LL35SE-CC-250-850-NFC

Helvar

35.7 W **SELV Constant current** LED driver

Product code: 5773

35.7 W 220 – 240 V 0 / 50 – 60 Hz

- SELV output protection for safety and flexibility in luminaires
- Very low current ripple, complying with IEEE 1789 recommendation
- NFC technology for wireless programming
- Wide fixed current output selection range
- Suitable for use in emergency lighting applications
- Active open load protection
- Long lifetime up to 100 000 h
- Ideal solution for Class I and Class II luminaires

Functional Description

- Programmable constant current output: 250 mA to 850 mA (default) via NFC
- 350 / 500 / 700 / 850 mA fixed current output options
- Optional functional earth connection, see page 5 for more details.

Mains Characteristics

Nominal rated voltage range	220 V – 240 V, 0 / 50 – 60 Hz
AC Voltage range	198 VAC – 264 VAC
	Withstands max. 320 VAC (max. 1 hour)
DC voltage range	176 VDC - 280 VDC
DC starting voltage	> 190 VDC
Mains current at full load	0.17 – 0.19 A
Frequency	0 / 50 Hz – 60 Hz
THD at full power	< 10 %
Leakage current to earth	< 0.3 mA
Tested surge protection	1 kV L-N, 2 kV L-GND (IEC 61000-4-5)
Tested fast transient protection	2 kV (IEC 61000-4-4)

Insulation between circuits & driver case

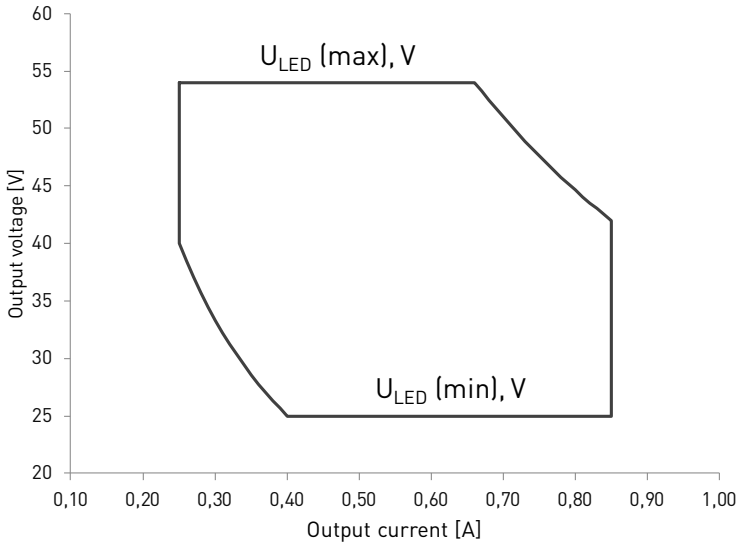
Mains circuit - SELV circuit	Double/reinforced insulation
Output - Driver case	Basic insulation
Mains input - Ground input	Double/reinforced insulation

Load Output (SELV <60 V)

Output current (I_{out})	250 mA – 850 mA
Accuracy	± 5 %
Ripple	< 1 %* at ≤ 120 Hz
	*) Low frequency, LED load: Cree XP-G LEDs
PstLM	< 0.03*
SVM	< 0.01*
	*) At full power, measured with Cree XP-G LED modules.
U_{out} (max) (abnormal)	60 V
EOF_I (EL use)	> 0.98 x output current with AC supply

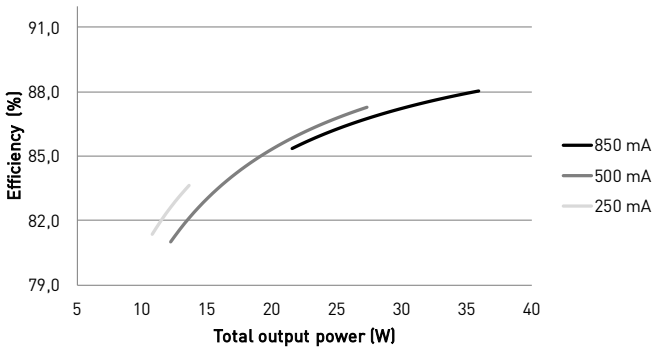
I_{LED}	250 mA	350 mA	500 mA	700 mA	850 mA
P_{Rated}	13.5 W	18.9 W	27 W	35 W	35.7 W
U_{LED}	40 - 54 V	29 – 54 V	25 – 54 V	25 – 50 V	25 – 42 V
PF (λ) at full load	0.88	0.93	0.96	0.98	0.98
Efficiency (n) at full load	84 %	85 %	87 %	88 %	88 %

Operating window

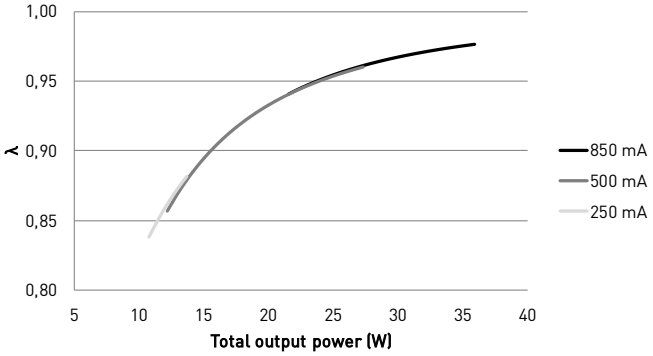


Driver performance

Typical efficiency



Typical power factor



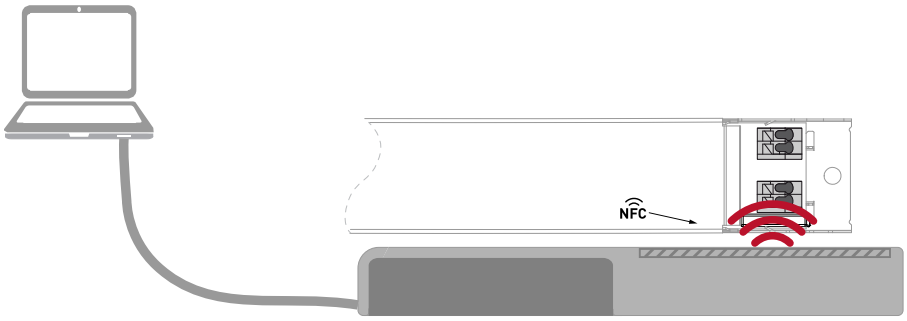
Operating Conditions and Characteristics

Absolute highest allowed t_c point temperature	75 °C
Tc life (50 000 h) temperature	75 °C
Ambient temperature range*	–25 °C ... +55 °C*
Storage temperature range	–40 °C ... +80 °C
Maximum relative humidity	No condensation
Lifetime (90 % survival rate)	100 000 h, at t_c = 65 °C 70 000 h, at t_c = 70 °C 50 000 h at t_c = 75 °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*

Wireless configuration

LL35SE-CC-250-850-NFC LED driver is equipped with NFC wireless technology for effortless configuration of the driver via Helvar Driver Configurator. Helvar Driver Configurator enables easy-to-use automatic configuration of the driver current via NFC, without mains connection to the driver. The most popular MD-SIG qualified NFC readers (FEIG CPR30-USB & ISC.MR102-USB) are supported giving flexibility for the operator. For further information about the usage with Helvar Driver Configurator, please see the user guide at www.helvar.com and for more details about the NFC programming, please see page 5.



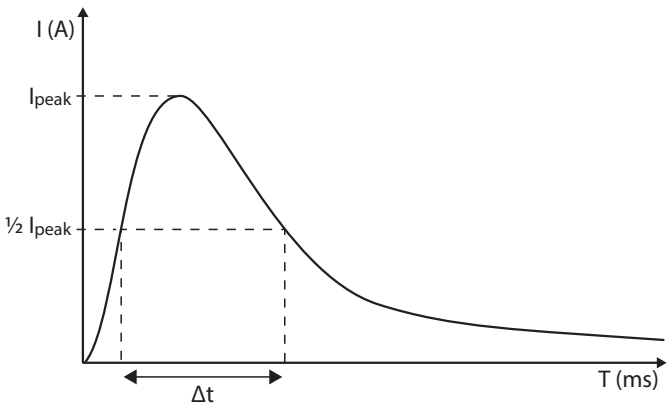
Feig NFC reader

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, $I_{peak}{}^2\Delta t$
91 pcs.	21 A	134 µs	0.0418 A^2s

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

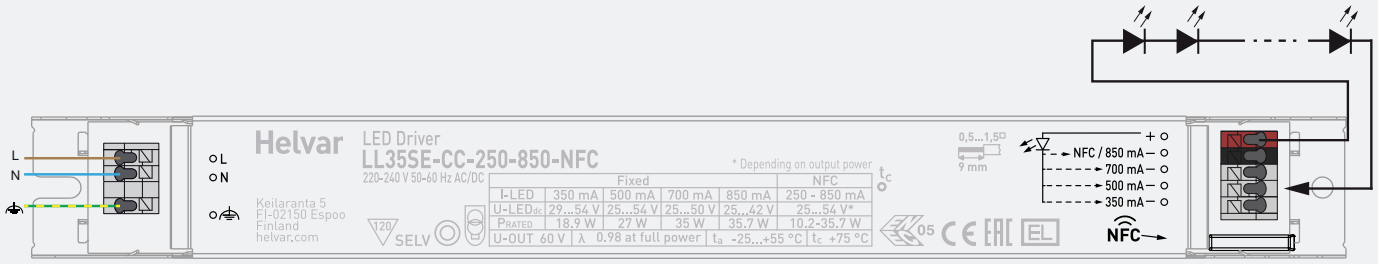
Total continous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continous current: $n(I_{cont}) = (16\ A\ (I_{nom,Ta}) /$ "nominal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

Connections and Mechanical Data

Wire size	0.5 mm² – 1.5 mm²
Wire type	Solid core and fine-stranded
Wire insulation	According to EN 60598
Maximum driver to LED wire length	1.5 m
Weight	198 g
IP rating	IP20

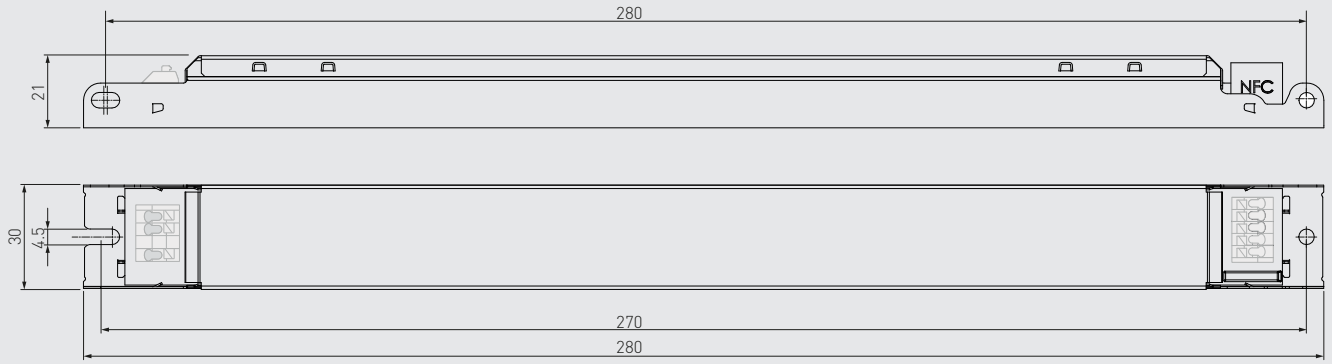
Connections



Note:

- *Earth connection to functional earth terminal is optional and not needed for the functionality of the driver. See page 5 for details.*
- *Not suitable for load side switching operation.*
- *Only the load connectors (red (+) and black (-) shall be used when the current is set with NFC.*
- *Label may differ if the unit is preset to fixed current.*

Dimensions (mm)



LL35SE-CC-250-850-NFC 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

LL35SE-CC-250-850-NFC LED driver features a constant current output programmable via NFC or selectable via four current output options (350 mA / 500 mA / 700 mA / 850 mA). When using the NFC current set, the following things shall be considered:

- Only the current output via NFC connectors (red connector (+) and black connector (-)) shall be used when the current is set with NFC.
- After the driver has been disconnected from mains, it is recommended to wait 30 s before starting to program via NFC.
- The driver shall not be connected to the mains if active NFC field is nearby.

LED driver earthing

- LL35SE-CC-250-850-NFC is LED driver suitable for Class I and II luminaires.
- When used inside **Class I and Class II** luminaires, the earth cable is recommended to be connected to improve the EMC performance of the driver, but it is not mandatory. It is the responsibility of the integrator to ensure that the assembled luminaire EMC performance complies with the latest standards.

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

Short circuit

Driver can withstand output short circuit.

Underload

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

Overload

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

No load

When open load is detected, driver limits output voltage according to Uout (max) (abnormal) and goes into low power consumption stand-by mode. After resolving the fault, the normal driver operation can be resumed through a mains reset (> 2 seconds).

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, C5e
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 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 120 °C.

Driver equipped with NFC wireless technology for effortless configuration.

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