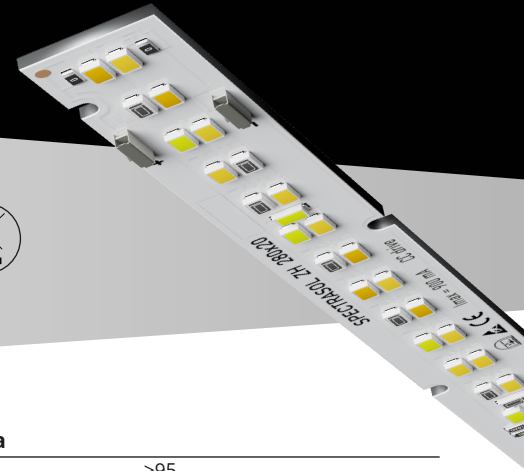


# BUILT-IN PROCOGNITIVE LED MODULES SPECTRASOL ZH



**SPECTRASOL**  
BIODYNAMIC HUMAN SOLUTIONS



## Procoognitive LED modules Spectrasol ZH

The patented Spectrasol LED modules will equip your luminaires with artificial light comprising properties close to natural sunlight. Thanks to uniquely balanced spectral composition (SPD) that positively influences the body's circadian rhythms through the non-image-forming (NIF) system of the eyes, you will get biologically optimised full-spectrum lighting that supports overall health, physical and mental vitality, mood and cognitive functions (cognitive performance and endurance, concentration and attention) indoors during the day.

Due to specific patented construction (from standard LED chip set in different colours) Spectrasol light does not emit concentrated energy in the short-wavelength blue part of the light spectrum, the so-called harmful blue light, which increases the risk of macular retina degeneration. On the contrary, Spectrasol regenerates the eyes by emitting energy in the red, photobiomodulating part of the light spectrum, which acts as a compensating factor for harmful blue light with both preventive and therapeutic effect.

Procoognitive Spectrasol Zhaga LED modules provide an option to integrate high-quality advanced light with the best, closest to natural sunlight spectrum within a wide range of indirect and direct light fixtures and applications.

## Technical Data

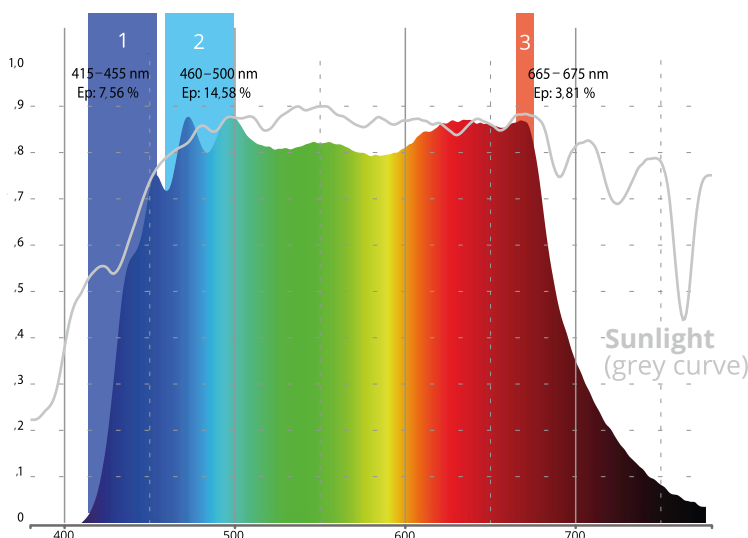
CRI	>95
CCT real <sup>1</sup>	4800 K
CCT specific <sup>2</sup>	5000 K
Beam characteristic	120°
Tc	max 80°C
Ambient temperature (TC≤80°C)	-40...+50°C
Calculated LED lifetime	L80B20 70.000 h
PCB material	aluminum
PCB mask color	white
Type of protection	IP00
Insulation max working voltage <sup>3</sup>	250 V
Insulation test voltage <sup>3</sup>	2000 V
CTI of the printed circuit board	600

<sup>1</sup>Real CCT in a typical illuminated room

<sup>2</sup>Specific CCT lights (spherical integrator)

Tolerance CCT +/- 200 K

## Visualisation of Spectrasol spectral composition and description of its key areas



- 1 HARMFUL BLUE LIGHT**  
**Does not damage retina cells**  
**Does not emit concentrated energy in the harmful blue light risk region (415 - 455 nm)**
- 2 PROCOGNITIVE - CIRCADIAN MELANOPIC ENERGY**  
**Supports the circadian system and the resulting cognitive performance, health and mood**  
**Better energy in cyan region (460 - 500 nm)**
- 3 REGENERATIVE PHOTOBIMODULATION ENERGY**  
**Regenerates damaged retinal cells**  
**Peak emission in the photobiomodulation red (~ 670 nm)**



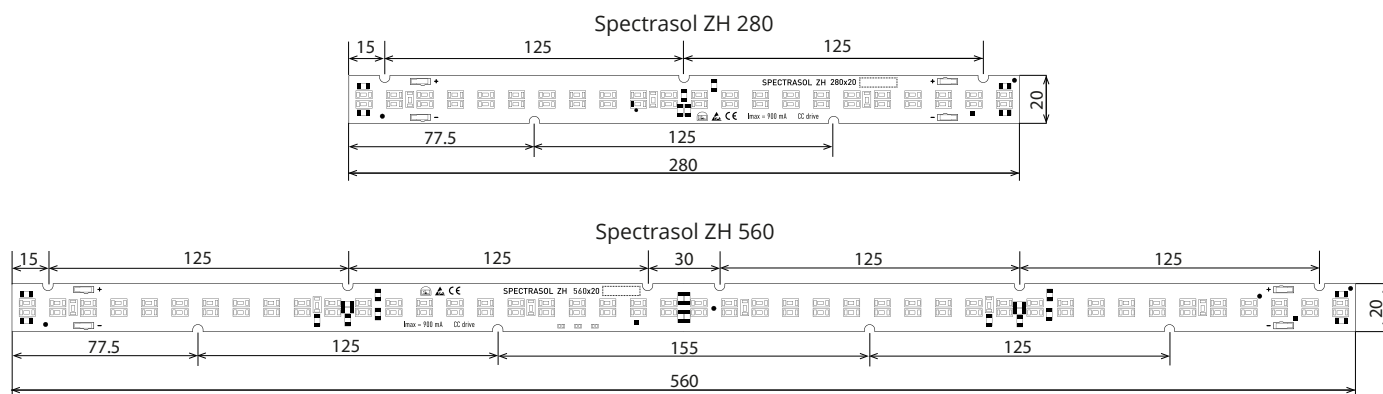


## Electrical and optical parameters

Order code	Variant	Max current [mA]	current [mA]	Typical Voltage [V]	Luminous flux (Tc: 80°C) [lm]	Power (Tc: 80°C) [W]	Optical Power (Tc: 80°C) [W]	Efficiency (Tc: 80°C) [lm/W]
98201	Spectrasol ZH 560x20 UP	900	900	32,7	3220	29,4	12,4	109,4
			450	30,5	1726	13,7	6,6	125,7
98202	Spectrasol ZH 560x20 UP HV	450	450	65,4	3223	29,4	12,4	109,6
			225	61	1721	13,7	6,6	125,6
98101	Spectrasol ZH 280x20 UP	450	450	32,7	1626	14,7	6,2	110,5
			225	30,5	855	6,8	3,4	125,7

Tolerance of measured values +/- 10%

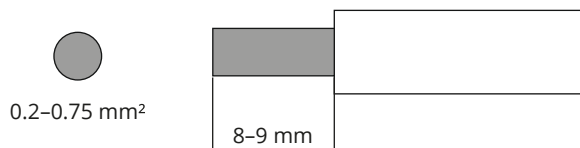
## Dimensions



## Wiring type and cross section

For wiring use stranded wire with ferrules or solid wire from 0.2-0.75 mm<sup>2</sup>.

For the push-wire connection you have to strip the insulation (8-9 mm).



## LED driver specification

Spectrasol ZH modules must be supplied by a constant current LED driver. Operation with a constant voltage LED driver will lead to an irreversible damage of the module. Wrong polarity can damage the Spectrasol ZH.

Use only high-quality LED drivers with very low output current ripple (flicker free)

LED drivers must be provided the following protections:

- Short-circuit protection
- Overload protection
- Overtemperature protection

## Wiring

### Parallel wiring

With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness. If a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably. The max. permissible output current of the LED driver for parallel wiring is 1800mA.

### Serial wiring

Spectrasol Zhaga can be operated either from SELV LED drivers or from NONSELV LED drivers.

Spectrasol Zhaga are basic insulated up to 250 V (if mounted with M4 screws with head diameter 7 mm in combination with plastic washers) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED driver (also against earth) is above 250V, an additional insulation between LED module and heat sink is required (for example by insulated thermal pads) or by a suitable luminaire construction.

At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

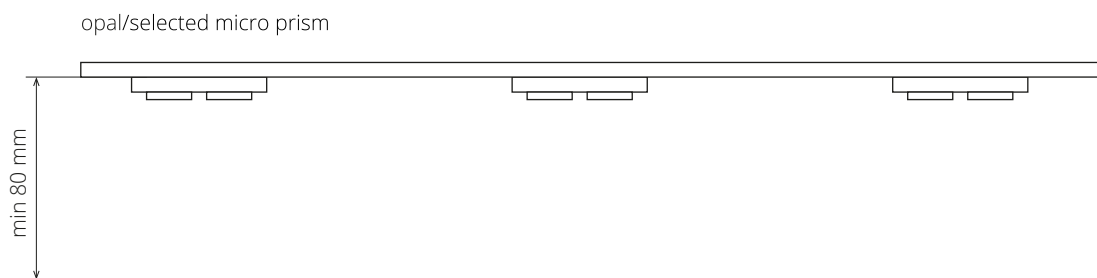




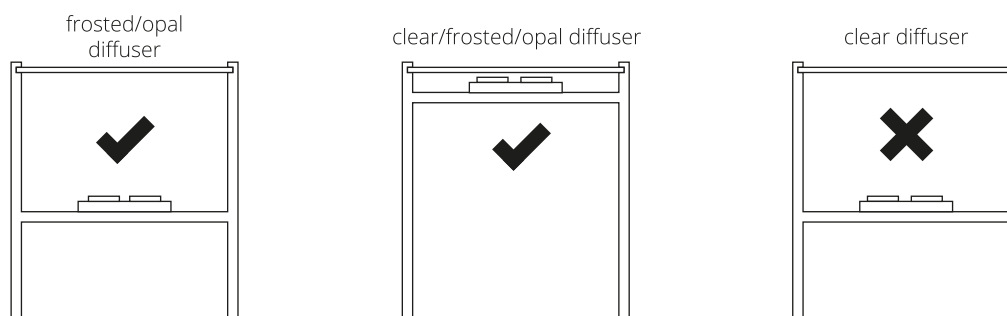
## LED DPS integration instructions

Spectrasol ZH LED circuit boards are equipped with different colour LED chips. When designing integration into luminaires, the risk of multi-colour shadows or glare from light from different colour chips needs to be minimised.

### Direct integration - surface light fixtures



### indirect integration - linear light fixtures



### direct integration - linear light fixtures

