

## SYM I AND II

### IP20 BUILT-IN MODULES



## LED INDUSTRY AND HALL LIGHTING

### WU-M-475-C

These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities as well as for petrol station lighting (especially SYM II).

These modules were designed for built-in into luminaire casings. They enable a modular luminaire design.

The modules are available in three white colour tones.

### Typical Applications

- Integration in luminaires
- Indoor lighting
- Industrial lighting for:
  - Production halls
  - Warehouses
- Petrol station lighting
- Lighting for Sports Facilities

### LED Industry and Hall Lighting

- **HIGHLY EFFICIENT: UP TO 149 LM/W**
- **VERY HOMOGENOUS ILLUMINATION**
- **HUGE RANGE OF CCT VARIANTS**
- **INITIAL COLOUR ACCURACY: 5 SDCM**
- **SURGE PROTECTION: 4 KV**
- **VDE APPROVED (ACC. TO EN 62031)**



## SYM I, SYM II

### Technical Notes

- LED built-in module for integration into luminaires
- 16 high-efficiency High Power LEDs
- Push-in terminals (WAGO series 2060)
- Design for optimum thermal management
- Degree of protection: IP20
- ESD protection class 2
- Surge protection: 4 kV



### Electrical Characteristics

at  $t_p = 60^\circ\text{C}$

Type	Voltage DC (V)									Temp. coeff. mV/K	Power consumption (W)														
	350 mA			700 mA			1050 mA				1400 mA			350 mA			700 mA			1050 mA			1400 mA		
	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
All types	40	44.1	45.9	41.7	46	47.8	43.3	47.8	49.7	44.6	49.1	51.1	-39.7	14	15.4	16.1	29.2	32.2	33.5	45.5	50.2	52.2	62.5	68.8	71.5

Use of external LED constant current driver required.

### Maximum Ratings

Exceeding the maximum ratings can lead to destruction of the module.

Type	Operation current mA	Operation temperature range at $t_c$ point $^\circ\text{C}$		Storage temperature range $^\circ\text{C}$		Max. allowed repetitive peak current mA
		min.	max.	min.	max.	
All types	350	-30	+85	-30	+85	2270
All types	700	-30	+85	-30	+85	2060
All types	1050	-30	+80	-30	+85	1940
All types	1400	-30	+60	-30	+85	1860

### Optical Characteristics

at  $t_p = 60^\circ\text{C}$

Type	Colour	Correlated colour temperature K	Luminous flux* (lm) and typ. efficiency (lm/W)												CRI**	Photo-metric code
			350 mA			700 mA			1050 mA			1400 mA				
			min.	typ.	typ. lm/W	min.	typ.	typ. lm/W	min.	typ.	typ. lm/W	min.	typ.	typ. lm/W	$R_a$	

#### Square – 16 LEDs

WU-M-475-C-830	warm white	3000 <sup>-90/+185</sup>	1950	2195	142	3600	4040	125	4920	5530	110	6070	6815	99	≥ 80	830/579
WU-M-475-C-840	neutral white	4000 <sup>-235/+230</sup>	2105	2300	149	3875	4230	131	5300	5785	115	6535	7135	104	≥ 80	840/579
WU-M-475-C-850	cool white	5000 <sup>-265/+360</sup>	1950	2220	144	3600	4090	127	4920	5585	111	6070	6890	100	≥ 80	850/579

On account of the complex manufacturing process of the modules, the above values only represent statistical variables.

The values do not necessarily correspond exactly to the actual parameters of every single product, which can vary from the typical specification.

\* Measurement tolerance of luminous flux:  $\pm 7\%$  | \*\* Measurement tolerance CRI:  $\pm 2$

### Operating Life

Modules	Operating life in hours at measured temperature at $t_p$ point											
	$I_f$ 350 mA			$I_f$ 700 mA			$I_f$ 1050 mA			$I_f$ 1400 mA		
	40 $^\circ\text{C}$	60 $^\circ\text{C}$	85 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	85 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	80 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$
L80/B10*	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000
L70/B10*	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000	> 108,000

These values do not refer to the colour temperature. | \*  $L_x/B_{yy}$  (lumen maintenance at  $xx\%$ , failure rate  $yy\%$ )

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## LED Industrial Light SYM I – IP20

### Technical Notes

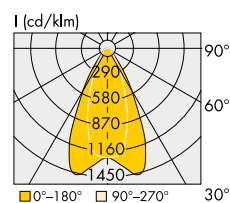
- Dimensions (incl. optics) LxWxH:  
120x120x12 mm
- Lenses for high-bay symmetrical lighting
- Optimum illumination – installation ratio: 1:1  
in the 0–180° lengthwise layer and 8:5 in the  
90–270° crosswise layer (ratio of height to the  
distance between luminaires).



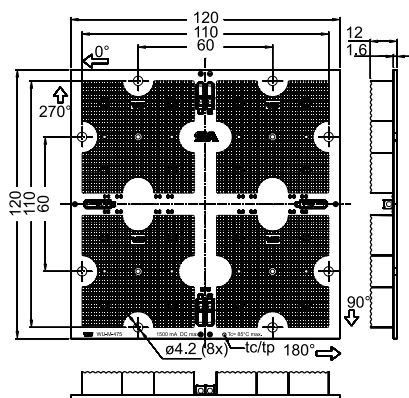
### Reference Numbers

Type	Ref. No.
WU-M-475-C-830	<b>561904</b>
WU-M-475-C-840	<b>561909</b>
WU-M-475-C-850	<b>561914</b>

### Typical Light Distribution Curve



### Mechanical Dimensions



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## LED Industrial Light SYM II – IP20

### Technical Notes

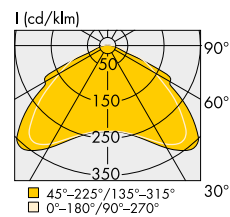
- Dimensions (incl. optics) LxWxH:  
120x120x6.2 mm
- Lenses for high-bay symmetrical lighting
- Optimum illumination – installation ratio: 1:2  
(ratio of height to the distance between luminaires)



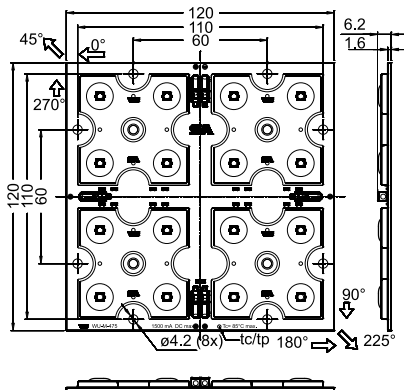
### Reference Numbers

Type	Ref. No.
WU-M-475-C-830	<b>561905</b>
WU-M-475-C-840	<b>561910</b>
WU-M-475-C-850	<b>561915</b>

### Typical Light Distribution Curve

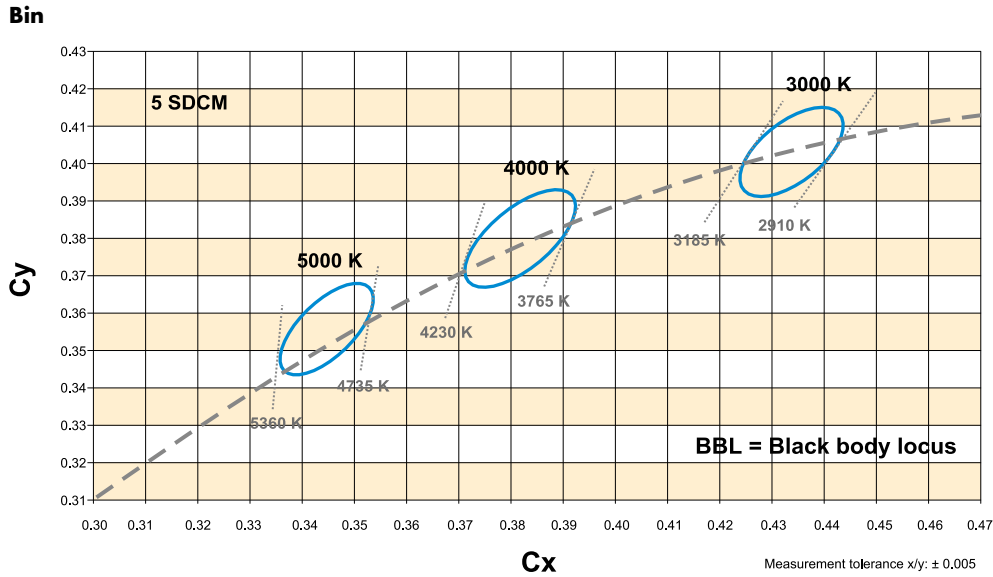


### Mechanical Dimensions



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## LED Industrial Light SYM I, SYM II – IP20



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## LED Industrial Light SYM I, SYM II – IP20

### Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. The LED modules are designed for operation within a casing or luminaire. Safety regulations acc. to EN 60598 has to be observed. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains).

- LED built-in modules must not be subjected to any undue mechanical stress, e. g.:
  - handle LED modules carefully
  - avoid shear and compressive forces onto the optics during handling and installation
  - avoid vibrations of more than 2 kHz, 40 G
- The module must be fixed onto a thermally conductive surface with 8 (M4) screws. Recommended torque: 0.6–0.8 Nm.
- When installing/screwing the module into a luminaire, please ensure that the cables are not squeezed between luminaire/heat-sink and LED module.
- Safe operation only possible by the use of external constant current sources ( $I_{max}$ , see table "Electrical Characteristics").
- Operation is dependent on constant current drivers that should provide the following protective measures:
  - short-circuit protection
  - overload protection
  - overheating protection
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- The maximum output of the power supply must be observed.
- For optimal load of used constant current driver the modules can only be connected in series. The quantity of LED modules is limited by the sum of forward voltage and the capacity of used constant current driver. Safety regulations acc. to EN 60598 has to be observed if the sum of forward voltage exceed the permitted touchable value.
- The clearance and creepage distances of LED modules WU-M-475 are designed for working voltages up to 450 V DC (acc. to EN 62031/EN 60598).
- Insulation of LED modules WU-M-475 is designed for basic insulation for working voltages of up to max. 450 V.
- Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.
- To ensure problem-free operation, the specified maximum temperature at the  $t_c$  and  $t_p$  point (see "Operating Life") must be observed (measured in accordance with EN 60598-1). To satisfy this point, it is necessary to put measures in place to ensure any heat is dissipated from the LED module to the environment.

- A parallel connection of the modules is not allowed.
  - In the event of outdoor applications or applications in damp locations, care must be taken to protect LED assembly modules against humidity, splashes and jets of water. Any corrosion damage resulting from humidity or contact with condensation will not be recognised as a defect or manufacturing fault. LED assembly modules are not specially protected against foreign bodies or dust. Depending on the type of application, further protection must be ensured to prevent dust and foreign bodies from entering.
  - Operating LED modules in the presence of certain chemical substances or in chemically enriched (aggressive) environments can impair module functionality or even cause total module failure. Detailed information can be found in our "Chemical Incompatibility" PDF on our website [www.vossloh-schwabe.com](http://www.vossloh-schwabe.com)
  - The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471: 2008.
    - general lighting  
exempt group: WU-M-475-C
    - other applications  
risk group 2: WU-M-475-C
- Assessment in acc. with IEC/TR 62778:  
Given a clearance of more than  $d_{min}$ , within which the lighting intensity limit of  $E_{thr} = 1200 \text{ lx}$  is attained, the classification goes down to Risk Group 1.



### Applied Standards

EN 62031  
LED modules for general lighting – Safety specifications



EN 62471  
Photobiological safety of lamps and lamp systems

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