LC1x50 Active+ Stairway function

freedom in lighting **Helvar**

1x50 W **Dimmable** LED driver with Active+ stairway functionality

50 W 220 – 240 VAC 50 – 60 Hz

- Fully automatic standalone setup with stairway functionality
- Never enter a dark stairway or corridor
- Optimised presence detection, daylight harvesting and Constant Lumen Output (CLO) operation
- No programming, configuration, or external control wiring needed
- Suitable for class I and class II luminaires
- Optional strain relief for independent use outside of luminaire (LC1x70-SR)

Functional Description

- ON level: fully automatic Constant Lumen Output. Dynamic operational area between ON level and energy saving level
- Occupancy timeout: 3,5 min, fadetime to energy saving level: 1,5 min
- Energy saving level: 10 %, never switching OFF
- Customization of luminaire parameters through use of Helvar Active+ mobile app (see User Guide)
- Adjustable constant current output via external resistors: 1050 mA (default) to 1400 mA
- Hybrid dimming technique for high quality light
- Adaptive LED overload protection. Reduces output current if overload of 1 - 4 V is detected
- Full load recognition, open and shortcircuit protection

Mains Characteristics

Voltage range	198 VAC – 264 VAC
DC range	176 VDC - 280 VDC
starting voltage	> 190 VDC
Mains current at full load	0.22 A – 0.31 A
Frequency	0 / 50 Hz – 60 Hz
Stand-by power consumption	0.47 W
THD at full power	< 15 %
Leakage current to earth	< 0.7 mA
Tested surge protection	1 kV L-N, 2 kV L-GND (IEC 61000-4-5)
Tested fast transient protection	4 kV (IEC 61000-4-4)

Insulation between circuits

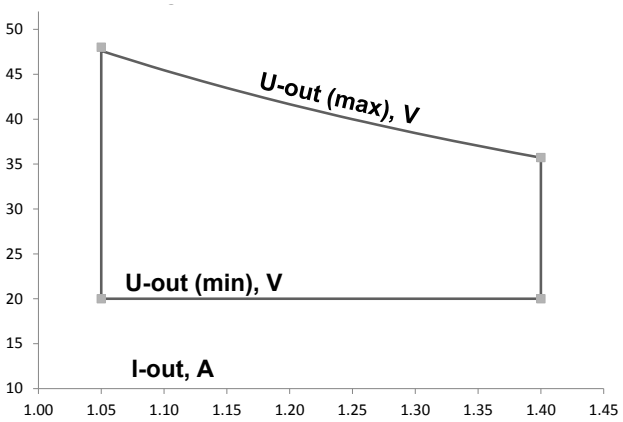
Mains circuit - SELV circuit	Double/reinforced insulation

Load Output (SELV <60 V)

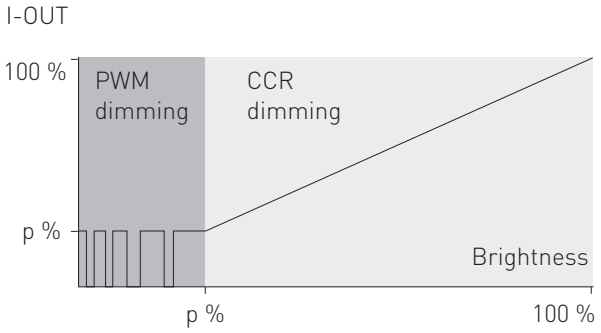
Output current (I_{out})	1050 mA (default) – 1400 mA
Accuracy	± 5 %
Ripple	< ± 2 %, at ≤ 120 Hz*
	< ± 20 %, at > 20 kHz*
	*) LED load: Cree XM-L LEDs
U_{out} (max) (abnormal)	60 V

I_{out}	1050 mA	1400 mA
P_{out}(max)	50.4 W	50.4 W
U_{out}	20 V – 48 V	20 V – 36 V
λ at full power	0.98	0.98
Efficiency (η), max load	0.89	0.87

Operating window



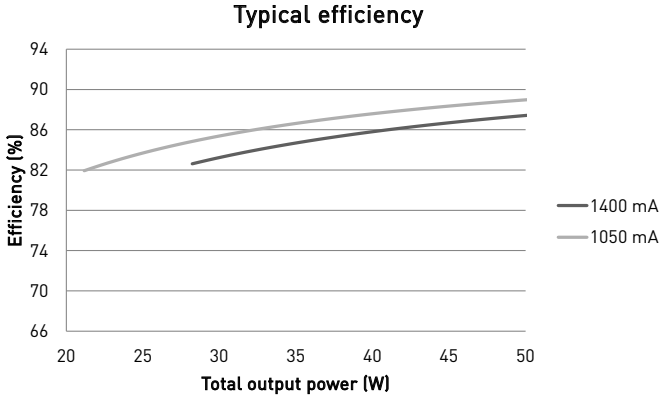
Hybrid dimming technique in automatic dimming

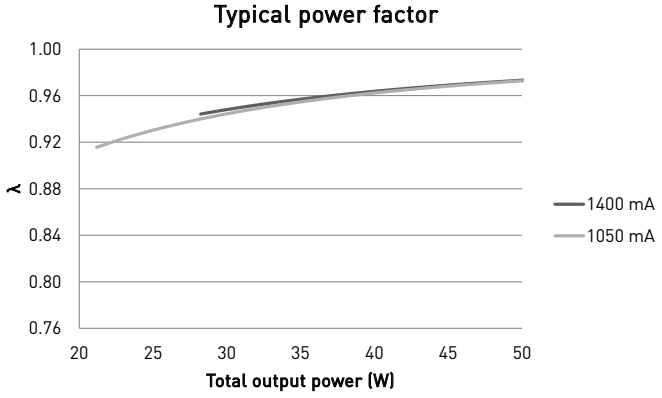


Dimming range	Dimming technique
1 % – 20 %	Pulse Width Modulation (PWM)*
20 % – 100 %	Constant Current Reduction (CCR)

* PWM dimming frequency 800 Hz

Driver performance





Operating Conditions and Characteristics

Highest allowed t_c point temperature	75 °C
Ambient temperature range	–20 °C ... +50 °C
in independent use	–20 °C ... +40 °C
Storage temperature range	–40 °C ... +80 °C
Maximum relative humidity	No condensation
Life time (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

Quantity of drivers per miniature circuit breaker 16 A Type C

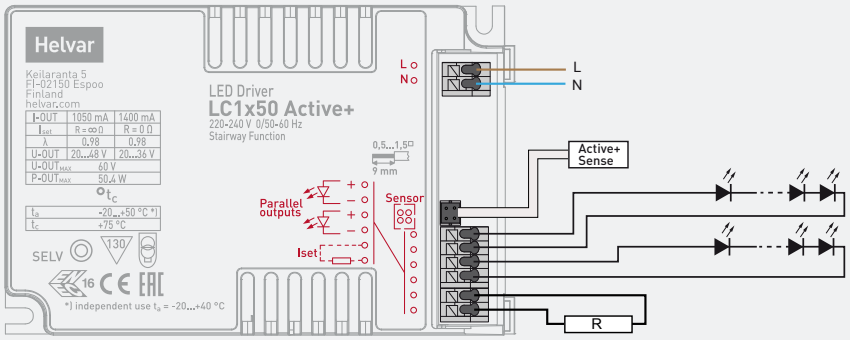
Based on I_{cont}	Based on I_{peak}	Typ.inrush current	1/2 value time, Δt	Calculated energy, $I_{peak}^2 \Delta t$
43 pcs.	61 pcs.	29 A	146 µs	0.097 A^2s

Type-C MCB's are recommended with trip characteristics according to EN 60898.

Connections and Mechanical Data

Wire size	0.5 mm² – 1.5 mm²
Wire type	Solid core and fine-stranded
Wire insulation	According to EN60598
Maximum driver to LED wire length	5 m
Weight	270 g
IP rating	IP20

Connections



Current setting (p. 2)	
Resistor R	**output I_{out}**
open	1050 mA
0 Ω	1400 mA

Note:

- *Not suitable for load side switching operation.*

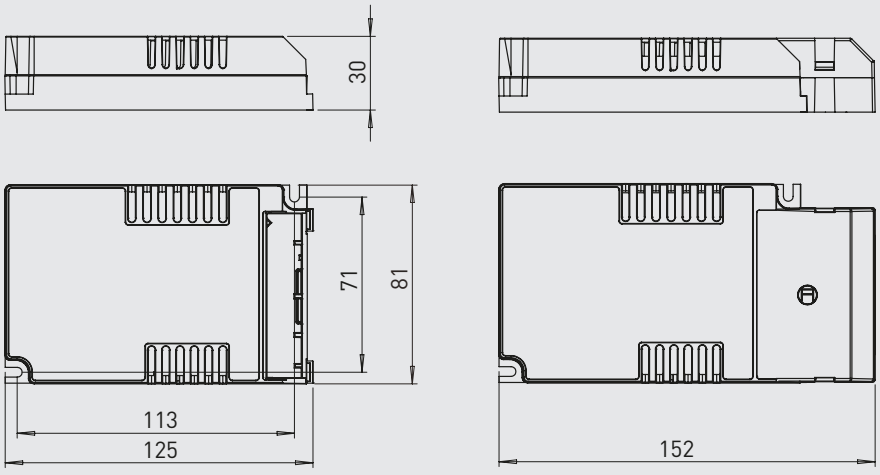
Available Iset resistor values (Nominal I_{out} (±5 % tol.))

Resistor (Ω)	0	1k	2k2	3k3	4k7	8k2	10k	18k	Open
I_{out} (mA)	1400	1380	1360	1340	1320	1290	1270	1220	1050
SAP code	N/A	T70102	T70222	T70332	T70472	T70822	T70103	T70183	N/A

Current setting resistor values, E24 series resistors (Nominal Iout (±5 % tol.)

R (Ω)	0	1k	2k2	3k3	4k7	8k2	10k	15k	22k	33k	47k	68k	100k	220k	∞
I_{out} (mA)	1400	1380	1360	1340	1320	1290	1270	1240	1200	1170	1140	1120	1100	1070	1050

Dimensions (mm)



LC1x50 Active+ Stairway function LED driver is suited for built-in luminaire usage. 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. 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. Specifications of the LED drivers may never exceed the operating conditions as per the product datasheets.

Installation & operation

Maximum t_c temperature: Reliable operation and lifetime is only guaranteed if the maximum t_c point temperature is not exceeded under the conditions of use.

Installation site: Ensure that the LED driver does not exceed temperature higher than specified on the product datasheets.

The general preferred installation position of LED drivers for independent use is to have the top cover facing upwards.

Current setting resistor

LC1x50 Active+ Stairway function LED driver features an adjustable constant current output

- An external resistor can be inserted in to the current setting terminal, allowing the user to adjust the LED driver output current
- When no external resistor is connected, then the LED drivers will operate at their default lowest current level
- A standard through-hole resistor can be used for the current setting. To achieve the most accurate output current it is recommended to select a quality low tolerance resistor. Minimum diameter for resistor leg is 0.51mm
- Resistor/current values are presented on page 3

Lamp failure functionality

No load

When open load is detected, driver will go to standby. Automatic recovery is on during the first 10 minutes. If open load is still detected after the first 10 minutes, driver goes to standby mode and recovers through mains reset.

Short circuit

When short circuit is detected, driver goes to standby mode and returns through mains reset.

Overload

When high over load is detected, driver goes to standby mode and follows the same logic as described in the short circuit condition. When low over load is detected, output current will be reduced to have maximum rated output power.

Underload

When under voltage is detected, driver goes to standby mode and returns through mains reset.

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
Thermal protection class	EN61347, 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
Compliant with relevant EU directives	
ENEC and CE marked	