

SYM I

WATER PROTECTED BUILT-IN MODULES



LED INDUSTRY AND HALL LIGHTING

WU-M-425-C – SYM I

These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities.

The combination of a robust aluminium base and the enhanced degree of protection enables a simpler, 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
- Lighting for Sports Facilities

LED Industry and Hall Lighting

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



SYM I

Technical Notes

- LED built-in module for integration into luminaires
- 16 high-efficiency High Power LEDs, serial connected
- Encapsulated for outdoor applications with degree of protection (in preparation): IP66/(IP67)/IK05
- Weight: 0.37 kg
- Pre-assembled leads: 2 leads: + (red); – (blue) for luminaires of protection class II, length: 500 mm
- Design for optimum thermal management
- 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		Storage temperature range		Max. allowed repetitive peak current mA
		$^\circ\text{C}$ min.	$^\circ\text{C}$ max.	$^\circ\text{C}$ min.	$^\circ\text{C}$ 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**	Photometric code
			350 mA			700 mA			1050 mA			1400 mA				
			min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.	R_a	

Square – 16 LEDs

WU-M-425-C-830	warm white	3000 ^{-90/+185}	1950	2195	142	3600	4040	125	4920	5530	110	6070	6815	99	≥ 80	830/579
WU-M-425-C-840	neutral white	4000 ^{-235/+230}	2105	2300	149	3875	4230	131	5300	5785	115	6535	7135	104	≥ 80	840/579
WU-M-425-C-850	cool white	5000 ^{-265/+360}	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: ± 2

Operating Life

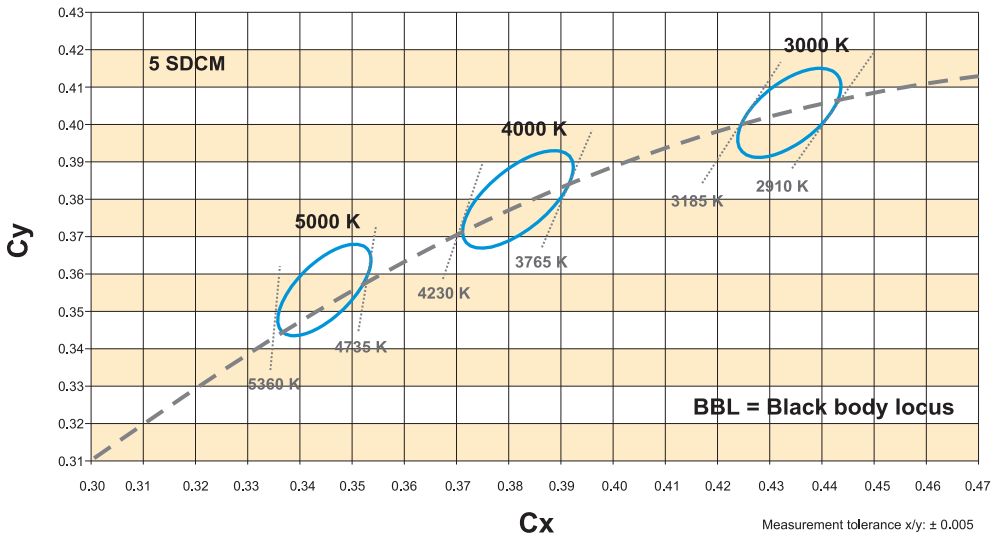
Modules	Operating life in hours at measured temperature at t_p point											
	I_f 350 mA			I_f 700 mA			I_f 1050 mA			I_f 1400 mA		
	40 $^\circ\text{C}$	60 $^\circ\text{C}$	85 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	85 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	80 $^\circ\text{C}$	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_{xx}/B_{yy} (lumen maintenance at xx%, failure rate yy%)

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

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Bin



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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
 - Do not carry or move LED modules by using the wires.
- The modules must not be used in hermetically sealed casings.
- The module must be fixed onto a thermally conductive surface with four M4 screws.
- 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 are designed for working voltages up to 250 V DC acc. to EN 62031/EN 60598.
- 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.

- 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

- 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-425-C
 - other applications
risk group 2: WU-M-425-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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