LC15TINY-DA-100-700

15 W **SELV Dimmable DALI-2** LED driver

Product code: 5972

15.4 W 220 – 240 V 50 – 60 Hz

- DALI-2 certified miniature LED driver
- Extremely compact dimensions (162.6 x 23.1 x 21 mm) for tight spaces - fits through a cutout hole of Ø 30 mm
- Amplitude dimming for high quality light output, 1 - 100 % dimming range
- NFC technology for wireless programming
- D4i compatible Smart Data features (DALI 251-253)
- Suitable for emergency lighting applications with central battery systems (e.g. Eaton-CEAG, Inotec), AC/DC input recognition
- Integrated (removable) strain reliefs for independent installation and driving Class III luminaires
- Suitable for Class I and Class II luminaires too

CONSTANT LIGHT OUTPUT (CLO) smart DATA NFC SELV DALI 2

Functional Description

- Adjustable constant current output: 100 (default) to 700 mA
- Output current setting programmable via software NFC / DALI
- D4i compatible Smart Data features, e.g. OEM customer and luminaire data, energy reporting, diagnostics and maintenance
- Amplitude dimming technology for the highest quality light in every application
- Push to Fade technology for easy-to-use intensity control
- Constant Light Output (CLO), adjustable up to 100 000 h (default disabled)
- Overload, open & short circuit protection

Mains Characteristics

Nominal rated voltage range	220 V – 240 V, 50 – 60 Hz
AC voltage range	198 VAC – 264 VAC
DC voltage range	180 VDC – 280 VDC
Mains current at full load	Max. 0.09 A
Frequency	50 Hz – 60 Hz
Stand-by power consumption	< 0.5 W
THD at full power	< 10 %
Tested surge protection	2 kV L/N-GND (IEC 61000-4-5)
	1 kV L-N (IEC 61000-4-5)
Tested fast transient protection	2 kV (IEC 61000-4-4)

Insulation between circuits & driver case

Mains circuit - SELV circuit	Double/reinforced insulation
DALI circuit - SELV circuit	Double/reinforced insulation
Mains circuit - DALI circuit	Basic insulation
Mains, DALI and output - Driver case	Double/reinforced insulation

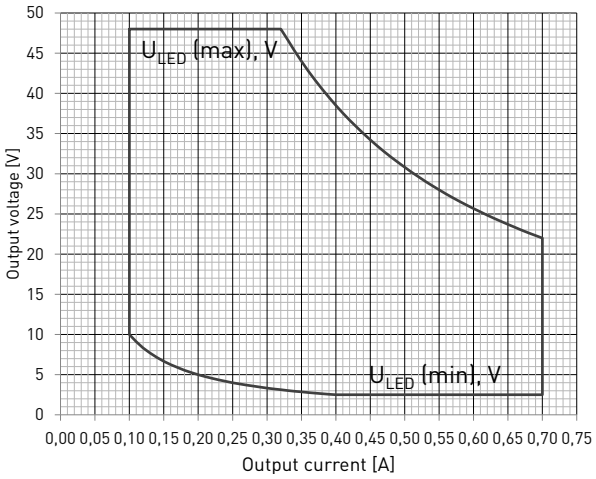
Load Output (SELV <60 V)

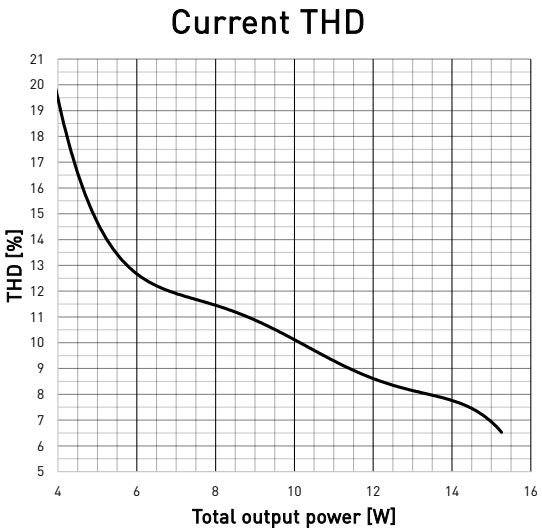
Output current (I_{out})	100 mA (default) – 700 mA	
Accuracy	± 5 % [1]	1) ±7% with 100-200mA, ±5% with 250mA-700mA
Ripple	< 5 % [2] at ⩽ 120 Hz	2) Low frequency ripple
PstLM	⩽ 1 [2]	
SVM	⩽ 0.4 [3]	3) At full power
U_{OUT} (max) (abnormal)	59 V	
EOFx (EL use)	15 % [4]	4) By default setting, available range 1...100 %

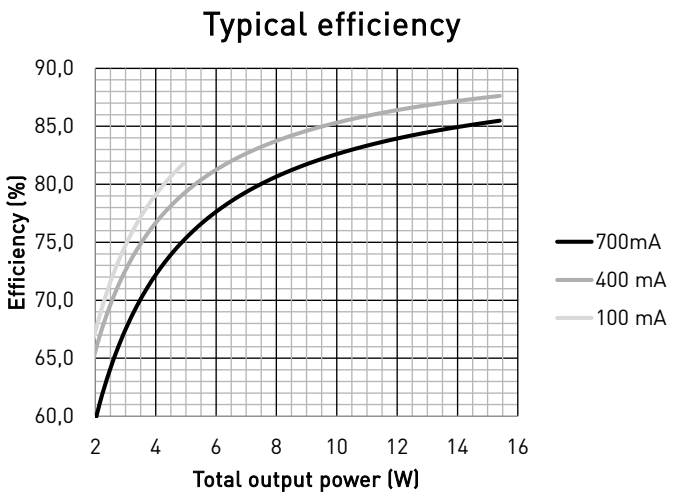
This LED driver does not allow operation with high output capacitance according to IEC 62384 clause 7.3.

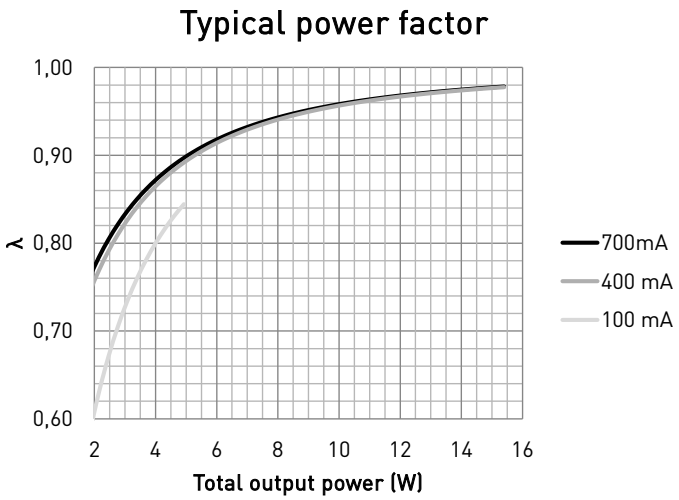
I_{LED}	100 mA (default)	400 mA	700 mA
P_{Rated}	1...4.8 W	1...15.2 W	1.75...15.4 W
U_{LED}	10 - 48 V	2.5 - 38 V	2.5 - 22 V
PF (λ) at full load	⩾ 0.80	⩾ 0.96	0.97
Efficiency (η) at full load	80.8 %	86 %	84.5 %

Operating window & driver performance







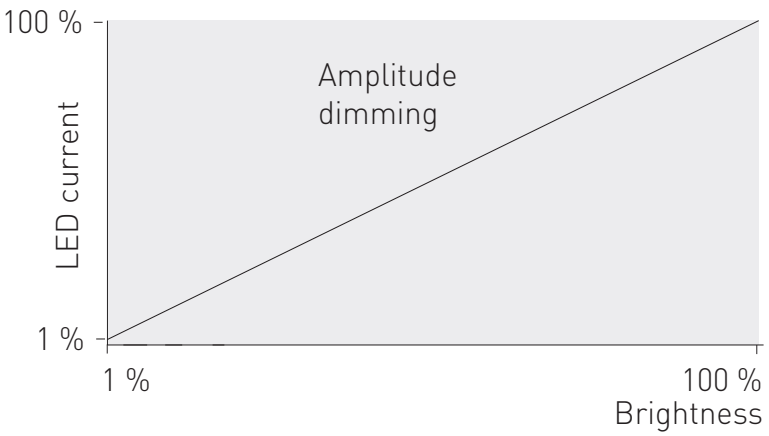


Operating Conditions and Characteristics

Absolute highest allowed t_c point temperature	85 °C
Tc life (50 000 h) temperature	80 °C
Ambient temperature range	–20 °C ... +45 °C[1)]
Storage temperature range	–40 °C ... +80 °C
Maximum relative humidity	No condensation
Life time(90 % survival rate)	50 000 h, at t_c = 80 °C 35 000 h, at t_c = 85 °C

1) For other than independent use, higher t_a of the controlgear possible as long as highest allowed t_c point temperature is not exceeded

Amplitude dimming technology



Dimming range	Dimming technology
1 % – 100 %	Amplitude (DC)

LC15TINY-DA-100-700 LED driver implements amplitude dimming technology across whole dimming range. Amplitude dimming offers the best available technology for dimming the light output in an accurate and flicker-free way to ensure high quality lighting in even the most demanding situations such as camera recording applications. Amplitude dimming technology complies with IEEE 1789-2015 recommendations of current modulation to mitigate health risks to viewers.

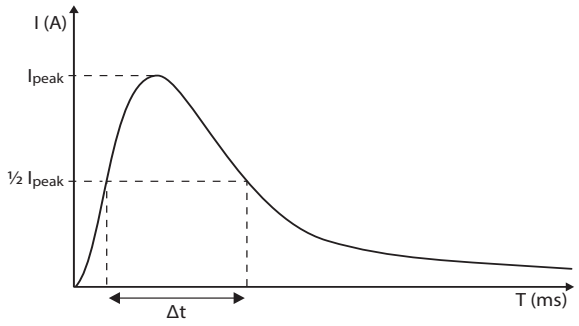
Quantity of drivers per miniature circuit breaker 16 A Type C

Based on inrush current I_{peak}	Typ. peak inrush current I_{peak}	1/2 value time, Δt	Calculated energy, $I_{peak}^2 \Delta t$
> 200 pcs*	6 A	**32 µs**	**0.00084 A^2s**

**Inrush current is not the limiting factor for the products per C 16 A MCB, please notice the continuous current limitations.*

CONVERSION TABLE FOR OTHER TYPES OF MINIATURE CIRCUIT BREAKER

MCB type	Relative quantity of LED drivers
B 10 A	37 %
B 16 A	60 %
B 20 A	75 %
C 10 A	62 %
C 16 A	100 % (see table above)
C 20 A	125 %



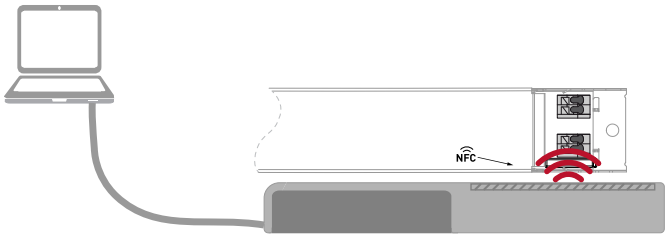
CONTINOUS CURRENT

Total continous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continous current: n(I_{cont}) = (16 A ($I_{nom,Ta}$) / "nominal mains current with full load") x 0.76). This calculation is an example according to recommended precautions due to multiple adjacent circuit breakers (> 9 MCBs) and installation environment (T_a 30 degrees); variables may vary according to the use case. Both inrush current and continous current calculations are based on ABB S200 series circuit breakers. More specific information in ABB series S200 circuit breaker documentation.

NOTE! Type C MCB's are strongly recommended to use with LED lighting. Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

Wireless configuration

LC15TINY-DA-100-700 LED driver is equipped with NFC wireless technology for effortless configuration of the driver via Helvar Driver Configurator Support. Helvar Driver Configurator enables easy-to-use automatic configuration of the driver parameters via NFC, without mains or DALI connection to the driver. The most popular MD-SIG qualified NFC readers are supported giving flexibility for the operator. For further information about the usage with Helvar Driver Configurator, please see the user guide at www.helvarcomponents.com



Feig NFC reader

DC emergency lighting functionality

When AC supply is switched to DC, the LED driver will recognise this and switch to emergency lighting mode. The light level will be adjusted to 15 % of the nominal AC operation output current by default. The output level in DC input situation cannot be dimmed up/down or turned off before AC input is switched on again. When the AC is switched back on, the driver returns to normal operation.

The DC emergency lighting mode output level can be adjusted by programming with HDC software tool via NFC or DALI bus.

D4i-compatible Smart Data Features (DALI 251-253)

LC15TINY-DA-100-700 LED driver has integrated Smart Data features, which monitor, gather and provide key data about the LED driver usage and internal parameters through DALI. This useful data provided by LED driver enables various applications and integrations into data management and IoT services, establishing the Helvar Components LED drivers as key components in the latest generation of smart luminaires.
The DALI parts 251-253 include:

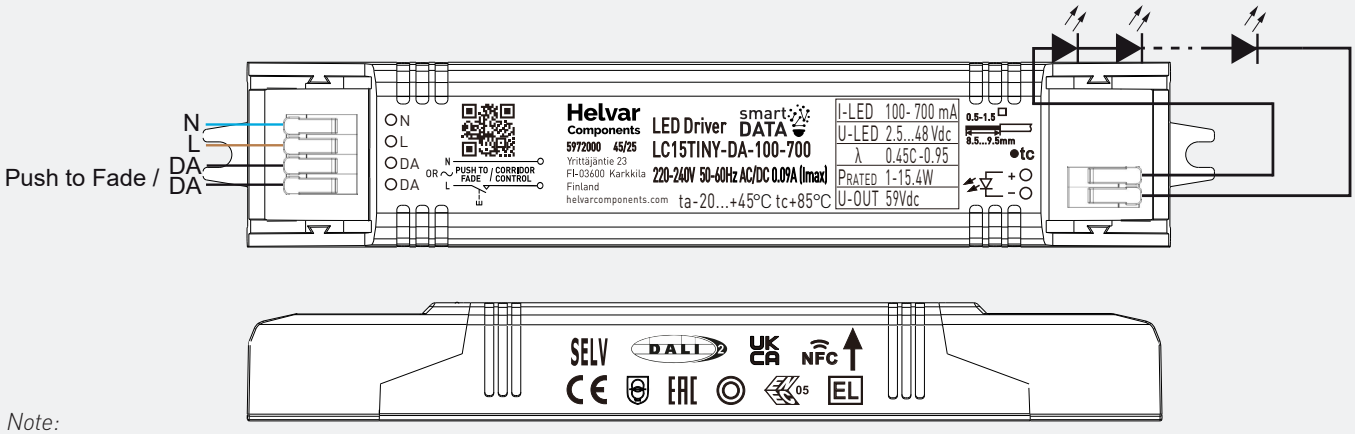
- OEM Customer data (DALI part 251)
- Energy reporting (DALI part 252)
- Diagnostics and maintenance (DALI part 253)

Connections and Mechanical Data

Wire size	Input: 0.5 mm² – 1.5 mm² Output: 0.2 mm² – 1.5 mm²*
Cable size (when strain reliefs in use)	Ø 3 - 10 mm
Wire type	Solid core and fine-stranded
Wire insulation	According to EN 60598
Maximum driver to LED wire length	1.5 m
Weight	79 g
IP rating	IP20

**) ENEC certified only from 0.5 mm² – 1.5 mm². When using strain reliefs, always check and refer to the allowed cable diameter range of the strain reliefs in this datasheet!*

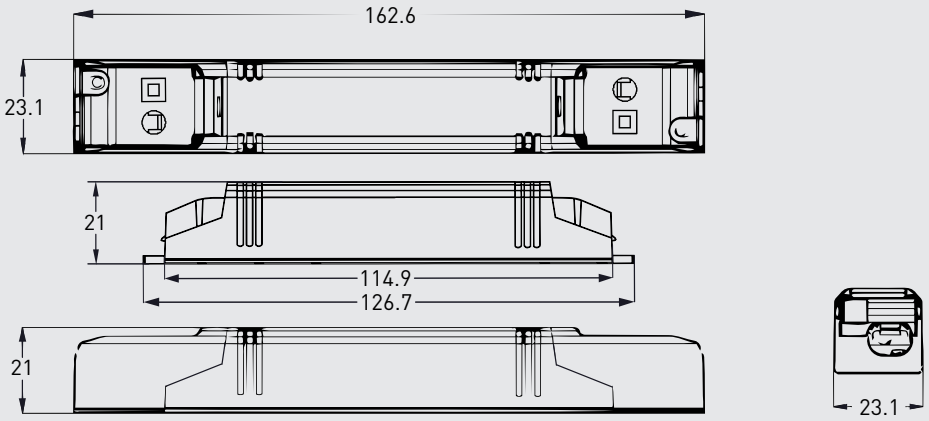
Connections



Note:

- *Not suitable for load side switching operation*

Dimensions (mm)



Note:

- *Strain reliefs can be detached if desired for built-in purposes.*

Information and conformity

LC15TINY-DA-100-700 LED driver is suited for independent use as well as built-in usage in luminaires. In order to have safe and reliable LED driver operation, the LED luminaires will need to comply with the relevant standards and regulations (e.g. IEC/EN 60598-1). The LED luminaire shall be designed to adequately protect the LED driver from dust, moisture and pollution. The luminaire manufacturer is responsible for the correct choice and installation of the LED drivers according to the application and product datasheets. Operating conditions of the LED drivers may never exceed the specifications as per the product datasheet.

Installation & operation

Maximum ambient and t_c temperature:

- For built-in components inside luminaires, the t_a ambient temperature range is a guideline given for the optimum operating environment. However, integrator must always ensure proper thermal management (i.e. mounting base of the driver, air flow etc.) so that the t_c point temperature does not exceed the t_c maximum limit in any circumstance.
- Reliable operation and lifetime is only guaranteed if the maximum t_c point temperature is not exceeded under the conditions of use.

DALI control terminals

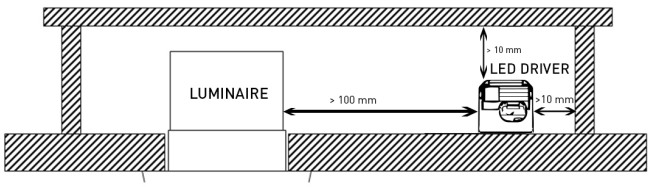
- DALI control terminals are classified as FELV terminals and they are not safe to touch. Circuits connected to DALI terminals shall be insulated for the LV supply voltage of the controlgear and any terminals connected to the DALI circuit shall be protected against accidental contact.

Miniature Circuit Breakers (MCB)

- Type-C MCB's with trip characteristics in according to EN 60898 are recommended.
- Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

Installation site

- The general preferred installation position of LED drivers for independent use is to have the top cover facing upwards.
- The minimum clearance distances to normally flammable building elements and the luminaire part:



Helvar Driver Configurator -support

LC15TINY-DA-100-700 LED driver is supported by Helvar Driver Configurator software. With the LC15TINY-DA-100-700 the output current of the driver can be programmed using the HDC software, as well as OEM customer data and parameters for features such as CLO and DC emergency lighting mode level. Programming the driver with Helvar Driver Configurator can be done either wirelessly via NFC or then via DALI bus.

Lamp failure functionality

No load

When open load is detected, the driver will go to standby mode and remain in automatic recovery status. In automatic recovery mode, the driver will check constantly if the load has been reconnected. Once that happens, it returns to normal operation.

Short circuit

When short circuit is detected, driver will go to standby mode and remain in automatic recovery status. In automatic recovery mode, the driver will check constantly if the connection has been corrected. Once that happens, it returns to normal operation.

Overload

When short circuit is detected, driver will go to standby mode and remain in automatic recovery status. In automatic recovery mode, the driver will check constantly if the load has been corrected. Once that happens, it returns to normal operation.

AC to DC emergency lighting mode

When AC supply is switched to DC, driver will recognise this and switch to emergency lighting mode. The light level will be adjusted to 15 % of the nominal AC operation output current by default. The DC light level cannot be dimmed or turned off by manual control. When the AC is switched back on, the driver returns to normal operation.

Push to Fade

Push to Fade solution includes additional fading behavior, which provides smooth transition between on and off states. Please note that Push to Fade is not compatible to be installed in the same circuit with Helvar Switch-Control or Switch-Control 2/3 devices.

Before installation and for troubleshoot and guidance, refer to user guide at www.helvarcomponents.com.

Use of Push to Fade functionality

- Maximum numbers of LED drivers to be connected to one switch is 30.
- Ensure that all components connected to Push to Fade circuitry are mains rated.
- The transition between 0 to 100% (when turned ON / OFF) is ~ 1 second.

Conformity & standards

General and safety requirements	EN 61347-1
Particular safety requirements for DC or AC supplied electronic control gear for LED modules	EN 61347-2-13
Additional safety requirements for AC or DC supplied electronic controlgear for emergency lighting	EN 61347-2-13, Annex J
Thermal protection class	EN 61347, C5e
Mains current harmonics	EN IEC 61000-3-2
Limits for voltage fluctuations and flicker	EN 61000-3-3
Radio frequency interference	EN IEC 55015
Immunity standard	EN 61547
Performance requirements	EN IEC 62384
Digital addressing lighting interface:	
General requirements for DALI system	EN 62386-101 (DALI-2)
Requirements for DALI control gear	EN 62386-102 (DALI-2)
Requirements for control gear of LED modules (DALI Device Type 6)	EN 62386-207 (DALI-2)
Memory Bank 1 extension	DALI Part 251
Energy Reporting	DALI Part 252
Diagnostics & Maintenance	DALI Part 253
Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers	IEEE 1789-2015
Compliant with relevant EU directives	
RoHS/REACH compliant	
ENEC and CE / UKCA marked	

Label symbols

Safety isolating control gear with short circuit protection (SELV control gear).

Double insulated control gear suitable for independent use.

Symbol for independent control gear.

DALI-2 certified control gear.

AC/DC supplied electronic control gear for emergency lighting purposes intended for connection to a centralized emergency power supply.

Driver is capable of monitoring and measuring key data about driver usage and providing access to that data via DALI, complying with DALI parts 251-253. This includes data sets such as OEM customer data, energy reporting and diagnostics.

Driver equipped with NFC wireless technology for effortless configuration.