

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

Product code: 5921xxx (see last page)

**44.1 W 220 – 240 V 50 – 60 Hz**

- DALI-2 certified LED driver, 1-100 % dimming range
- SELV output protection for safety and flexibility in luminaires
- Amplitude dimming for the highest quality light output
- Low current ripple, complying with IEEE 1789 recommendation
- Suitable for use in emergency lighting applications
- Extremely compact dimensions for flexible usage
- Ideal solution for Class I and Class II
- For driving Class III (SELV) luminaires, optional strain relief for independent use outside of luminaire (LC-SR-MINI, LC-SR-MINI-B or LC-SR-MINI-LOOP)\*



\*See also last page.

**Functional Description**

- Adjustable constant current output: 700 mA to 1050 mA (default)
- Current setting via with dip-switches
- Amplitude dimming technology for the highest quality light in every application
- Push to Fade functionality for easy-to-use intensity control with smooth fade in transitions
- Suitable for flicker-free camera recording applications
- Overload, open & short circuit protection

**Mains Characteristics**

Nominal rated voltage range	220 V – 240 V, 50 – 60 Hz
AC voltage range	198–264 VAC
DC voltage range	176–280 VDC
Mains current at full load	0.34 A
Frequency	50 Hz – 60 Hz
Stand-by power consumption	< 0.5 W
THD at full power	< 10%
Tested surge protection	1 kV L/N-GND (IEC 61000-4-5) 2 kV L-N (IEC 61000-4-5)
Tested fast transient protection	1 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)**

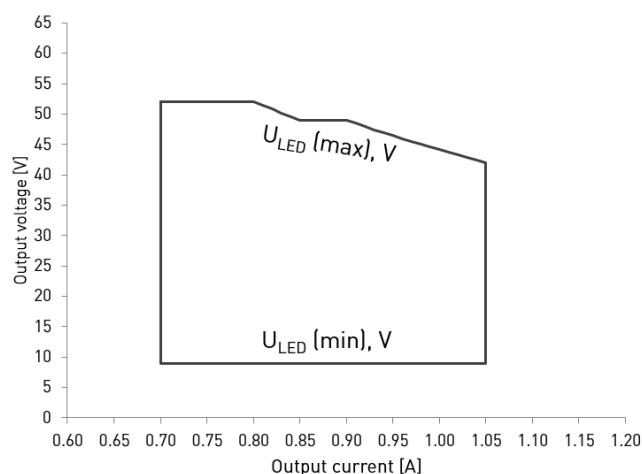
Output current ( $I_{out}$ )	700 mA – 1050 mA (default)
Accuracy	± 5 %
Ripple	< ± 3 % <sup>1)</sup> at ≤ 120 Hz
PstLM	< 0.1 % <sup>2)</sup>
SVM	< 0.01 % <sup>2)</sup>
$U_{out}$ (max) (abnormal)	60 V
EOFx (EL use)	15 %*      *Since revision E

1) Low frequency, LED load: Cree XP-G LEDs

2) At full power, measured with Cree XP-G LED modules.

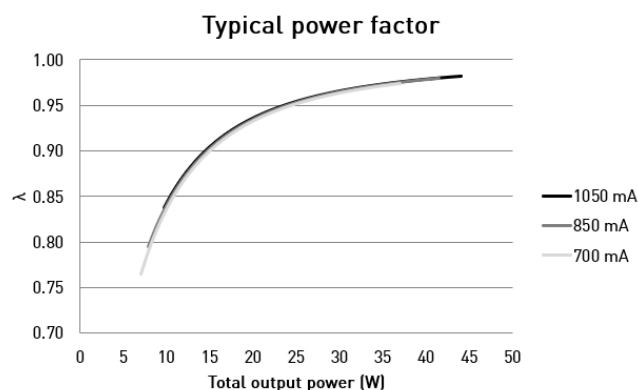
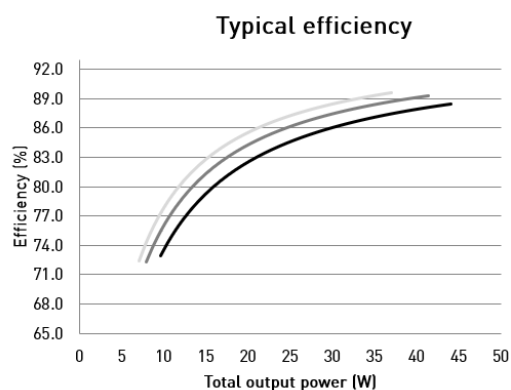
$I_{LED}$	700 mA	1050 mA
$P_{Rated}$	36.4 W	44.1 W
$U_{LED}$	9–52 V	9–42 V
PF (λ) at full load	0.95	0.95
Efficiency (η) at full load	> 85 %	> 87 %

## Operating window



Note: Current value is adjustable in steps via dip-switch. See dip-switch settings in page 3 for details.

## Driver performance

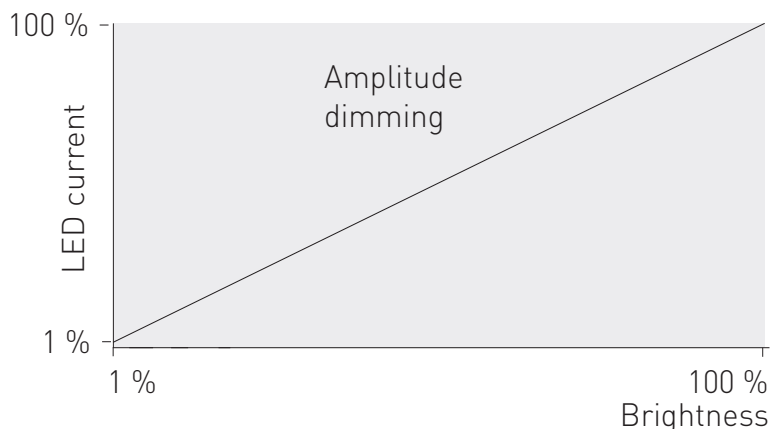


## Operating Conditions and Characteristics

Absolute highest allowed $t_c$ point temperature	85 °C
$T_c$ life (50 000 h) temperature	85 °C
Ambient temperature range	-20 °C .. +45 °C*
Storage temperature range	-40 °C ... +80 °C
Maximum relative humidity	No condensation
Life time (90 % survival rate)	50 000 h, at $t_c = 85$ °C

\*) For other than independent use, higher  $t_g$  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)

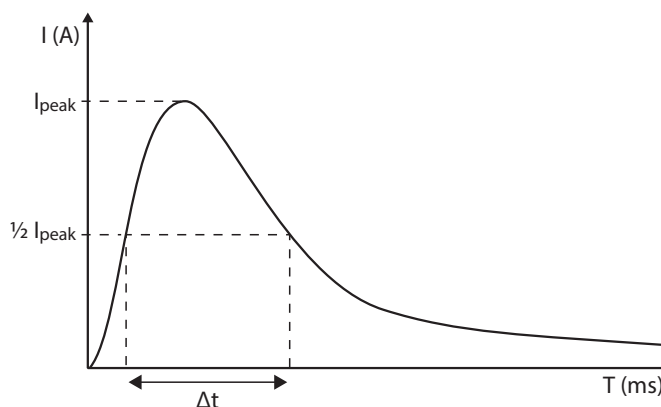
LC44MINI-DA-700-1050 LED driver implements amplitude dimming technology across whole dimming range. Amplitude dimming offers the best available technology for dimming the light output in an accurate and flicker-free way to ensure high quality lighting in even the most demanding situations such as camera 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, $\Delta t$
75 pcs	30 A	100 $\mu s$

## 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 %



## CONTINUOUS CURRENT

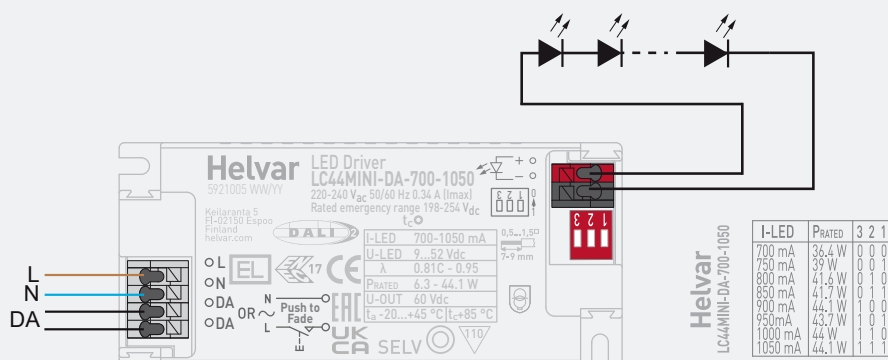
Total continuous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continuous current:  $n(I_{cont}) = (16 A (I_{nom,Ta}) / \text{"nominal mains current with full load"}) \times 0.76$ . 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 continuous 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.

## Connections and Mechanical Data

Wire size	0.5 mm <sup>2</sup> – 1.5 mm <sup>2</sup>
Wire type	Solid core and fine-stranded
Wire insulation	According to EN 60598
Maximum driver to LED wire length	1.5 m
Weight	175 g
IP rating	IP20

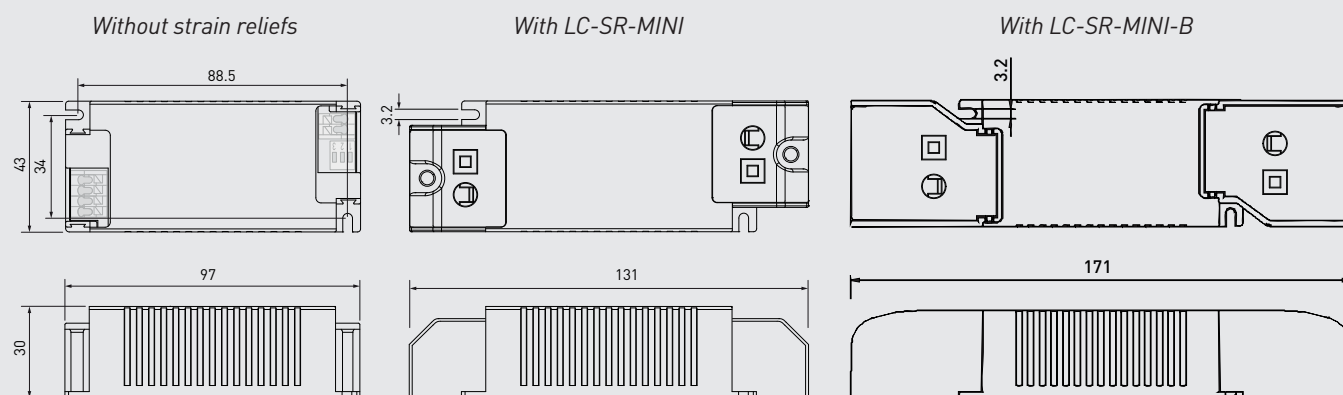
## Connections



Note:

- Not suitable for load side switching operation

## Dimensions (mm)



In LC44MINI-DA-700-1050, the current can be set with dip-switches. With each combination of switch setup, a different output current value can be set. The maximum value can be reached with all switches set to "1" (pushed downwards, away from the connectors, see connections picture above) and minimum with all switches set to "0" (pushed upwards, towards the connectors). The output current values according to the dip-switch settings are presented below.

Dip-switch combinations and currents (Nominal  $I_{out}$  ( $\pm 5\%$  tol.))

Dip-Switch combination	111	110	101	100	011	010	001	000
$I_{out}$ (mA)	1050	1000	950	900	850	800	750	700
Voltage range	9 - 42 V	9 - 44 V	9 - 46 V	9 - 49 V	9 - 49 V	9 - 52 V	9 - 52 V	9 - 52 V

LC44MINI-DA-700-1050 LED driver is suited for built-in usage in luminaires. With external strain relief (LC-SR-MINI, LC-SR-MINI-B or LC-SR-MINI-LOOP), independent use is possible too. 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.

### Current setting via dip-switch

LC44MINI-DA-700-1050 LED driver features a constant current output adjustable via dip-switch combinations.

- For the combination/current values, refer to the table on page 4.

### 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.

## Lamp failure functionality

### No load

When open load is detected, driver limits output voltage according to  $U_{out} (max)$  (abnormal).

### Overload

The driver can withstand output overload. When overload occurs, the driver goes to standby and returns through mains reset.

### Short circuit

The driver can withstand output short circuit. When short circuit occurs, the driver goes to standby and returns through mains reset.

### 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. The DC light level cannot be adjusted or turned off by manual control. When the AC is switched back on, the driver returns to normal operation.

*\*Since revision E*

## 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 devices.

Before installation and for troubleshoot and guidance, refer to user guide at [www.helvarcomponents.com](http://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 61000-3-2
Limits for voltage fluctuations and flicker	EN 61000-3-3
Radio frequency interference	EN 55015
Immunity standard	EN 61547
Performance requirements	EN 62384
<b>Digital addressing lighting interface:</b>	
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)
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 built-in use.



Thermally controlled control gear, incorporating means of protection against overheating to prevent the case temperature under any conditions of use from exceeding 110 °C.



DALI-2 certified control gear.



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

LC44MINI-DA-700-1050 LED driver can be ordered as just the built-in LED driver itself or then as a combination package with strain reliefs for input and output side. Input strain relief is a LOOPing model with the connector block inside, output strain relief is screwless easy-to-use model. Everything is preassembled from the factory, ready to be connected to your LED luminaire! Please refer to the order codes in the table below.

## ORDER CODES

	Order code	Product name	What is included
<i>LC44MINI-DA-700-1050</i>			
Product order codes	5921005	LC44MINI-DA-700-1050	LC44MINI-DA-700-1050 LED driver
	5921025	LC44MINI-DA-700-1050-LOOP	LC44MINI-DA-700-1050 LED driver and LC-SR-MINI-LOOP + LC-SR-MINI-B screwless strain reliefs (input + output), preassembled
	5999005	LC-SR-MINI	1 x Strain relief, screwable
	5998005	LC-SR-MINI-B	1 x Strain relief, screwless
	5996205	LC-SR-MINI-LOOP-4WIRED	1 x Strain relief, LOOP model
	5995005	LC-SR-MINI-COMBO	1 x LC-SR-MINI-B + 1 x LC-SR-MINI-LOOP-4WIRED

