LL1-CV-DA

12-24 V, **Dimmable constant voltage** DALI LED driver extension

- DALI control input, 0.1 %-100 % dimming range
- 2 kHz PWM dimming frequency*
- Complies with IEEE 1789-2015 recommendations*
- Stand-by power < 0.1 W
- Class III device
- Suitable for Class I, II or III (SELV) luminaires and independent use
- Duplicated output terminals for optional parallel connection
- DALI input is double insulated from driving signal input and output

**Products manufactured from 1/2022 onwards*

Product code: 5700

5 A, 12-24 VDC

The LL1-CV-DA DALI dimmable extension unit is designed to be used with the Helvar Components constant voltage LED drivers, creating controllable solutions for decorative lighting. It enables the use of DALI control in constant voltage (12 / 24 V) lighting applications.

Input Characteristics

Input signal	Constant voltage only
Voltage range	10.8 - 26.4 VDC
Control signal	DALI

Insulation between circuits & driver case

Input - Output	Non-isolated
Input and output - Driver extension case	Double/reinforced insulation
DALI signal - Input and output	Double/reinforced insulation

Load Output

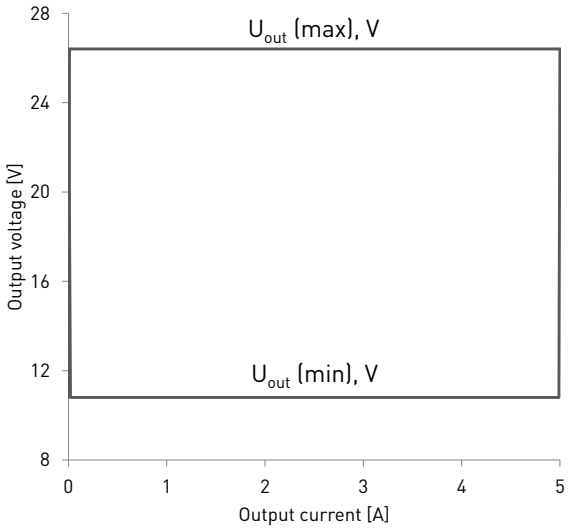
Output current (I-OUT)	Maximum 5 A*
Max output power	120 W
PWM frequency	2 kHz**

U-IN	12 V	24 V
P-OUT (max)	60 W	120 W
I-OUT (max)	5 A*	5 A*
U-OUT	12 V	24 V

** LL1-CV-DA LED driver extension must be used with a constant voltage power supply with current limited to max 5A and proper short circuit protection.*

*** From production revision N onwards (1/2022). Frequency 1 kHz in earlier revisions.*

Operating window



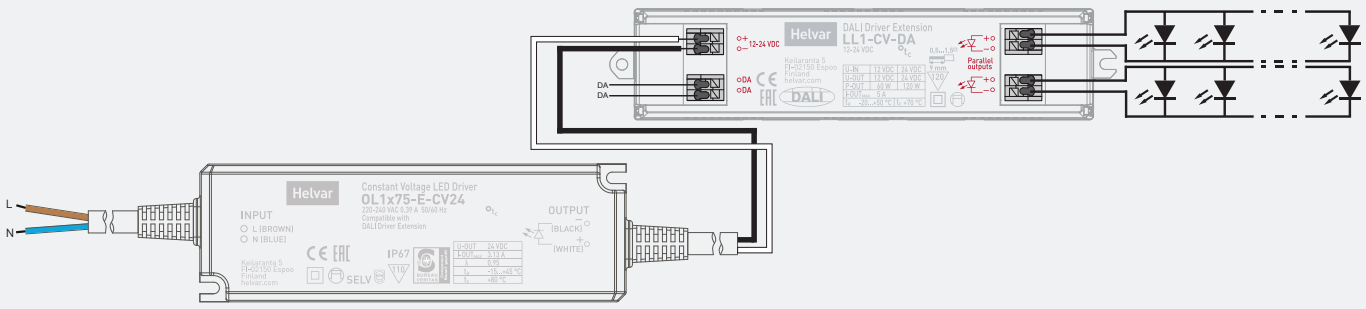
Operating Conditions and Characteristics

Max.temperature at tc point	70 °C
Ambient temperature range	-20...+50 °C
Storage temperature range	-40...+80 °C
Maximum relative humidity	no condensation
Lifetime (90 % survival rate)	100 000 h, at t_c = 60 °C 70 000 h, at t_c = 65 °C 50 000 h, at t_c = 70 °C

Connections and Mechanical Data

Wire size	0.5 - 1.5 mm^2
Wire type	Solid core and fine-stranded
Wire insulation	According to EN 60598
Maximum driver to LED wire length	5 m
Weight	70 g
IP rating	IP20

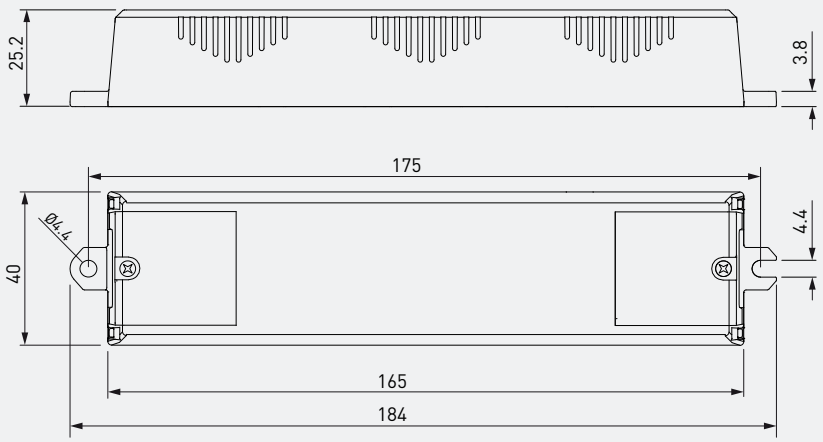
Connections



Note:

- *Output voltage is PWM modulated and equal to CV driver output voltage*
- *Must be used with constant voltage load based on resistor current limiting. Do not use loads with other current limiting methods.*

Dimensions



Information and conformity

Helvar Components

LL1-CV-DA LED driver extension is suited for built-in usage in luminaires as well as independent use. 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 and the LL1-CV-DA DALI LED driver extension 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 and with LL1-CV-DA specifications . Operating conditions of the LED drivers may never exceed the specifications as per the product datasheet.

Installation & operation

Maximum ambient and t_c temperature:

- 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 extension, 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.

LED driver earthing

- LL1-CV-DA LED driver extension is a Class II device and the electrical protection relies on double/reinforced insulation. Do not earth LL1-CV-DA in any way.
- When using a SELV-rated CV LED driver, then the SELV driver output and the LL1-CV-DA output has to be insulated from the luminaire earth connection (ref. EN60598-1 luminaire standard).

Installation considerations

- The LL1-CV-DA allows the use both inside the luminaire and outside the luminaire, with the use of the integrated strain relief. The strain relief provides reliable fastening method for input / output wiring.
- The general preferred installation position of LL1-CV-DA LED driver extension is to have the top cover facing upwards.

Conformity & standards

Particular requirements for miscellaneous electronic circuits used with luminaires	EN 61347-2-11
Particular safety requirements for DC or AC supplied electronic control gear for LED modules	EN 61347-2-13
Radio frequency interference	EN 55015
Immunity standard	EN 61547
Performance requirements	EN 62384
Digital addressing lighting interface:	
General requirements for DALI system	EN 62386-101
Requirements for DALI control gear	EN 62386-102
Requirements for control gear of LED modules (DALI Device Type 6)	EN 62386-207
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	
CE / UKCA marked	

** From product revision N onwards.*

Label symbols

A general symbol for double insulated electrical appliances that are equipped with strain relief and can therefore be used as an independent device.

Symbol for independent control gear.

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