

## Linear LED Module, LX20 Series

Product code: 5175400

**500 mA, 97.2 V**

- High lumen output slim 1120 mm (4 ft) linear module, very high efficacy up to 195 lm/W at T<sub>c</sub> = 50 °C (4000 K)
- Doubled connectors for easy series or parallel connection
- Narrow width of 20 mm to suit various applications
- Extremely homogenous light distribution, pitch only 5,2 mm between single LEDs
- Modular product platform for design flexibility
- Zhaga compliant dimensions
- Compatible with LEDiL Linnea optics
- Working voltage rated up to 400 V
- CCT 4000 K, other colour temperatures and CRI values available on request



	Nominal CCT [K]	Useful luminous flux at		Forward voltage [V]		Luminous efficacy		Power consumption		CRI
		T <sub>c</sub> = 50 °C Typ. [lm]	T <sub>c</sub> = 25 °C Typ. [lm]	T <sub>c</sub> = 50 °C Typ. [V]	T <sub>c</sub> = 25 °C Max. [V]	T <sub>c</sub> = 50 °C Typ. [lm/W]	T <sub>c</sub> = 25 °C Typ. [lm/W]	T <sub>c</sub> = 50 °C Typ. [W]	T <sub>c</sub> = 25 °C Typ. [W]	
<i>Very high efficacy @ 200 mA</i>										
<b>LX20-1122-840-9100lm</b>	4000	3610	3870	92.5	95.8	195	206	18.5	18.8	> 80
<i>High efficacy @ 350 mA</i>										
<b>LX20-1122-840-9100lm</b>	4000	6280	6780	95.0	97.9	189	202	33.3	33.6	> 80
<i>Nominal @ 500 mA</i>										
<b>LX20-1122-840-9100lm</b>	4000	9120	9500	97.2	99.7	188	194	48.6	49.0	> 80
<i>High flux @ 700 mA</i>										
<b>LX20-1122-840-9100lm</b>	4000	12550	13100	99.4	101.9	180	187	69.6	70.1	> 80
<i>Very high flux @ 850 mA</i>										
<b>LX20-1122-840-9100lm</b>	4000	15000	15680	100.8	103.3	175	182	85.7	86.3	> 80

### Electrical specifications

Direct current supply only	LX20-1122	
	Nominal	Maximum
Operating Current [mA]	500	900
Operating Voltage, typ. [V]	97.2 <sup>1)</sup>	102.2 <sup>2)</sup>

<sup>1)</sup> At 500 mA, T<sub>c</sub> = 50 °C

<sup>2)</sup> At 900 mA, T<sub>c</sub> = 25 °C

Maximum rated voltage in circuit 400 V <sup>1)</sup>

ESD protection tested:  
[according to IEC 61547 cl 5.2]

Air discharge 8 kV

Contact discharge 4 kV

IP rating IP00

<sup>1)</sup> With the maximum sizes of screwheads: M3 – 5.5mm and M4 – 8mm.

## Photometric specifications

Colour consistency at initial time	3 MacAdam steps
Colour Rendering Index	> 80
Beam angle	120°
Photobiological risk group	RG1 unlimited
Energy efficiency class (2019/2015)	C

## Operating Conditions and Characteristics

Tp point (performance measurements) Tc = 50 °C	
<b>Max. temperature at Tc point</b>	<b>85 °C</b>
Ambient temperature range	-20...+50 °C
Storage temperature	-20...+80 °C
Humidity	No condensation

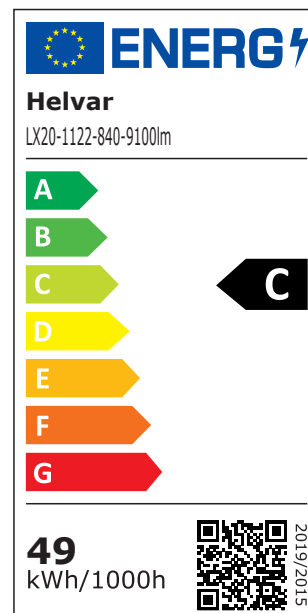
## Lumen maintenance specifications

Operating current	Temperature	L70B50	L70B20	L70B10	L80B50	L90B50
Very high efficacy 200 mA	Tc = 50 °C	> 72 000	> 72 000	> 72 000	> 72 000	> 54 000
	Tc = 85°C	> 72 000	> 72 000	> 72 000	> 72 000	53 000
High efficacy 350 mA	Tc = 50 °C	> 72 000	> 72 000	> 72 000	> 72 000	> 54 000
	Tc = 85°C	> 72 000	> 72 000	> 72 000	> 72 000	53 000
Nominal 500 mA	Tc = 50 °C	> 72 000	> 72 000	> 72 000	> 72 000	> 54 000
	Tc = 85°C	> 72 000	> 72 000	> 72 000	> 72 000	53 000
High flux 700 mA	Tc = 50 °C	> 72 000	> 72 000	> 72 000	> 72 000	> 54 000
	Tc = 85°C	> 72 000	> 72 000	> 72 000	> 72 000	52 000
Very high flux 850 mA	Tc = 50 °C	> 72 000	> 72 000	> 72 000	> 72 000	51 000
	Tc = 85°C	> 72 000	> 72 000	> 72 000	> 72 000	42 000

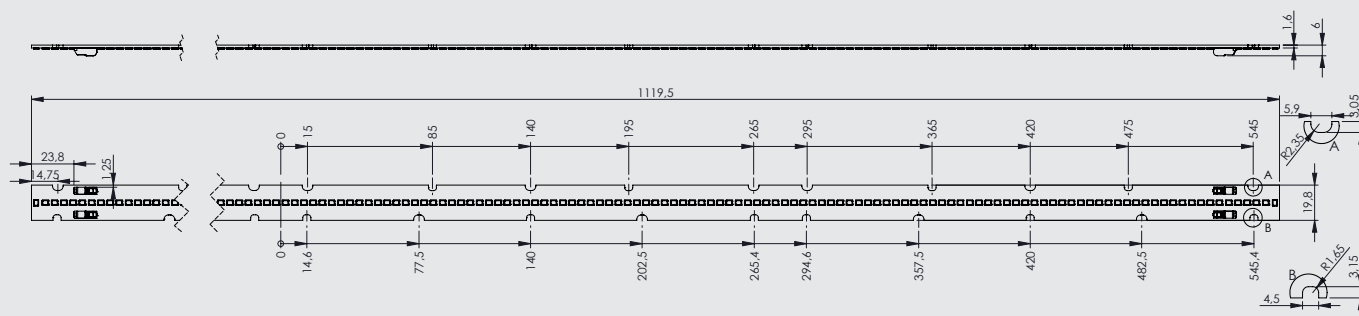
Lumen depreciation estimations in hours. Specified LxxBxx values are statistical and based on LED components' lumen maintenance values. Actual lumen maintenance may vary over individual LED modules.

## EPREL parameters

EPREL ID	1605804
Date of first placement on the market	05-06-2023
Angle for useful luminous flux	Sphere 360 degrees
Is the product equipped with an integrated light source?	No
Total luminous flux	9120 lm
Is this product a light source?	Yes
Beam angle in degrees	120
On-mode power Pon	48.6 W
Networked standby power Pnet	0
Lifetime L70B50	72000
Power Factor	—
Connected light source	No
Useful luminous flux Φuse	9120 lm
Non-directional or directional light source	NDLS
Mains or non- mains light source	NMLS
Colour-tuneable light source	No
Chromaticity coordinates x i y	x: 0.3818, y: 0.3797
Dimmable	Yes (with dimmable control gear)
Peak luminous intensity	— cd
R9 colour rendering index value	10
Survival factor	> 0.9
Lumen maintenance factor XLMF	> 0.96
Colour consistency in McAdam ellipses	3
Flicker metric PstLM	—
Standby power P <sub>sb</sub>	—
Stroboscopic effect metric SVM	—
Form of the product	Linear
Energy efficiency class 2019/2015	C (9120 lm / 48.6 W x 0.926 = 173.8 lm/W)
Minimum purchase quantity	36 pcs
Displacement factor Df	—



## Dimensions



Length	1119.5 ± 0.2 mm
Width	19.8 ± 0.2 mm
Thickness of PCB	1.6 ± 0.2 mm
Height	6.0 ± 0.2 mm

Packing details	1 Tray	1 Box	1 Pallet
Num. of modules	36	324	3240

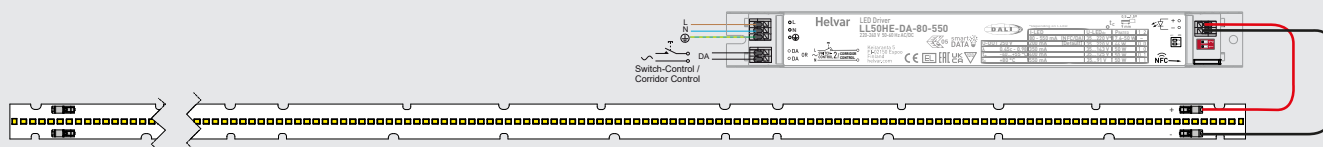
ESD foam trays and carton box

## Wiring specifications

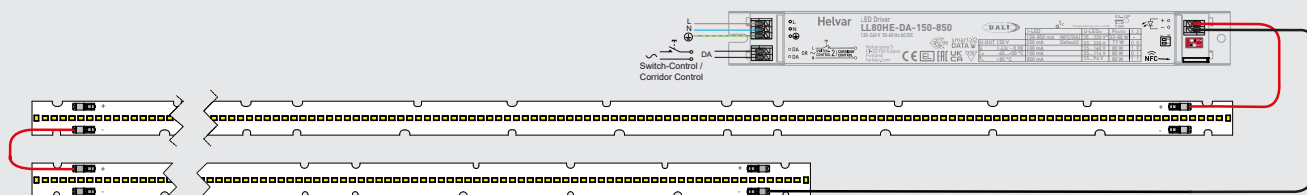
Connector type	Push-in connector
Wire size	0.2 - 0.75 mm <sup>2</sup> , solid connector 0.2 - 0.75 mm <sup>2</sup> , stranded 0.25 - 0.34 mm <sup>2</sup> , stranded (with ferrule)
Wire strip length	7 - 9 mm
Wire type	Solid core and fine-stranded

## Connection examples

1 x LX20-1122 module connected with Helvar LL50HE-DA-80-550 LED driver at 550 mA driving current

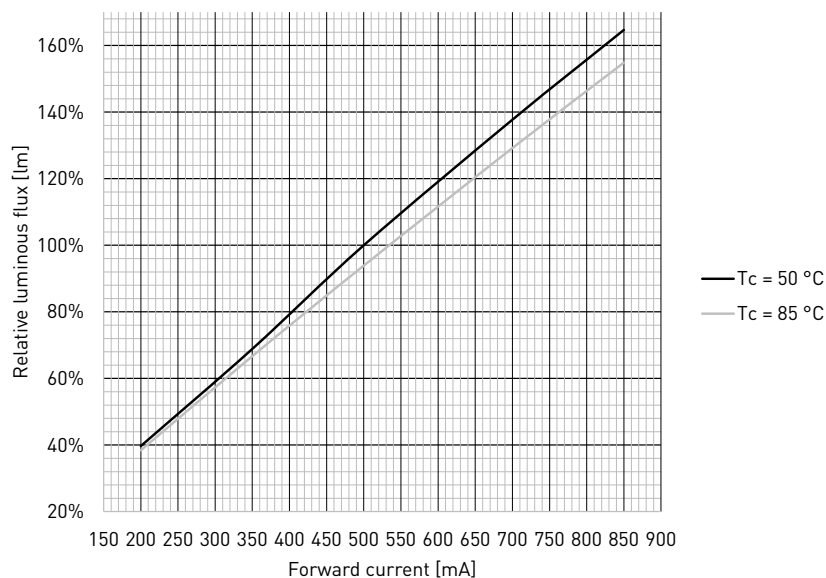


1 x LX20-1122 and 1 x LX20-562 modules connected in series with Helvar LL80HE-DA-150-850 LED driver at 500 mA driving current

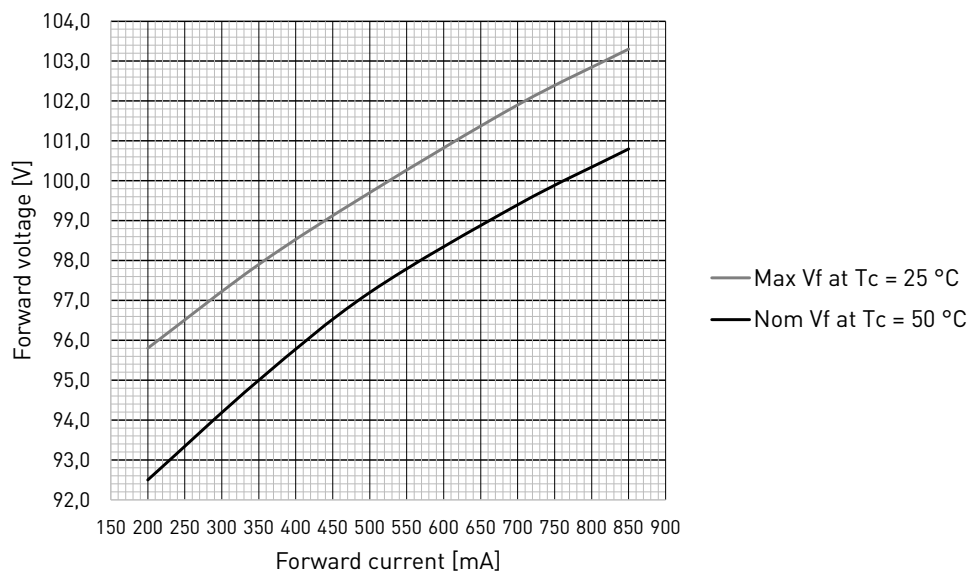


## Specification diagrams

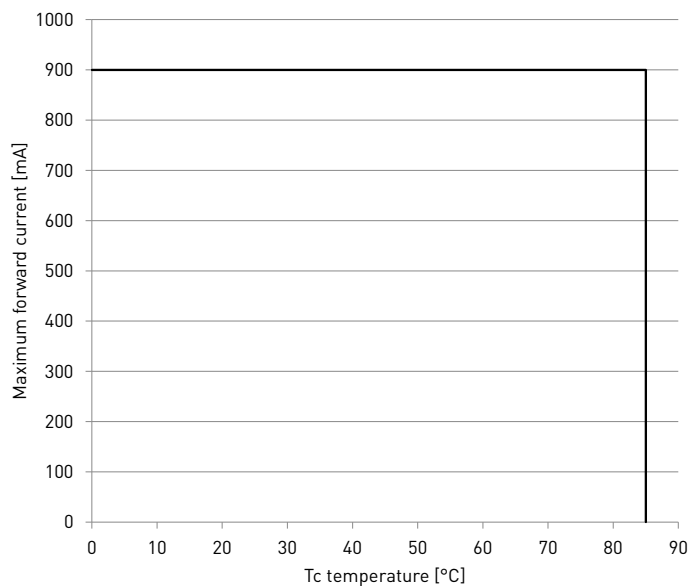
### LUMINOUS FLUX VS FORWARD CURRENT



### FORWARD VOLTAGE VS FORWARD CURRENT



### DERATING CURVE



LX20 series LED modules are suited for built-in usage in luminaires. In order to have safe and reliable 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 modules from dust, moisture and pollution. The luminaire manufacturer is responsible for the correct choice and installation of the LED module / LED driver combination according to the application and product datasheets. Operating conditions of the LED modules may never exceed the specifications as per the product datasheets.

## HANDLING OF THE LED MODULES

LED modules contain components (LED packages, chips) that are sensitive for mechanical stress, electrostatic discharge (ESD) and chemical contaminants. Improper handling of the modules might cause damage or even destruction of the LED modules. Damaged LEDs may show some unusual characteristics such as increase in leakage current, lowered turn-on voltage, or abnormal lighting of LEDs at low current. Please follow following instructions and the precautions given in the product datasheets while handling and assembling Helvar LED modules.

### Storage conditions

- Unused LED modules are recommended to stored carefully in an original sealed ESD package preventing moisture, pollutants or ESD to cause damage the module.
- Storage temperature range: -20...+80 °C

### Opening the package / resealing

- LED modules are kept in stable protected environment in the packaging, open the package only when you are ready to use the LED modules. If resealing of the original package is required remove excess air from the packaging and place the moisture absorber (silica-gel bag) in to the packaging and seal the ESD back with adhesive tape.

### ESD precautions at luminaire assembly site

The LEDs are sensitive to the electrostatic discharge (ESD) and surge current. If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.

- IEC / EN 61340-5-1: Protection of electronic devices from electrostatic phenomena – General Requirements describes procedures for protection for damage caused by electrostatic discharge while handling electronic devices, following list lists basic protective measures described in the standard.

### ESD protection measures in handling and assembling LED modules

- Employee training for correct handling .
- Personnel grounding via wrist band / footwear.
- ESD protective clothing / shoes.
- Handle LED modules only in ESD protected areas and workplaces.

## CHEMICAL CONSIDERATIONS

Chemical substances may cause damage the LED module by causing discoloration, loss of luminous flux or total failure of the module.

Avoid materials and substances containing:

- VOCs - Volatile Organic Compounds that may occur in adhesives or sealings, verify that the materials used in the luminaires are not causing VOCs
- Halogen compounds
- Chlorine
- Acetates
- Sulphuric compounds.

Never look directly into an operational LED module without suitable protective eye wear!

## ELECTRIC & THERMAL CONSIDERATIONS

### Wiring insulation

- According to recommendations in IEC / EN 60598.

### Wire connections

- Please refer to LED driver datasheets connections diagram.
- Wrong polarity might damage the LED modules.

### Choosing the LED driver

- To guarantee the safe and reliable operation of the LX20 series LED modules the LED driver must be provided with open and short circuit protection.
- LX20 series modules are designed to be used with constant current output type LED driver.

### Electrical design, electrical safety

During the design it is luminaire manufacturers responsibility to follow the international and national electric design regulations and recommendations for the electric safety and luminaire protection. Electric safety classification and protection class is depending on:

- Actual luminaire design and safety classification
- LED driver insulation
- LED driver output isolation.

ALWAYS CHECK AND FOLLOW EXACT REGULATIONS FROM LATEST RELEVANT IEC / EN STANDARDS.

### Maximum ambient and tc temperature

- The maximum ambient temperature is a guideline given for built-in components such as LED modules. However, integrator must always ensure proper thermal management (i.e. mounting base of the module, possible heatsink, air flow etc.) so that the tc point does not exceed the tc max limit.
- Reliable operation is only guaranteed if the maximum tc point temperature is not exceeded under the conditions of use.
- Lifetime is only guaranteed if the maximum tc point temperature specified for lifetime is not exceeded under the conditions of use.

## MECHANICAL CONSIDERATIONS

- While handling the LED modules avoid mechanical stress or pressure applied to the light emitting surface of the LEDs.
- Avoid dropping the modules.
- Bending of the modules is not permitted.
- Avoid touching the light emitting surface.
- Mechanical modifications (e.g. drilling, milling or sawing the module) are not permitted.

## INSTALLATION CONSIDERATIONS

The LX20 series modules are basic isolated against ground and can be installed on properly insulated metal parts of the luminaire. We recommend using either plastic mounting parts / insulating plastic washers or then M3 screws with max. 5.5 mm screwheads / M4 screws with max. 8 mm screwheads to achieve 400 V working voltage rating in the circuits.

Please always follow regulations from IEC/EN 60598-1 for creepage and clearance requirements.

## Conformity & standards

Led modules for general lighting - safety specifications	IEC / EN 62031
Photobiological safety of lamps and lamp systems	IEC / EN 62471 TR IEC / EN 62778
Compliant with relevant EU directives	
CE marked	
RoHS / REACH compliant	

All data were deemed correct at time of creation. Helvar is not liable for errors or omissions.

## Symbols



Built-in LED module that is designed to form a replaceable part built into a luminaire or an enclosure and not intended to be mounted outside a luminaire etc. without special precautions.