TRIDONIC

Driver LC 45W 500–1400mA flexC SC EXC

excite series





Product description

_ Constant current LED driver
_ Can be either used built-in or independent with clip-on strain-relief (see accessory)
_ Adjustable output current between 500 and 1,400 mA via ready2mains Programmer or I-SELECT 2 plugs
_ Max. output power 45 W
_ Up to 88 % 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

_ ready2mains (configuration via mains)
_ Terminal blocks: 45° push terminals

Functions

_ Adjustable output current in 1-mA-steps (ready2mains, I-SELECT 2)
_ Protective features (overtemperature, short-circuit, overload, no-load, input voltage range)
_ Intelligent Voltage Guard (overvoltage and undervoltage monitoring)
_ Suitable for emergency escape lighting systems acc. to EN 50172

Benefits

_ Application-oriented operating window for maximum compatibility
_ Best energy savings due to high efficiency
_ Flexible configuration via ready2mains and I-SELECT 2



Typical applications

_ For downlight, spotlight and decorative applications

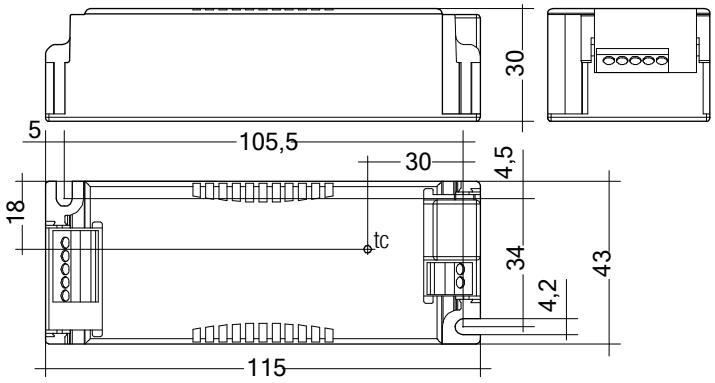
Website

http://www.tridonic.com/28000707

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

Driver LC 45W 500–1400mA flexC SC EXC

excite series



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pc.
LC 45W 500-1400mA flexC SC EXC	**28000707**	10 pc(s).	1,000 pc(s).	0.124 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	228 mA
Typ. current (220 V, 0 Hz, full load, 68 % dimming level) ①	162 mA
Leakage current (at 230 V, 50 Hz, full load) ①	< 250 µA
Max. input power	51.3 W
Typ. efficiency (at 230 V, 50 Hz, full load) ①	88 %
λ (at 230 V, 50 Hz, full load)	0.95
Typ. input current in no-load operation	17.3 mA
Typ. input power in no-load operation	0.58 W
In-rush current (peak / duration)	19.4 A / 250 µs
THD (at 230 V, 50 Hz, full load)	< 10 %
Starting time (at 230 V, 50 Hz, full load)	< 500 ms
Starting time (DC mode)	< 500 ms
Switchover time (AC/DC) ②	< 0.2 s
Turn off time (at 230 V, 50 Hz, full load)	< 50 ms
Output current tolerance ③	± 5 %
Max. output current peak (non-repetitive)	≤ output current + 35 %
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)	1 kV
Mains surge capability (between L/N - PE)	2 kV
Burst / surge peaks output side against PE	< 500 V
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	115 x 43 x 30 mm

Approval marks

IP20 SELV RoHS

Standards

EN 55015, EN 61000-3-2, EN 61000-3-3, 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[4][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)	tc point max.	Ambient temperature ta	I-SELECT 2 resistor value[5]
LC 45W 500-1400mA flexC SC EXC	500 mA	20 V	50.0 V	25.0 W	28.6 W	132 mA	80 °C	-25 … +45 °C	–
LC 45W 500-1400mA flexC SC EXC	550 mA	20 V	50.0 V	27.5 W	31.2 W	143 mA	80 °C	-25 … +45 °C	9.09 kΩ
LC 45W 500-1400mA flexC SC EXC	600 mA	20 V	50.0 V	30.0 W	33.8 W	155 mA	80 °C	-25 … +45 °C	8.33 kΩ
LC 45W 500-1400mA flexC SC EXC	650 mA	20 V	50.0 V	32.5 W	36.4 W	166 mA	80 °C	-25 … +45 °C	7.69 kΩ
LC 45W 500-1400mA flexC SC EXC	700 mA	20 V	50.0 V	35.0 W	38.9 W	176 mA	80 °C	-25 … +45 °C	7.14 kΩ
LC 45W 500-1400mA flexC SC EXC	750 mA	20 V	50.0 V	37.5 W	41.5 W	187 mA	80 °C	-25 … +45 °C	6.67 kΩ
LC 45W 500-1400mA flexC SC EXC	800 mA	20 V	50.0 V	40.0 W	44.3 W	199 mA	80 °C	-25 … +45 °C	6.25 kΩ
LC 45W 500-1400mA flexC SC EXC	850 mA	20 V	50.0 V	42.5 W	47.1 W	210 mA	80 °C	-25 … +45 °C	5.88 kΩ
LC 45W 500-1400mA flexC SC EXC	900 mA	20 V	50.0 V	45.0 W	49.6 W	221 mA	80 °C	-25 … +45 °C	5.56 kΩ
LC 45W 500-1400mA flexC SC EXC	950 mA	20 V	47.4 V	45.0 W	50.1 W	223 mA	80 °C	-25 … +45 °C	5.26 kΩ
LC 45W 500-1400mA flexC SC EXC	1,000 mA	20 V	45.0 V	45.0 W	50.1 W	223 mA	80 °C	-25 … +45 °C	5.00 kΩ
LC 45W 500-1400mA flexC SC EXC	1,050 mA	20 V	42.9 V	45.0 W	50.0 W	223 mA	80 °C	-25 … +45 °C	4.76 kΩ
LC 45W 500-1400mA flexC SC EXC	1,100 mA	20 V	40.9 V	45.0 W	49.8 W	223 mA	80 °C	-25 … +45 °C	4.55 kΩ
LC 45W 500-1400mA flexC SC EXC	1,150 mA	20 V	39.1 V	45.0 W	50.1 W	223 mA	80 °C	-25 … +45 °C	4.35 kΩ
LC 45W 500-1400mA flexC SC EXC	1,200 mA	20 V	37.5 V	45.0 W	49.9 W	223 mA	80 °C	-25 … +45 °C	4.17 kΩ
LC 45W 500-1400mA flexC SC EXC	1,250 mA	20 V	36.0 V	45.0 W	50.1 W	223 mA	80 °C	-25 … +45 °C	4.00 kΩ
LC 45W 500-1400mA flexC SC EXC	1,300 mA	20 V	34.6 V	45.0 W	50.8 W	226 mA	80 °C	-25 … +45 °C	3.85 kΩ
LC 45W 500-1400mA flexC SC EXC	1,350 mA	20 V	33.3 V	45.0 W	51.0 W	227 mA	80 °C	-25 … +45 °C	3.70 kΩ
LC 45W 500-1400mA flexC SC EXC	1,400 mA	20 V	32.1 V	45.0 W	51.3 W	228 mA	80 °C	-25 … +45 °C	0.00 kΩ

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 The table only lists a number of possible operating points but does not cover each single point. The output current can be set within the total value range in 1-mA-steps.
⑤ Not compatible with I-SELECT (generation 1). Calculated resistor value.

Strain-relief set 43x30mm

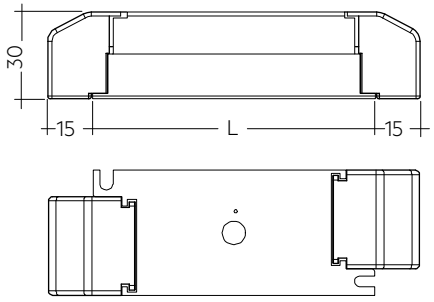
Accessory

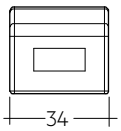


Product description

_ 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





Permissible cable jacket diameter: 3 – 9 mm

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

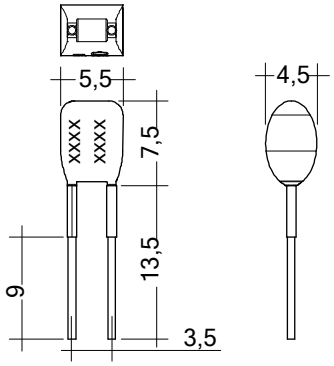
Approval marks

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).

I-SELECT 2 PLUG PRE / EXC

Accessory





Product description

_ Ready-for-use resistor to set output current value
_ Compatible with LED driver featuring I-select 2 interface; not compatible with I-SELECT (generation 1)
_ Resistor is base insulated
_ Resistor power 0.25 W
_ Current tolerance ± 2 % additional to output current tolerance
_ Compatible with LED driver series PRE and EXC

Example of calculation

_ R [kΩ] = 5 V / I_out [mA] x 1000
_ E96 resistor value used
_ Resistor value tolerance ≤ 1 %; resistor power ≥ 0.1 W; base insulation necessary
_ When using a resistor value beyond the specified range, the output current will automatically be set to the minimum value (resistor value too big), respectively to the maximum value (resistor value too small)

Website

http://www.tridonic.com/28001114

Ordering data

Type	Article number	Colour	Marking	Current	Resistor value	Packaging, bag	Weight per pc.
I-SELECT 2 PLUG 500MA BL	28001114	Blue	0500 mA	500 mA	10.00 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 525MA BL	28001960	Blue	0525 mA	525 mA	9.53 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 550MA BL	28001115	Blue	0550 mA	550 mA	9.09 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 600MA BL	28001116	Blue	0600 mA	600 mA	8.25 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 650MA BL	28001117	Blue	0650 mA	650 mA	7.68 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 700MA BL	28001118	Blue	0700 mA	700 mA	7.15 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 750MA BL	28001119	Blue	0750 mA	750 mA	6.65 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 800MA BL	28001120	Blue	0800 mA	800 mA	6.19 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 850MA BL	28001121	Blue	0850 mA	850 mA	5.90 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 900MA BL	28001122	Blue	0900 mA	900 mA	5.62 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 950MA BL	28001123	Blue	0950 mA	950 mA	5.23 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1000MA BL	28001124	Blue	1000 mA	1,000 mA	4.99 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1050MA BL	28001125	Blue	1050 mA	1,050 mA	4.75 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1100MA BL	28001126	Blue	1100 mA	1,100 mA	4.53 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1150MA BL	28001127	Blue	1150 mA	1,150 mA	4.32 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1200MA BL	28001128	Blue	1200 mA	1,200 mA	4.12 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1250MA BL	28001129	Blue	1250 mA	1,250 mA	4.02 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1300MA BL	28001130	Blue	1300 mA	1,300 mA	3.83 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1350MA BL	28001131	Blue	1350 mA	1,350 mA	3.74 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG 1400MA BL	28001132	Blue	1400 mA	1,400 mA	3.57 kΩ	10 pc(s).	0.001 kg
I-SELECT 2 PLUG MAX BL	28001099	Blue	MAX	MAX	0.00 kΩ	10 pc(s).	0.001 kg

1. Standards

EN 55015
EN 61000-3-2
EN 61000-3-3
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 lighting installations

Housing fulfils requirements for reinforced insulation according EN 60598-1.

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

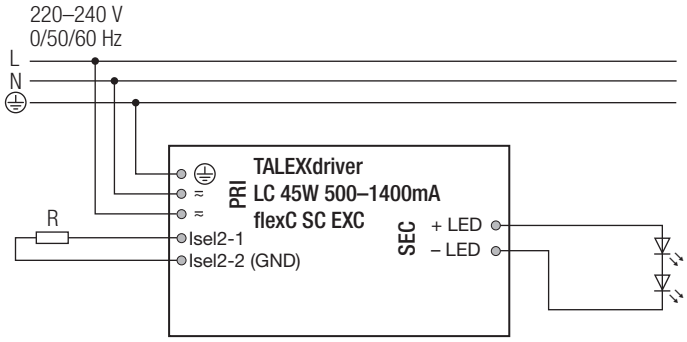
Type	Output current	ta	40 °C	45 °C
LC 45W 500-1400mA flexC SC EXC	500 – 1,400 mA	tc	75 °C	80 °C
		Lifetime	70,000 h	50,000 h

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.

3. Installation / wiring

3.1 Circuit diagram

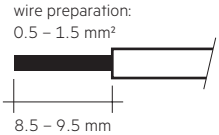


Recommendation to check glowing at standby in combination with class I luminaires.

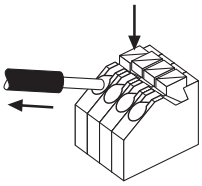
3.2 Wiring type and cross section

For wiring use stranded wire with ferrules or solid wire from 0.5–1.5 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



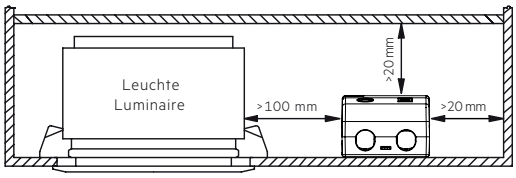
3.3 Loose wiring

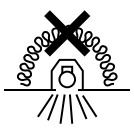


Press down the “push button” and remove the cable from front.

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

- Run the secondary lines separately from the mains connections and lines to achieve good EMC performance.
- The max. secondary cable length is 2 m (4 m circuit).
- For good EMC performance, keep the LED wiring as short as possible.
- 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 Hot plug-in

Hot plug-in is not supported due to residual output voltage of > 0 V.
When connecting an LED load, restart the device to activate the LED output. This can be done via mains reset.

3.7 Earth connection

The earth connection is conducted as protection earth (PE). 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.

- 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.

3.8 I-SELECT 2 resistors connected via cable

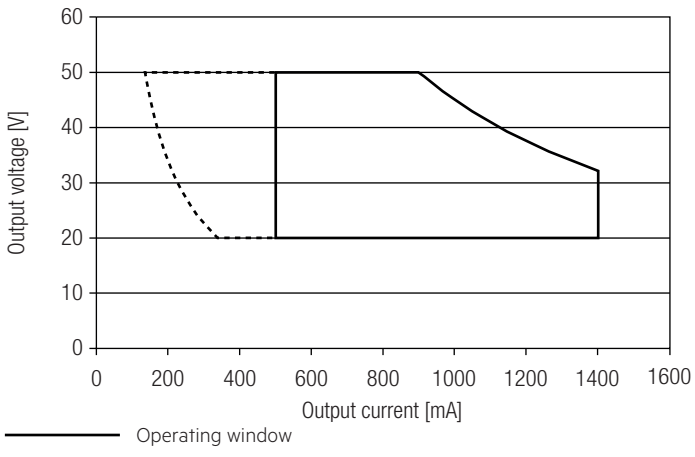
For details see:
http://www.tridonic.com/com/en/download/technical/LCA_PRE_LC_EXC_ProductManual_en.pdf.

3.9 Installation note

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

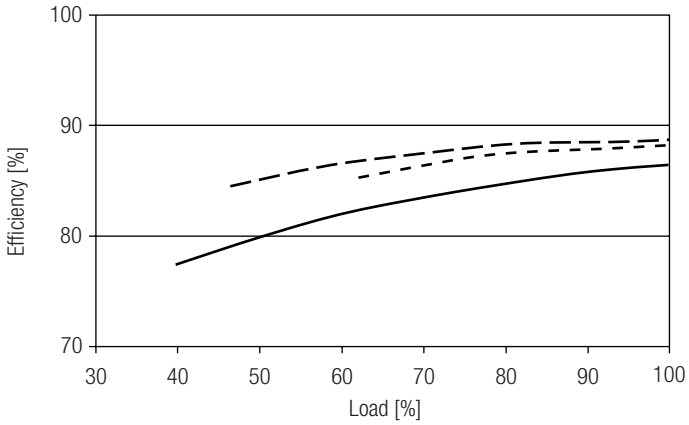
4. Electrical values

4.1 Operating window

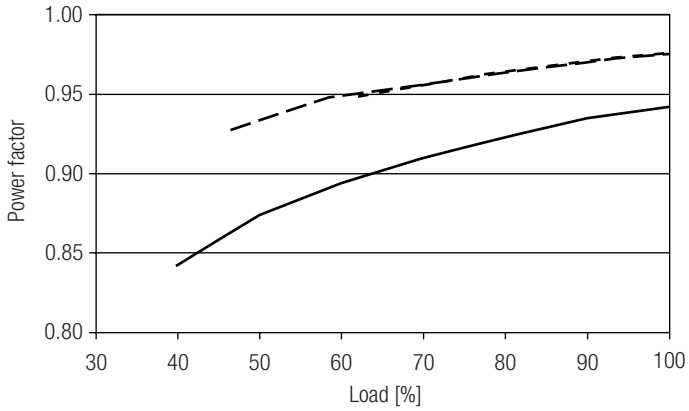


Make sure that the LED driver is operated within the given window under all operating conditions. Special attention needs to be paid at dimming and DC emergency operation as the forward voltage of the connected LED modules varies with the dimming level, due to the implemented amplitude dimming technology. Coming below the specified minimum output voltage of the LED driver may cause the device to shut-down.
See chapter “6.7 DC emergency operation” for more information.

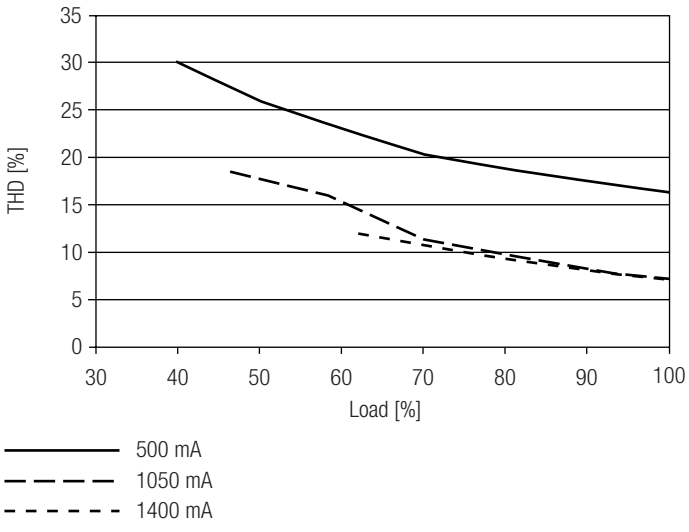
4.2 Efficiency vs load



4.3 Power factor vs load



4.4 THD vs load



100 % load corresponds to the max. output power (full load) according to the table on page 2.

4.5 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	2.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	2.5 mm²	I_{max}	time
LC 45W 500-1400mA flexC SC EXC	21	28	35	45	13	17	21	27	19.4 A	250 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.

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

	THD	3.	5.	7.	9.	11.
LC 45W 500-1400mA flexC SC EXC	< 7	< 2	< 3	< 3	< 3	< 2

5. Interfaces / communication

5.1 Configuration input ready2mains (L, N)

The digital ready2mains protocol is modulated onto the mains signal which is wired to the mains terminal (L and N).

6. Functions

6.1 Function: adjustable current

The output current of the LED driver can be adjusted in a certain range.
For adjustment there are two options available.

Option 1: I-SELECT 2
By inserting a suitable resistor or third party resistor into the I-SELECT 2 interface, the current value can be adjusted. The relationship between output current and resistor value can be found in the chapter
“Accessories I-SELECT 2 Plugs”.

Please note that the resistor values for I-SELECT 2 are not compatible with I-SELECT (generation 1). Installation of an incorrect resistor may cause irreparable damage to the LED module(s).

Resistors for the main output current values can be ordered from Tridonic (see accessories).

Option 2: ready2mains
Adjustment is done by the ready2mains Programmer and the corresponding configuration software (see ready2mains documentation).

Current adjustment can only be done five times over ready2mains. To program the LED driver a connected load is necessary that is within the operating window of the LED driver.

The priority for current adjustment methods is I-SELECT 2 followed by ready2mains (lowest priority).

6.2 ready2mains – configuration

The ready2mains interface can be used to configure the main parameters of LED drivers via the mains wiring, such as LED output current.
These parameters can be adjusted either via ready2mains-capable configuration software or directly via the ready2mains Programmer.

6.3 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.

6.4 No-load operation

The LED driver will not be damaged in no-load operation. The output will be deactivated and is therefore free of voltage. If a LED load is connected the device has to be restarted before the output will be activated again.

6.5 Overload protection

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

6.6 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.
On DC operation this function is deactivated to fulfill emergency requirements.

6.7 DC emergency 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 (EOF_j): 68 % (cannot be adjusted)

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: < 18 mA
DC: < 2 mA

6.8 Intelligent Voltage Guard

Intelligent Voltage Guard is the name of the electronic monitoring of the mains voltage. It immediately shows if the mains voltage rises above certain thresholds. Measures can then be taken quickly to prevent damage to the LED driver.

- If the mains voltage rises above approx. 280 Vrms (voltage depends on the LED driver type), the LED light starts flashing on and off.
- To avoid a damage of the LED driver the mains supply has to be switched off at this signal.

7. Miscellaneous

7.1 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.

7.2 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).

7.3 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.

7.4 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.