TRIDONIC

LED Driver
Linear / area fixed output

IP20 SELV RoHS

Driver LCI 20W 150mA–400mA TOP lp

TOP series

PHASED OUT

Product description

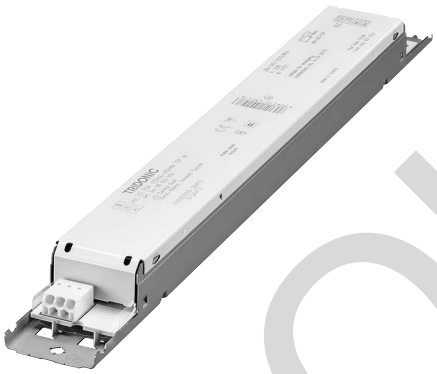
- Fixed output built-in LED Driver
- Constant current LED Driver
- Output current settable 150 – 400 mA
- Max. output power 20 W
- Nominal life-time up to 100,000 h
- For luminaires of protection class I and protection class II
- Temperature protection as per EN 61347-2-13 C5e
- 5-year guarantee

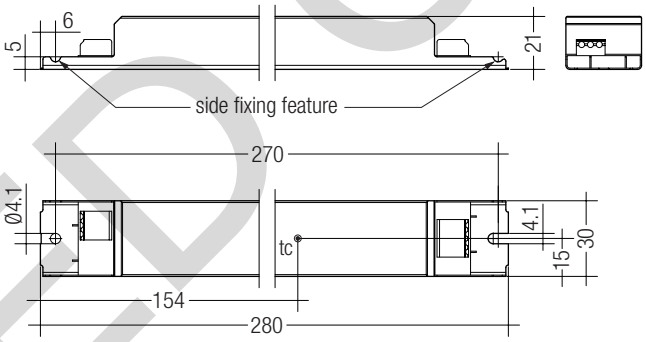
Properties

- Low-profile metal casing with white cover
- Type of protection IP20

Functions

- Intelligent Temperature Guard (overtemperature protection)
- Short-circuit proof
- Overload protection
- Suitable for emergency escapge lighting systems acc. to EN 50172





Ordering data

Type	Article number	Packaging carton	Packaging pallet	Weight per pc.
LCI 20W 150mA-400mA TOP lp	**28000205**	10 pc(s).	960 pc(s).	0.173 kg

Standards, page 4

Technical data

Rated supply voltage	220 – 240 V
AC voltage range	198 – 264 V
DC voltage range	176 – 280 V (start ≥ 198 V DC)
Mains frequency	0 / 50 / 60 Hz
Overvoltage protection	320 V AC, 48 h
Leakage current (PE)	< 0.5 mA
Max. input power	22.6 W
Efficiency (at 230 V, 50 Hz, full load)	79 – 85 %
THD (at 230 V, 50 Hz, full load)	12 – 22 %
Output current tolerance[1]	± 5 %
Output LF current ripple (< 120 Hz)	< 2 %
Max. peak output current	Output current + 20 %
Max. output voltage	60 V
Time to light	< 0.5 s
Hold on time at power failure or switch-off	< 0.5 s
Switchover time (AC/DC)	< 0.5 s
Burst / surge peaks output side against PE	2 kV
Dimensions L x W x H	280 x 30 x 21 mm

Specific technical data

Type	Output current[1]	Min. forward voltage	Max. forward voltage	Max. output power	Input power (at 230 V, 50 Hz, full load)	Input current (at 230 V, 50 Hz, full load)	λ (at 230 V, 50 Hz, full load)	tc point	Ambient temperature ta	tc/ta for ≥ 50.000 h	I sel resistor value
LCI 20W 150mA-400mA TOP lp	150 mA	21.6 V	48 V	7.2 W	9.1 W	51 mA	0.78	75 °C	-25 … +65 °C	75 / 65 °C	open
	175 mA	21.6 V	48 V	8.4 W	10.4 W	56 mA	0.81	75 °C	-25 … +65 °C	75 / 65 °C	63.40 kΩ
	200 mA	21.6 V	48 V	9.6 W	11.8 W	61 mA	0.84	75 °C	-25 … +65 °C	75 / 65 °C	54.90 kΩ
	225 mA	21.6 V	48 V	10.8 W	13.2 W	67 mA	0.86	75 °C	-25 … +65 °C	75 / 65 °C	47.50 kΩ
	250 mA	21.6 V	48 V	12.0 W	14.4 W	71 mA	0.88	75 °C	-25 … +65 °C	75 / 65 °C	40.20 kΩ
	275 mA	21.6 V	48 V	13.2 W	15.8 W	76 mA	0.90	75 °C	-25 … +65 °C	75 / 65 °C	34.00 kΩ
	300 mA	21.6 V	48 V	14.4 W	17.2 W	82 mA	0.91	75 °C	-25 … +65 °C	75 / 65 °C	27.40 kΩ
	325 mA	21.6 V	48 V	15.6 W	18.6 W	88 mA	0.92	75 °C	-25 … +60 °C	75 / 60 °C	22.00 kΩ
	350 mA	21.6 V	48 V	16.8 W	20.0 W	94 mA	0.93	75 °C	-25 … +60 °C	75 / 60 °C	12.00 kΩ
	375 mA	21.6 V	48 V	18.0 W	21.3 W	99 mA	0.94	75 °C	-25 … +60 °C	75 / 60 °C	6.19 kΩ
	400 mA	21.6 V	48 V	19.2 W	22.6 W	105 mA	0.94	75 °C	-25 … +60 °C	75 / 60 °C	short circuit (0 Ω)

[1] Output current is mean value.

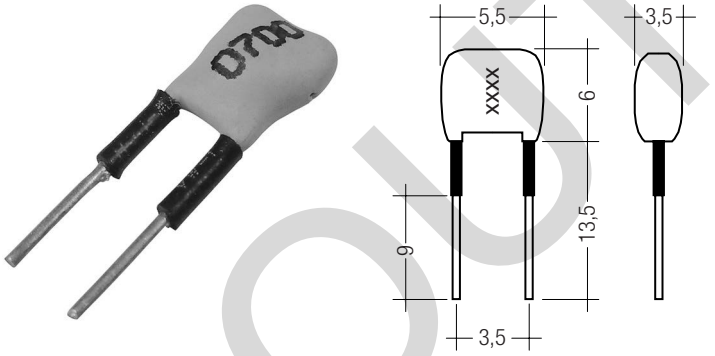
PHASED OUT

ACCES-SORIES

I-SELECT PLUG TOP / ECO

Product description

- Ready-for-use resistor to set output current value
- Compatible with LED Driver series TOP and ECO
- Resistor is base isolated
- Resistor power 0.25 W
- Resistor value tolerance ± 1 %



Ordering data

Type	Article number	Colour	Marking	Resistor value	Packaging bag	Weight per pc.
I-SELECT PLUG 175mA BL	**28000446**	Blue	0175	63.40 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 200mA BL	**28000447**	Blue	0200	54.90 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 225mA BL	**28000448**	Blue	0225	47.50 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 250mA BL	**28000368**	Blue	0250	40.20 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 275mA BL	**28000369**	Blue	0275	34.00 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 300mA BL	**28000275**	Blue	0300	27.40 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 325mA BL	**28000449**	Blue	0325	22.00 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 350mA BL	**28000276**	Blue	0350	12.00 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG 375mA BL	**28000450**	Blue	0375	6.19 kΩ	10 pc(s).	0.001 kg
I-SELECT PLUG MAX GR	**28000274**	Grey	MAX	0 Ω	10 pc(s).	0.001 kg

PHASE OUT

Standards
EN 55015
EN 61000-3-2
EN 61000-3-3
EN 61347-2-13
EN 62384
EN 61547
According to EN 50172 for use in central battery systems
According to EN 60598-2-22 suitable for emergency lighting installations

Output current setting
Output current can be set by connecting a resistor between the 2 "I sel" terminals. Relationship between output current and resistor value can be found at the table "Specific technical data". Resistor values specified from standardised resistor value ranges.
Resistor value tolerance has to be ≤ 1 %.
Resistor power has to be ≥ 0.1 W.
If the resistor is connected with wires a max. wire length of 2 m may not be exceeded and possible interferences have to be avoided.
Resistor detection at each start.
Change of the resistor value during the operation will be not considered.
Resistors for the main output current values can be ordered from Tridonic (see accessories).

DC emergency operation
The LED Driver is designed for operation on DC voltage and pulsed DC voltage.

Light output level in DC operation: 100 % (EOFx).

The voltage-dependent input current of Driver incl. LED module is depending on the used load.

The voltage-dependent no-load current of Driver (without or defect LED module) is for:
AC: < 22 mA
DC: < 9 mA

Overload protection
LED Driver will switch off at overload operation. Mains reset is required to restart the LED Driver.

Underload operation
LED Driver will switch off at underload operation. Mains reset is required to restart the LED Driver.

Overtemperature protection
The LED Driver will reduce output current at temporary thermal over-heating (exceeding max. tc point).
On DC operation this function is deactivated to fulfill emergency requirements.

Short-circuit behaviour
LED Driver will switch off in case of short-circuit of LED output. Mains reset is required to restart the LED Driver.

No-load operation or load loss during operation
LED Driver will detect a load loss during operation. In this case and no-load operation the max. output voltage can apply at the LED output for max. 5 s before LED Driver shuts down. Mains reset is required to restart the LED Driver.

Hot plug-in
Hot plug-in is not recommend within 5 s after shutdown due to output voltage of > 0 V. Mains reset is required to restart the LED Driver if LED module is connected to the LED Driver after these 5 s.

Conditions of use and storage

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 (ta) before they can be operated.

Temperature range
The LED Driver life duration is related to the ambient temperature ta.
The relation of tc to ta temperature depends also on the luminaire design. If the measured tc temperature is approx. 5 K below tc max. or higher, ta temperature should be checked and eventually critical components (e.g. ELCAP) measured.
Detailed information on request.

Expected life-time

Type	Output current	**ta**	**40 °C**	**50 °C**	**55 °C**	**60 °C**	**65 °C**
LCI 20W 150mA-400mA TOP lp	150 – 300 mA	tc	50 °C	60 °C	65 °C	70 °C	75 °C
		life-time	>100,000 h	>100,000 h	90,000 h	75,000 h	50,000 h
	325 – 400 mA	tc	55 °C	65 °C	70 °C	75 °C	x
		life-time	>100,000 h	75,000 h	65,000 h	55,000 h	x

x = not permitted

The LED Driver is designed for a life-time stated above under reference conditions and with a failure probability of less than 10 %.

PHASED OUT

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1,5 mm²	1,5 mm²	2,5 mm²	2,5 mm²	1,5 mm²	1,5 mm²	2,5 mm²	2,5 mm²	I_{max}	time
LCI 20W 150mA-400mA TOP lp	65	85	115	130	65	85	115	130	4 A	40 µs

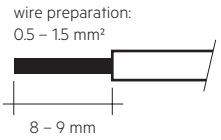
Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

	Output current	THD	3.	5.	7.	9.	11.
LCI 20W 150mA-400mA TOP lp	150 mA	22	15	9.5	6.5	4.5	2.5
	175 mA	21	15	9.0	6.5	4.5	2.5
	200 mA	20	14	9.0	6.0	4.5	2.5
	225 mA	19	13	8.0	6.0	4.0	2.5
	250 mA	17	11	7.0	5.0	4.0	2.5
	275 mA	16	10	6.0	5.0	4.0	2.5
	300 mA	15	10	6.0	4.0	3.0	2.0
	325 mA	14	9	5.0	4.0	3.0	2.0
	350 mA	13	9	4.0	3.0	3.0	2.0
	375 mA	12	9	4.0	3.0	3.0	2.0
	400 mA	12	9	3.0	2.0	2.0	2.0

Installation instructions

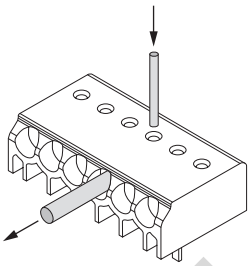
Wiring type and cross section

Solid wire with a cross section of 0.5 – 1.5 mm². Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals.



Release of the wiring

Loosen wire through twisting and pulling or using a Ø 1 mm release tool.



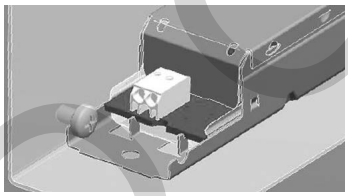
Wiring guidelines

- All connections must be kept as short as possible to ensure good EMI behaviour.
- Earthing is not required for the device to operate but will improve the EMI behaviour.
- If LCI TOP C will be earthed protection earth (PE) has to be used.
- Mains leads should be kept apart from LED Driver and other leads (ideally 5 – 10 cm distance)
- Max. length of output and I sel wires is 2 m.
- Secondary switching is not permitted.
- Incorrect wiring can demage LED modules.
- The wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

Earth connection

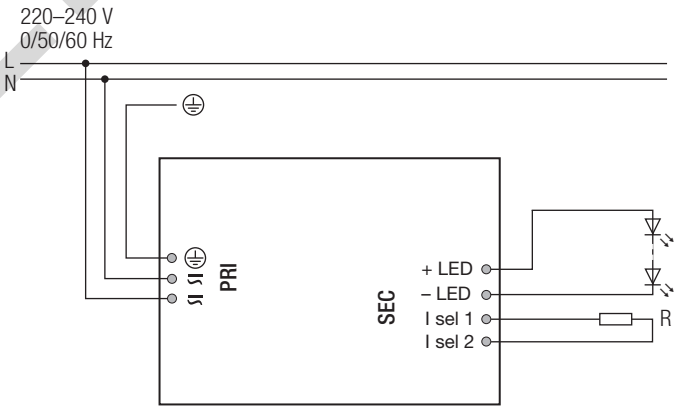
The earth connection is conducted as protection earth (PE). The LED Driver can be earthed via earth terminal or metal housing. If the LED Driver will be earthed, protection earth (PE) has to be used. There is no earth connection required for the functionality of the LED Driver.
Earth connection is recommended to improve following behaviour.

Side fixing feature



Screw M4, screw head diameter 8–10 mm

Circuit diagram



- Electromagnetic interferences (EMI)
- Transmission of mains transients to the LED output

In general it is recommended to earth the LED Driver if the LED module is mounted on earthed luminaire parts respectively heat sinks and thereby representing a high capacity against earth.

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.

PHASED OUT

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

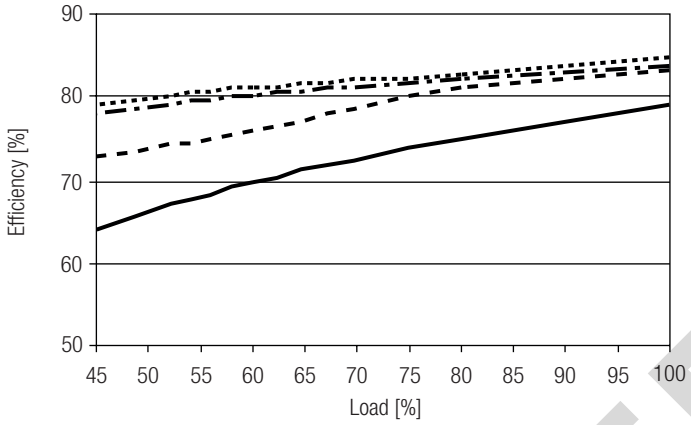
Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

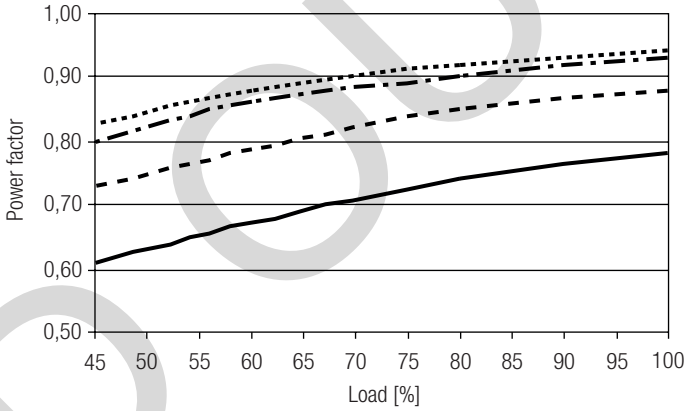
Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.

Diagrams LCI 20W 150mA-400mA TOP lp

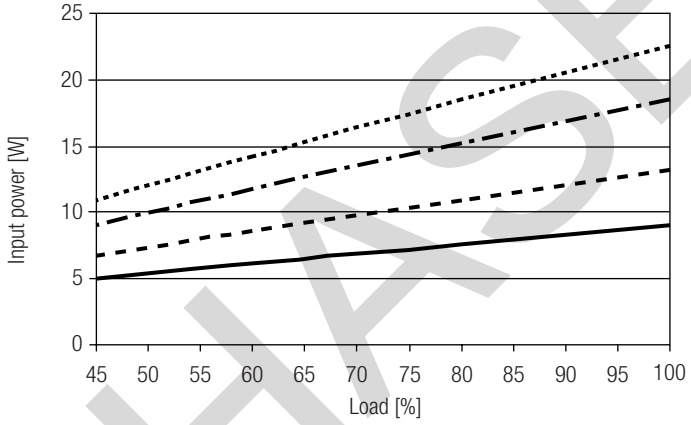
Efficiency vs load



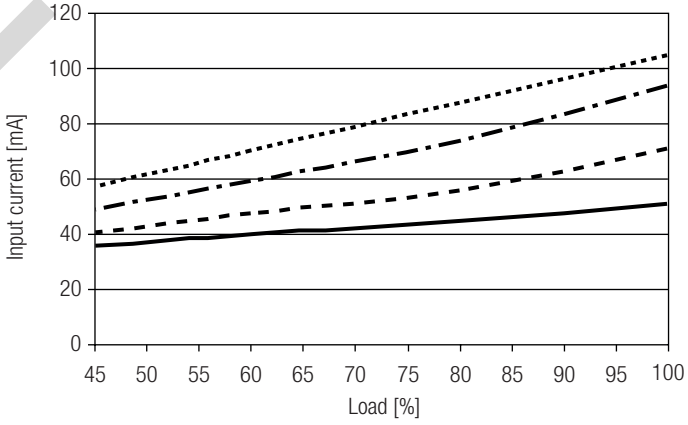
Power factor vs load



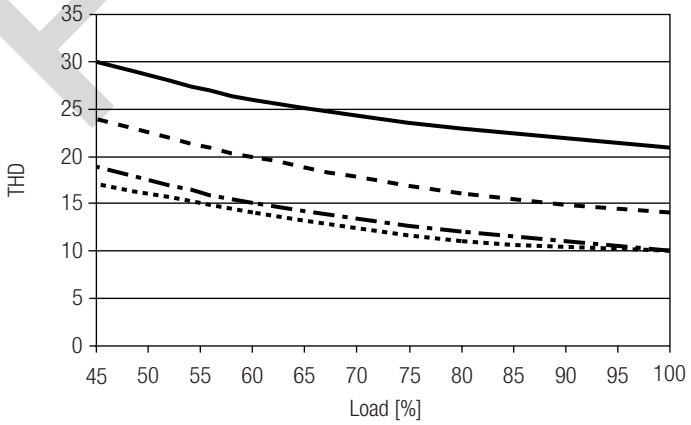
Input power vs load

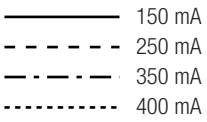


Input current vs load



THD vs load





PHASED OUT