

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

Product code: 5900

38 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
- Integrated strain reliefs for independent installation
- Ideal solution for Class I, Class II and Class III (SELV) luminaires

**Functional Description**

- Adjustable constant current output: 300 mA (default) to 1050 mA
- Current setting programmable with dip-switches
- Amplitude dimming technology for the highest quality light in every application
- 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                                |
| Rated emergency voltage range    | 196 V – 250 V, 0 Hz                                      |
| AC voltage range                 | 198 VAC – 264 VAC                                        |
| DC voltage range                 | 176 VDC - 275 VDC                                        |
| Mains current at full load       | 0.16 – 0.20 A                                            |
| Frequency                        | 50 Hz – 60 Hz                                            |
| Stand-by power consumption       | < 0.5 W                                                  |
| THD at full power                | < 10 %                                                   |
| Tested surge protection          | 4 kV L/N-GND (IEC 61000-4-5)<br>2 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 |

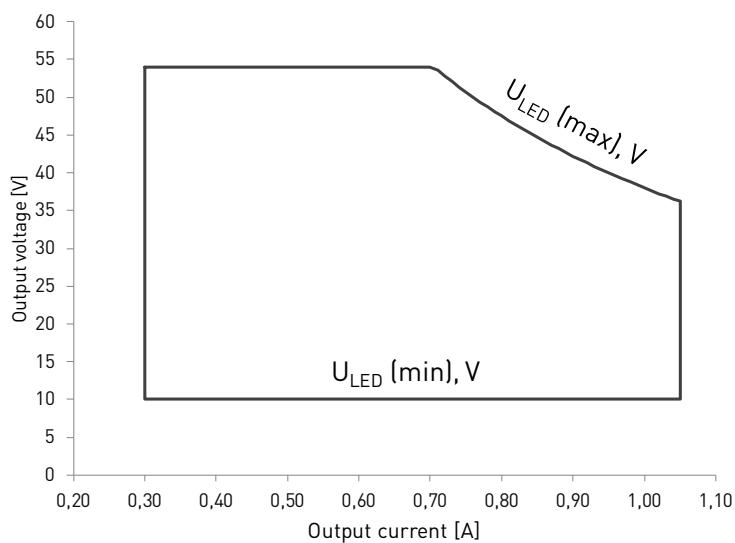
**Load Output (SELV <60 V)**

|                              |                                                                |
|------------------------------|----------------------------------------------------------------|
| Output current ( $I_{out}$ ) | 300 mA (default) – 1050 mA                                     |
| Accuracy                     | ± 5 %                                                          |
| Ripple                       | < 3 %* at ≤ 120 Hz                                             |
| PstLM                        | *] Low frequency, LED load: Cree XP-G LEDs<br>< 0.10*          |
| SVM                          | < 0.02*                                                        |
| $U_{out}$ (max) (abnormal)   | *] At full power, measured with Cree XP-G LED modules.<br>59 V |
| EOF <sub>I</sub> (EL use)    | > 0.98 x output current with AC supply                         |

| $I_{LED}$                   | 300 mA    | 700 mA    | 1050 mA   |
|-----------------------------|-----------|-----------|-----------|
| $P_{Rated}$                 | 16 W      | 37.8 W    | 38 W      |
| $U_{LED}$                   | 10 - 54 V | 10 - 54 V | 10 - 36 V |
| PF (λ) at full load         | 0.95      | 0.95      | 0.95      |
| Efficiency (η) at full load | 88 %      | 90 %      | 89 %      |

ENEC certified U-LED voltage range is 18 - 54 V, however LC38MINI-DA-300-1050-SR supports LED loads down to 10 V.

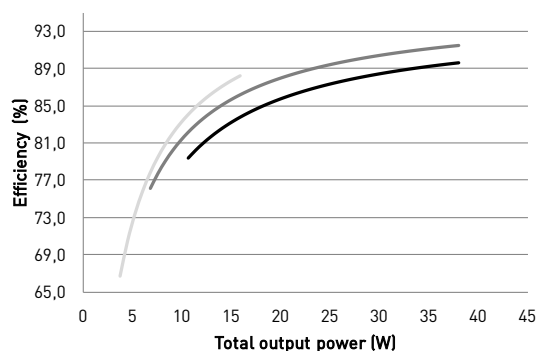
## Operating window



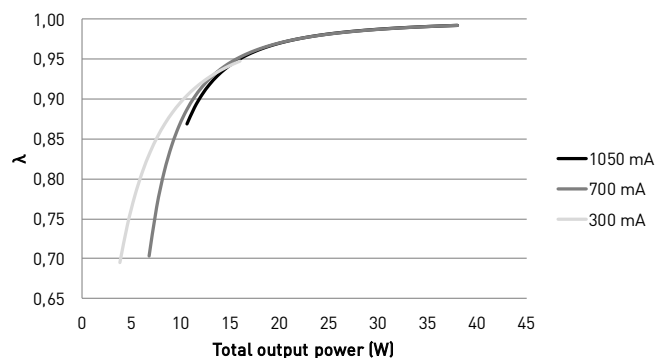
Note: 1) Dimming between 1 % - 100 % possible across the operating window, restricted by the absolute minimum dimming current of 7 mA.  
2) Current value is adjustable in steps via dip-switch. See dip-switch settings in page 3 for details.

## Driver performance

Typical efficiency



Typical power factor

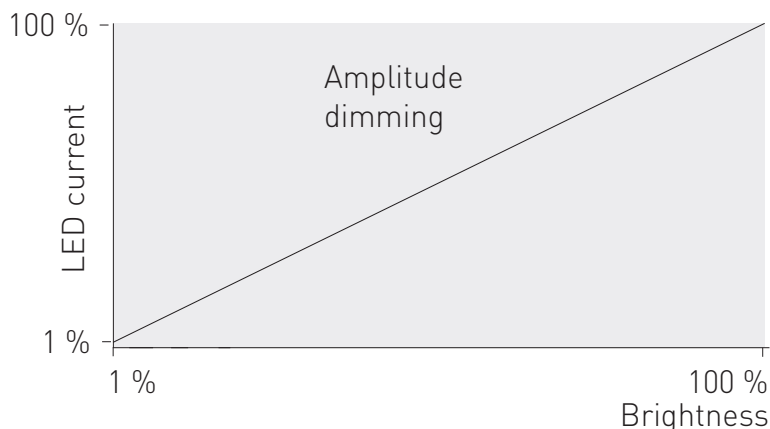


## Operating Conditions and Characteristics

|                                                  |                                                                                        |
|--------------------------------------------------|----------------------------------------------------------------------------------------|
| Absolute highest allowed $t_c$ point temperature | 85 °C                                                                                  |
| $T_c$ life (50 000 h) temperature                | 80 °C                                                                                  |
| Ambient temperature range                        | -25 °C ... +45 °C*                                                                     |
| Storage temperature range                        | -40 °C ... +80 °C                                                                      |
| Maximum relative humidity                        | No condensation                                                                        |
| Life time (90 % survival rate)                   | 80 000 h, at $t_c = 75$ °C<br>50 000 h, at $t_c = 80$ °C<br>40 000 h, at $t_c = 85$ °C |

\*) 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)     |

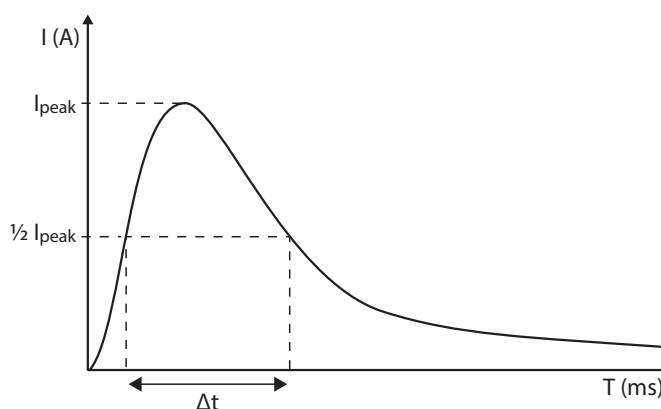
LC38MINI-DA-300-1050-SR LED driver implements amplitude dimming technology across whole dimming range. Amplitude dimming offers the best available technology for dimming the light output in an accurate and flicker-free way to ensure high quality lighting in even the most demanding situations such as 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, $\Delta t$ |
|------------------------------------|-------------------------------------|----------------------------|
| 85 pcs.                            | 5 A                                 | 50 $\mu s$                 |

## 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

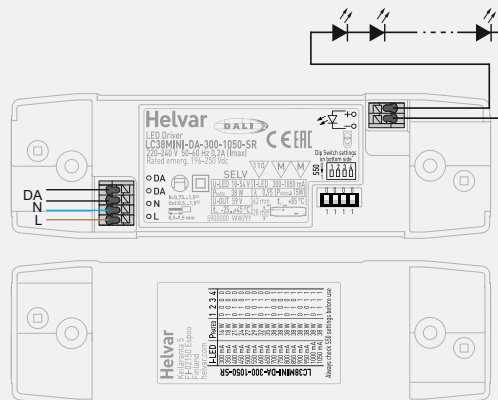
Total continuous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continuous current:  $n(I_{cont}) = (16 \text{ A } (I_{nom, T_a})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

|                                   |                                                                                                         |
|-----------------------------------|---------------------------------------------------------------------------------------------------------|
| Cable Size                        | Ø 2 mm – 9 mm                                                                                           |
| Wire size                         | Input: 0.75 mm <sup>2</sup> – 1.5 mm <sup>2</sup><br>Output: 0.50 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                            | 137 g                                                                                                   |
| IP rating                         | IP20                                                                                                    |

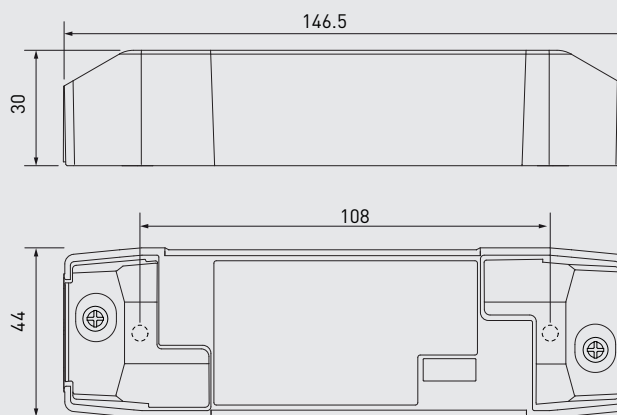
## Connections



Note:

- Not suitable for load side switching operation
- ENEC certified U-LED voltage range is 18 - 54 V, however LC38MINI-DA-300-1050 supports LED loads down to 10 V.

## Dimensions (mm)



In LC38MINI-DA-300-1050-SR, 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 away from label, see connections picture above) and minimum with all switches set to "0" (pushed towards the label). The output current values according to the dip-switch settings are presented below.

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

| Dip-switch combination | 1111      | 0111      | 1011      | 0011      | 1101      | 0101      | 1001      | 0001      |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $I_{out}$ (mA)         | 1050      | 1000      | 950       | 900       | 850       | 800       | 750       | 700       |
| Voltage range          | 10 - 36 V | 10 - 38 V | 10 - 40 V | 10 - 43 V | 10 - 45 V | 10 - 48 V | 10 - 51 V | 10 - 54 V |
| Dip-switch combination | 1110      | 0110      | 1010      | 0010      | 1100      | 0100      | 1000      | 0000      |
| $I_{out}$ (mA)         | 650       | 600       | 550       | 500       | 450       | 400       | 350       | 300       |
| Voltage range          | 10 - 54 V | 10 - 54 V | 10 - 54 V | 10 - 54 V | 10 - 54 V | 10 - 54 V | 10 - 54 V | 10 - 54 V |

LC38MINI-DA-300-1050-SR LED driver is suited for independent use and 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.

### Current setting via dip-switch

LC38MINI-DA-300-1050-SR LED driver features a constant current output adjustable via dip-switch combinations.

- For the combination/current values, refer to the table on page 3.

### 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.

## Lamp failure functionality

### No load

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

### Overload

Driver can withstand overload, however reliable operation is only guaranteed in specified voltage range.

### Short circuit

Driver can withstand output short circuit.

## 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, C5a          |
| 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                                                                                      |                        |
| CE / UKCA marked                                                                                            |                        |

## Label symbols



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



Double insulated control gear suitable for independent 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.