



PCA TCL EXCEL one4all Ip xitec, 55 W

Compact and T5c fluorescent lamps

Product description

- Processor-controlled ballast with xitec inside
- Noise-free precise control via DSI signal, switchDIM, corridorFUNCTION or DALI
- DALI-MEMORY
- Extended DALI commands
- OEM-specific reserved memory areas
- CELMA energy class A1 BAT¹⁾

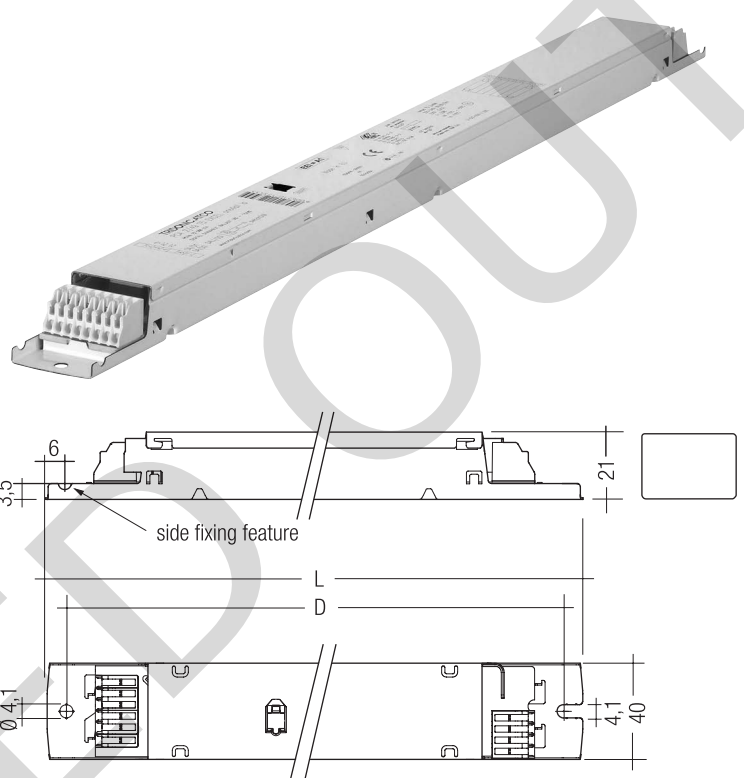
Interfaces

- DALI
- DSI
- switchDIM (with memory function + selectable dimming rate)
- corridorFUNCTION (3 preprogrammed profiles + individually programmable)
- 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.)
- plugADDRESSING – simple configuration of lighting systems
- corridorFUNCTION with daylight control
- Dimming possible in DC mode
- Automatically triggered emergency lighting value in DC mode, can be set between 1 and 100 %
- For emergency lighting systems as per EN 50172
- Automatic start after replacement of defective lamps
- Backwards compatible

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



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 1x55 TCL EXCEL one4all Ip xitec	22176236
For luminaires with 2 lamps	
PCA 2x55 TCL EXCEL one4all Ip xitec	22176238

Packaging 360 mm casing: 10 pieces/carton, 760 pieces/pallet
Packaging 425 mm casing: 10 pieces/carton, 640 pieces/pallet



Standards, page 3

Wiring diagrams and installation examples, page 6

Specific technical data

Lamp wattage	Lamp type	Type	Length L	Hole spacing D	Weight	Circuit power ^①	Lamp wattage ^①	Current at 230 V / 50 Hz ^①	λ at 50 Hz / 230 V	tc point	Ambient temperature ta ^②
For luminaires with 1 lamp											
1 x 55 W	TC-L	PCA 1x55 TCL EXCEL one4all Ip xrtec	360 mm	350 mm	0.27 kg	59 W	55 W	0.26 A	0.98	80 °C	-25 ... 60 °C
For luminaires with 2 lamps											
2 x 55 W	TC-L	PCA 2x55 TCL EXCEL one4all Ip xrtec	425 mm	415 mm	0.34 kg	118 W	110 W	0.51 A	0.99	80 °C	-25 ... 50 °C

^① Valid at 100 % dimming level

^② +10 °C to ta max: unrestricted dimming. -25 °C to +10 °C: unrestricted dimming from 100 % to 30 %. -25 °C to +10 °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

Programmable from 0 % to 100 %
Programming by extended DSI or DALI signal (16 bit).
Default value is 70 %
In DC operation dimming mode can be activated.

Emergency units

The "PCA TCL EXCEL one4all Ip x|tec" 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 10 °C to t_a max.
-25 °C to +10 °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 1x55 TCL EXCEL one4all Ip x tec	1x55 W	0.21 A	0.19 A
PCA 2x55 TCL EXCEL one4all Ip x tec	2x55 W	0.42 A	0.38 A

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

Type	Wattage	AC-BLF at $U = 230 V_{AC}$
PCA 1x55 TCL EXCEL one4all Ip x tec	1x55 W	0.98
PCA 2x55 TCL EXCEL one4all Ip x tec	2x55 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 1x55 TCL EXCEL one4all Ip x tec	1x55 W	7.1	5.7	1.0	1.3	1.4	1.2
PCA 2x55 TCL EXCEL one4all Ip x tec	2x55 W	4.1	2.1	0.6	0.9	1.0	0.8

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
- DALI signal: 16 bit Manchester Code
Maximum speed 1 % to 100 % in 550 ms
(adjustable between 50 ms and 90 s)
Programmable parameter:
Minimum dimming level
Maximum dimming level
Default minimum = 1 %
Default maximum = 100 %

Control input (DA/D1, DA/D2)

Digital DALI/DSI signal or a push-to-make switch (switchDIM) can be wired on the same terminals (DA and DA).

Digital signal DALI/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 Ip¹⁾ light sensor. The sensor registers actual ambient light and maintains the individually defined lux level.

After every mains reset the SMART interface automatically checks for an installed sensor. With the sensor installed the PCA TCL EXCEL one4all Ip xtec automatically runs in the constant lux level mode. ON/OFF switch via mains, switchDIM or DALI/DSI signal.

DALI/DSI signal = 0 switches off,
DALI/DSI signal ≥ 1 switches on.

With relative DALI dimming commands (e.g. up, down etc.) or 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.

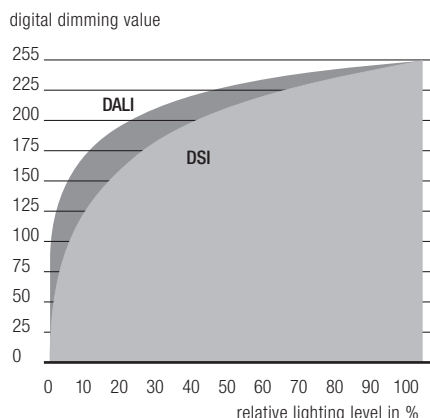
switchDIM

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

¹⁾ SMART-LS II Ip: article number 86458258

Dimming characteristics

PCA TCL EXCEL one4all Ip xtec



Dimming characteristics as seen by the human eye

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.

switchDIM and corridorFUNCTION are very simple tools for controlling ballasts with conventional momentary-action switches or motion sensors.

To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the control input.

Special attention must be paid to achieving clear zero crossings.

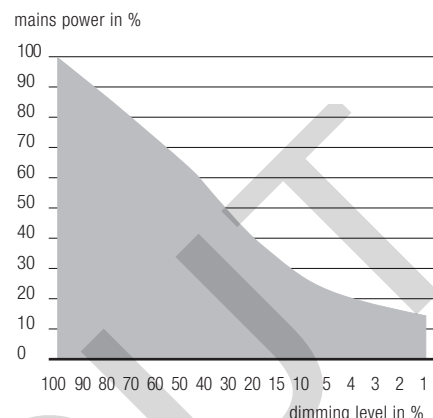
Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.

Backwards compatibility

With a simple key combination a PCA TCL EXCEL one4all Ip xtec can be reset as a normal PCA EXCEL Ip from the previous generation. Synchronisation

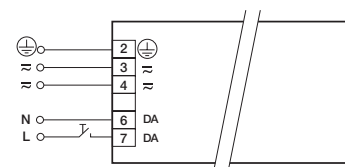
Energy saving

PCA TCL EXCEL one4all Ip xtec

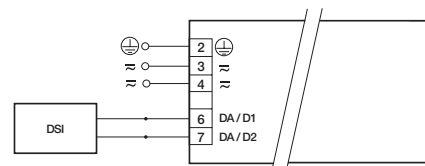


simply has to take place three times within one minute (3 x 10 s).

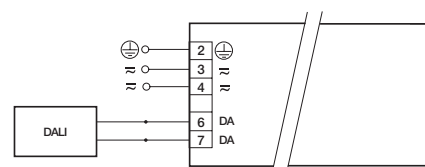
To activate the "xtec" settings again, synchronisation has to take place four times within one minute.



switchDIM PCA TCL EXCEL one4all Ip xtec



DSI PCA TCL EXCEL one4all Ip xtec



DALI PCA TCL EXCEL one4all Ip xtec

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
PCA 1x55 TCL EXCEL one4all Ip xtec	22	34	48	52	11	17	24	26
PCA 2x55 TCL EXCEL one4all Ip xtec	12	16	22	26	6	8	11	13

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

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. 305 V (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.

corridorFUNCTION

The corridorFUNCTION can be programmed in two different ways.

To program the corridorFUNCTION by means of software a DALI-USB interface is needed in combination with a DALI PS. The software can be the configTOOL, the pcaCONFIGURATOR or the corridorFUNCTION CONFIGURATOR.

To activate the corridorFUNCTION without using software a voltage of 230 V simply has to be applied for five minutes at the switchDIM connection. The unit will then switch automatically to the corridorFUNCTION.

Note: 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. It is also possible to combine the corridorFUNCTION with the SMART-LS II Ip light sensor.

Application and functionality of profiles see user manual.

Intelligent Temperature Guard

The intelligent temperature guard protects the PCA TCL EXCEL one4all 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_c temperature.

plugADDRESSING – simple handling, commissioning and wiring

The new plug&play solution simplifies handling.

By attaching different colored marked plugs to the SMART-Interface, group addresses are assigned to the PCA TCL EXCEL one4all Ip x:tec.

This supersedes a single addressing and the devices can be put into operation without any additional programming. Another significant advantage of this concept is in case of exchange and no limits to 64 DALI addresses. Ideal for RGB applications and cost-effective system solutions with simple controllers.

Simple – Quick – Plug & Play!

Operating voltage

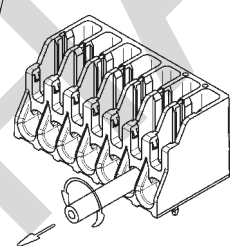
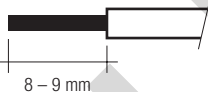
Type	Wattage	U _{out}
PCA 1x55 TCL EXCEL one4all Ip x:tec	1x55 W	250 V
PCA 2x55 TCL EXCEL one4all Ip x:tec	2x55 W	350 V

Installation instructions

Wiring type and cross section

The wiring can be solid cable with a cross section of 0.5 to 0.75 mm² for push terminal and 0.5 mm² for IDC terminal. For the push-wire connection you have to strip the insulation (8–9 mm).

wire preparation:
0.5 – 0.75 mm²



Loosen wire through
twisting and pulling

Wiring advice

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

Ballast Type	Terminal	Maximum capacitance allowed			
		Cold	Hot	Cold	Hot
PCA 1xx TCL EXCEL one4all Ip x:tec	11, 12	9, 10	200 pF	100 pF	
PCA 2xx TCL EXCEL one4all Ip x:tec	11, 12, 13, 14	9, 10, 15, 16	200 pF	100 pF	

With standard solid wire 0.5/0.75 mm² the capacitance of the lead is 30–80 pF/m.

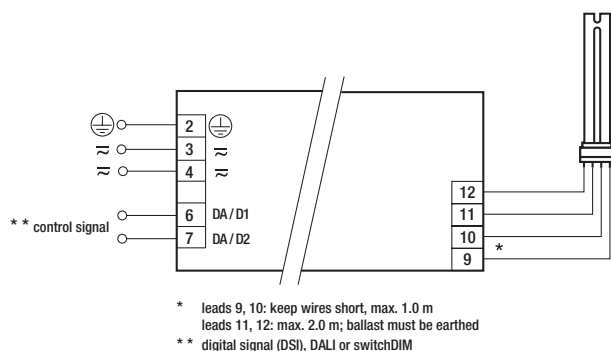
This value is influenced by the way the wiring is made.

Lamp connection should be made with symmetrical wiring.

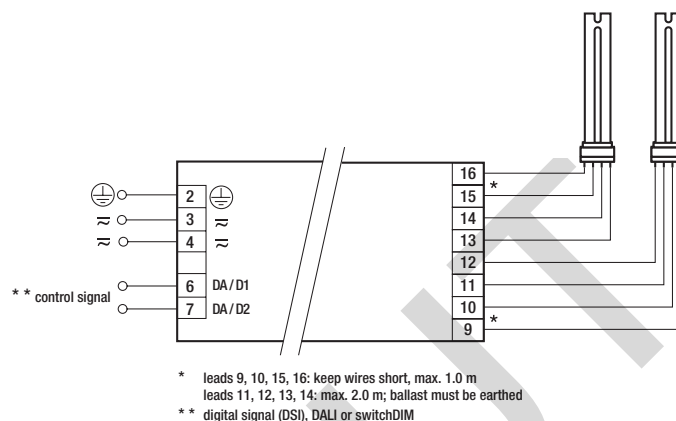
Hot leads (9, 10, 15, 16) and cold leads (11, 12, 13, 14) should be separated as much as possible.

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 TCL EXCEL one4all Ip x:tec 1x55 W



PCA TCL EXCEL one4all Ip x:tec 2x55 W

Dimmable ballasts from Tridonic have to be earthed.

RFI

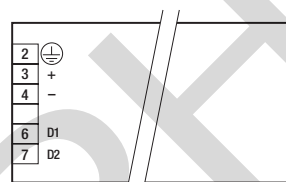
- Connection to the lamps of the hot leads must be kept as short as possible
- Mains leads should be kept apart from lamp leads (ideally 5–10 cm distance)
- Do not run mains leads adjacent to the electronic ballast
- Twist the lamp leads
- Keep the distance of lamp leads from the metal work as large 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 constructed to operate DC voltage and pulsed DC voltage. To operate ballasts with pulsed DC voltage the polarity is absolute mandatory.



Programming

With appropriate software and a USB interface different functions can be activated and various parameters can be configured in the new PCA TCL EXCEL one4all Ip x:tec. All that is needed is a DALI-USB and the software.

configTOOL

Full version for programming all the functions and parameters.

pcaCONFIGURATOR

For programming the corridorFUNCTION, device configuration (fade time, ePowerOnLevel, etc.) DC level, compatibility settings, and startup date and for resetting. Maximum amount of ballast see DALI/DSI specification.

corridorFUNCTION CONFIGURATOR

For activating and deactivating the corridorFUNCTION and for project-specific programming of the PCA TCL EXCEL one4all Ip x:tec units. Maximum amount of ballast see DALI/DSI specification.

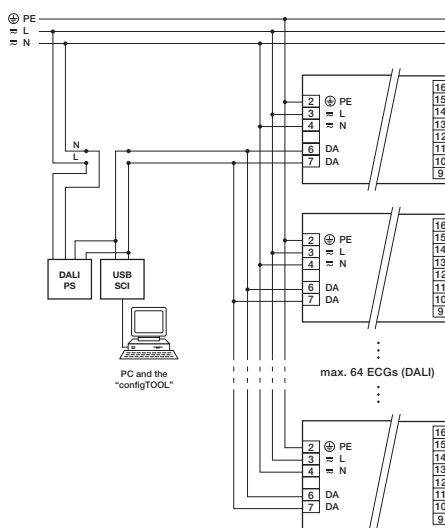
Isolation and electric strength testing of luminaires

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 Vdc 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 VAC (or 1.414 x 1500 Vdc). To avoid damage to the electronic devices this test must not be conducted.



① For further technical information please visit www.tridonic.com