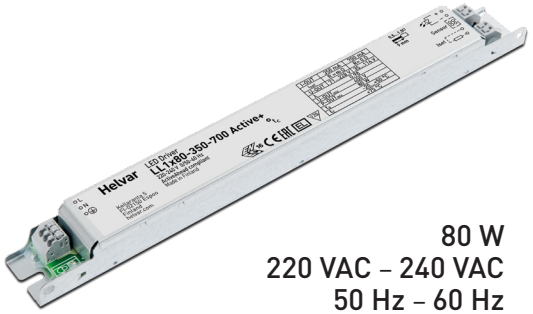
80 W **Dimmable** LED driver with Active+ (and ActiveAhead gen.1*) functionality

- Fully automatic standalone setup with smart learning functionality
- Optimised presence detection, daylight harvesting and Constant Lumen Output (CLO) operation
- Enhanced hybrid dimming, with varying PWM frequency for high quality light, complying with IEEE 1789 recommendation**
- No programming, configuration, or external control wiring needed
- Long lifetime 100 000 h



80 W
220 VAC – 240 VAC
50 Hz – 60 Hz

** ActiveAhead Gen 1 phased out, visit www.helvar.com for more information on the newest generation of ActiveAhead*

*** See page 2 for details.*

Connections

Current setting (p. 2)	
Resistor R	**output I_{fv}**
open	350 mA
0 Ω	700 mA

Note:
- *Not suitable for load side switching operation.*

Mains Characteristics

Voltage range	198 VAC – 264 VAC
DC range	176 VDC – 280 VDC, starting voltage > 190 VDC
Max mains current at full load	0.34 A – 0.44 A
Frequency	0 / 50 Hz – 60 Hz
Stand-by power	0.30 W

Load Output (non-isolated)

Output current (I_{out})	350 mA (default) – 700 mA
- Accuracy	± 5 %
- Ripple	< 2 %* at ⩽ 120 Hz
	*) Low frequency, LED load: Cree MX3 LEDs
PstLM	< 1*
SVM	< 0.4*
	*) At full load
U_{out} (max) (abnormal)	400 V
EOFx (EL use)	> 0.98

I_{out}	350 mA	700 mA
P_{out}(max)	80 W	80 W
U_{out}	71 V – 228 V	35 V – 114 V
λ	0.98	0.98
Efficiency (η), max load	0.94	0.92

Operating Conditions and Characteristics

Max. temperature at t_c point	75 °C
Ambient temperature range	–20 °C ... +50 °C
Storage temperature range	–40 °C ... +80 °C
Maximum relative humidity	no condensation
Life time (90% survival)	100 000h, at t_c=65 °C
	75 000h, at t_c=70 °C
	50 000h, at t_c=75 °C

Connections and Mechanical Data

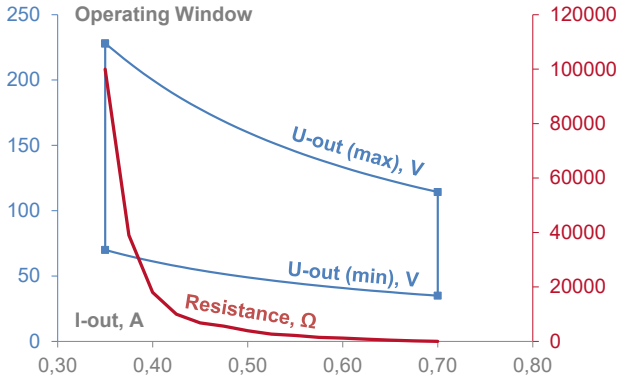
Wire size	0.5 mm² – 1.5 mm²
Wire type	solid core and fine-stranded
Maximum driver to LED wire length	5 m
Weight	220 g
IP rating	IP20

Functional Description

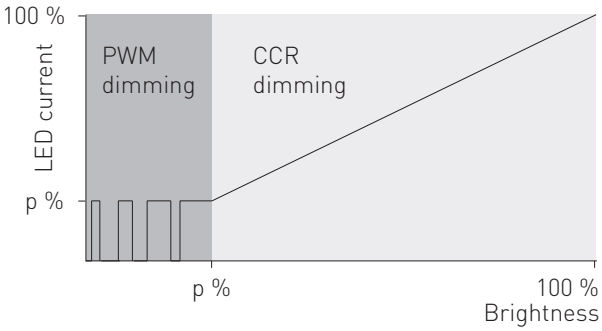
- Active+ functionality as default (see User Guide)
- Overriding setting of sensor parameters by Helvar Active+ mobile app (see User Guide)
- Linear dimming curve. Dynamic range can be set within 1 - 100 %.
- Adaptive overload protection up to 85 W
- Limited outrush current (1200 mA) during load change
- Full load recognition, automatic recovery
- High Efficiency

Note: See page 2 - 3 for dimensions and additional information

Load output



Hybrid dimming technique



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

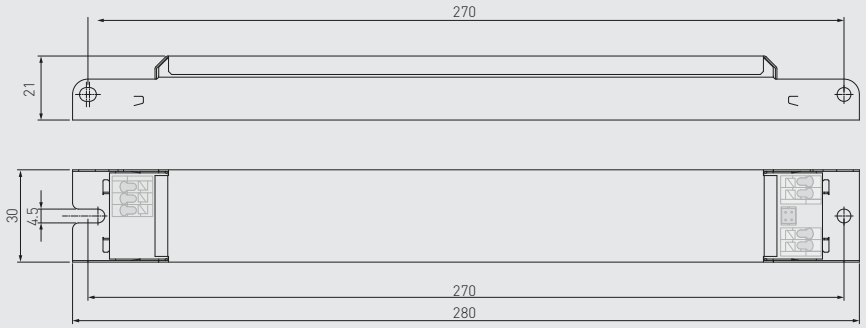
* PWM dimming frequency 1 – 8 kHz

Helvar hybrid dimming products combines both Constant Current Reduction (CCR) amplitude dimming and Pulse Width Modulation (PWM) dimming. CCR is a very efficient technique for dimming the light output, especially on higher range. On lower range, the hybrid dimming products implement high-frequency PWM dimming according to the table above.The dimming technology complies with IEEE 1789-2015 recommendation about current modulation percent and frequency in the dimming range between 3 % - 100 %.

Current setting resistor values (Nominal I_{out} (±5 % tol.)

R (Ω)	0	220	470	820	1k2	1k5	2k2	2k7	3k9	5k6	6k8	10k	18k	39k	Open
I_{out} (mA)	700	675	650	625	600	575	550	525	500	475	450	425	400	375	350

Dimensions



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, $I_{peak}^2 \Delta t$
30 pcs.	30 pcs.	42 A	186 µs	0.24 A^2s

LL1x80-350-700 Active+ LED driver is suited for in-built 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. 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. Specifications of the LED drivers may never exceed the operating conditions as per the product datasheets.

Wiring

Wire type and cross section

Refer to datasheets connections & mechanical data

Wiring insulation

According to recommendations in EN 60598

Maximum wire lengths

Refer to datasheets connections & mechanical data

Wire connections

Refer to datasheets connections diagram

Miniature Circuit Breakers (MCB)

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

LED driver earthing

- LED drivers are designed to support different luminaire classifications, such as Class I or Class II fittings (no earth required). Check the individual LED driver type for its exact safety class rating.
- For Helvar LED drivers to have a reliable operation and EMC performance, the luminaires are expected to have an earth connection.

Installation & operation

Maximum Tc temperature

Reliable operation and lifetime is only guaranteed if the maximum tc 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

LL1x80-350-700 Active+ 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.
- For the resistor/current value selection, refer to the table on page 2.
- For drivers not providing isolation (non-isolated), current setting resistor must be insulated according safety regulations.

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/ DC supplied electronic controlgear for emergency lighting	EN61347-2-13 Annex J
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
Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers	IEEE 1789-2015
Compliant with relevant EU directives	
CE / UKCA marked	