freedom in lighting Helvar

80 W Dimmable DALI-2 | FD driver

Product code: 5559

80 W 220 - 240 V 0 / 50 - 60 Hz

- DALI-2 certified LED driver, 1 100 % dimming range
- Very low flicker output complying with IEEE 1789 recommendations
- Suitable for flicker-free camera recording applications
- Very high efficiency up to 93 %
- Suitable for use in emergency lighting applications
- Long lifetime up to 100 000 h
- Driver protection Class I
- Suitable for closed luminaires where protection done with luminaire construction (Class I or II)
- Helvar Driver Configurator support





Functional Description

- Adjustable constant current output: 350 mA (default) to 700 mA
- Current setting programmable via DALI or with external resistors
- Filtered dimming for high-quality light in every application
- Latest technology Switch-Control 2* functionality for easy-to-use intensity control
- Adaptive LED overload protection, reduces output current if output power over 81 W is detected
- Full load recognition with automatic recovery, open and short circuit protection
- Multipurpose terminal Iset/NTC for current setting or overtemperature protection
- Constant Light Output (CLO), adjustable up to 100 000 h (default disabled)
- Power consumption monitor (real time), running hour monitor (accumulative), energy management (accumulative)

*Available since 11/2018

Mains Characteristics

Voltage range 198 VAC - 264 VAC DC range 176 VDC - 280 VDC > 190 VDC starting voltage Mains current at full load 0.34 A - 0.44 AFrequency 0 / 50 Hz - 60 Hz

Stand-by power consumption 0.3 W THD at full power < 10 % Leakage current to earth $< 0.5 \, \text{mA}$

1 kV L-N. 2 kV L-GND (IEC 61000-4-5) Tested surge protection

4 kV (IEC 61000-4-4) Tested fast transient protection

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) 350 mA (default) - 700 mA

Accuracy ±5%

Ripple < 2 %* at $\le 120 \text{ Hz}$

*) Low frequency, LED load: Cree XM-L LEDs

U_{out} (max) (abnormal) 250 V Outrush current 1000 mA*

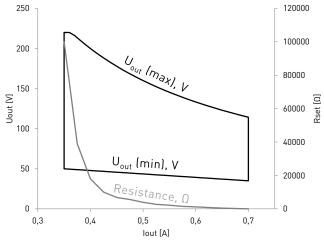
*) When starting driver with short-circuited load or connecting load to running driver

EOFx (EL use) > 0.98

lout	350 mA	700 mA
P _{out} (max)	77 W	80 W
U_out	50 V - 220 V	35 V - 114 V
PF (λ) at full load	0.98	0.98
Efficiency (n) at full load	93 %	91 %

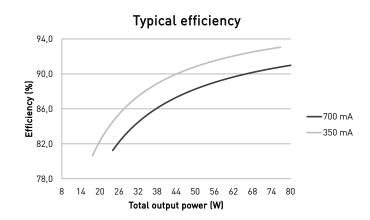


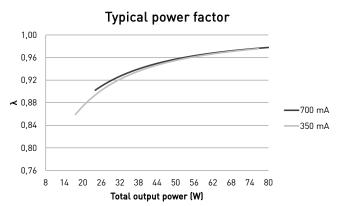
Operating window



Note: Dimming between 1 % - 100 % possible across the whole operating window

Driver performance





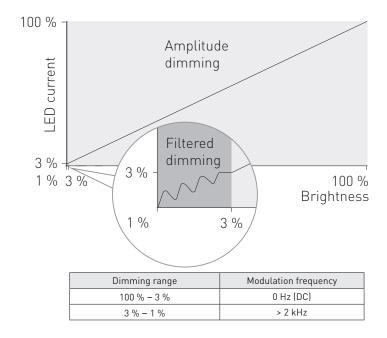
Operating Conditions and Characteristics

Highest allowed t _c point temperature*	85 °C
t _c life (50 000 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
	50 000 h, at t = 75 °C
	25 000 h. at t = 85 °C

^{*)} ENEC certified only up to t_ life temperature

^{**)} For other than independent use, higher t, of the controlgear possible as long as highest allowed t, point temperature is not exceeded

Filtered dimming technology



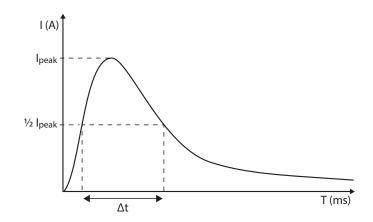
Filtered dimming technology is created to achieve extremely high quality and flicker free light output even at the lowest dimming levels. Light output is dimmed with amplitude dimming until the very lowest light levels (< 3%) and below that, stable light output is provided with filtered high frequency signal. Dimming technology complies with IEEE 1789-2015 recommendations of current modulation to mitigate health risks to viewers.

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, Δt	Calculated energy, I _{peak} ² Δt	
30 pcs.	30 pcs.	42 A	186 µs	0.24 A ² s	

CONVERSION TABLE FOR OTHER TYPES OF MINIATURE CIRCUIT BREAKER

MCB type	Relative quantity of LED drivers
B 10 A	37 %
B 16 A	60 %
B 20 A	75 %
C 10 A	62 %
C 16 A	100 % (see table above)
C 20 A	125 %



Type C MCB's are strongly recommended to use with LED lighting. Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

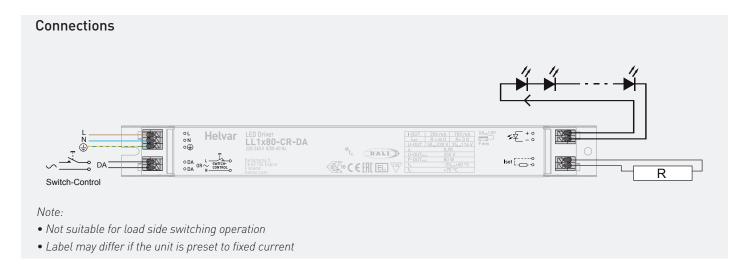


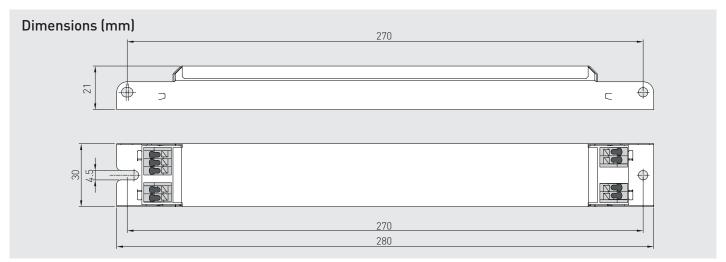
Connections and Mechanical Data

Wire size $0.5 \text{ mm}^2 - 1.5 \text{ mm}^2$

Wire type Solid core and fine-stranded Wire insulation According to EN 60598

Maximum driver to LED wire length 5 m Weight 220 g IP20 IP rating





Output current can be set with the current setting resistor connected to the Iset terminal. Example current and resistor values across the range can be found in the following table. More information about the current setting resistor is given on page 4.

Iset current setting resistor values

Resistor (Ω)	0	220	470	820	1k2	1k5	2k2	2k74	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
Order code	T70000	N/A	T70471	T70821	N/A	T70152	T70222	T72741	T70392	T70562	T70682	T70102	T70183	N/A	N/A

Information and conformity



LL1x80-CR-DA LED driver is suited for built-in usage in luminaires. With LL1x2130-SR strain reliefs, independent use is possible too (see the LL1x2130-SR datasheet for details). 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 ambient and t_c temperature

- For built-in components inside luminaires, 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, 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.

Current setting resistor

LL1x80-CR-DA 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.
- Always connect the current setting resistor only into the terminals marked with lset on the LED driver label.
- Specific lset resistor/current values are illustrated in the operating window on page 2 and presented on page 3.

Miniature Circuit Breakers (MCB)

- Type-C MCB's with trip characteristics in according to EN 60898 are recommended.
- Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

Switch-Control 2

Use of Switch-Control functionality

- Maximum numbers of LED drivers to be connected to one switch is 60. Wire length is not restricted by the driver technology.
- Ensure that all components connected to Switch-Controt circuitry are mains rated.
- More information in Switch-Control User Guide a www.helvar. com.

Helvar Driver Configurator support

LL1x80-CR-DA LED driver is supported by Helvar Driver configurator software. The LL1x80-CR-DA driver supports output current setting with software, the output current of the driver can be programmed using Helvar Driver Configurator, as well as parameters for functions such as CLO. Also the operation of the multifunction lset terminal usage can be changed from current setting resistor (default) to NTC overtemperature protection operation.

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, 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.

NTC trigger

When NTC is enabled via Helvar Driver Configurator, driver follows NTC feature behaviour. Default NTC trigger point is 8,2 k Ω , after which the driver starts to decrease the output level.

Information and conformity



Conformity & standards

General and safety requirements	EN 61347-1: 2015				
Particular safety requirements for DC	EN 61347-2-13: 2014+				
or AC supplied electronic control gear for LED modules	A1:2017				
Additional safety requirements for AC	EN 61347-2-13: 2014,				
or DC supplied electronic controlgear	Annex J				
for emergency lighting					
Thermal protection class	EN 61347, C5e				
Mains current harmonics	EN 61000-3-2: 2014				
Limits for voltage fluctuations and flicker	EN 61000-3-3: 2013				
Radio frequency interference	EN 55015: 2013				
Immunity standard	EN 61547: 2009				
Performance requirements	EN 62384: 2006+ A1:2009				
Digital addressing lighting interface:					
General requirements for DALI system	EN 62386-101 (DALI-2)				
Requirements for DALI control gear	EN 62386-102 (DALI-2)				
Requirements for control gear of LED modules (DALI Device Type 6)	EN 62386-207 (DALI-2)				
Compliant with relevant EU directives					
RoHS / REACH compliant					
ENEC and CE marked					

Label symbols



AC/DC supplied electronic control gear for emergency lighting purposes intended for connection to a centralized emergency power supply.



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



DALI-2 certified control gear.