

## 10-42 W **Dimmable** LED driver with Active+ (and ActiveAhead gen.1\*) functionality

42 W 220 – 240 V 0 / 50 – 60 Hz

- Fully automatic standalone setup with smart learning functionality
- Optimised presence detection, daylight harvesting and Constant Lumen Output (CLO) operation
- No programming, configuration, or external control wiring needed
- Hybrid dimming technology
- Ideal solution for closed luminaires where protection done with luminaire construction (Class I or II)
- Fully automatic standalone setup with smart learning functionality for stairways



\*ActiveAhead Gen 1 phased out, visit [www.helvar.com](http://www.helvar.com) for more information on the newest generation of ActiveAhead



### Functional Description

- Adjustable constant current output: 120 mA (default) to 350 mA
- Current setting programmable with external resistors
- Hybrid dimming for high-quality light in every application
- Adaptive LED overload protection, reduces output current if minor overload (up to 45 W) is detected
- Output current peak limited (600 mA) during load change
- Full load recognition with automatic recovery, open and short circuit protection
- 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
- Customization of luminaire parameters through use of Helvar Active+ mobile app (see User Guide)
- Inbuilt power supply for use of sensor and control unit

### Mains Characteristics

Voltage range	198 VAC – 264 VAC
DC range	176 VDC – 280 VDC
starting voltage	> 190 VDC
Mains current at full load	0.18 A – 0.24 A
Frequency	0 / 50 Hz – 60 Hz
Stand-by power consumption	< 0.5 W
THD at full power	< 12 %
Leakage current to earth	< 0.5 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

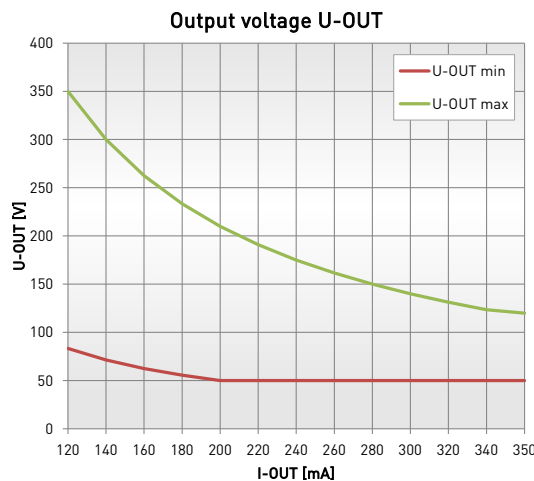
Mains circuit - Output	Non-isolated
DALI circuit - Output	Basic insulation
Mains circuit - DALI circuit	Basic insulation
Mains, DALI and output - Driver case	Basic insulation

### Load Output

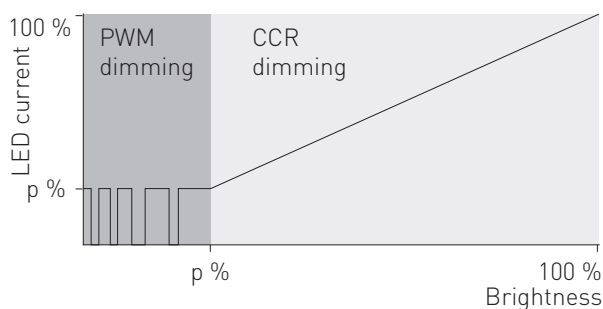
Output current ( $I_{out}$ )	120 mA (default) – 350 mA
Accuracy	± 5 %
Ripple	< 2 %* at ≤ 120 Hz
	*] Low frequency, LED load: Cree XM-L LEDs
PstLM	< 1*
SVM	< 0.4*
	*] At full load
$U_{OUT}$ (max) (abnormal)	400 V
Outrush current	600 mA*
	*] When starting driver with short-circuited load or connecting load to running driver

	120 mA	350 mA
$I_{LED}$	120 mA	350 mA
$P_{Rated}$	42 W	42 W
$U_{LED}$	80 V – 350 V	50 V – 120 V
PF (λ) at full load	0.96	0.96
Efficiency (η) at full load	93 %	91 %

## Operating window



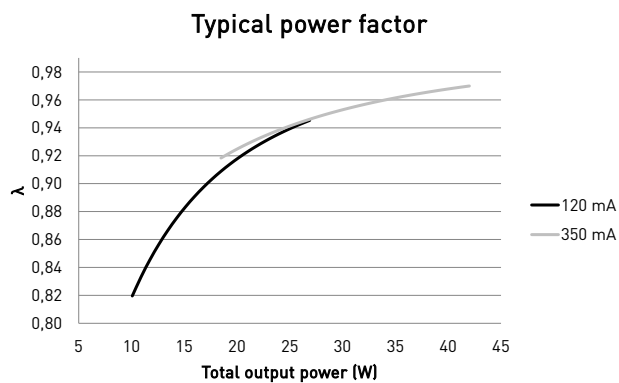
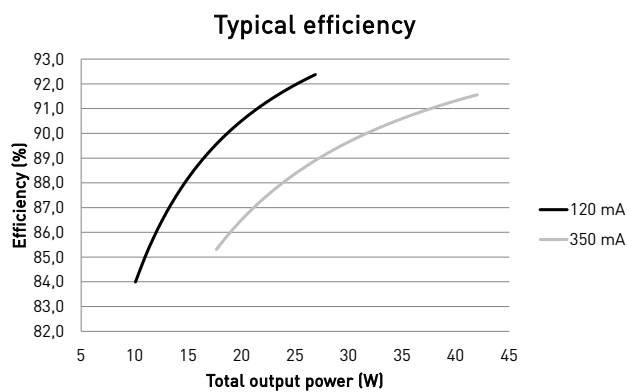
## Hybrid dimming technology in automatic dimming



Dimming range	Dimming technique
1-20 %	Pulse Width Modulation (PWM)*
20-100 %	Linear current reduction

\* PWM dimming frequency 1 kHz

## Driver performance



## Operating Conditions and Characteristics

Absolute highest allowed $t_c$ point temperature	75 °C
$t_c$ life (60 000 h) 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
Lifetime (90 % survival rate)	100 000 h, at $t_c = 65$ °C 80 000 h, at $t_c = 70$ °C 60 000 h, at $t_c = 75$ °C

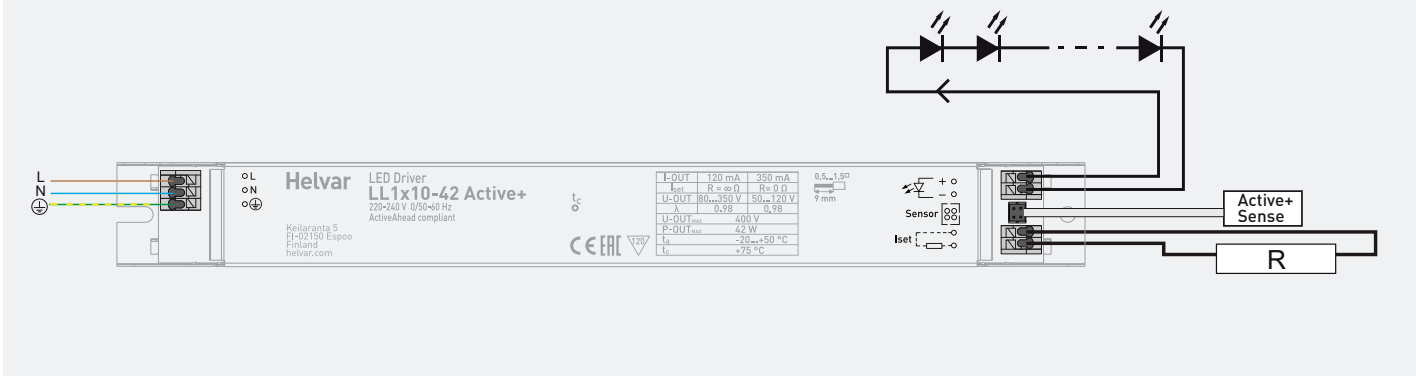
## Quantity of drivers per miniature circuit breaker 16 A Type C

Based on $I_{cont}$	Based on inrush current $I_{peak}$	Typ. peak inrush current $I_{peak}$	1/2 value time, $\Delta t$	Calculated energy, $I_{peak}^2 \Delta t$
53 pcs.	56 pcs.	25 A	177 $\mu s$	0.08 A <sup>2</sup> s

## 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	5 m
Weight	190 g
IP rating	IP20

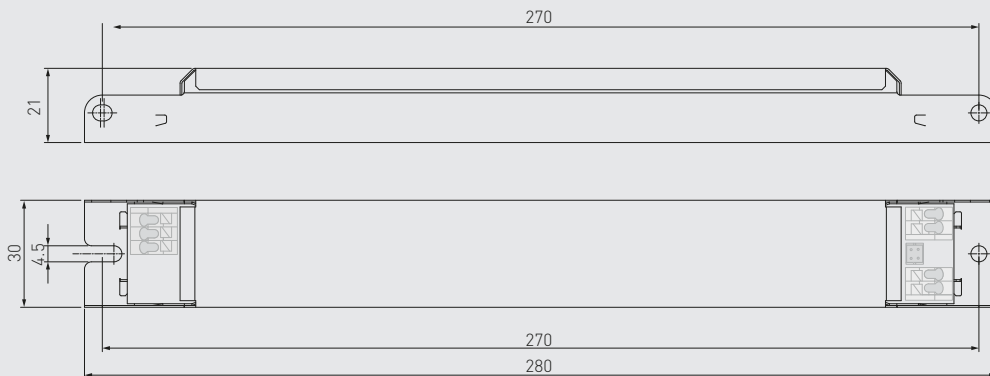
## Connections



## Default current setting resistor values, E48 series (Nominal I<sub>out</sub> (±5 % tol.))

Resistor (Ω)	0	120	270	330	470	680	1k	1k5	2k2	3k3	4k7	8k2	12k	22k	Open
I <sub>out</sub> (mA)	350	330	310	300	290	270	250	230	210	190	170	150	140	130	120
Order code	T70000	T70121	T70271	T70331	T70471	T70681	T70102	T70152	T70222	T70332	T70472	T70822	T70123	T70223	N/A

## Dimensions (mm)



LL1x10-42 Active+ 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 $t_c$ temperature:

- Reliable operation and lifetime is only guaranteed if the maximum  $t_c$  point temperature is not exceeded under the conditions of use
- Ensure that the  $t_c$  point temperature does not rise higher than specified on the product datasheets

### Current setting resistor

LL1x10-42 Active+ LED driver features a constant current output adjustable via current setting resistor or software.

- 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.
- Specific resistor/current values are presented on page 3. The values are Helvar specific by default.

## 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 overload is detected, driver goes to standby mode and follows the same logic as described in the short circuit condition. When low overload is detected (up to 45 W), output current will be reduced to have maximum rated output power.

### Underload

When undervoltage 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	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
Compliant with relevant EU directives	
RoHS / REACH compliant	
CE / UKCA marked	

## Label symbols



Thermally controlled control gear, incorporating means of protection against overheating to prevent the case temperature under any conditions of use from exceeding 120 °C.