TRIDONIC

Driver LC 28W 300–700mA flexC NF SC EXC3

excite series





With strain-relief

Product description

_ Can be either used build-in or independent with clip-on strain-relief (see accessory)
_ For luminaires of protection class I and protection class II
_ Temperature protection as per EN 61347-2-13 C5e
_ Adjustable output current between 300 – 700 mA via NFC
_ Max. output power 28 W
_ Up to 86 % efficiency
_ Nominal lifetime up to 100,000 h
_ 5 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)

Housing properties

_ Casing: polycarbonate, white
_ Type of protection IP20

Interfaces

_ Near field communication (NFC)
_ Terminal blocks: 45° push terminals

Functions

_ Adjustable output current in 1-mA-steps (NFC)
_ Constant light output function (CLO)
_ Protective features (overtemperature, short-circuit, overload, no-load)
_ Suitable for emergency escape lighting systems acc. to EN 50172

Benefits

_ Flexible configuration via companionSUITE (NFC)
_ Application-oriented operating window for maximum compatibility
_ Best energy savings due to low stand-by losses and high efficiency
_ In-field programming possible after installation with NFC interface



Typical applications

_ For downlight, spotlight and decorative applications

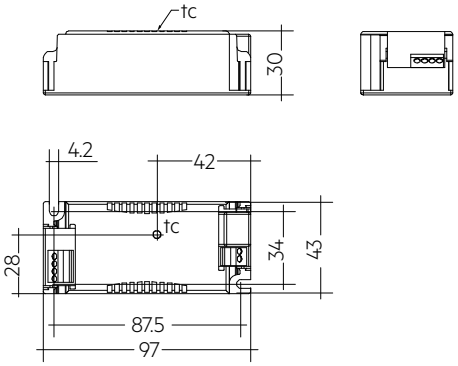
Website

http://www.tridonic.com/87501027

Linear | High bay | **Decorative** | **Downlights** | **Spotlights** | Free-standing | **Area** | Floor | Wall | Street

Driver LC 28W 300–700mA flexC NF SC EXC3

excite series



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pc.
LC 28/300-700/42 flexC NF SC EXC3	**87501027**	10 pc(s).	230 pc(s).	0.094 kg

Technical data

Rated supply voltage	220 – 240 V
AC voltage range	198 – 264 V
DC voltage range	176 – 280 V
Mains frequency	0 / 50 / 60 Hz
Overvoltage protection	320 V AC, 48 h
Typ. rated current (at 230 V, 50 Hz, full load) ①	150 mA
Leakage current (at 230 V, 50 Hz, full load) ①	< 450 µA
Max. input power	32 W
Typ. efficiency (at 230 V, 50 Hz, full load) ①	86 %
λ (at 230 V, 50 Hz, full load)	0.93C
λ (over full operating range)	0.4C – 0.93C
In-rush current (peak / duration)	4 A / 60 µs
THD (at 230 V, 50 Hz, full load)	< 15 %
Starting time (AC mode)	< 500 ms
Starting time (DC mode)	< 500 ms
Switchover time (AC/DC) ②	< 800 ms
Turn off time (at 230 V, 50 Hz, full load)	< 50 ms
Output current tolerance ③④	± 5 %
Max. output current peak (non-repetitive)	≤ output current + 20 %
Output LF current ripple (< 120 Hz)	± 5 %
Output P_ST_LM (at full load)	≤ 1
Output SVM (at full load)	≤ 0.4
Max. output voltage (U-OUT)	60 V
Mains surge capability (between L - N) ⑤	1 kV
Mains surge capability (between L/N - PE)	2 kV
Burst protection	1 kV
Burst / surge peaks output side against PE	< 3 kV
Ambient temperature ta	-20 … +50 °C
Max. casing temperature tc	80 °C
Type of protection	IP20
Lifetime	up to 100,000 h
Guarantee (conditions at www.tridonic.com)	5 Year(s)
Dimensions L x W x H	97 x 43 x 30 mm

Approval marks

NFC IP20 SELV RoHS

Standards

EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61000-4-4, EN 61000-4-5, EN 61347-1, EN 61347-2-13, EN 62384, EN 61547, according to EN 50172, according to EN 60598-2-22

Specific technical data

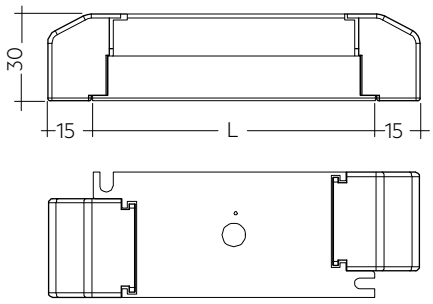
Type	Output current[3]	Min. output voltage	Max. output voltage	Max. output power	Typ. power consumption (at 230 V, 50 Hz, full load)	Typ. current consumption (at 230 V, 50 Hz, full load)
LC 28/300-700/42 flexC NF SC EXC3	300 mA	7.5 V	42 V	12.6 W	15.0 W	87 mA
LC 28/300-700/42 flexC NF SC EXC3	400 mA	7.5 V	42 V	16.8 W	19.5 W	105 mA
LC 28/300-700/42 flexC NF SC EXC3	500 mA	7.5 V	42 V	21.0 W	24.0 W	120 mA
LC 28/300-700/42 flexC NF SC EXC3	600 mA	7.5 V	42 V	25.2 W	28.5 W	135 mA
LC 28/300-700/42 flexC NF SC EXC3	666 mA	7.5 V	42 V	28.0 W	32.0 W	150 mA
LC 28/300-700/42 flexC NF SC EXC3	700 mA	7.5 V	40 V	28.0 W	32.0 W	150 mA

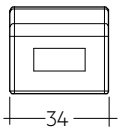
① Depending on the selected output current.
② Valid for immediate change of power supply type otherwise the starting time is valid.
③ Output current is mean value.
④ Test result at 25 °C.
⑤ L-N acc. to EN 61000-4-5. 2 Ohm, 1.2/50 µs, 8/20 µs.

Strain-relief set 43x30mm

Accessory







Permissible cable jacket diameter: 3 – 9 mm

Product description

_ Optional strain-relief set for independent applications
_ Transforms the LED driver into a fully class II compatible LED driver (e.g. ceiling installation)
_ Easy and tool-free mounting to the LED driver, screwless cable-clamp channels for long strain-relief (30 x 43 x 30 mm)
_ With screws for short strain-relief (15 x 34 x 30 mm)
_ Overall length = length L (LED driver) + 2 x 30 mm (long strain-relief set), 2 x 15 mm (short strain-relief) or long and short strain-relief any combination
_ Standard SC (L = 30 mm) available as non-pre-assembled and pre-assembled
_ Short SC (L = 15 mm) only pre-assembled available

Website
http://www.tridonic.com/28001168

Ordering data

Type	Article number	Packaging, carton ①	Packaging, outer box	Weight per pc.
ACU SC 43x30mm CLIP-ON SR SET	**28001168**	10 pc(s).	500 pc(s).	0.018 kg
ACU SC 43x30mm CLIP-ON SR SET 300	**28001351**	300 pc(s).	300 pc(s).	0.033 kg
ACU SC 30x43x30mm CLIP-ON SR PA	**28001699**	10 pc(s).	500 pc(s).	0.015 kg
ACU SC 15x43x30mm CLIP-ON SR PA	**28001574**	10 pc(s).	1,200 pc(s).	0.012 kg

Approval marks

① 28001168: A carton of 10 pcs. is equal to 10 sets, each with 2 strain-reliefs parts. 28001351: A carton of 300 pcs. is equal to 300 sets, each with 2 strain-reliefs parts. 28001699 + 28001574: A carton contains exactly 10 pcs. strain-reliefs (no sets).

1. Standards

EN 55015
EN 61000-3-2
EN 61000-3-3
EN 61000-4-4
EN 61000-4-5
EN 61347-1
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 luminaire

1.1 Glow wire test

according to EN 61347-1 with increased temperature of 850 °C passed.

2. Thermal details and lifetime

2.1 Expected lifetime

Expected lifetime for build-in use

Type	Output current	ta	40 °C	50 °C
LC 28/300-700/42 flexC NF SC EXC3	300 mA	tc	60 °C	65 °C
		Lifetime	>100,000 h	>100,000 h
	> 300 – 400 mA	tc	63 °C	70 °C
		Lifetime	>100,000 h	>100,000 h
	> 400 – 500 mA	tc	68 °C	75 °C
		Lifetime	>100,000 h	>100,000 h
	> 500 – 666 mA	tc	72 °C	80 °C
		Lifetime	>100,000 h	70,000 h
	> 666 – 700 mA	tc	72 °C	80 °C
		Lifetime	>100,000 h	60,000 h

Expected lifetime for independent use

Type	Output current	ta	45 °C	50 °C
LC 28/300-700/42 flexC NF SC EXC3	300 mA	tc	66 °C	70 °C
		Lifetime	>100,000 h	>100,000 h
	> 300 – 400 mA	tc	70 °C	72 °C
		Lifetime	>100,000 h	>100,000 h
	> 400 – 500 mA	tc	72 °C	75 °C
		Lifetime	>100,000 h	80,000 h
	> 500 – 666 mA	tc	78 °C	80 °C
		Lifetime	50,000 h	50,000 h
	> 666 – 700 mA	tc	78 °C	80 °C
		Lifetime	50,000 h	50,000 h

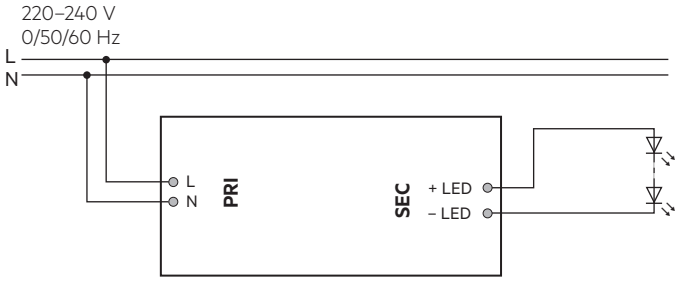
The LED driver is designed for a lifetime stated above under reference conditions and with a failure probability of less than 10 %.

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., ta temperature should be checked and eventually critical components (e.g. ELCAP) measured. Detailed information on request.

According to IEC 60598 – 1 mounting surface temperature is limited to max. 90 °C.
For output power > 21 W, the maximum ambient temperature is limited to 45° C for SR applications.

3. Installation / wiring

3.1 Circuit diagram

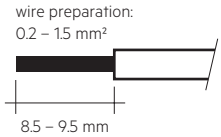


Recommendation to check glowing at standby in combination with class I luminaires.

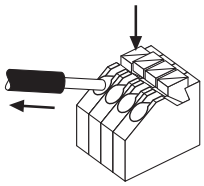
3.2 Wiring type and cross section

For wiring use stranded wire with ferrules or solid wire from 0.2–1.5 mm².
Strip 8.5–9.5 mm of insulation from the cables to ensure perfect operation of the push-wire terminals.
Use one wire for each terminal connector only.

LED module/LED driver/supply



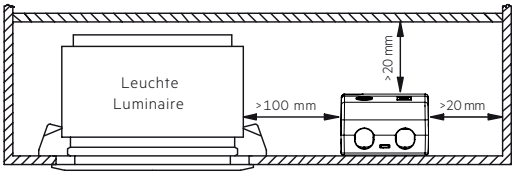
3.3 Loose wiring

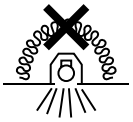


Press down the “push button” and remove the cable from front.

3.4 Fixing conditions when using as independent Driver with Clip-On

Dry, acidfree, oilfree, fatfree. It is not allowed to exceed the maximum ambient temperature (ta) stated on the device. Minimum distances stated below are recommendations and depend on the actual luminaire.
Is not suitable for fixing in corner.





Device not suitable for covering with thermally insulating material according to IEC 60598-1 Ed.9

3.5 Wiring guidelines

- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit), this applies for LED output.
- To comply with the EMC regulations run the secondary wires (LED module) in parallel.
- Secondary switching is not permitted.
- The LED driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.
- Wrong wiring of the LED driver can lead to malfunction or irreparable damage.
- To avoid damage of the Driver, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

3.6 Replace LED module

1. Mains off
2. Remove LED module
3. Wait for 30 seconds
4. Connect LED module again

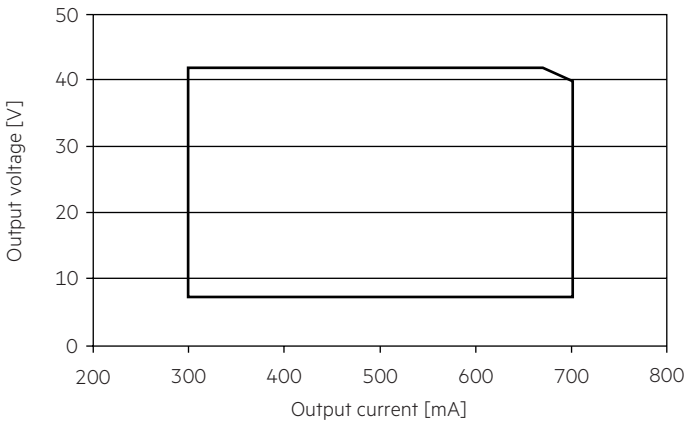
Hot plug-in or secondary switching of LEDs is not permitted and may cause a very high current to the LEDs.

3.7 Installation note

Max. torque at the clamping screw: 0.5 Nm / M4

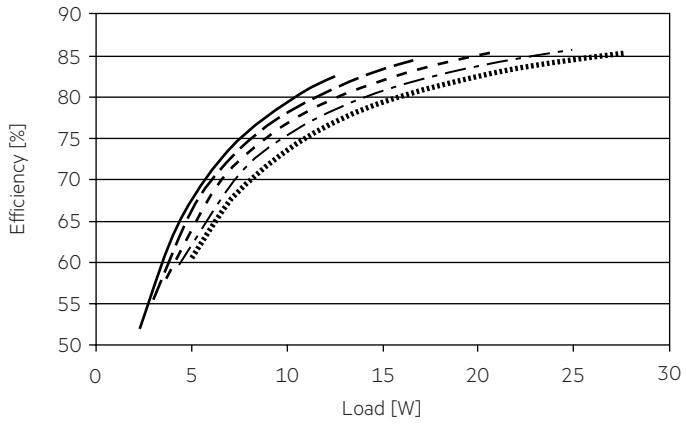
4. Electrical values

4.1 Operating window



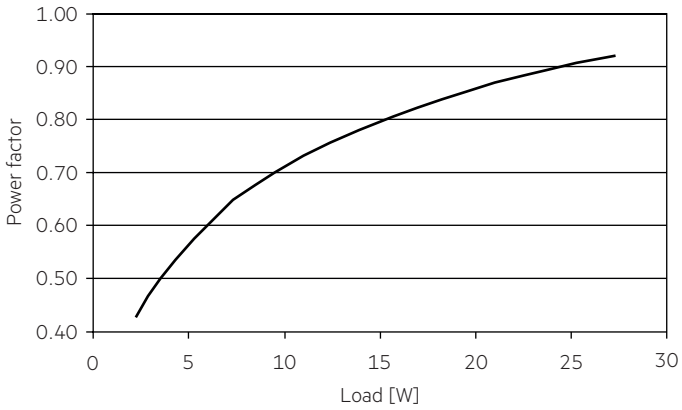
Make sure that the LED driver is operated within the given window under all operating conditions. Coming below the specified minimum output voltage of the LED driver may cause the device to shut-down.

4.2 Efficiency vs load



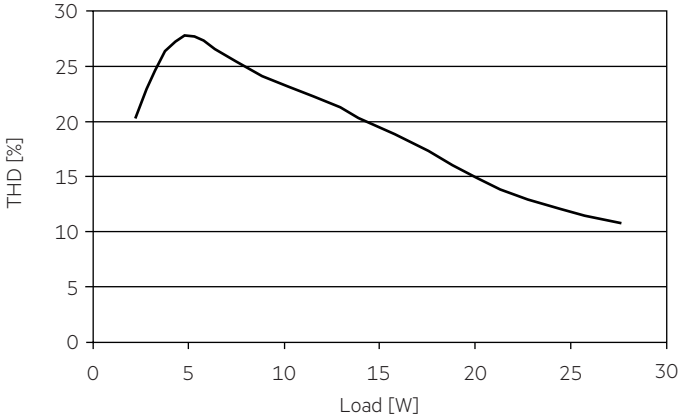
300 mA
400 mA
500 mA
600 mA
700 mA

4.3 Power factor vs load



4.4 THD vs load

THD without harmonic < 5 mA (0.6 %) of the input current:



100 % load corresponds to the max. output power (full load) according to the table on page 3.

4.8 Maximum loading of automatic circuit breakers in relation to inrush current

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	4 mm²	1.5 mm²	1.5 mm²	2.5 mm²	4 mm²	I_{max}	time
LC 28/300-700/42 flexC NF SC EXC3	47	61	75	94	47	61	75	94	4 A	60 µs

These are max. values calculated out of inrush current! Please consider not to exceed the maximum rated continuous current of the circuit breaker.
Calculation uses typical values from ABB series S200 as a reference.
Actual values may differ due to used circuit breaker types and installation environment.

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

	THD	3.	5.	7.	9.	11.
LC 28/300-700/42 flexC NF SC EXC3	< 15	< 12	< 7	< 5	< 3	< 3

Acc. to 61000-3-2. Harmonics < 5 mA or < 0.6 % (whatever is greater) of the input current are not considered for calculation of THD.

5. Software / Programming / Interfaces

5.1 Software / programming

With appropriate software and interface different functions can be activated and various parameters can be configured in the LED driver.
The Driver supports the following software and interfaces:

Software / hardware for configuration:
- companionSUITE (deviceGENERATOR, deviceCONFIGURATOR, deviceANALYSER)

Interfaces for data transfer:
- NFC

5.2 Nearfield communication (NFC)

The NFC Interface allows wireless communication with the LED driver.
This interface offers the option to write configuration and to read configuration, errors and events with the companionSUITE.
A correct communication between the LED driver and the NFC antenna can only be guaranteed if the antenna is placed directly on the Driver.
Any material placed between the LED driver and the NFC antenna can cause a deterioration of the communication quality.
After programming the device via NFC power up the device one time for one second till the deviceANALYSER can read out the parameters.
We recommend the use of following NFC antenna:
www.tridonic.com/nfc-readers

NFC is complied with ISO/IEC 15963 standard.

Changing parameters via NFC shall be done by qualified engineers only.

6. Functions

⊙ companionSUITE:
NFC
The companionSUITE with deviceGENERATOR, deviceCONFIGURATOR and deviceANALYSER is available via our WEB page:
https://www.tridonic.com/com/en/products/companionsuite.asp

Icon	Function	NFC
	LED current	⊙
	Constant light output (CLO)	⊙

6.1 LED current



The LED output current must be adapted to the connected LED module. The value is limited by the current range of the respective device.

The output current of the LED driver can be adjusted in a certain range. Adjustment is done by companionSUITE via NFC.

6.2 Constant Light Output (CLO)



With this function the light output of the LED module can be kept equal over the lifetime.
The light output of an LED module reduces over the course of its lifetime. The Constant Light Output (CLO) function compensates for this natural decline by constantly increasing the output current of the LED driver throughout its lifetime.
CLO shall be achieved by limitation of the LED current at the commissioning of the LED driver and providing a linear interpolation of the current over the time, depending on the data points given by the user.
Actual current value could be around 0 – 2.5 % lower than the ideal value between two CLO steps in addition to the output current tolerance.

The minimal CLO starting point is limited by the smallest output current of the LED driver.

6.3 Light level in DC operation



The LED driver is designed to operate on DC voltage and pulsed DC voltage. For a reliable operation, make sure that also in DC emergency operation the LED driver is run within the specified conditions as stated in chapter “4.1 operating window”.

Light output level in DC operation: 100 % (not adjustable, EOF_i = 0.96)

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: < 29.5 mA
DC: < 7.7 mA

7. Protective features

7.1 Overtemperature protection

The LED driver is protected against temporary thermal overheating.
If the temperature limit is exceeded the output current of the LED module(s) is reduced. The temperature protection is activated above tc max.
The activation temperature differs depending on the LED load.

7.2 Short-circuit behaviour

In case of a short-circuit at the LED output the LED output is switched off.
After restart of the LED driver the output will be activated again.
The restart can be done via mains reset.

7.3 No-load operation

The LED driver works in burst working mode to provide a 60 ms pulse output voltage regulation which allows the application to be able to work safely when LED string opens due to a failure.

7.4 Overload protection

If the maximum load is exceeded by a defined internal limit, the LED driver works in burst working mode. After restart of the LED driver the output will be activated again.
The restart can be done via mains reset.

7.5 Insulation between terminals

Insulation	Mains	LED
Mains	–	double
LED	double	–

double … represents double or reinforced insulation.

8. Miscellaneous

8.1 Insulation 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 insulation 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 insulation 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.

8.2 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 acclimatised to the specified temperature range (ta) before they can be operated.

The LED driver is declared as inbuilt LED controlgear, meaning it is intended to be used within a luminaire enclosure.
If the product is used outside a luminaire, the installation must provide suitable protection for people and environment (e.g. in illuminated ceilings).

8.3 Maximum number of switching cycles

All LED driver are tested with 50,000 switching cycles.
The actually achieved number of switching cycles is significantly higher.

8.4 Additional information

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

Lifetime declarations are informative and represent no warranty claim.
No warranty if device was opened.