



PCA ECO Ip xitec, 36 – 58 W  
T8 fluorescent lamps

Product description

- Processor-controlled ballast with xitec inside
- Noise-free precise control via DSI signal, switchDIM or corridorFUNCTION
- CELMA energy class A1 BAT

Interfaces

- DSI
- switchDIM (with memory function + selectable dimming rate)
- corridorFUNCTION (3 preprogrammed profiles)
- Integrated SMART-Interface

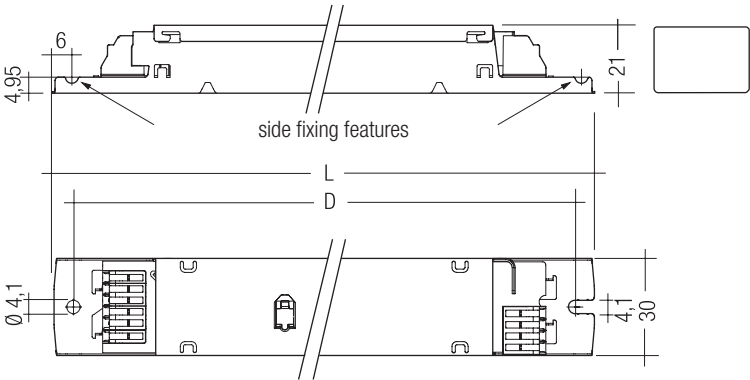
Functions

- Intelligent Temperature Guard (protection against thermal damage)
- Intelligent Voltage Guard (overvoltage indication and undervoltage shutdown)
- Optimum filament heating in any dimmer setting
- Disconnection of filament heating from a dimming level of approx. 90 % for maximum energy efficiency (SMART-Heating Concept)
- Fade rates between 50 ms and 90 s (min-max.)
- Automatically triggered emergency lighting value in DC mode, 70 %
- For emergency lighting systems as per EN 50172
- Automatic start after replacement of defective lamps
- Backwards compatible



Standards, page 3

Wiring diagrams and installation examples, page 6



Technical data

Power input on standby	< 0.5 W
Protective hot restart	0.5 s for AC / 0.2 s for DC
Dimming range	1 – 100 %
Lamp start possible from	1 %
Operating frequency	~40 – 100 kHz
Life	50,000 h
Height	21 mm

Ordering data

Type	Article number
For luminaires with 1 lamp	
PCA 1x36 T8 ECO Ip xitec	22176354
PCA 1x58 T8 ECO Ip xitec	22176356
For luminaires with 2 lamps	
PCA 2x36 T8 ECO Ip xitec	22176355
PCA 2x58 T8 ECO Ip xitec	22176357

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

Packaging 425 mm casing: 10 pieces/carton, 640 pieces/pallet

## Specific technical data

Lamp wattage	Lamp type	Type	Length L	Dimensions LxWxH	Hole spacing D	Weight	Circuit power <sup>①</sup>	Lamp wattage <sup>①</sup>	Current at 230 V / 50 Hz	λ at 50 Hz / 230 V	tc point	Ambient temperature ta <sup>②</sup>
<b>For luminaires with 1 lamp</b>												
1 x 36 W	T8	PCA 1x36 T8 ECO Ip x!tec	360 mm	360 x 30 x 21 mm	350 mm	0.25 kg	35.3 W	36 W	0.15 A	0.96	75 °C	-25 ... 60 °C
1 x 58 W	T8	PCA 1x58 T8 ECO Ip x!tec	360 mm	360 x 30 x 21 mm	350 mm	0.27 kg	53.6 W	58 W	0.23 A	0.97	75 °C	-25 ... 60 °C
<b>For luminaires with 2 lamps</b>												
2 x 36 W	T8	PCA 2x36 T8 ECO Ip x!tec	360 mm	360 x 30 x 21 mm	350 mm	0.28 kg	68.5 W	72 W	0.30 A	0.98	80 °C	-25 ... 60 °C
2 x 58 W	T8	PCA 2x58 T8 ECO Ip x!tec	425 mm	425 x 30 x 21 mm	415 mm	0.34 kg	107.8 W	116 W	0.47 A	0.99	80 °C	-25 ... 60 °C

<sup>①</sup> Valid at 100 % dimming level

<sup>②</sup> 0 °C to ta max: unrestricted dimming. -25 °C to 0 °C: unrestricted dimming from 100 % to 30 %. -25 °C to 0 °C, dimming below 30 %: malfunction possible but no damage to ECG. This applies to AC and DC operation.

## Standards

EN 55015  
EN 55022  
EN 60929  
EN 61000-3-2  
EN 61347-2-3  
EN 61547  
Suitable for emergency installations according to EN 50172

## Lamp starting characteristics

Warm start  
Starting time 0.5 s with AC  
Starting time 0.2 s with DC  
Start at any dimming level

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

## Light output level in DC operation

Default value is 70 %

## Emergency units

The "PCA T8 ECO Ip xrttec" ballasts are compatible with all emergency units from Tridonic. See the table in the data sheet. Also all "5-pole" emergency units can be used. When used with other emergency units tests are necessary.

## Temperature range

Unlimited dimming range from 0 °C to  $t_a$  max.  
-25 °C to 0 °C: dimming operation from 100 % to 30 %. If dimm level goes below 30 % malfunction possible, but no electronic ballast damage.  
This applies to AC and DC operation.

Mains currents in DC operation (at 70 % light output)

Type	Wattage	Mains current at $U_n = 220 V_{DC}$	Mains current at $U_n = 240 V_{DC}$
PCA 1x36 T8 ECO Ip xrttec	1x36 W	0.13 A	0.12 A
PCA 2x36 T8 ECO Ip xrttec	2x36 W	0.26 A	0.24 A
PCA 1x58 T8 ECO Ip xrttec	1x58 W	0.19 A	0.18 A
PCA 2x58 T8 ECO Ip xrttec	2x58 W	0.40 A	0.36 A

Ballast lumen factor AC operation (AC-BLF) EN 60929 8.1

Type	Wattage	AC-BLF at $U = 230 V_{AC}$
PCA 1x36 T8 ECO Ip xrttec	1x36 W	0.99
PCA 2x36 T8 ECO Ip xrttec	2x36 W	0.97
PCA 1x58 T8 ECO Ip xrttec	1x58 W	0.98
PCA 2x58 T8 ECO Ip xrttec	2x58 W	0.99

The ballast lumen factor for AC operation (AC-BLF) does not alter from  $U_n = 198 V_{AC}$  to  $U_n = 254 V_{AC}$ .  
The ballast lumen factor for DC operation (DC-BLF) on the basis of an automatic power reduction of the ballasts (default value is 70 %) will be smaller than AC. It does not alter in the DC operating range (198–280 V DC).

Harmonic distortion in the mains supply (at 230 V / 50 Hz)

Type	Wattage	THD	3	5	7	9	11
PCA 1x36 T8 ECO Ip xrttec	1x36 W	6.1	4.4	2.2	1.6	1.2	1.2
PCA 2x36 T8 ECO Ip xrttec	2x36 W	6.7	3.3	1.3	1.6	2.6	1.6
PCA 1x58 T8 ECO Ip xrttec	1x58 W	7.5	5.8	1.2	1.5	1.8	1.2
PCA 2x58 T8 ECO Ip xrttec	2x58 W	5.9	4.2	0.7	1.0	1.0	0.6

## Dimming

Dimming curve is adapted to the eye sensitiveness.  
Dimming range 1 % to 100 %  
Digital control with DSI signal:  
8 bit Manchester Code  
Speed 1 % to 100 % in 1.4 s

## Control input (D1, D2)

Digital DSI signal, push-to-make switch (switchDIM)  
or a motion detector (corridorFUNCTION) can be  
wired on the same terminals (D1 and D2).

## Digital signal DSI

The control input is non-polar and protected against  
accidental connection with a mains voltage up to  
264 V. The control signal is not SELV. Control cable has  
to be installed in accordance to the requirements of  
low voltage installations.  
Different functions depending on each module.

## SMART interface

An additional interface for the direct connection of  
the SMART-LS II Ip<sup>1)</sup> light sensor or corridorFUNCTION  
Plugs.

Application and functionality see corridorFUNCTION  
user manual.

SMART-LS II Ip<sup>1)</sup> light sensor operating mode:

The sensor registers actual ambient light and main-  
tains the individually defined lux level.

After every mains reset the SMART interface auto-  
matically checks for an installed sensor. With the  
sensor installed the PCA T8 ECO Ip x:tec automatically  
runs in the constant lux level mode.

ON/OFF switch via mains, switchDIM or DSI signal.

DSI signal = 0 switches off,

DSI signal ≥ 1 switches on.

With switchDIM signals it is possible to change the  
controlled light level temporarily.

Temporarily means that after a switching cycle OFF/  
ON command the ballast will start at the preset value  
determined by the SMART-LS II Ip. The installation of  
the two wire bus is according to the appropriate low  
voltage regulations.

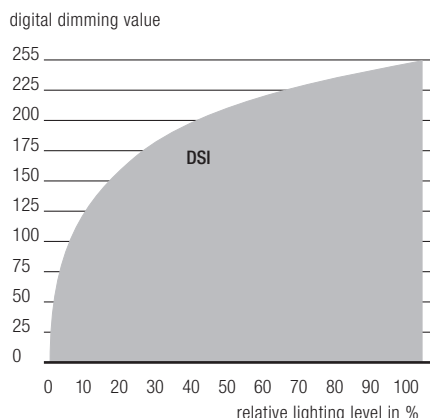
## switchDIM

Integrated switchDIM function allows a direct  
connection of a push to make switch for dimming  
and switching.

<sup>1)</sup> SMART-LS II Ip: article number 86458258

## Dimming characteristics

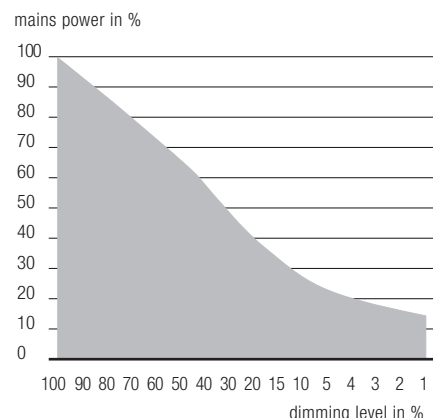
### PCA T8 ECO Ip x:tec



Dimming characteristics as seen by the human eye

## Energy saving

### PCA T8 ECO Ip x:tec



Brief push (< 0.6 s) switches ballast ON and OFF. The  
ballasts switch-ON at light level set at switch-OFF.  
When the push to make switch is held, PCA ballasts  
are dimmed. After repush the PCA is dimmed in the  
opposite direction.

The switchDIM fade time is set to 3 s from min. to  
max. in the factory settings. With a 20 s push to the  
push to make switch this fade time can be changed  
to 6 s. In this instance the switchDIM application will  
be synchronized to 50 % light level after 10 s and after  
20 s the light level rises to 100 % with the new fade  
time.

At every synchronisation (10 s keystroke) the device  
will reset to 3 s (factory setting)

In installations with PCAs with different dimming levels  
or opposite dimming directions (e.g. after a system  
extension), all PCAs can be synchronized to 50 %  
dimming level by a 10 s push.

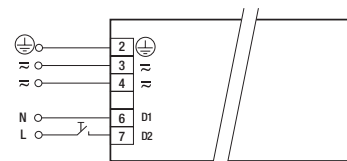
Use of push to make switch with indicator lamp is not  
permitted.

Deactivation: If the corridorFUNCTION is wrongly  
activated in a switchDIM system (for example a  
switch is used instead of pushbutton), there is the  
option of installing a pushbutton and deactivating the  
corridorFUNCTION mode by five short pushes of the  
button within three seconds.

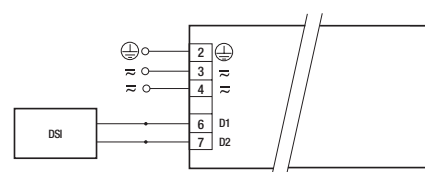
## Backwards compatibility

With a simple key combination a PCA T8 ECO Ip x:tec  
can be reset as a normal PCA ECO from the previous  
generation. Synchronisation simply has to take place  
three times within one minute (3 x 10 s).

To activate the "x:tec" settings again, synchronisation  
has to take place four times within one minute.



switchDIM PCA T8 ECO Ip x:tec



DSI PCA T8 ECO Ip x:tec

Dimmable ballasts from Tridonic have to be earthed.

## Loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20
Installation Ø	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
PCA 1x36 T8 ECO Ip x:tec	30	50	74	80	15	25	37	40
PCA 2x36 T8 ECO Ip x:tec	16	24	34	38	8	12	17	19
PCA 1x58 T8 ECO Ip x:tec	22	34	48	52	11	17	24	26
PCA 2x58 T8 ECO Ip x:tec	16	24	32	36	8	12	16	18

Continuous operation: to calculate the protective safety switch see main current, page 2

### corridorFUNCTION

Activation: To activate the corridorFUNCTION a voltage of 230V simply has to be applied for five minutes at D1, D2. The unit will then switch automatically to the corridorFUNCTION.

Deactivation: If the corridorFUNCTION is wrongly activated in a switchDIM system (for example a switch is used instead of pushbutton), there is the option of installing a pushbutton and deactivating the corridorFUNCTION mode by five short pushes of the button within three seconds.

The corridorFUNCTION V2 offers the added benefit of a second and third preprogrammed profile, which can be activated by the corridorFUNCTION plugs.

Application and functionality of profiles see user manual.

### Intelligent Temperature Guard

The intelligent temperature guard protects the PCA T8 ECO Ip x:tec from thermal overheating by reducing the output power or switching off in case of operation above the thermal limits of the luminaire or ballast. Depending on the luminaire design, the ITG operates at about 5 to 10 °C above T<sub>c</sub> temperature.

### Intelligent Voltage Guard

Intelligent Voltage Guard is the name of the new electronic monitor from Tridonic. This innovative feature of the PCA family of control gear from Tridonic immediately shows if the mains voltage rises above certain thresholds. Measures can then be taken quickly to prevent damage to the control gear.

- If the mains voltage rises above approx. 305V (voltage depends on the ballast type), the lamp starts flashing on and off.
- This signal "demands" disconnection of the power supply to the lighting system.

### Operating voltage

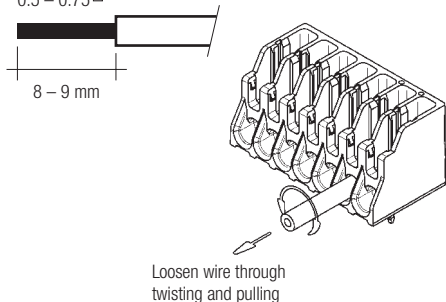
Type	Wattage	U <sub>out</sub>
PCA 1x36 T8 ECO Ip x:tec	1x36 W	250 V
PCA 2x36 T8 ECO Ip x:tec	2x36 W	350 V
PCA 1x58 T8 ECO Ip x:tec	1x58 W	250 V
PCA 2x58 T8 ECO Ip x:tec	2x58 W	350 V

### Installation instructions

#### Wiring type and cross section

The wiring can be solid cable with a cross section of 0.5 to 0.75 mm<sup>2</sup> for push terminal and 0.5 mm<sup>2</sup> for IDC terminal. For the push-wire connection you have to strip the insulation (8–9 mm).

wire preparation:  
0.5 – 0.75 □



#### Wiring advice

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

Ballast	Terminal	Maximum capacitance allowed			
		Cold	Hot	Cold	Hot
PCA 1xx T8 ECO Ip x:tec		11, 12	9, 10	200 pF	100 pF
PCA 2xx T8 ECO Ip x:tec		11, 12, 13, 13	9, 10, 15, 16	200 pF	100 pF

With standard solid wire 0.5/0.75 mm<sup>2</sup> the capacitance of the lead is 30–80 pF/m.

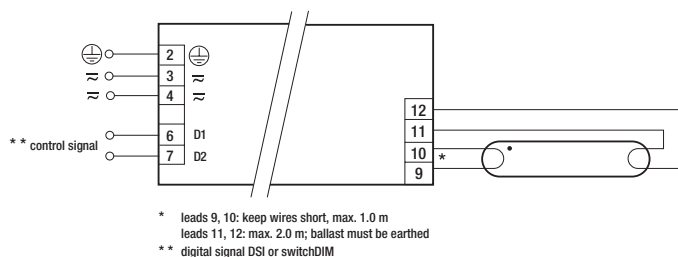
This value is influenced by the way the wiring is made.

Lamp connection should be made with symmetrical wiring.

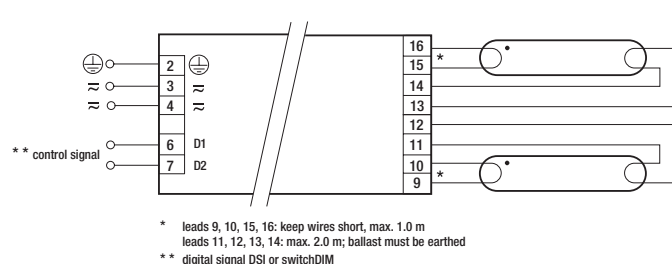
Hot leads (9, 10, 15, 16) and cold leads (11, 12, 13, 14) should be separated as much as possible.

When using two or more dimmable ballasts in one luminaire with separate dimming controls, the lamp leads must be kept separate.

Dimmable ballasts from Tridonic have to be earthed.



PCA T8 ECO Ip xrttec 1x36–58 W



PCA T8 ECO Ip xrttec 2x36–58 W

Dimmable ballasts from Tridonic have to be earthed.

## RFI

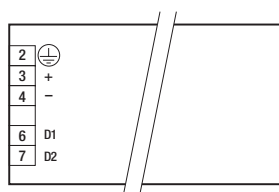
- Connection to the lamps of the hot leads must be kept as short as possible
- Mains leads should be kept apart from lamp leads (ideally 5–10 cm distance)
- Do not run mains leads adjacent to the electronic ballast
- Twist the lamp leads
- Keep the distance of lamp leads from the metal work as large as possible
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

## General advise

Electronic ballasts are virtually noise free. Magnetic fields generated during the ignition cycle can cause some background noise but only for a few milliseconds.

## Operation on DC voltage

Our ballasts are construed to operate DC voltage and pulsed DC voltage. To operate ballasts with pulsed DC voltage the polarity is absolute mandatory.



## 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.

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