LL2x35-E-DA

2x35 W **Dimmable DALI** LED driver

Helvar
freedom in lighting

- Adjustable constant current output: 350 mA (default) - 700 mA
- Two independent SELV rated output channels (default two DALI addresses)
- DALI control input 1 % - 100 % dimming range
- Low standby power, < 0.5 W
- Protected up to 4 kV power network fast transients
- High efficiency, 0.90
- Overload, open & short circuit protection
- Suitable for Class I or II luminaire
- External NTC thermal input
- Current setting resistor input

2x35 W 220-240 VAC 50-60 Hz

SELV

Connections

Note:

- *Not suitable for load side switching operation.*
- *Wrong wiring will serious damage the product*
- *PE needs not to be connected in class II luminaires if they are suitably designed*

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

Mains Characteristics

Voltage range	198 - 264 VAC
DC range	176 - 280 VDC, starting voltage > 190 VDC
Max mains current at full load	0.33- 0.42 A
Frequency	0 / 50 - 60 Hz
U-OUT$_{max}$ (abnormal)	120 V
Stand-by power	< 0.5 W

Load Output

Output current (I-OUT)	350 mA (default) - 700 mA
Max output power	35 W / channel
Efficiency, at full load, typical	0.90

I-OUT	350 mA	700 mA
P-out (max) / channel	35 W / ch	35 W / ch
U-OUT	25-100 V	25-50 V
λ (both channels loaded)	0.98	0.98
η (both ch loaded @ max)	0.90	0.90

Operating Conditions and Characteristics

Max.temperature at tc point	80 °C
Ambient temperature range	-20...+50 °C
Storage temperature range	-40...+80 °C
Maximum relative humidity	no condensation
Life time	50 000h, at TC max (90 % survival rate)

Connections and Mechanical Data

Maximum driver to LED wire length	5 m
Weight	365 g
IP rating	IP20
NTC trigger point	8.2 kΩ

Conformity & Standards

General and safety requirements	EN 61347-1
Particular safety requirements for d.c. or a.c. supplied electronic controlgear for LED modules, acc. to	EN 61347-2-13
Thermal protection class	EN61347, C5e
Mains current harmonics, acc. to	EN 61000-3-2
Limits for Voltage Fluctuations and Flicker, acc to	EN 61000-3-3
Radio Frequency Interference, acc. to	EN 55015
Immunity standard, acc. to	EN 61547
Performance requirements, acc to	EN 62384
Digital adressing lighting interface (DALI) **	EN62386-207

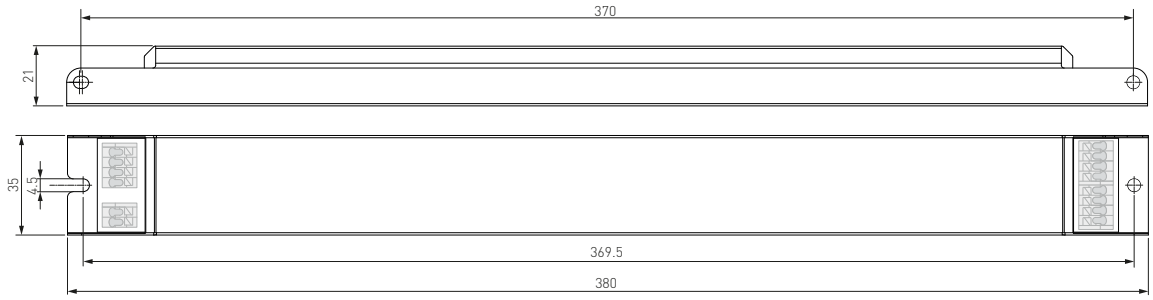
Compliant with relevant EU directives
ENEC,CE & SELV marked

** with additional extensions

SELV = *Control gear for inbuilt usage is double insulated from live parts*

Note: See page 2 for dimensions

Dimensions



LL2x35-E-DA is designed for in-built luminaire to use either class I or class II 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 drivers 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 datasheet. Specifications of the LED driver may never exceed the operating conditions as per the product datasheet.

Wiring considerations

Wire type and cross section

- Please refer to datasheets connections & mechanical data

Wiring insulation

- According to recommendations in EN 60598

Maximum wire lengths

- Please refer to datasheets connections & mechanical data

Wire connections

- Please 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 all luminaire classifications. Please 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. Earth connection can be left out if luminaire safety is guaranteed by its construction.
- When using a SELV-rated LED driver, then the SELV driver output has to be insulated from the luminaire earth connection (ref. EN60598-1 luminaire standard).

Installation & operational considerations

Maximum tc temperature

- Reliable operation and lifetime is only guaranteed if the maximum tc point temperature is not exceeded under the conditions of use.

Strain Relief for independent use

- Some of the Helvar LED drivers allow use both inside the luminaire and outside the luminaire, via a strain relief. The strain relief provides reliable fastening method for the mains and LED output wiring.
- Ensure that the LED driver does not exceed temperature higher than specified on the product datasheets.
- The general preferred installation position of LED drivers is to have the top cover facing upwards.

Current setting resistor

The Helvar LL2x35 driver platforms feature 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, please refer to the enclosed table below.

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.	40 A	186 µs	0.2198 A^2s

Current setting resistor values LL2x35-E-DA

R (Ω)	0	1k	1k2	1k5	1k8	2k2	2k7	3k3	3k9	4k7	5k6	6k8	8k2	10k	12k	15k	22k	27k	33k	39k	47k	56k	68k	82k	100k	150k	330k	1M	∞
I_{out} (mA)	700	650	640	630	620	610	600	580	570	550	530	520	500	480	470	450	430	420	410	400	390	385	380	375	370	365	360	355	350