

## 70 W SELV Constant current LED driver

Product code: 5907

70 W 220 – 240 V 50 – 60 Hz

- SELV output protection for safety and flexibility in luminaires
- Very low current ripple, complying with IEEE 1789 recommendation
- Suitable for use in emergency lighting applications
- Suitable for Class I luminaires



### Functional Description

- Adjustable constant current output: 350 mA (default) to 1400 mA
- Current setting via dip-switches
- 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	0.48 A
Frequency	50 Hz – 60 Hz
THD at full power	< 10 %
Leakage current to earth	< 0.7 mA
Tested surge protection	3.5 kV L/N-GND (IEC 61000-4-5) 2 kV L-N (IEC 61000-4-5)
Tested fast transient protection	2 kV (IEC 61000-4-4)

\*For emergency use, see details in page 4

### Insulation between circuits & driver case

Mains circuit - SELV circuit	Double/reinforced insulation
Output - Driver case	Basic insulation
Mains input - Ground input	Double/reinforced insulation

### Load Output (SELV <60 V)

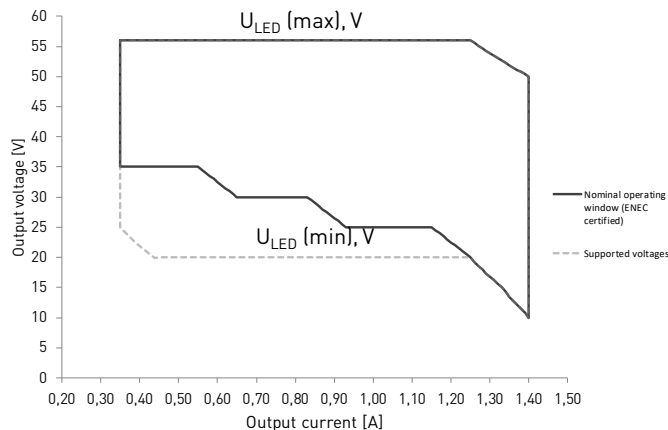
Output current ( $I_{out}$ )	350 mA (default) – 1400 mA
Accuracy	$\pm 7\%$ <sup>1)</sup>
Ripple	< 3 %* at $\leq 120$ Hz
	*] Low frequency, LED load: Cree XP-G LEDs
$U_{out}$ (max) (abnormal)	59 V
$EOF_1$ (EL use)	> 0.98 x output current with AC supply

	350 mA	1400 mA
$I_{LED}$	350 mA	1400 mA
$P_{Rated}$	19.5 W	70 W
$U_{LED}$	25 <sup>2)</sup> /35 - 56 V	10 - 50 V
PF ( $\lambda$ ) at full load	0.95	0.95
Efficiency ( $\eta$ ) at full load	86 %	89 %

1)  $\pm 7\%$  tolerance down to 500 mA, below that  $\pm 12.5\%$

2) ENEC certificated and verified for 35 - 56 V range, usable on the voltages below as well.

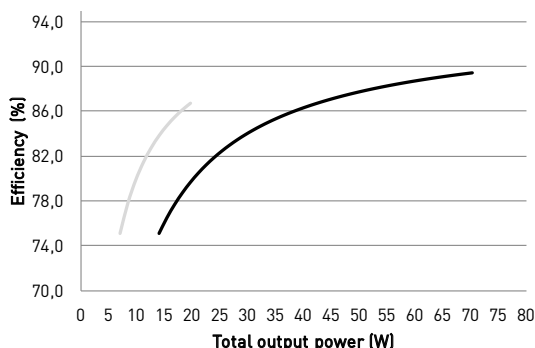
## Operating window



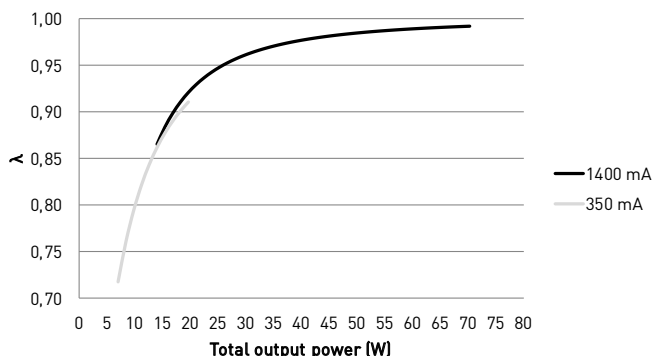
Current value is adjustable in steps via dip-switch. See dip-switch settings in page 3 for details.

## Driver performance

### Typical efficiency



### Typical power factor



## Operating Conditions and Characteristics

Absolute highest allowed $t_c$ point temperature	80 °C
$T_c$ life (50 000 h) temperature	80 °C
Ambient temperature range*	-25 °C ... +50 °C*
Storage temperature range	-40 °C ... +80 °C
Maximum relative humidity	No condensation
Lifetime (90 % survival rate)	100 000 h, at $t_c = 70$ °C 70 000 h, at $t_c = 75$ °C 50 000 h at $t_c = 80$ °C

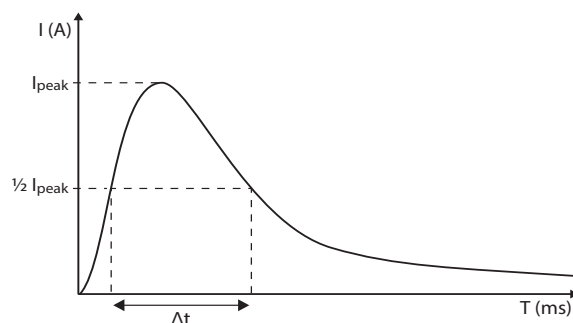
\*) Higher  $t_a$  of the controlgear possible as long as highest allowed  $t_c$  point temperature is not exceeded

## 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, $\Delta t$
51 pcs.	10 A	200 $\mu s$

### 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

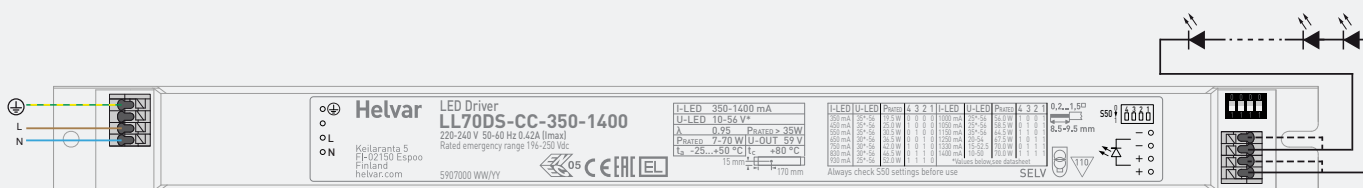
Total continuous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continuous current:  $n(I_{cont}) = [16 A (I_{nom,Ta}) / \text{"nominal mains current with full load"}] \times 0.76$ . 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	0.2 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	264 g

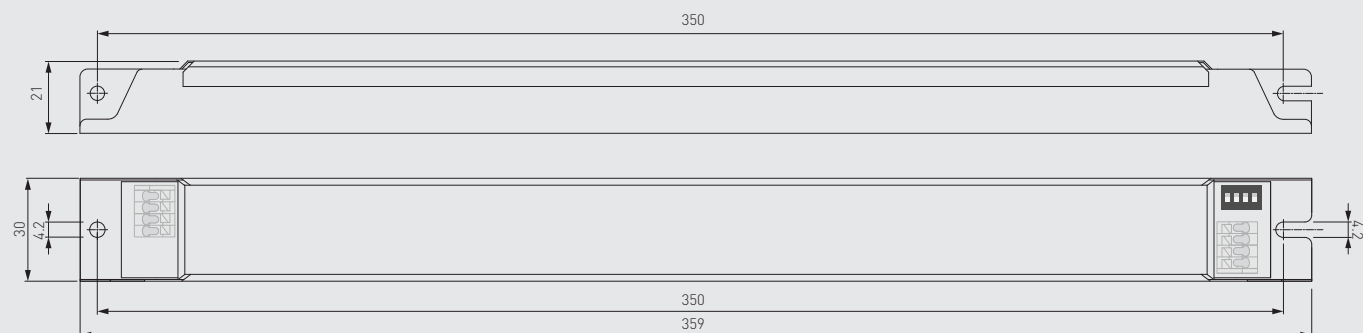
## Connections



Note:

- Not suitable for load side switching operation

## Dimensions (mm)



In LL70DS-CC-350-1400, 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 ON (pushed downwards towards the connectors) and minimum with all switches OFF (pushed upwards away from connectors) The output current values according to the dip-switch settings are presented below, with "1" presenting ON and "0" presenting OFF.

### Dip-switch combinations, output currents and voltage ranges (Nominal I<sub>out</sub> (±7 % toL.))

<b>Dip-Switch combination</b>	1111	0111	1011	1101	0101	1001	1110
I <sub>out</sub> (mA)	1400	1330	1250	1150	1050	1000	930
Voltage range	10 - 50 V	15 - 52.5 V	20 - 54 V	20*/25 - 56 V	20*/25 - 56 V	20*/25 - 56 V	20*/25 - 56 V
<b>Dip-Switch combination</b>	0110	1010	0010	0100	1000	0000	
I <sub>out</sub> (mA)	830	750	650	550	450	350	
Voltage range	20*/30 - 56 V	20*/30 - 56 V	20*/30 - 56 V	20*/35 - 56 V	25*/35 - 56 V	25*/35 - 56 V	

\*Not ENEC certified with the lower minimum voltage values

LL70DS-CC-350-1400 LED driver is suited for 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

LL70DS-CC-350-1400 LED driver features a constant current output adjustable via dip-switch combinations

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

### Emergency use

- The product can be continuously operated only with AC, the DC is reserved only for emergency usage.

### LED driver earthing

- LL70DS-CC-350-1400 LED driver is a protective Class I device and designed for Class I luminaires.
- LED driver must always have the protective earth cable connected for safety reasons.

### 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

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: 2015
Particular safety requirements for DC or AC supplied electronic control gear for LED modules	EN 61347-2-13: 2014+ A1:2017
Additional safety requirements for AC or DC supplied electronic controlgear for emergency lighting	EN 61347-2-13: 2014 + A1:2017, Annex J
Thermal protection class	EN 61347, C5a
Mains current harmonics	EN 61000-3-2: 2014
Limits for voltage fluctuations and flicker	EN 61000-3-3: 2013
Radio frequency interference	EN 55015: 2013+ A1: 2015
Immunity standard	EN 61547: 2009
Performance requirements	EN 62384: 2006+ A1:2009
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 (pending) and CE marked	

## Label symbols



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



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



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