

- High efficacy, up to 151 lm/W
- Homogenous light distribution, 11.5 mm pitch between LEDs
- Accurate colour matching (SDCM), < 3-step MacAdam
- High colour rendering index CRI > 80
- Easy connection with push-in connectors
- Modular product platform for design flexibility
- Easy installation

**350 mA, 23.6 V**



	Colour (K)	Luminous flux $\Phi_v$			Forward voltage						Power consumption Tc= 65 °C Typ. (W)	Efficacy Tc= 65 °C Typ. (lm/W)	CRI (Ra)
		Tc= 65 °C			Tc= 25 °C			Tc= 65 °C					
		Min. (lm)	Nom. (lm)	Max. (lm)	Typ. (V)	Min. (V)	Max. (V)	Typ. (V)	Min. (V)	Max. (V)			
<i>Efficient @ 250 mA</i>													
LS-282-830-011A	3000	800	830	860	23.4	22.1	24.5	22.8	21.4	23.8	5.7	144	> 80
LS-282-840-011A	4000	840	870	900	23.4	22.1	24.5	22.8	21.4	23.8	5.7	151	> 80
<i>Nominal @ 350 mA</i>													
LS-282-830-011A	3000	1080	1120	1160	24.1	23.0	25.4	23.6	22.3	24.7	8.2	135	> 80
LS-282-840-011A	4000	1140	1180	1220	24.1	23.0	25.4	23.6	22.3	24.7	8.2	143	> 80
<i>Maximum @ 450 mA</i>													
LS-282-830-011A	3000	1330	1380	1430	24.7	23.8	26.2	24.3	23.1	25.5	10.9	127	> 80
LS-282-840-011A	4000	1410	1460	1510	24.7	23.8	26.2	24.3	23.1	25.5	10.9	133	> 80

### Electrical specifications

	LS-282		
	Min.	Nom.	Max
<i>at Tc = 65 °C</i>			
Operating Current (mA)	-	350	450
Operating Voltage (V)	-	23.6	25.5
Power Consumption (W)	-	8.2	-

Maximum rated voltage in circuit	400 V (r.m.s)
Insulation test voltage	1.8 kV
Max. permissible peak current	900 mA (Duty 1/10 pulse width 10ms)
IP rating	IP00

### Colour specification

Colour consistency at initial time	< 3 MacAdam steps
Colour Rendering Index	> 80 RA

### Operating Conditions and Characteristics

Max.temperature at tc point	85 °C
Operating temperature range	-20...+50 °C
Humidity	no condensation
Life time (L70B50)	50 000 h, at Tp= 75 °C

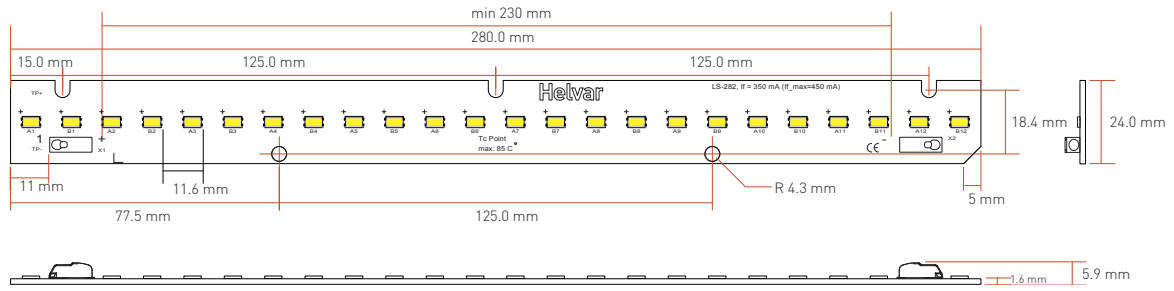
### Connections and Mechanical Data

Wire size	0.2 - 0.75 mm <sup>2</sup> , solid core 0.2 - 0.34 mm <sup>2</sup> , stranded
Wire strip length	7-9 mm
Wire type	solid core and fine-stranded
PCB material	CEM-3 type, PLC3, UL94V-0

### Conformity & Standards

Photobiological safety of lamps and lamp systems	IEC62471
Led modules for general lighting - safety specifications	IEC62031:2008

Compliant with relevant EU directives, CE marked, ROHS compliant



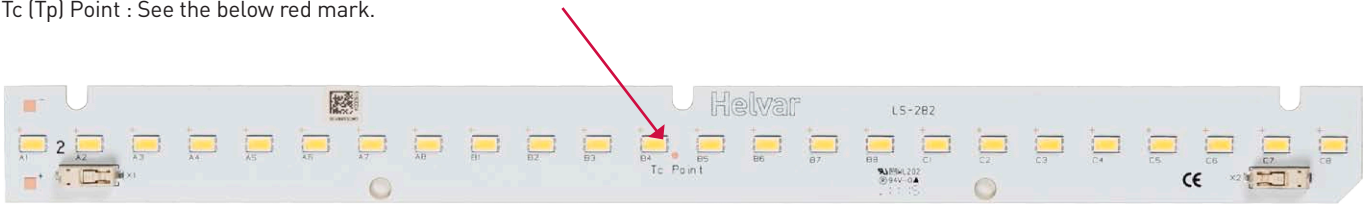
Length	280.0 mm
Width	24.0 mm
Thickness of PCB	1.6 mm
Height	5.9 mm

Packing details	1 Tray	1 Box
Num. of modules	60	300

ESD foam trays, antistatic bag and carton box

## Thermal Management

Tc (Tp) Point : See the below red mark.

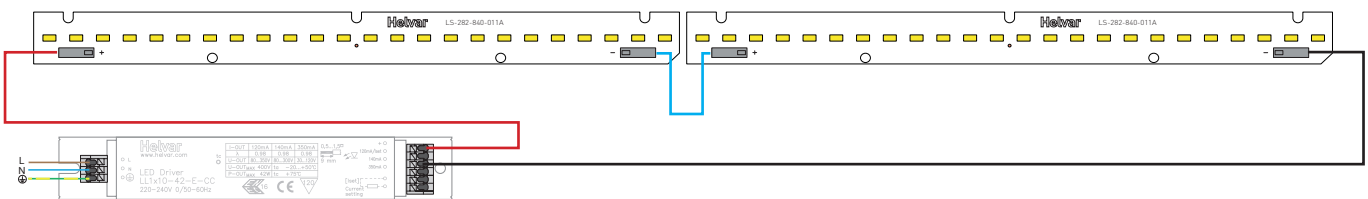


## Connection

Following diagrams show examples how to connect multiple LED modules with Helvar LED drivers.

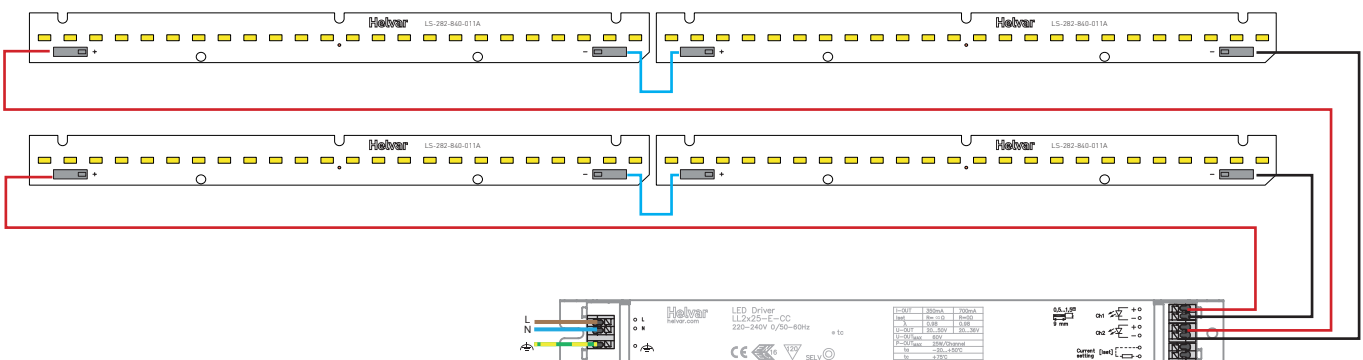
### Non-isolated solution example

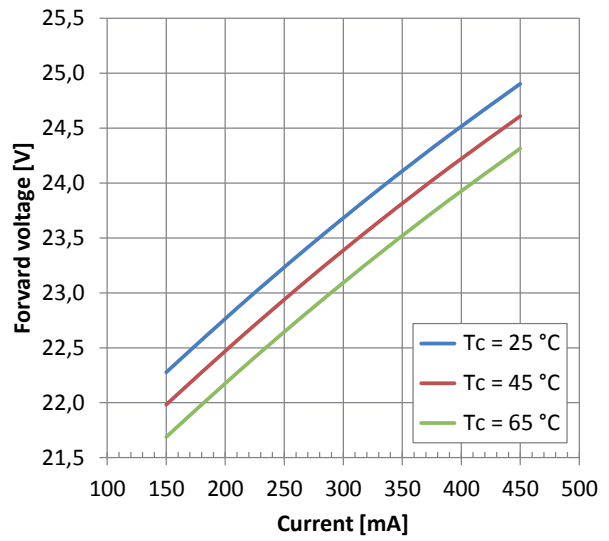
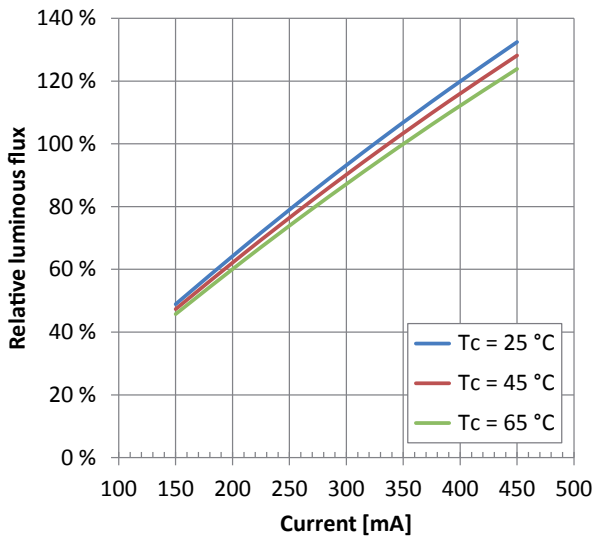
LS-282 modules series connected with Helvar LL10-42-E-CC LED driver @ 350 mA



### SELV < 60 V solution example

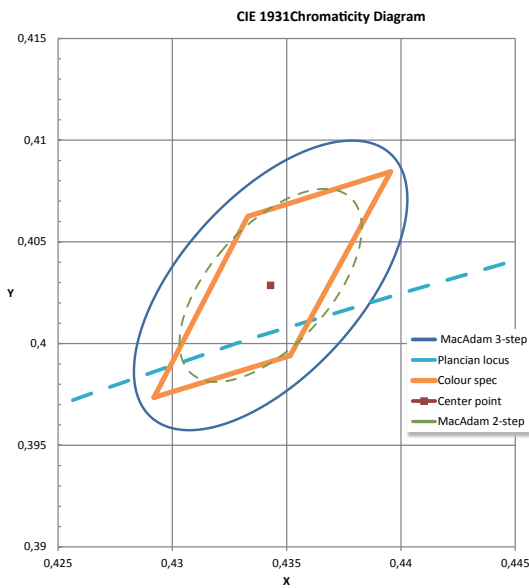
LS-282 modules connected with Helvar LL2x25-E-CC LED driver @ 350 mA





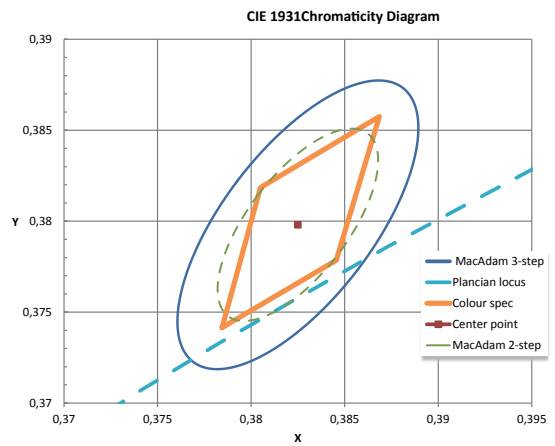
## Photometric characteristics

3000 K

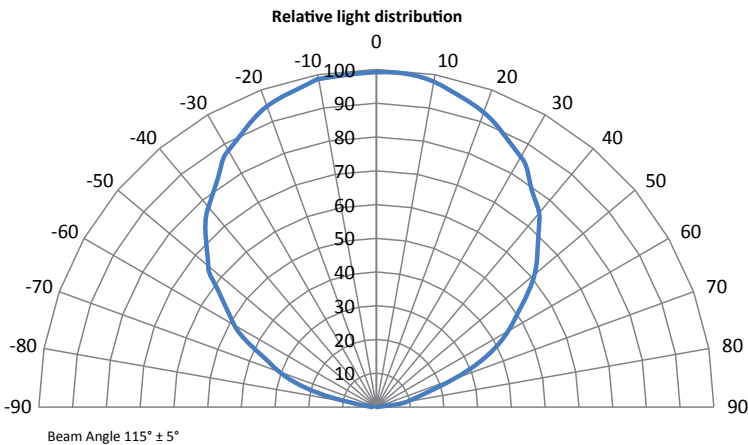


3040 K	x0	y0
Center point	0,4343	0,40286

4000 K



3975 K	x0	y0
Center point	0,3825	0,3798



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. Specifications of the LED modules may never exceed the operating conditions 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.

- 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 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 LS-series LED-modules the LED driver must be provided with open and short circuit protection.
- LS-Series modules are dedigned 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 (safety isolating, non-isolated ALWAYS CHECK AND FOLLOW EXACT REGULATIONS FROM LATEST RELEVANT IEC/EN STANDARDS.

### Maximum tc & tp temperature

- 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 tp point temperature specified for lifetime is not exceeded under the conditions of use.

## MECHANICAL CONSIDERATIONS

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

### Document revision history

26/06/2015: rev A	Document creted, initial information	p.1-4
14/07/2015: rev A	Product specification	p.1-4