

Driver LCO 600W 600–2800mA 286V NF DA C PRE

premium NFC outdoor series

**Product description**

- _ Premium NFC and DALI-2 outdoor LED driver with IP66/67 protection, UL Dry/Damp/Wet Location
- _ Universal input voltage range (90–305 V AC) and wide output current adjustable via NFC and DALI
- _ High reliability: up to 100,000 h nominal lifetime, 7 year guarantee (conditions at <https://www.tridonic.com/en/int/services/manufacturerguarantee-conditions>)
- _ Exceptional energy efficiency up to 94.6 %
- _ Superior surge protection: 6 kV (L-N), 10 kV (L/N-PE)
- _ Wide operating window for maximum compatibility with various LED module combinations and luminaire operating points

Interfaces

- _ NFC wireless programming via NFC Programming Utility Tool
- _ DALI-2 control interface
- _ Programmable dimming curves via NFC/DALI
- _ Output current configuration, constant light output (CLO)
- _ Timer dimming function support

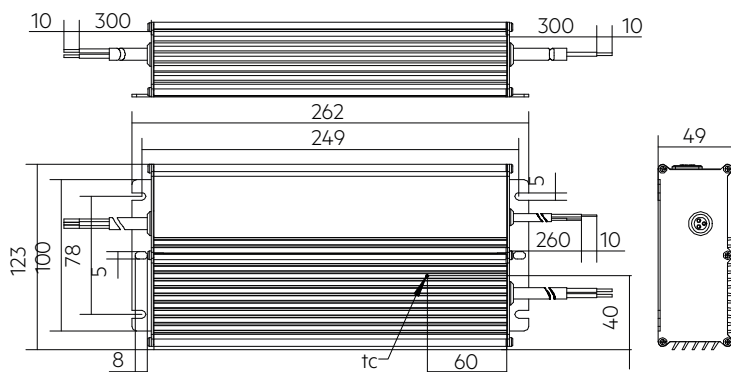
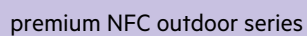
Benefits

- _ DALI-2 dimmable for flexible lighting control
- _ Universal input voltage range for global applicability
- _ NFC-enabled on-site configuration without disassembling luminaires
- _ Operating window for maximum compatibility with LED modules
- _ Best energy savings thanks to high efficiency and low stand-by power
- _ Robust thermal behavior to ease design-in and overtemperature protection
- _ High surge protection (up to 10 kV) for harsh outdoor conditions
- _ For class I luminaires

Typical applications

- _ Sport, stadium and area lighting

Website<http://www.tridonic.com/28006365>



Type	Article number	Packaging, carton	Packaging, pallet	Weight per pc.
LCO 600/600-2800/286 NF DA C PRE	28006365	4 pc(s).	112 pc(s).	2.7 kg

Technical data

Rated supply voltage	120 – 277 V
AC voltage range	90 – 305 V
Mains frequency	50 / 60 Hz
Typ. current (at 120 V, 60 Hz, full load)	5,500 mA
Typ. rated current (at 230 V, 50 Hz, full load) ^{①②}	2,830 mA
Typ. current (at 277 V, 60 Hz, full load)	2,380 mA
Leakage current (at 230 V, 50 Hz, full load) ^{①②③}	< 700 µA
Max. input power	636 W
Max. input power (at 120 V, 60 Hz, full load)	649 W
Max. input power (at 277 V, 60 Hz, full load)	633 W
Output power range (P _{rated})	77.4 – 600 W
Typ. efficiency (at 120 V, 60 Hz, full load)	92.1 %
Typ. efficiency (at 230 V, 50 Hz, full load) ^②	94.2 %
Typ. efficiency (at 277 V, 60 Hz, full load)	94.6 %
λ (at 120 V, 60 Hz, full load)	0.99
λ (at 230 V, 50 Hz, full load) ^①	0.97
λ (at 277 V, 60 Hz, full load)	0.96
Typ. power consumption on stand-by ^④	< 0.5 W
Typ. input current in no-load operation	222 mA
Typ. input current in no-load operation (at 120 V, 60 Hz)	230 mA
Typ. input current in no-load operation (at 277 V, 60 Hz)	267 mA
Typ. input power in no-load operation	4.1 W
Typ. input power in no-load operation (at 120 V, 60 Hz)	3.8 W
Typ. input power in no-load operation (at 277 V, 60 Hz)	3.8 W
In-rush current (peak / duration)	6.1 A / 70 ms
In-rush current (peak / duration at 120 V)	3.4 A / 65 ms
In-rush current (peak / duration at 277 V)	7.5 A / 70 ms
THD (at 120 V, 60 Hz, full load)	< 15 %
THD (at 230 V, 50 Hz, full load) ^①	< 15 %
THD (at 277 V, 60 Hz, full load)	< 17 %
Starting time (at 230 V, 50 Hz, full load) ^①	≤ 1 s
Turn off time (at 230 V, 50 Hz, full load)	< 1 s
Hold time (power failure, full load)	< 20 ms
Output current tolerance ^{①⑤}	± 3 %
Max. output current peak (non-repetitive)	3,080 mA
Output LF current ripple (< 120 Hz)	± 2 %
Output P _{ST_LM} (at full load)	< 0.2
Output SVM (at full load)	< 0.16
Max. output voltage (U-OUT)	300 V
Dimming range	10 – 100 % (min. 210 mA)
Mains surge capability (between L - N)	6 kV
Mains surge capability (between L/N - PE)	10 kV
Surge voltage at output side (against PE)	< 2 kV
Type of protection	IP67
Lifetime	up to 100,000 h
Guarantee (conditions at www.tridonic.com)	7 Year(s)
Dimensions L x W x H	262 x 123 x 49 mm

Approval marks

IP66 IP67          RoHS

Specific technical data

Type	Output current ^⑤	Min. output voltage	Max. output voltage	Max. output power	Typ. power consumption (at 120 V, 60 Hz, full)	Typ. power consumption (at 230 V, 50 Hz, full)	Typ. power consumption (at 277 V, 60 Hz, full)	Typ. current consumption (at 120 V, 60 Hz, full load)	Typ. current consumption (at 230 V, 50 Hz, full load)	Typ. current consumption (at 277 V, 60 Hz, full load)	tc point max.
LCO 600/600-2800/286 NF DA C PRE	600 mA	129 V	286 V	171.6 W	190.3 W	188.3 W	187.7 W	1,645 mA	886 mA	791 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	1,100 mA	129 V	286 V	314.6 W	342.4 W	334.9 W	334.5 W	2,907 mA	1,510 mA	1,279 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	1,300 mA	129 V	286 V	371.8 W	404.1 W	394.3 W	393.5 W	3,436 mA	1,766 mA	1,487 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	1,600 mA	129 V	286 V	457.6 W	495.5 W	484.6 W	482.4 W	4,200 mA	2,154 mA	1,802 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	1,800 mA	129 V	286 V	514.8 W	557.6 W	544.7 W	541.9 W	4,720 mA	2,415 mA	2,013 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	2,100 mA	129 V	286 V	600.6 W	650.7 W	635.2 W	633.0 W	5,518 mA	2,804 mA	2,340 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	2,400 mA	129 V	250 V	600.0 W	650.5 W	634.2 W	632.1 W	5,472 mA	2,803 mA	2,334 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	2,600 mA	129 V	231 V	600.6 W	649.8 W	636.4 W	634.0 W	5,469 mA	2,813 mA	2,345 mA	90 °C
LCO 600/600-2800/286 NF DA C PRE	2,800 mA	129 V	214 V	599.2 W	649.4 W	636.5 W	634.5 W	5,465 mA	2,814 mA	2,346 mA	90 °C

① Valid at 100 % dimming level.

② Depending on the selected output current.

③ Grounding effectively

④ Test result at 230 V, 50 Hz.

⑤ Output current is mean value.

⑥ 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.

1. Standards

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61347-1
 EN 61347-2-13
 EN 61547
 EN 62384
 EN 62386-101 (according to DALI standard V2)
 EN 62386-102
 EN 62386-207
 EN 61000-4-4
 EN 61000-4-5
 EN 62386 part 251
 EN 61000-4-2
 EN 61000-4-3
 EN 61000-4-4
 EN 61000-4-8
 EN 61000-4-11
 UL8750
 CSA C22.2
 FCC Part 15, Class B

2. Thermal details and lifetime

2.1 Expected lifetime

Expected lifetime 120 V

Type	Output current	ta	25 °C	30 °C	35 °C	40 °C	45 °C
LCO 600/600-2800/286 NF DA C PRE	600 – 1,300 mA	tc	65 °C	71 °C	78 °C	85 °C	90 °C
		Lifetime	130,000 h	89,000 h	55,000 h	34,000 h	24,000 h
	1,300 – 2,800 mA	tc	70 °C	76 °C	83 °C	90 °C	–
		Lifetime	96,000 h	63,000 h	39,000 h	24,000 h	–

Expected lifetime 230 V

Type	Output current	ta	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C	55 °C
LCO 600/600-2800/286 NF DA C PRE	600 – 1,300 mA	tc	54 °C	59 °C	64 °C	71 °C	78 °C	85 °C	90 °C
		Lifetime	130,000 h	130,000 h	130,000 h	93,000 h	57,000 h	35,000 h	25,000 h
	1,300 – 2,800 mA	tc	59 °C	64 °C	69 °C	76 °C	83 °C	90 °C	–
		Lifetime	130,000 h	130,000 h	107,000 h	66,000 h	40,000 h	25,000 h	–

Expected lifetime 277 V

Type	Output current	ta	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C	50 °C
LCO 600/600-2800/286 NF DA C PRE	600 – 1,300 mA	tc	53 °C	58 °C	63 °C	69 °C	75 °C	83 °C	89 °C
		Lifetime	130,000 h	130,000 h	130,000 h	110,000 h	72,000 h	41,000 h	27,000 h
	1,300 – 2,800 mA	tc	57 °C	62 °C	67 °C	74 °C	80 °C	86 °C	–
		Lifetime	130,000 h	130,000 h	126,000 h	77,000 h	51,000 h	33,000 h	–

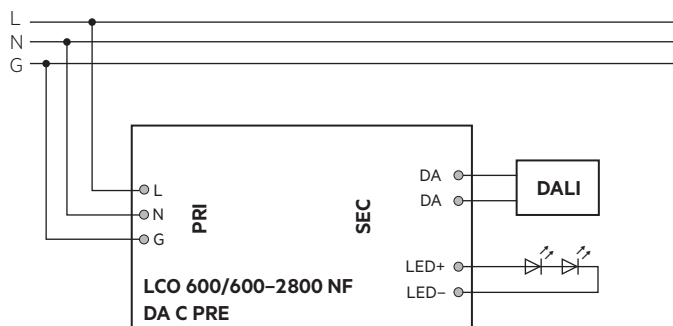
The LED driver is designed for a lifetime stated above under reference conditions and with a failure probability of less than 10 %.

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

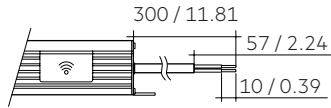
3.1 Circuit diagram



3.2 Connection

Primary cable			Secondary cable			
L	N	PE	DA	DA	LED+	LED-
brown	blue	green/yellow	purple	pink	brown	blue

For connection of the device, only suitable spring terminals may be used. Screw terminals may only be used if the screw only touches untinned parts of the lead.



Section	Type	Cross Section	Wire Preparation	
Input	Rubber cable	3x1.0 mm ²	8.2±0.3 mm	300 mm
Output	Rubber cable	2x1.0 mm ²	7.7±0.3 mm	300 mm
Interfaces	PVC cable	2x22 AWG	5.0±0.2 mm	260 mm

3.3 Wiring instructions

- All connections must be kept as short as possible to ensure good EMI behaviour
- Mains leads should be kept apart from LED driver and other leads (ideally 5 – 10 cm distance)
- Secondary switching is not permitted.
- Incorrect wiring can damage LED modules.
- 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.).

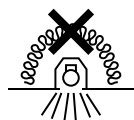
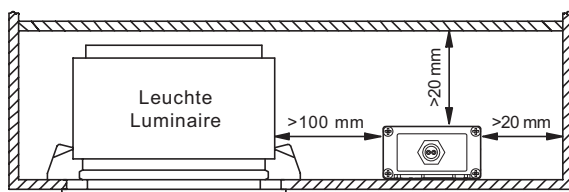
3.4 Installation instructions

The switching of LEDs on secondary side is not permitted.

3.5 Fixing conditions

Acidfree, oilfree, fatfree. It is not allowed to exceed the maximum ambient temperature (t_a) stated on the device. Minimum distances stated below are recommendations and depend on the actual luminaire. Is not suitable for fixing in corner. Terminals according to EN 60998-2-1 or EN 60998-2-2 are required.

The LED driver offers a type of protection of IP66 and IP67.



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

3.6 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.

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.

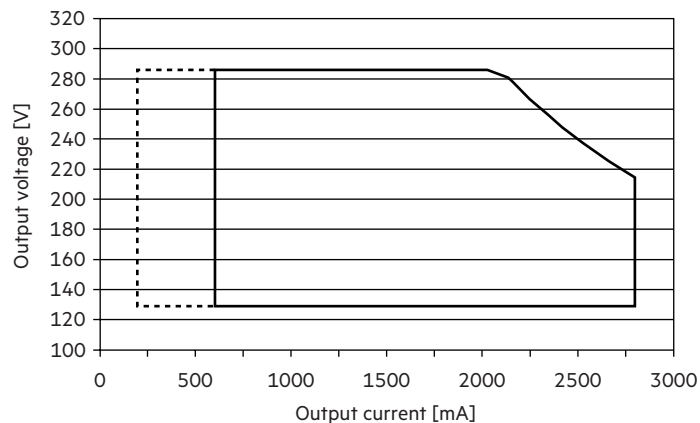
3.7 IP Protection

IP67 and IP66 provides protection against dust and temporary water immersion. Due to environmental impacts (UV radiation, bird dropping, freezing...) the IP protection level may be impaired over time. To avoid this, it is required to apply means reducing these impacts to a minimum, e.g. mounting of the device in an additional enclosure.

Further details please see document "Protection classes and protective measures for Outdoor devices" in the general topics section in the download area of our homepage.

4. Electrical values

4.1 Operating window

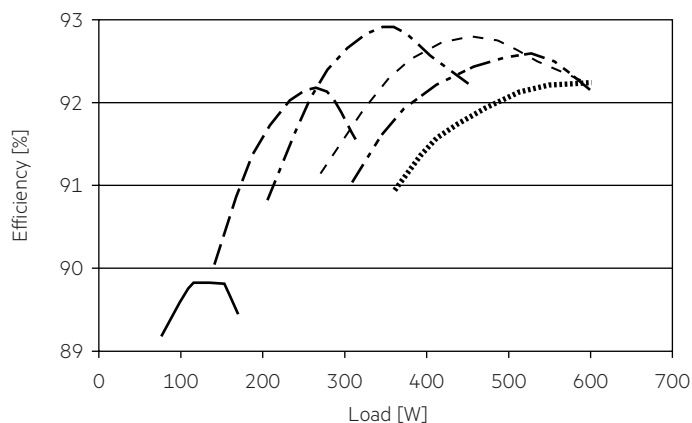


- Operating window 100 %
- - - Operating window dimmed

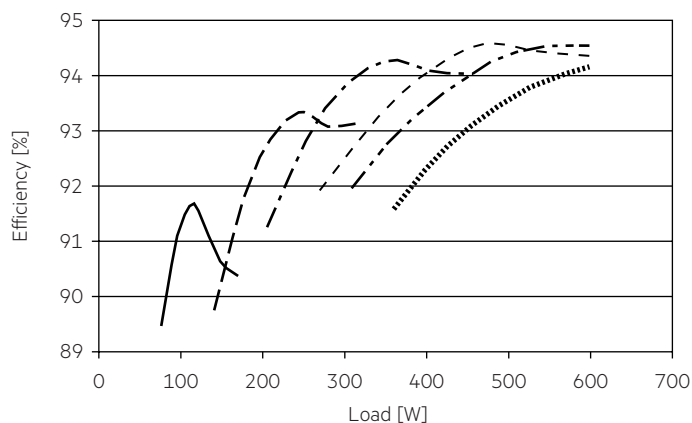
Make sure that the LED driver is operated within the given window under all operating conditions. Special attention needs to be paid at dimming as the forward voltage of the connected LED modules varies with the dimming level, due to the implemented amplitude dimming technology. Coming below the specified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

4.2 Efficiency vs load

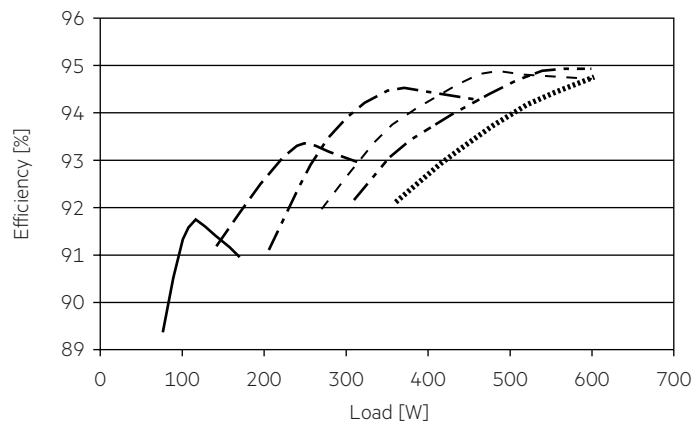
4.2.1 Efficiency vs load 120 V:



4.2.2 Efficiency vs load 230 V:

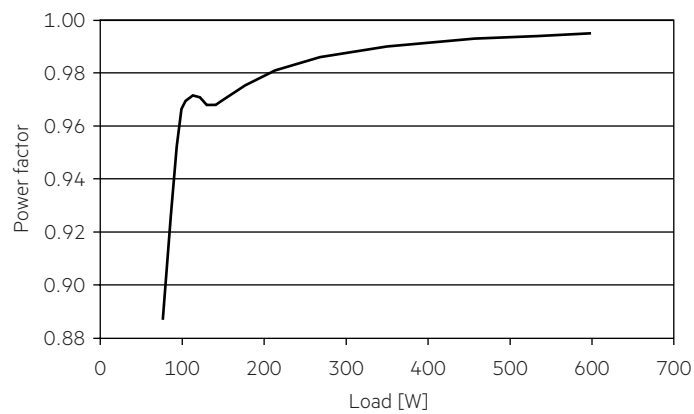


4.2.3 Efficiency vs load 277 V:

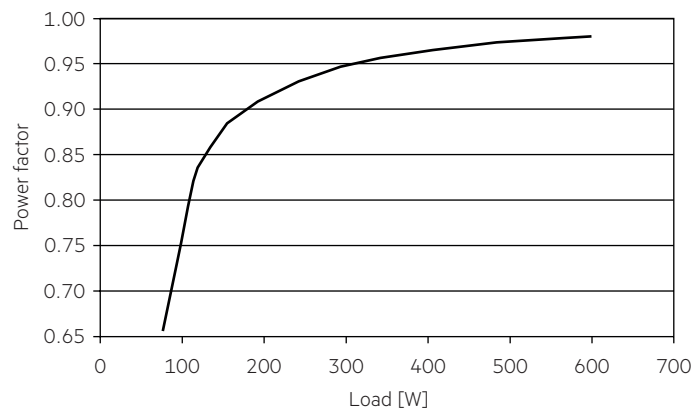


4.3 Power factor vs load

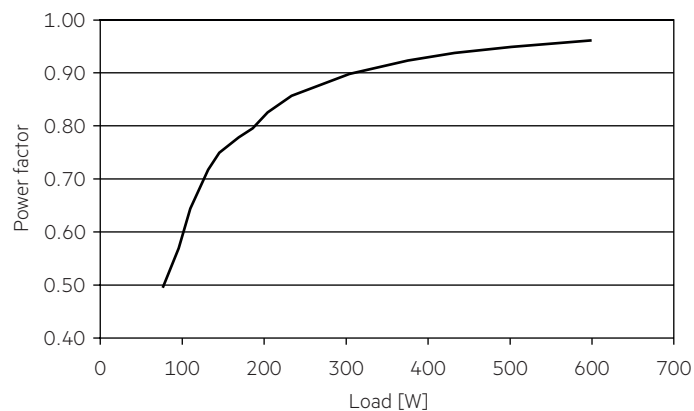
4.3.1 Power factor vs load 120 V:



4.3.2 Power factor vs load 230 V:

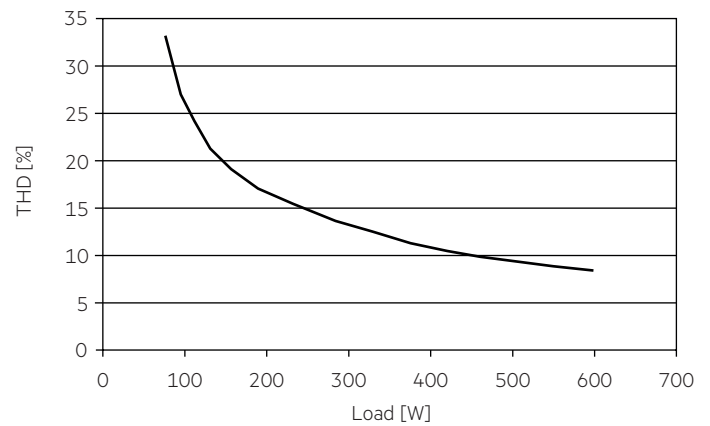


4.3.3 Power factor vs load 277 V:

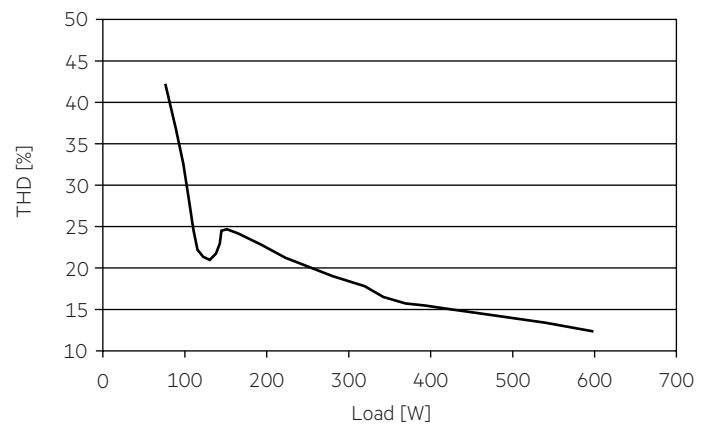


4.4 THD vs load

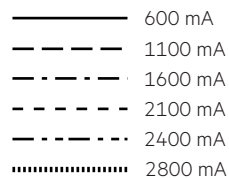
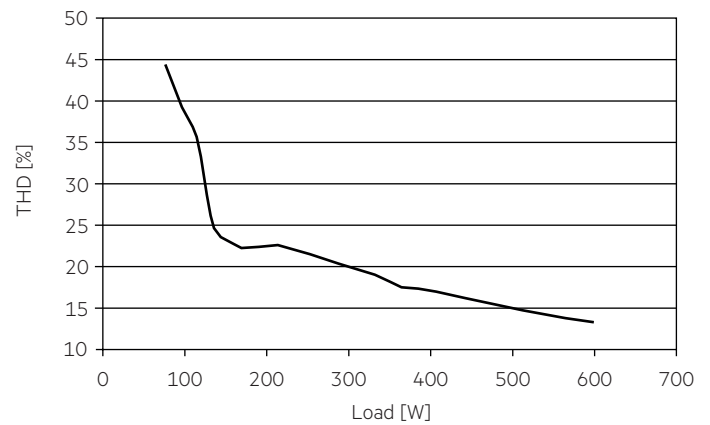
4.4.1 THD vs load 120 V:



4.4.2 THD vs load 230 V:



4.4.3 THD vs load 277 V:



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

120 V, 50 Hz:

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5 mm ² / AWG16	1.5 mm ² / AWG16	2.5 mm ² / AWG14	2.5 mm ² / AWG14	1.5 mm ² / AWG16	1.5 mm ² / AWG16	2.5 mm ² / AWG14	2.5 mm ² / AWG14	I _{max}	time
LCO 600/600-2800/286 NF DA C PRE	1	1	2	2	1	1	1	2	3.4 A	65 ms

220 V, 50 Hz:

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5 mm ² / AWG16	1.5 mm ² / AWG16	2.5 mm ² / AWG14	2.5 mm ² / AWG14	1.5 mm ² / AWG16	1.5 mm ² / AWG16	2.5 mm ² / AWG14	2.5 mm ² / AWG14	I _{max}	time
LCO 600/600-2800/286 NF DA C PRE	2	3	3	4	2	2	3	4	6.1 A	70 ms

277 V, 50 Hz:

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5 mm ² / AWG16	1.5 mm ² / AWG16	2.5 mm ² / AWG14	2.5 mm ² / AWG14	1.5 mm ² / AWG16	1.5 mm ² / AWG16	2.5 mm ² / AWG14	2.5 mm ² / AWG14	I _{max}	time
LCO 600/600-2800/286 NF DA C PRE	3	3	4	6	2	3	4	5	7.5 A	70 ms

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 120 V / 230 V / 277 V and full load in %:

	THD	3.	5.	7.	9.	11.
LCO 600/600-2800/286 NF DA C PRE	< 20	< 28.6	< 10	< 7	< 5	< 3

4.7 Dimming

Dimming range 10 % to 100 %

Digital control with:

- DALI signal:
16 bit Manchester Code Speed 10 % to 100 % in 0.2 s
Programmable parameter:
Minimum dimming level Maximum dimming level
Default minimum = 10 % Programmable range $10 \% \leq \text{MIN} \leq 100 \%$
Default maximum = 100 % Programmable range $100 \% \geq \text{MAX} \geq 10 \%$

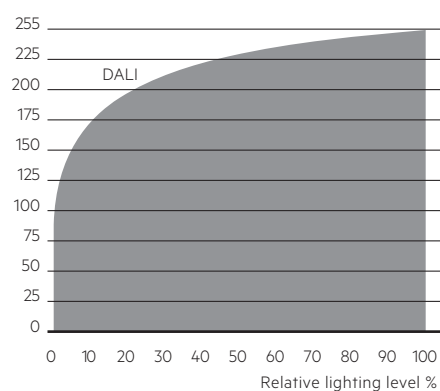
Dimming curve is adapted to the eye sensitiveness.

Dimming is realized by amplitude dimming.

Physical minimal current is 10 % of max current of the driver.

4.8 Dimming characteristics

Digital dimming value



Dimming characteristics as seen by the human eye

4.9 Insulation between terminals

Insulation	Mains	LED+/LED-	DA/DA	PE
Mains	–	double	double	basic
LED+/LED-	double	–	basic	basic
DA/DA	double	basic	–	basic
PE	basic	basic	basic	–

basic ... represents basic insulation.

double ... represents double or reinforced insulation.

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:

- NFC Programming tool

Interfaces for data transfer:

- NFC
- DALI

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 Driver is directly placed on the antenna.

Any material placed between the LED driver and the NFC antenna can cause a deterioration of the communication quality.

Driver has to be removed from the NFC antenna before powering it the first time to ensure proper transfer of the programming data.

We recommend the use of following NFC antennas:

www.tridonic.com/nfc-readers

NFC is compliant with ISO/IEC 15693 standard.

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

6. Functions

Function	NEC
Luminaire data/OEM data	☉
OEM identification	☉
OEM GTIN	☉
Output current configuration	☉
CLO	☉
TimerDim	☉
DALI default parameters	☉
Scenes and groups	-
Dimming curve 1) Linear dimming curve 2) Logarithmic dimming curve (default)	☉

For a detailed function description refer to the manual in the download section.

7. Protective features

7.1 Short-circuit behaviour

The LED drivers is protected against short circuits at the output side and will auto-restart all the time (burst mode), resume normal operating once the fault is eliminated.

7.2 No-load operation

When the output is unloaded, the output voltage remains stable at the no-load voltage.

7.3 Overload protection

When the LED driver is in overload, it will switch to constant voltage mode, the working voltage is equal to no-load voltage

7.4 Overtemperature protection

When T_c temperature hits 95°C, output current drops to 50%. At 100°C, it drops to 10%. When temp falls to 70°C, it resumes 100%.

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 UL 8750 (informative only!) each luminaire should be submitted to an insulation test with 500 V_{DC}. The dielectric withstand test equipment shall employ a transformer of 500-VA or larger capacity and have a variable output voltage that is essentially sinusoidal or continuous direct current. The applied potential is to be increased from zero at a substantially uniform rate until the required test level is reached, and is to be held at that level for 1 minute.

As an alternative, UL8750 (informative only!) describes a test of the electrical strength with 2V AC + 1000V (or 1.414 x V DC) where "V" is the maximum AC (rms) voltage between the parts under tests. To avoid damage to the electronic devices this test must not be conducted.

8.2 Conditions of use and storage

Relative Humidity: 10 % up to max. 100 %,
not condensed
(max. 56 days/year at 85 %)

Storage temperature: -40 °C / -40 °F up to max. +80 °C / +176 °F

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

8.3 Maximum number of switching cycles

All LED driver are tested with 50,000 switching cycles.

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.