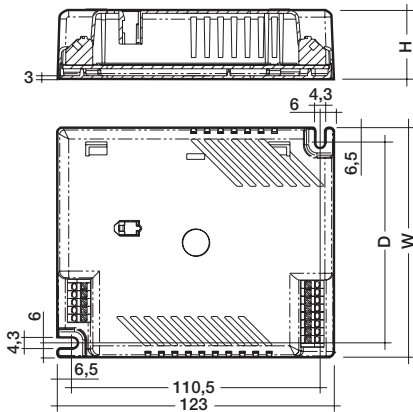




## Electronic ballasts for dimming to 3% Compact lamps

### PCA EXCEL one4all 11–57 W 220–240 V 50/60/0 Hz, dimmable



- dimming range from 3–100% (10–100% with 57 W)
- lamp start at 3% (10% with 57 W)
- defined lamp warm start within 0.6 s with AC and DC
- switch via the mains or with digital control signal
- dimming which is comfortable to the eye
- disturbance free precise control with a digital signal (**DSI**), switch**DIM** or **DALI** (digital addressable lighting interface)
- error feed back and programmable features in both DALI and DSI mode
- integrated SMART interface

- fully electronic lamp management and digital communication with ASIC and  $\mu$ C
- constant light output independent of fluctuating supply voltage
- DC operation in emergency lighting installations to VDE 0108
- safe shutdown of defective lamps
- safe shutdown of lamps at end of life (rectifying effect)
- automatic restart after lamp replacement
- operating frequency ~40–100 kHz
- **NEW:** with DALI-MEMORY and corridor**FUNCTION**

**Packaging:**  
box of 10  
50 boxes/pallet  
500 pieces/pallet

**Certified:**  
EN 55015  
EN 55022  
EN 60929  
EN 61000-3-2  
EN 61347-2-3  
EN 61547  
in accordance with VDE 0108

Lamp		Ballast										
watt-age W	type	type	article number	L x W x H mm	fixing centres D mm	weight kg	circuit power W ②	lamp power W ②	current at 230V/50Hz A ②	$\lambda$ at 230V/50Hz	tc point °C	temperature range ① °C
11	TC-SEL	PCA 1/11/13 TCD EXCEL 220–240V 50/60/0Hz	22084724	123x79x31	66.5	0.22	15.5	11.4	0.072	0.95	75	-15 → +60
2x11	TC-SEL	PCA 2/11/13 TCD EXCEL 220–240V 50/60/0Hz	22084718	123x102x31	89.5	0.25	29.5	22.5	0.132	0.96	80	-15 → +60
13	TC-DEL	PCA 1/11/13 TCD EXCEL 220–240V 50/60/0Hz	22084724	123x79x31	66.5	0.22	16.5	12.7	0.076	0.95	75	-15 → +60
2x13	TC-DEL	PCA 2/11/13 TCD EXCEL 220–240V 50/60/0Hz	22084718	123x102x31	89.5	0.25	31	24	0.140	0.96	80	-15 → +60
18	TC-DEL	PCA 1/18 TCD EXCEL 220–240V 50/60/0Hz	22084709	123x79x31	66.5	0.22	20.5	16	0.10	0.96	75	-25 → +60
2x18	TC-DEL	PCA 2/18 TCD EXCEL 220–240V 50/60/0Hz	22084692	123x102x31	89.5	0.25	40	32	0.18	0.98	85	-25 → +60
26	TC-DEL	PCA 1/26 TCD EXCEL 220–240V 50/60/0Hz	22084686	123x79x31	66.5	0.22	27.5	23	0.13	0.97	85	-25 → +60
2x26	TC-DEL	PCA 2/26 TCD EXCEL 220–240V 50/60/0Hz	22084670	123x102x31	89.5	0.25	55	45	0.25	0.99	80	-25 → +50
18	TC-TEL	PCA 1/18 TCD EXCEL 220–240V 50/60/0Hz	22084709	123x79x31	66.5	0.22	20.5	16	0.10	0.96	75	-25 → +60
2x18	TC-TEL	PCA 2/18 TCD EXCEL 220–240V 50/60/0Hz	22084692	123x102x31	89.5	0.25	40	32	0.18	0.98	85	-25 → +60
26	TC-TEL	PCA 1/26 TCD EXCEL 220–240V 50/60/0Hz	22084686	123x79x31	66.5	0.22	27.5	23	0.13	0.97	85	-25 → +60
2x26	TC-TEL	PCA 2/26 TCD EXCEL 220–240V 50/60/0Hz	22084670	123x102x31	89.5	0.25	55	45	0.25	0.99	80	-25 → +50
32	TC-TEL	PCA 1/32 TCT EXCEL 220–240V 50/60/0Hz	22088622	123x79x31	66.5	0.22	36.2	30	0.16	0.95	80	-25 → +60
2x32	TC-TEL	PCA 2/32 TCT EXCEL 220–240V 50/60/0Hz	22088638	123x102x31	89.5	0.25	70.7	61	0.31	0.97	80	-25 → +50
42	TC-TEL	PCA 1/42 TCT EXCEL 220–240V 50/60/0Hz	22088663	123x79x31	66.5	0.22	47	41	0.21	0.97	80	-25 → +60
2x42	TC-TEL	PCA 2/42 TCT EXCEL 220–240V 50/60/0Hz	22088679	123x102x31	89.5	0.25	91	81	0.40	0.98	80	-25 → +50
57	TC-TEL	PCA 1/57 TCT EXCEL 220–240V 50/60/0Hz	22086941	123x79x31	66.5	0.22	66	57	0.29	0.99	85	-25 → +50

① dimming to 3% (10% with 57 W) between 0 °C to ta max.

② valid at 100% light output

**Lamp starting characteristics:**

Warm start  
Starting time 0.6 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 ( $\pm 10\%$ )  
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 VDE 0108 or for emergency luminaires according to EN 61347-2-3 appendix J.

**Temperature range:**

Dimming range 100% to 3% from 0 °C to maximum permissible ambient temperature  $t_a$ . (57 W from 100% to 10%)  
100% operation from -25 °C to maximum permissible ambient temperature  $t_a$ .

**Mains currents in DC operation:**

Ballast Type	Mains current at $U_n = 220\text{VDC}$	Mains current at $U_n = 240\text{VDC}$
PCA 1/11/13_11 TCD EXCEL 220–240V 50/60/0Hz	72 mA	67 mA
PCA 1/11/13_13 TCD EXCEL 220–240V 50/60/0Hz	73 mA	66 mA
PCA 1/18 TCD EXCEL 220–240V 50/60/0Hz	80 mA	74 mA
PCA 1/26 TCD EXCEL 220–240V 50/60/0Hz	116 mA	107 mA
PCA 1/32 TCT EXCEL 220–240V 50/60/0Hz	135 mA	124 mA
PCA 1/42 TCT EXCEL 220–240V 50/60/0Hz	180 mA	166 mA
PCA 1/57 TCT EXCEL 220–240V 50/60/0Hz	254 mA	233 mA
PCA 2/11/13_11 TCD EXCEL 220–240V 50/60/0Hz	118 mA	110 mA
PCA 2/11/13_13 TCD EXCEL 220–240V 50/60/0Hz	108 mA	100 mA
PCA 2/18 TCD EXCEL 220–240V 50/60/0Hz	146 mA	134 mA
PCA 2/26 TCD EXCEL 220–240V 50/60/0Hz	214 mA	196 mA
PCA 2/32 TCT EXCEL 220–240V 50/60/0Hz	240 mA	211 mA
PCA 2/42 TCT EXCEL 220–240V 50/60/0Hz	353 mA	326 mA

**Light output level in DC operation:**

Programmable from 3% to 70% (57 W from 10% to 70%)  
Programming by extended DSI signal (16 bit) or DALI  
Default value is 70%  
In DC operation dimming is not possible.

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

Ballast Type	AC-BLF at $U_n = 230\text{VAC}$
PCA 1/11/13_11 TCD EXCEL 220–240V 50/60/0Hz	1.03
PCA 1/11/13_13 TCD EXCEL 220–240V 50/60/0Hz	0.99
PCA 1/18 TCD EXCEL 220–240V 50/60/0Hz	1.02
PCA 1/26 TCD EXCEL 220–240V 50/60/0Hz	0.97
PCA 1/32 TCT EXCEL 220–240V 50/60/0Hz	1.05
PCA 1/42 TCT EXCEL 220–240V 50/60/0Hz	1.02
PCA 1/57 TCT EXCEL 220–240V 50/60/0Hz	1.01
PCA 2/11/13_11 TCD EXCEL 220–240V 50/60/0Hz	1.03
PCA 2/11/13_13 TCD EXCEL 220–240V 50/60/0Hz	1.01
PCA 2/18 TCD EXCEL 220–240V 50/60/0Hz	0.99
PCA 2/26 TCD EXCEL 220–240V 50/60/0Hz	0.98
PCA 2/32 TCT EXCEL 220–240V 50/60/0Hz	1.01
PCA 2/42 TCT EXCEL 220–240V 50/60/0Hz	1.03

The ballast lumen factor for AC operation (AC-BLF) does not alter from  $U_n = 198\text{VAC}$  to  $U_n = 254\text{VAC}$ .

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 VDC).

**Harmonic distortion in the mains supply (at 220 V / 50 Hz):**

Ballast Type	THD	3	5	7	9	11
PCA 1/11/13_11 TCD EXCEL 220–240V 50/60/0Hz	17.1	16.0	5.0	3.2	1.9	1.2
PCA 1/11/13_13 EXCEL ECO 220–240V 50/60/0Hz	3.5	2.5	4.3	2.5	2.0	1.1
PCA 1/18 TCD EXCEL 220–240V 50/60/0Hz	8.1	7.5	2.8	1.2	1.8	1.0
PCA 1/26 TCD EXCEL 220–240V 50/60/0Hz	9.5	8.9	2.7	1.9	1.3	1.1
PCA 1/32 TCT EXCEL 220–240V 50/60/0Hz	10.2	9.3	3.6	2.4	1.7	1.1
PCA 1/42 TCT EXCEL 220–240V 50/60/0Hz	6.6	5.9	1.9	1.3	1.0	0.8
PCA 1/57 TCT EXCEL 220–240V 50/60/0Hz	11.6	9.9	5.6	1.8	3.9	1.5
PCA 2/11/13_11 TCD EXCEL 220–240V 50/60/0Hz	12.3	11.7	3.3	2.3	1.6	1.2
PCA 2/11/13_13 TCD EXCEL 220–240V 50/60/0Hz	11.3	10.6	3.1	2.1	1.5	1.2
PCA 2/18 TCD EXCEL 220–240V 50/60/0Hz	10.7	9.8	3.7	2.4	1.7	1.1
PCA 2/26 TCD EXCEL 220–240V 50/60/0Hz	9.1	8.5	2.7	1.8	1.3	0.9
PCA 2/32 TCT EXCEL 220–240V 50/60/0Hz	11.7	10.8	3.8	2.4	1.5	0.9
PCA 2/42 TCT EXCEL 220–240V 50/60/0Hz	8.4	7.7	2.9	1.9	1.3	0.7

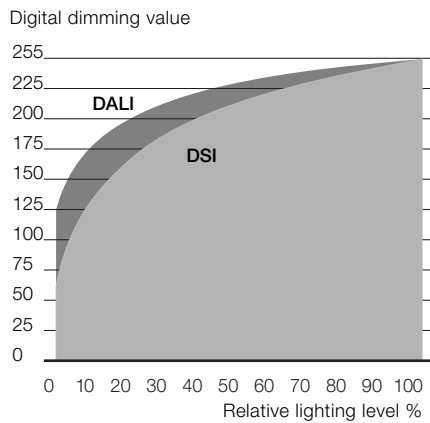
**Dimming:**

Dimming range 3% to 100%  
(57 W from 10% to 100%)

Digital control with:

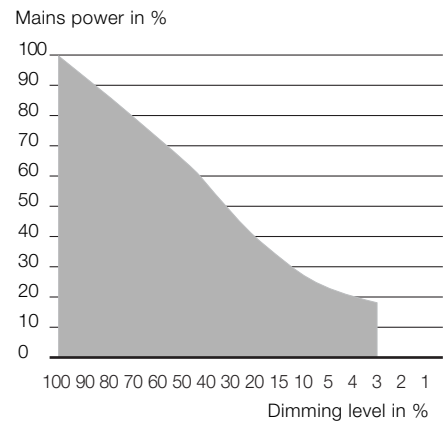
- DSI signal: 8 bit Manchester Code  
Maximum speed 3% to 100%  
(57 W from 10% to 100%) in 1.4 s
  - DALI signal: 16 bit Manchester Code  
Maximum speed 3% to 100%  
(57 W from 10% to 100%) in 0.5 s
- Programmable parameter:  
Minimum dimming level  
Maximum dimming level  
Default minimum = 3% (10% for 57 W)  
Programmable range 3% ≤ MIN ≤ 49%  
(10% ≤ MIN ≤ 49% for 57 W)  
Default maximum = 100%  
Programmable range 100% ≥ MAX ≥ 50%
- Dimming curve that is friendly to the eye.

**Dimming characteristics PCA EXCEL**



Dimming characteristics as seen by the human eye

**Energy Savings PCA EXCEL**



**Control input (D1/D2):**

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

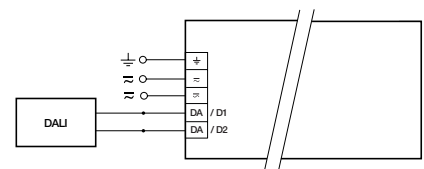
**Digital signal DALI/DSI:**

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.

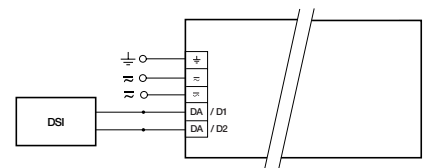
DALI/DSI signal = 0 switches off,  
DALI/DSI signal ≥ 1 switches on.  
Dimming with DALI or a DSI signal with the SMART-LS installed is not possible.  
switchDIM enables a temporary change of light level.  
The installation of the two wire bus is according to the appropriate low voltage regulations.



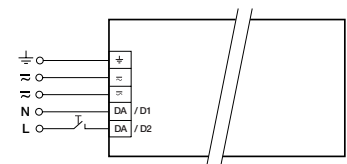
DALI PCA TCx EXCEL one4all

**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.  
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.



DSI PCA TCx EXCEL one4all



switchDIM PCA TCx EXCEL one4all

**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 1/11/13_11 TCD EXCEL	40	60	80	80	20	30	40	40
PCA 1/11/13_13 TCD EXCEL	40	60	80	80	20	30	40	40
PCA 1/18 TCD EXCEL	30	50	70	76	15	25	35	38
PCA 1/26 TCD EXCEL	30	50	70	76	15	25	35	38
PCA 1/32 TCT EXCEL	26	38	50	58	13	19	25	29
PCA 1/42 TCT EXCEL	26	38	50	58	13	19	25	29
PCA 1/57 TCT EXCEL	12	16	22	26	6	8	11	13
PCA 2/11/13_11 TCD EXCEL	28	40	60	64	14	20	30	32
PCA 2/11/13_13 TCD EXCEL	28	40	60	64	14	20	30	32
PCA 2/18 TCD EXCEL	22	32	46	68	11	16	23	34
PCA 2/26 TCD EXCEL	22	32	46	56	11	16	23	28
PCA 2/32 TCT EXCEL	10	18	24	28	5	9	12	14
PCA 2/42 TCT EXCEL	12	18	24	28	6	9	12	14

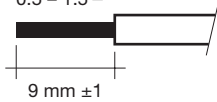
**Installation instructions:**

**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 mm<sup>2</sup>. For perfect function of the simple to use push-wire terminals the strip length should be 9 mm.

$U_{out} = 250V/250V$  ( $U_{out} = 400V/400V$  for 57 W)

wire preparation:  
0.5 – 1.5 mm<sup>2</sup>



**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

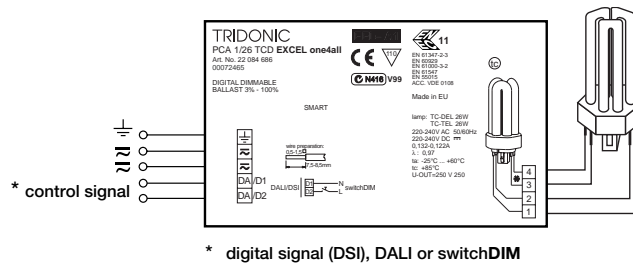
**Wiring advice:**

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

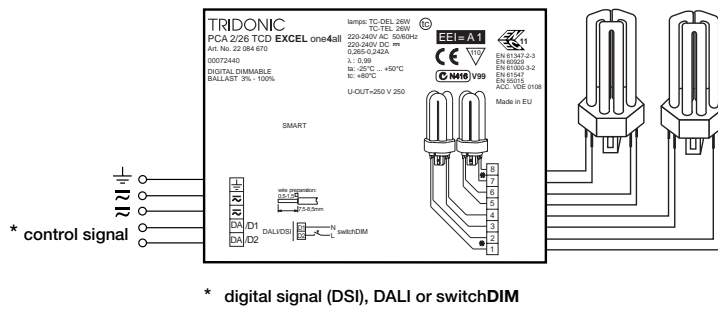
Ballast Type	Terminal		Maximum capacitance allowed	
	Cold	Hot	Cold	Hot
PCA 1/xx TCx EXCEL	1, 2	3, 4	100 pF	100 pF
PCA 2/xx TCx EXCEL	3, 4, 5, 6	1, 2, 7, 8	100 pF	100 pF

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 and cold leads should be separated as much as possible.



PCA EXCEL one4all 11–57 W



PCA EXCEL one4all 2x11–2x42 W