz
Type of protection	IP20



Standards, page 2

Wiring diagrams and installation examples, page 5

Ordering data

Type	Article number
For luminaires with 1 lamp	
PC 1/14-21-28-35 T5 PRO Ip	22176096
For luminaires with 2 lamps	
PC 2/14-21-28-35 T5 PRO Ip	22176097
For luminaires with 3 or 4 lamps	
PC 3/4/14 T5 PRO Ip	22176315

Packaging 280 mm casing: 10 pieces/carton, 960 pieces/pallet

Packaging 360 mm casing: 10 pieces/carton, 760 pieces/pallet

Specific technical data

Lamp wattage	Lamp type	Type	Length L	Hole spacing D	Weight	Lamp wattage	Circuit power	EEL	Current at 50 Hz		λ at 50 Hz		tc point	Ambient temperature ta
									220 V	240 V	220 V	240 V		
For luminaires with 1 lamp														
1 x 14 W	T5	PC 1/14-21-28-35 T5 PRO Ip	280 mm	270 mm	0.20 kg	14.0 W	16.0 W	A2 BAT	0.07 A	0.07 A	0.98	0.96	75 °C	-25 ... 55 °C
1 x 21 W	T5	PC 1/14-21-28-35 T5 PRO Ip	280 mm	270 mm	0.20 kg	20.6 W	22.5 W	A2 BAT	0.10 A	0.10 A	0.98	0.96	75 °C	-25 ... 55 °C
1 x 28 W	T5	PC 1/14-21-28-35 T5 PRO Ip	280 mm	270 mm	0.20 kg	27.9 W	30.5 W	A2 BAT	0.14 A	0.13 A	0.98	0.96	75 °C	-25 ... 55 °C
1 x 35 W	T5	PC 1/14-21-28-35 T5 PRO Ip	280 mm	270 mm	0.20 kg	35.5 W	38.5 W	A2	0.18 A	0.17 A	0.98	0.96	75 °C	-25 ... 55 °C
1 x 28 W	TC-L	PC 1/14-21-28-35 T5 PRO Ip	280 mm	270 mm	0.20 kg	25.8 W	29.0 W	A2 BAT	0.13 A	0.12 A	0.98	0.97	70 °C	-25 ... 55 °C
For luminaires with 2 lamps														
2 x 14 W	T5	PC 2/14-21-28-35 T5 PRO Ip	360 mm	350 mm	0.26 kg	28.0 W	31.0 W	A2 BAT	0.14 A	0.14 A	0.98	0.96	80 °C	-25 ... 50 °C
2 x 21 W	T5	PC 2/14-21-28-35 T5 PRO Ip	360 mm	350 mm	0.26 kg	41.2 W	45.5 W	A2 BAT	0.21 A	0.20 A	0.99	0.97	80 °C	-25 ... 50 °C
2 x 28 W	T5	PC 2/14-21-28-35 T5 PRO Ip	360 mm	350 mm	0.26 kg	55.8 W	61.0 W	A2 BAT	0.28 A	0.26 A	0.99	0.97	80 °C	-25 ... 50 °C
2 x 35 W	T5	PC 2/14-21-28-35 T5 PRO Ip	360 mm	350 mm	0.26 kg	71.0 W	76.5 W	A2	0.35 A	0.33 A	0.99	0.97	80 °C	-25 ... 50 °C
2 x 28 W	TC-L	PC 2/14-21-28-35 T5 PRO Ip	360 mm	350 mm	0.26 kg	49.7 W	54.5 W	A2 BAT	0.25 A	0.23 A	0.98	0.97	70 °C	-25 ... 50 °C
For luminaires with 3 or 4 lamps														
3 x 14 W	T5	PC 3/4/14 T5 PRO Ip	360 mm	350 mm	0.25 kg	42.0 W	47.1 W	A2 BAT	0.22 A	0.20 A	0.98	0.97	65 °C	-25 ... 50 °C
4 x 14 W	T5	PC 3/4/14 T5 PRO Ip	360 mm	350 mm	0.25 kg	56.0 W	62.3 W	A2 BAT	0.29 A	0.26 A	0.99	0.98	70 °C	-25 ... 50 °C

Standards

EN 55015
 EN 61347-2-4
 EN 61347-2-3
 EN 60929
 EN 61000-3-2
 EN 61547
 in accordance with EN 50172
 IEC 68-2-64 Fh
 IEC 68-2-29 Eb
 IEC 68-2-30

Lamp starting characteristics

Warm start
 Starting time 1.5 secs with AC and DC operation
 Cathode heating will be reduced after preheat time

AC operation

Mains voltage:
 220–240 V 50/60 Hz
 198–264 V 50/60 Hz including safety
 tolerance ($\pm 10\%$)
 202–254 V 50/60 Hz including performance
 tolerance ($+6\%$ / -8%)

DC operation

220–240 V 0 Hz
 198–280 V 0 Hz certain lamp start
 176–280 V 0 Hz operating range
 Light output level in DC operation: 100 %

Emergency lighting

Use in emergency lighting installations according to EN 50172 or for emergency luminaires according to EN 61347-2-3 appendix J.

Instant start after mains interruption < 0.5 s

Intelligent Voltage Guard

Intelligent Voltage Guard is the name of the new electronic monitor from Tridonic. This innovative feature of the PC PRO family of control gear from Tridonic immediately shows if the mains voltage rises above or falls below certain thresholds. 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.
- If the mains voltage falls below 150 V the control gear automatically disconnects the lamp circuit to protect the control gear from being irreparably damaged.

Smart Heating

Innovative heating circuit. Reduced filament heating after lamp ignition.

Mains currents in DC operation

Type	lamp type	wattage	mains current at $U_n = 220\text{ V}_{DC}$	mains current at $U_n = 240\text{ V}_{DC}$
PC 1/14-21-28-35 T5 PRO Ip	T5	1x14 W	73 mA	67 mA
PC 2/14-21-28-35 T5 PRO Ip	T5	2x14 W	141 mA	129 mA
PC 3/4/14 T5 PRO Ip	T5	3x14 W	217 mA	201 mA
PC 3/4/14 T5 PRO Ip	T5	4x14 W	287 mA	264 mA
PC 1/14-21-28-35 T5 PRO Ip	T5	1x21 W	102 mA	94 mA
PC 2/14-21-28-35 T5 PRO Ip	T5	2x21 W	207 mA	190 mA
PC 1/14-21-28-35 T5 PRO Ip	T5	1x28 W	139 mA	127 mA
PC 2/14-21-28-35 T5 PRO Ip	T5	2x28 W	277 mA	254 mA
PC 1/14-21-28-35 T5 PRO Ip	TC-L	1x28 W	125 mA	115 mA
PC 2/14-21-28-35 T5 PRO Ip	TC-L	2x28 W	250 mA	230 mA
PC 1/14-21-28-35 T5 PRO Ip	T5	1x35 W	175 mA	160 mA
PC 2/14-21-28-35 T5 PRO Ip	T5	2x35 W	348 mA	319 mA

Harmonic distortion in the mains supply

Type	lamp type	wattage	THD at 230 V / 50 Hz
PC 1/14-21-28-35 T5 PRO Ip	T5	1x14 W	$< 12\%$
PC 2/14-21-28-35 T5 PRO Ip	T5	2x14 W	$< 12\%$
PC 3/4/14 T5 PRO Ip	T5	3x14 W	$< 10\%$
PC 3/4/14 T5 PRO Ip	T5	4x14 W	$< 10\%$
PC 1/14-21-28-35 T5 PRO Ip	T5	1x21 W	$< 10\%$
PC 2/14-21-28-35 T5 PRO Ip	T5	2x21 W	$< 10\%$
PC 1/14-21-28-35 T5 PRO Ip	T5	1x28 W	$< 10\%$
PC 2/14-21-28-35 T5 PRO Ip	T5	2x28 W	$< 10\%$
PC 1/14-21-28-35 T5 PRO Ip	TC-L	1x28 W	$< 10\%$
PC 2/14-21-28-35 T5 PRO Ip	TC-L	2x28 W	$< 10\%$
PC 1/14-21-28-35 T5 PRO Ip	T5	1x35 W	$< 10\%$
PC 2/14-21-28-35 T5 PRO Ip	T5	2x35 W	$< 10\%$

Output voltage

Type	lamp type	wattage	U_{out}
PC 1/14-21-28-35 T5 PRO Ip	T5	1x14 W	300 V
PC 2/14-21-28-35 T5 PRO Ip	T5	2x14 W	400 V
PC 3/4/14 T5 PRO Ip	T5	3x14 W	400 V
PC 3/4/14 T5 PRO Ip	T5	4x14 W	400 V
PC 1/14-21-28-35 T5 PRO Ip	T5	1x21 W	300 V
PC 2/14-21-28-35 T5 PRO Ip	T5	2x21 W	400 V
PC 1/14-21-28-35 T5 PRO Ip	T5	1x28 W	300 V
PC 2/14-21-28-35 T5 PRO Ip	T5	2x28 W	400 V
PC 1/14-21-28-35 T5 PRO Ip	TC-L	1x28 W	300 V
PC 2/14-21-28-35 T5 PRO Ip	TC-L	2x28 W	400 V
PC 1/14-21-28-35 T5 PRO Ip	T5	1x35 W	300 V
PC 2/14-21-28-35 T5 PRO Ip	T5	2x35 W	400 V

Ballast lumen factor (EN 60929 8.1)

Type	lamp type	wattage	AC/DC-BLF at $U = 198\text{--}254\text{ V}$, 25°C
PC 1/14-21-28-35 T5 PRO Ip	T5	1x14 W	1.00
PC 2/14-21-28-35 T5 PRO Ip	T5	2x14 W	1.00
PC 3/4/14 T5 PRO Ip	T5	3x14 W	1.00
PC 3/4/14 T5 PRO Ip	T5	4x14 W	1.00
PC 1/14-21-28-35 T5 PRO Ip	T5	1x21 W	1.00
PC 2/14-21-28-35 T5 PRO Ip	T5	2x21 W	1.00
PC 1/14-21-28-35 T5 PRO Ip	T5	1x28 W	1.00
PC 2/14-21-28-35 T5 PRO Ip	T5	2x28 W	1.00
PC 1/14-21-28-35 T5 PRO Ip	TC-L	1x28 W	0.93
PC 2/14-21-28-35 T5 PRO Ip	TC-L	2x28 W	0.93
PC 1/14-21-28-35 T5 PRO Ip	T5	1x35 W	1.00
PC 2/14-21-28-35 T5 PRO Ip	T5	2x35 W	1.00

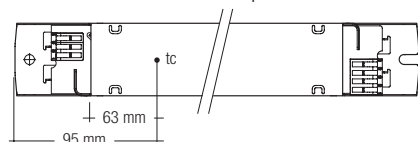
PC PRO with xitec processor

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 / A2 BAT¹⁾

PC T5 PRO 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.

¹⁾ according to the EU directives on ecodesign requirements (EC) No. 245/2009 and (EC) No. 347/2010

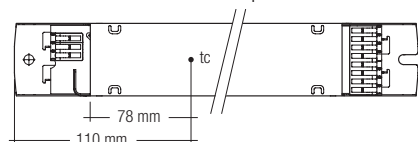
Ambient Temperature**PC 1/14-21-28-35 T5 PRO Ip**

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.

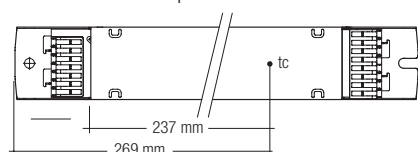
Detailed information on request.

PC T5 PRO 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.

PC 2/14-21-28-35 T5 PRO Ip

Humidity: 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Storage temperature: -40 °C up to max. +80 °C

PC 3/4/14 T5 PRO Ip

The devices have to be within the specified temperature range (t_a) before they can be operated.

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20
Installation Ø	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²
PC 1/14-21-28-35 T5 PRO Ip	32	44	50	64	16	22	25	32
PC 2/14-21-28-35 T5 PRO Ip	18	24	28	34	9	12	14	17
PC 3/4/14 T5 PRO Ip	32	42	52	65	20	30	33	39

Wiring advice

The lead length is dependant on the capacitance of the cable.

For safety reasons, the PC T5 PRO 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.

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 9, 10, 15, 16 and cold leads 11, 12, 13, 14 should be separated as much as possible

Ballast	Terminal	Maximum capacitance allowed			
		Cold	Hot	Cold	Hot
PC 1/14-21-28-35 T5 PRO Ip		11, 12	9, 10	200 pF	100 pF
PC 2/14-21-28-35 T5 PRO Ip		11, 12, 13, 14	9, 10, 15, 16	200 pF	100 pF
PC 3/4/14 T5 PRO Ip		5, 6, 7, 8, 11, 12, 13, 14, 15, 16	9, 10	200 pF	100 pF

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.)

Installation instructions

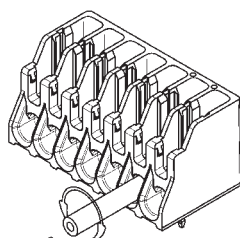
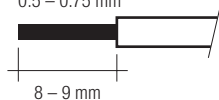
IDC interface

- solid wire with a cross section of 0.5 mm² according to the specification from WAGO

Horizontal interface

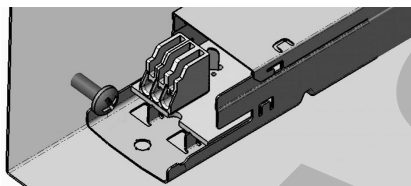
- solid wire with a cross section of 0.5–0.75 mm² according to the specification from WAGO
- solid wire with a cross section of 1.0 mm² with an insulation diameter up to 2.5 mm
- strip 9 mm of insulation from the cables to ensure perfect operation of the push terminals
- Loosen wire through twisting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

wire preparation:
0.5 – 0.75 mm²



Loosen wire through
twisting and pulling

Side fixing feature



Screw M4, screw head diameter 8–10 mm

Defective lamp

If a lamp is defective, the ballast switches off and goes into standby. There is an automatic restart once the lamp has been changed.

T5 lamp information

T5 High Efficiency (FH)

	wattage	length
	14 W	549 mm
	21 W	849 mm
	28 W	1149 mm
	35 W	1449 mm

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 must be earthed, either over the terminal or over the mounting screw of the ballast
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

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 V_{DC} 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 1500 V_{AC} (or 1.414 x 1500 V_{DC}). To avoid damage to the electronic devices this test must not be conducted.

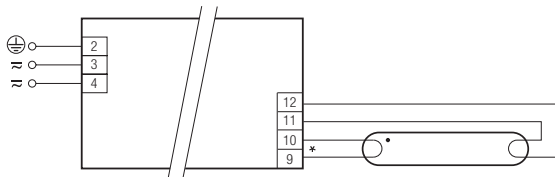
Additional information

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

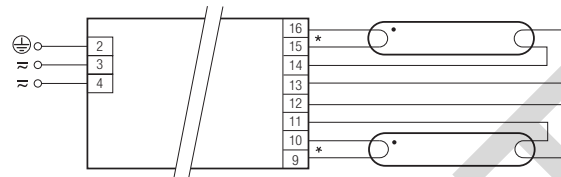
Guarantee conditions at www.tridonic.com → Services

No warranty if device was opened.

Wiring diagrams



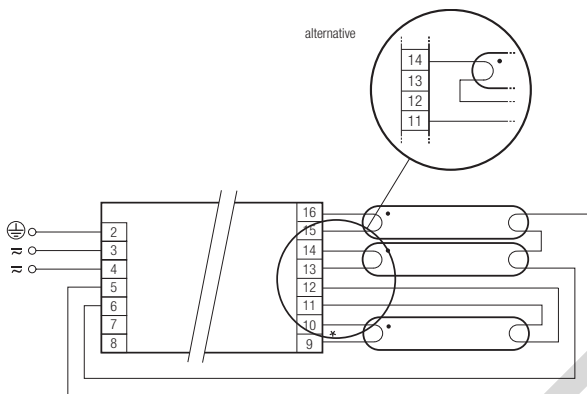
* leads 9, 10 max. 1.0 m (< 100 pF)
leads 11, 12 max. 2.0 m (< 200 pF)
Protection class I - luminaires: earth of ballast housing or ground terminal required (according to IEC 60598)
Protection class II - luminaires: no earth required



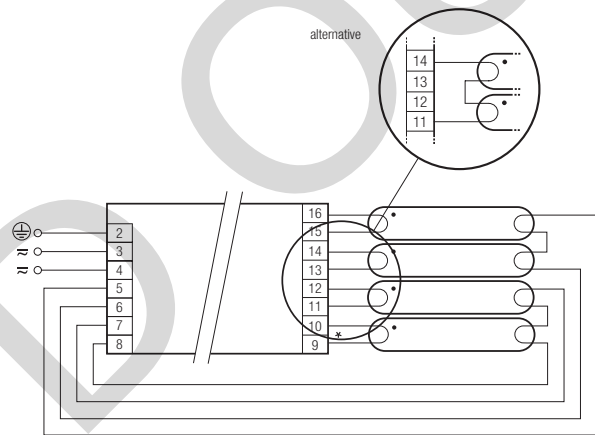
* leads 9, 10, 15, 16 max. 1.0 m (< 100 pF)
leads 11, 12, 13, 14 max. 2.0 m (< 200 pF)
Protection class I - luminaires: earth of ballast housing or ground terminal required (according to IEC 60598)
Protection class II - luminaires: no earth required

PC 1/14-21-28-35 T5 PRO Ip

PC 2/14-21-28-35 T5 PRO Ip



* leads 9, 10 max. 1.0 m (< 100 pF)
leads 5, 6, 7, 8, 11, 12, 13, 14, 15, 16 max. 2.0 m (< 200 pF)
Protection class I - luminaires: earth of ballast housing or ground terminal required (according to IEC 60598)
Protection class II - luminaires: no earth required



* leads 9, 10 max. 1.0 m (< 100 pF)
leads 5, 6, 7, 8, 11, 12, 13, 14, 15, 16 max. 2.0 m (< 200 pF)
Protection class I - luminaires: earth of ballast housing or ground terminal required (according to IEC 60598)
Protection class II - luminaires: no earth required

PC 3/14 T5 PRO Ip

PC 4/14 T5 PRO Ip