CE ⬚ RoHS

PCA T5c EXCEL one4all, 22 – 55 W
Compact and T5c fluorescent lamps

T5c

Product description

- Noise-free precise control via DSI signal,
  switchDIM, corridorFUNCTION or DALI
- DALI-MEMORY
- Extended DALI commands
- CELMA energy class A1[1]

Interfaces

- DALI
- DSI
- switchDIM (with memory function)
- corridorFUNCTION (individually programmable)
- Integrated SMART-Interface

Functions

- Automatically triggered emergency lighting value in DC mode,
  can be set between 1 and 70 %
- For emergency lighting systems as per EN 50172
  (Exclusion article number 22176467, PCA 1/55 T5c EXCEL one4all
  not suitable for emergency lighting units according to EN 50172 and
  only ÖVE, EN 61347-2-3)
- Automatic start after replacement of defective lamps

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

→

Standards, page 2

Wiring diagrams and installation examples, page 4

3, 4,3, 6, 6,5, H, D, B, 4,3, 6, 6,5, 110,5, 123
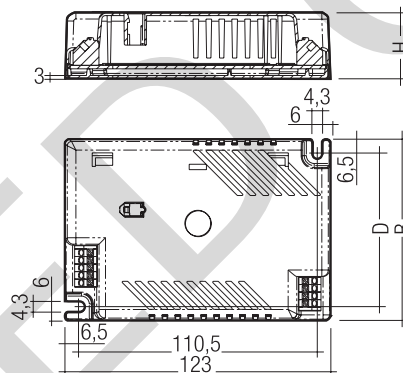
Technical data

Power input on standby	< 1 W
Protective hot restart	1.5 s for AC / 0.6 s for DC
Dimming range	3 – 100 %
Lamp start possible from	3 %
Operating frequency	~40 – 100 kHz
Life	50,000 h
Height	31 mm

Ordering data

Type	Article number
For luminaires with 1 lamp	
PCA 1/22 T5c EXCEL one4all	22086881
PCA 1/40 T5c EXCEL one4all	22185145
PCA 1/55 T5c EXCEL one4all	22176467[1]

Packaging: 10 pieces/carton, 500 pieces/pallet

Specific technical data

Lamp wattage	Lamp type	Type	Dimensions LxWxH	Hole spacing D	Weight	Circuit power[2]	Lamp wattage[2]	Current at 230 V / 50 Hz[2]	λ at 50 Hz / 230 V	tc point	Ambient temperature ta[3]
For luminaires with 1 lamp											
1 x 22 W	T5c	**PCA 1/22 T5c EXCEL one4all**	123 x 79 x 31 mm	66.5 mm	0.22 kg	26.1 W	22 W	0.12 A	0.96	70 °C	10 ... 60 °C
1 x 40 W	T5c	**PCA 1/40 T5c EXCEL one4all**	123 x 79 x 31 mm	66.5 mm	0.22 kg	45.5 W	40 W	0.20 A	0.98	65 °C	10 ... 50 °C
1 x 55 W	T5c	**PCA 1/55 T5c EXCEL one4all**[1]	123 x 79 x 31 mm	66.5 mm	0.22 kg	61.0 W	55 W	0.24 A	0.98	75 °C	10 ... 50 °C

[1] Exclusion PCA 1/55 T5c EXCEL one4all only ÖVE, EN 61347-2-3, not suitable for emergency lighting untis according to EN 50172.

[2] Valid at 100 % dimming level.

[3] 3 % dimming from +10 °C to ta max.

Standards
EN 55015
EN 55022
EN 60929
EN 61000-3-2
EN 61347-2-3
EN 61547
in accordance
with EN 50172
Exclusion PCA 1/55 T5c EXCEL one4all only ÖVE, EN 61347-2-3, not suitable for emergency lighting untis according to EN 50172.

Lamp starting characteristics
Warm start
Starting time 1.5 s with AC
Starting time 0.6 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 (±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.
Exclusion: PCA 1/55 T5c EXCEL only ÖVE approved.

Temperature range
Dimming range 100 % to 3 % from 10 °C to maximum permissible ambient temperature ta.

Mains current in DC operation

Type	Mains current at $U_n = 220\,V_{DC}$	Mains current at $U_n = 240\,V_{DC}$
PCA 1/22 T5c EXCEL	0.10 A	0.09 A
PCA 1/40 T5c EXCEL	0.17 A	0.16 A
PCA 1/55 T5c EXCEL	0.24 A	0.22 A

Light output level in DC operation:
Programmable from 3 % to 70 %
Programming by extended DSI signal (16 bit)
Default value is 70 %
In DC operation dimming is not possible

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

Type	AC/DC-BLF at U = 198–254 V, 25 °C
PCA 1/22 T5c EXCEL	1.00
PCA 1/40 T5c EXCEL	1.01
PCA 1/55 T5c EXCEL	0.97

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	THD	3	5	7	9	11
PCA 1/22 T5c EXCEL	5.3	5.2	1.1	0.7	0.5	0,5
PCA 1/40 T5c EXCEL	8.9	8.3	3.1	1.2	1,7	0.4
PCA 1/55 T5c EXCEL	8.2	7.4	3.1	1.3	1.3	0.9

Dimming
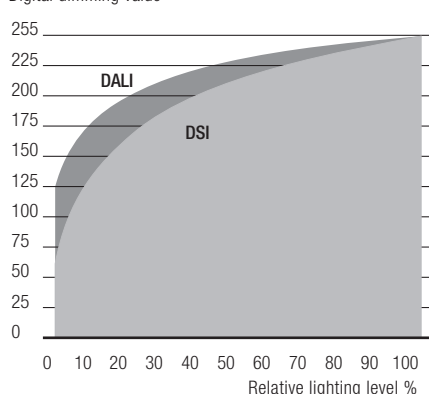
Dimming range 3 % to 100 %
Digital control with:
- DSI signal: 8 bit Manchester Code
  Maximum speed 3 % to 100 % in 1.4 s
- DALI signal: 16 bit Manchester Code
  Maximum speed 3 % to 100 % in 0.5 s
  Programmable parameter:
  Minimum dimming level
  Maximum dimming level
  Default minimum = 3 %
  Programmable range 3 % ≤ MIN ≤ 49 %
  Default maximum = 100 %
  Programmable range 100 % ≥ MAX ≥ 50 %
Dimming curve that is friendly to the eye.

Control input (D1, D2)

Digital DALI/DSI signal or switchDIM can be wired on the same terminals (D1 and D2).

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 should 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 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 EXCEL 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.
Dimming with DALI or a DSI signal with the SMART-LS installed is not possible.
switchDIM enables a temporary change of light level. The installation of the two wire bus is according to the appropriate low voltage regulations.

Dimming characteristics PCA EXCEL

Digital dimming value

Dimming characteristics as seen by the human eye

Energy Savings PCA EXCEL

Mains power in %

switchDIM

Integrated switchDIM function allows a direct connection of a push to make switch for dimming and switching.
Brief push (< 0.6 s) switches ballast ON and OFF. The ballasts switch-ON at light level set at switch-OFF (switchDIM Memory).
When the push to make switch is held, PCA ballasts are dimmed. After repush the PCA is dimmed in the opposite direction.
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.
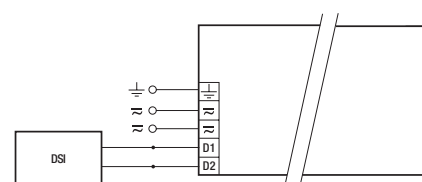To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the control input.
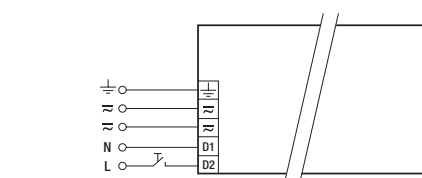Special attention must be paid to achieving clear zero crossings.
Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.
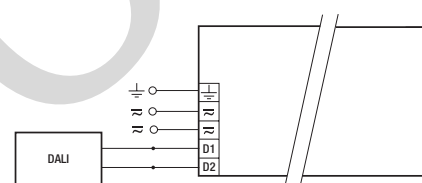
DALI PCA T5c EXCEL one4all

DSI PCA T5c EXCEL one4all

switchDIM PCA T5c EXCEL one4all

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20
Installation Ø	1.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	1.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²
PCA 1/22 T5c EXCEL	24	38	54	64	12	19	27	32
PCA 1/40 T5c EXCEL	24	38	54	64	12	19	27	32
PCA 1/55 T5c EXCEL	16	24	34	40	8	12	17	20

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.

Installation instructions

Wiring type and cross section

The wiring can be in flexible cable with ferules or solid with a cross section of 0.5–1.5 mm². For perfect function of the simple to use push-wire terminals the strip length should be 9 mm.

wire preparation:
0.5 – 1.5 mm²

9 mm ±1
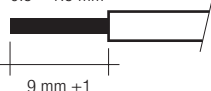
Output voltage

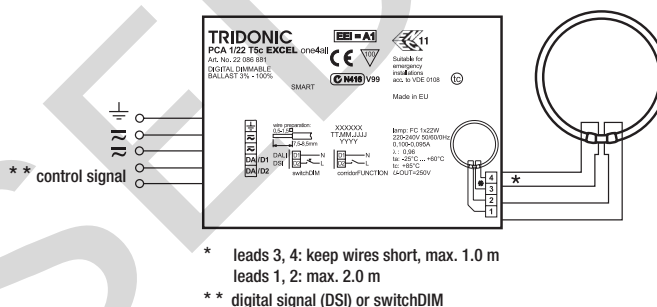| Type	Wattage	U$_{out}$
PCA 1/22 T5c EXCEL	1x22 W	250 V
PCA 1/40 T5c EXCEL	1x40 W	250 V
PCA 1/55 T5c EXCEL	1x55 W	250 V

Wiring advice

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

Ballast	Terminal		Maximum capacitance allowed	
Type	Cold	Hot	Cold	Hot
PC 1/xx T5c EXCEL	1, 2	3, 4	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 and cold leads should be separated as much as possible.

** control signal

* leads 3, 4: keep wires short, max. 1.0 m
leads 1, 2: max. 2.0 m
** digital signal (DSI) or switchDIM

**PCA T5c EXCEL one4all 22–55 W**

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
- Ballast must be earthed
- Mains wiring to be twisted when through wiring
- Keep the mains leads inside the luminaire as short as possible

Important advise

- When using two or more dimmable ballasts in one luminaire with separate dimming controls, the lamp leads must be kept separate
- All lamps must have the same length lead
- PCA 1/55 T5c EXCEL only ÖVE approved

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.
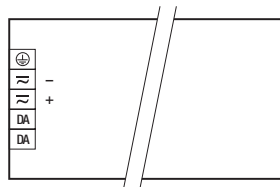
Isolation and electric strength testing of luminaires

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.