

PC BASIC, 4 – 28 W

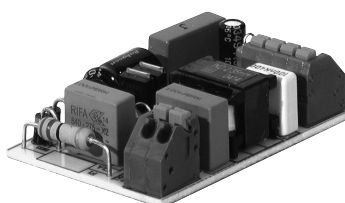
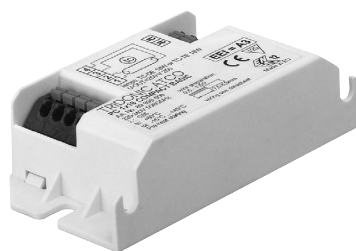
Electronic ballast for system output < 25 W

Product description

- CELMA Energy Efficiency Index A2 / A3
- Nominal life time up to 50,000 h (at t_a 50 °C with a failure rate max. 0.2 % per 1,000 h)
- Large temperature range (for values see table)
- Automatic start after replacement of defective lamps
- Safety shutdown of defective lamps and at end of life
- Temperature protection as per EN 61347-2-3 C5e

Technical data

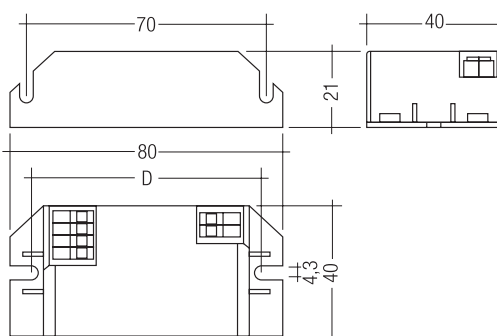
AC voltage range	198 – 264 V
DC voltage range	176 – 264 V (Lamp start \geq 198 V DC)
Overvoltage protection	270 V AC, 360 h
Defined warm start	\leq 2 s
Operating frequency	\geq 40 kHz
Type of protection	IP20 (except PCB versions)



Standards, page 3

Lamp matrix, page 3

Wiring diagrams and installation examples, page 5



Ordering data

Type	Article number	Packaging carton	Packaging pallet	Weight
For luminaires with 1 lamp				
PC 1x4-13 W BASIC	24138831	25 pieces	1,100 pieces	0.042 kg
PC 1x5-16 W BASIC	24138830	25 pieces	1,100 pieces	0.042 kg
PC 1x5-16 W BASIC PCB Printed circuit board without case	24138836	25 pieces	1,100 pieces	0.028 kg
PC 1x18 W BASIC	24138829	25 pieces	1,100 pieces	0.042 kg
PC 1x18 W BASIC PCB Printed circuit board without case	24138835	25 pieces	1,100 pieces	0.028 kg
PC 1x26 W BASIC	22176208	25 pieces	1,100 pieces	0.042 kg

Specific technical data

Lamp wattage	Lamp type	Type	Article number	Dimensions L x W x H	Hole spacing D	Lamp power	Circuit power	EEI	Current at 50 Hz		λ at 50 Hz		tc point max.®	Ambient temperature ta ®
									220 V	240 V	220 V	240 V		
For luminaires with 1 lamp														
1 x 4 W	T5	PC 1x4-13 W BASIC	24138831	80.0 x 40.0 x 21 mm	70 mm	3.5 W	5.0 W	A2	0.045 A	0.043 A	0.51	0.48	80 °C	-25 ... 50 °C
1 x 6 W	T5	PC 1x4-13 W BASIC	24138831	80.0 x 40.0 x 21 mm	70 mm	5.0 W	7.0 W	A2	0.059 A	0.057 A	0.54	0.51	80 °C	-25 ... 50 °C
1 x 8 W	T5	PC 1x4-13 W BASIC	24138831	80.0 x 40.0 x 21 mm	70 mm	6.5 W	8.5 W	A2	0.067 A	0.063 A	0.58	0.56	80 °C	-25 ... 50 °C
1 x 13 W	T5	PC 1x4-13 W BASIC	24138831	80.0 x 40.0 x 21 mm	70 mm	11.0 W	15.5 W	A3	0.114 A	0.106 A	0.62	0.61	80 °C	-25 ... 50 °C
1 x 10 W	TC-DD	PC 1x4-13 W BASIC	24138831	80.0 x 40.0 x 21 mm	70 mm	9.0 W	11.5 W	A3	0.087 A	0.081 A	0.60	0.59	80 °C	-25 ... 50 °C
1 x 16 W	TC-DD	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	14.0 W	18.0 W	A3	0.130 A	0.121 A	0.63	0.62	85 °C	-25 ... 50 °C
1 x 10 W	TC-DEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	8.5 W	11.5 W	A3	0.089 A	0.084 A	0.59	0.57	85 °C	-25 ... 50 °C
1 x 13 W	TC-DEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	12.0 W	15.5 W	A3	0.112 A	0.106 A	0.63	0.61	85 °C	-25 ... 50 °C
1 x 5 W	TC-SEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	4.5 W	6.5 W	A2	0.055 A	0.051 A	0.54	0.53	85 °C	-25 ... 50 °C
1 x 7 W	TC-SEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	6.0 W	8.0 W	A2	0.065 A	0.063 A	0.56	0.53	85 °C	-25 ... 50 °C
1 x 9 W	TC-SEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	7.5 W	10.0 W	A2	0.078 A	0.073 A	0.58	0.57	85 °C	-25 ... 50 °C
1 x 11 W	TC-SEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	11.0 W	15.0 W	A3	0.110 A	0.104 A	0.62	0.60	85 °C	-25 ... 50 °C
1 x 13 W	TC-TEL	PC 1x5-16 W BASIC	24138830	80.0 x 40.0 x 21 mm	70 mm	11.5 W	15.5 W	A3	0.112 A	0.106 A	0.63	0.61	85 °C	-25 ... 50 °C
1 x 16 W	TC-DD	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	14.0 W	18.0 W	A3	0.130 A	0.121 A	0.63	0.62	–	-25 ... 50 °C
1 x 10 W	TC-DEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	8.5 W	11.5 W	A3	0.089 A	0.084 A	0.59	0.57	–	-25 ... 50 °C
1 x 13 W	TC-DEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	12.0 W	15.5 W	A3	0.112 A	0.106 A	0.63	0.61	–	-25 ... 50 °C
1 x 5 W	TC-SEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	4.5 W	6.5 W	A2	0.055 A	0.051 A	0.54	0.53	–	-25 ... 50 °C
1 x 7 W	TC-SEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	6.0 W	8.0 W	A2	0.065 A	0.063 A	0.56	0.53	–	-25 ... 50 °C
1 x 9 W	TC-SEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	7.5 W	10.0 W	A2	0.078 A	0.073 A	0.58	0.57	–	-25 ... 50 °C
1 x 11 W	TC-SEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	11.0 W	15.0 W	A3	0.110 A	0.104 A	0.62	0.60	–	-25 ... 50 °C
1 x 13 W	TC-TEL	PC 1x5-16 W BASIC PCB	24138836	56.6 x 36.5 x 17 mm	–	11.5 W	15.5 W	A3	0.112 A	0.106 A	0.63	0.61	–	-25 ... 50 °C
1 x 18 W	TC-DEL	PC 1x18 W BASIC	24138829	80.0 x 40.0 x 21 mm	70 mm	15.5 W	19.0 W	A3	0.135 A	0.128 A	0.64	0.62	85 °C	-25 ... 50 °C
1 x 18 W	TC-TEL	PC 1x18 W BASIC	24138829	80.0 x 40.0 x 21 mm	70 mm	15.0 W	19.0 W	A3	0.135 A	0.128 A	0.64	0.62	85 °C	-25 ... 50 °C
1 x 18 W	TC-DEL	PC 1x18 W BASIC PCB	24138835	56.6 x 36.5 x 17 mm	–	15.5 W	19.0 W	A3	0.135 A	0.128 A	0.64	0.62	–	-25 ... 50 °C
1 x 18 W	TC-TEL	PC 1x18 W BASIC PCB	24138835	56.6 x 36.5 x 17 mm	–	15.0 W	19.0 W	A3	0.135 A	0.128 A	0.64	0.62	–	-25 ... 50 °C
1 x 28 W	TC-DD	PC 1x26 W BASIC®	22176208	80.0 x 40.0 x 21 mm	70 mm	21.5 W	25.0 W	A2	0.180 A	0.170 A	0.62	0.61	80 °C	-25 ... 45 °C
1 x 26 W	TC-DEL	PC 1x26 W BASIC	22176208	80.0 x 40.0 x 21 mm	70 mm	20.5 W	24.0 W	A2	0.180 A	0.170 A	0.62	0.61	80 °C	-25 ... 50 °C
1 x 26 W	TC-TEL	PC 1x26 W BASIC	22176208	80.0 x 40.0 x 21 mm	70 mm	21.0 W	24.5 W	A2	0.180 A	0.170 A	0.62	0.61	80 °C	-25 ... 50 °C

® For enclosed luminaires to fulfil the requirement of circuit power ≤ 25 W according to EN 61000-3-2. For AC operation only.

® Temperature specification printed circuit board

Standards

EN 55015
 EN 61000-3-2
 EN 61347-2-3
 EN 61347-2-4
 EN 61547

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 %)

Min. lamp starting temperature -25 °C

DC operation

220 – 240 V_{DC}
 198 – 264 V_{DC} certain lamp start
 176 – 264 V_{DC} operating possible

Min. lamp starting temperature -25 °C

With a DC supply L and N terminals are interchangeable.

EOS/ESD safety guidelines

The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at: <http://www.tridonic.com/com/en/technical-docs.asp>

Abnormal operation protection

All ballasts are equipped with a protection circuit against abnormal operation. The circuit is used to shut down the ballast if the lamp fails to strike, or if the lamp is defect.

The ballast can be restarted after shut down by turning off the supply for 10 seconds or by replacing the lamp.

Ingress protection

IP 20 for boxed versions

Protection class

The ballasts are suitable for use in class I or class II luminaires.

Energy class CELMA EEI = A2 / A3¹⁾

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

Harmonic distortion in the mains supply

EMC standard EN 61000-3-2 for lighting equipment with active input power ≤ 25 W.

All ballasts comply with the standard EN 61000-3-2 to operate lighting equipment with an active input power ≤ 25 W where distortion limits for current drawn from the supply are 86 % for 3rd harmonic and 61 % for 5th harmonic only.

Remark

The EMC standard applies to the luminaire and reflects the specific properties of each fitting whether single or multi-lamp.

Ballast lumen factor

Type	Lamp type	Wattage	AC/DC-BLF at 230V, 50Hz
PC 1x4-13 W BASIC	T5	1x4 W	1.00
PC 1x4-13 W BASIC	T5	1x6 W	1.03
PC 1x4-13 W BASIC	T5	1x8 W	1.01
PC 1x4-13 W BASIC	T5	1x13 W	0.93
PC 1x4-13 W BASIC	TC-DD	1x10 W	0.98
PC 1x5-16 W BASIC	TC-DD	1x16 W	0.99
PC 1x5-16 W BASIC	TC-DEL	1x10 W	0.95
PC 1x5-16 W BASIC	TC-DEL	1x13 W	1.00
PC 1x5-16 W BASIC	TC-SEL	1x5 W	0.98
PC 1x5-16 W BASIC	TC-SEL	1x7 W	0.96
PC 1x5-16 W BASIC	TC-SEL	1x9 W	0.98
PC 1x5-16 W BASIC	TC-SEL	1x11 W	1.03
PC 1x5-16 W BASIC	TC-TEL	1x13 W	1.00
PC 1x18 W BASIC	TC-DEL	1x18 W	0.96
PC 1x18 W BASIC	TC-TEL	1x18 W	0.96
PC 1x26 W BASIC	TC-DD	1x28 W	0.85
PC 1x26 W BASIC	TC-DEL	1x26 W	0.91
PC 1x26 W BASIC	TC-TEL	1x26 W	0.97

Lamp matrix

Lamp	PC Basic 4–13 W	PC Basic 5–16 W	PC Basic 18 W	PC Basic 28 W
TC-SEL 5 W		•		
7 W		•		
9 W		•		
11 W		•		
TC-DEL 10 W		•		
13 W		•		
18 W			•	
26 W				•
TC-TEL 13 W		•		
18 W	•			
26 W				•
T5 4 W	•			
6 W	•			
8 W	•			
13 W	•			
TC-DD 10 W	•			
16 W		•		
28 W				•

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 1x4–13 W Basic	90	117	144	181	90	117	144	181
PC 1x5–16 W Basic	80	106	130	163	80	106	130	163
PC 1x14–21 W Basic	56	83	102	127	28	54	102	127
PC 1x18 W Basic	76	99	122	153	76	99	122	153
PC 1x18–24 W Basic	56	73	90	112	28	54	90	112
PC 1x26 W Basic	56	71	88	110	28	54	88	110

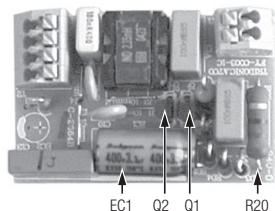
Max. load per MCB at supply voltage $U_n = 230\text{ V}$

Hottest point for the open PCB

When open PCB version are supplied it is the responsibility of the fitting/housing manufacturer to ensure the circuit board is adequately protected from dust and moisture and that no live parts are accessible to the end user during operation or when changing the lamp.

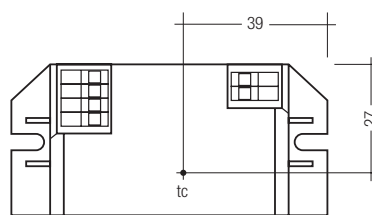
Be aware that the maximum temperature limits of the devices are not exceeded. The max. temperature values can be taken from the attached table (max. device temperature).

The exact measurement points on the devices are shown in the graphic "Temperature measurement points".



Temperature range

from -25 °C to +50 °C



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

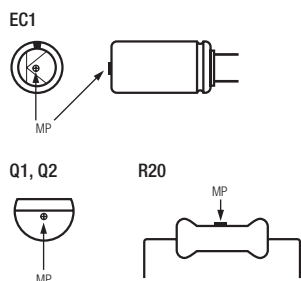
Storage temperature: -40 °C up to max. +80 °C

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

Max. device temperature

Device	Max. temperatur
R20	110 °C
Q1, Q2	120 °C
EC1 (4–13W)	85 °C
EC1 (5–16W)	90 °C
EC1 (18W)	95 °C

Temperature measurement points



Wiring advice

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

Ballast Type	Terminal	Maximum capacitance allowed			
		Cold	Hot	Cold	Hot
PC 1x4–13 W Basic	1, 2	3, 4	120 pF	60 pF	
PC 1x5–16 W Basic	1, 2	3, 4	120 pF	60 pF	
PC 1x18 W Basic	1, 2	3, 4	120 pF	60 pF	
PC 1x26 W Basic	1, 2	3, 4	120 pF	60 pF	

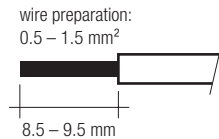
With standard solid wire 0.5 / 0.75 mm² the capacitance of the lead is 80 pF/m. This value is influenced by the way the wiring is made. In borderline cases the capacitance must be measured inside the luminaire. Lamp connection should be as short as possible and be made with symmetrical wiring.

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

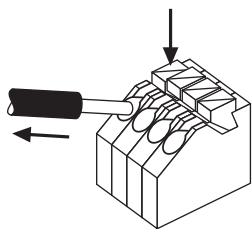
Wiring type and cross section

The wiring can be in flexible cable with ferules or solid with a cross section of 0.5 – 1.5 mm². Strip 9.5 mm of insulation from the cables to ensure perfect operation of push-wire terminals.

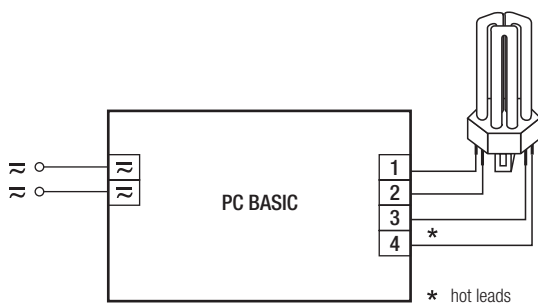


Release of the wiring

Press down the “push button” and remove the cable from front.



Wiring diagram



* leads 3, 4 max. 0.5 m (< 60 pF)
leads 1, 2 max. 1.0 m (< 120 pF)

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 must be kept as short as possible
- Mains leads should be kept apart from lamp leads (ideally 5 – 10 cm distance)
- Do not lead mains leads too closely along the electronic ballast
- 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

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.