# 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)**

LIGHTING SOLUTIONS

A member of the Panasonic group Panasonic

**Vossloh-Schwabe Deutschland GmbH** · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

# 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 °C

| Type | Voltage DC (V) | | | | | | | | | | | | Temp. | Power consumption (W) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 350 mA | | | 700 mA | | | 1050 mA | | | 1400 mA | | | coeffi. | 350 mA | | | 700 mA | | | 1050 mA | | | 1400 mA | | |
| | min. | typ. | max. | min. | typ. | max. | min. | typ. | max. | min. | typ. | max. | mV/K | 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 | Operation temperature range at $t_c$ point | | Storage temperature range | | Max. allowed repetitive peak current |
|---|---|---|---|---|---|---|
| | mA | °C min. | °C max. | °C min. | °C max. | mA |
| 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 °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. lm | typ. lm | typ. lm/W | min. lm | typ. lm | typ. lm/W | min. lm | typ. lm | typ. lm/W | min. lm | typ. lm | typ. lm/W | $R_a$ | |
| **Square – 16 LEDs** | | | | | | | | | | | | | | | | |
| WU-M-475-C-830 | warm white | 3000 $^{-90/+185}$ | 1950 | 2195 | 142 | 3600 | 4040 | 125 | 4920 | 5530 | 110 | 6070 | 6815 | 99 | ≥ 80 | 830/579 |
| WU-M-475-C-840 | neutral white | 4000 $^{-235/+230}$ | 2105 | 2300 | 149 | 3875 | 4230 | 131 | 5300 | 5785 | 115 | 6535 | 7135 | 104 | ≥ 80 | 840/579 |
| WU-M-475-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: ±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 °C | 60 °C | 85 °C | 40 °C | 60 °C | 85 °C | 40 °C | 60 °C | 80 °C | 40 °C | 60 °C | 70 °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. | * Lxx/Byy (lumen maintenance at xx%, failure rate yy%)





LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
**Vossloh-Schwabe Deutschland GmbH** · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

# LED Industrial Light SYM I – IP20

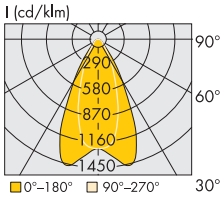
### Technical Notes

- 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).

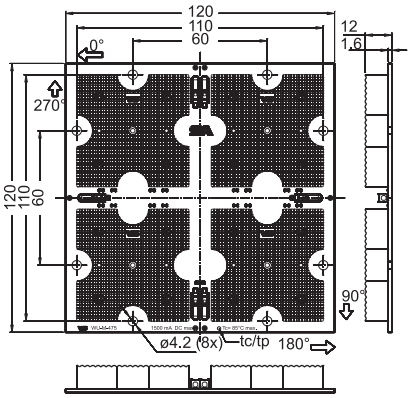
### Reference Numbers

| Type | Ref. No. |
|---|---|
| WU-M-475-C-830 | **561904** |
| WU-M-475-C-840 | **561909** |
| WU-M-475-C-850 | **561914** |

### Typical Light Distribution Curve




### Mechanical Dimensions








LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
**Vossloh-Schwabe Deutschland GmbH** · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

# LED Industrial Light SYM II – IP20

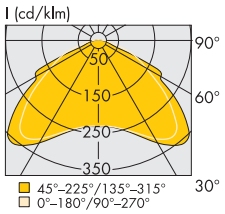
### Technical Notes

- 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)

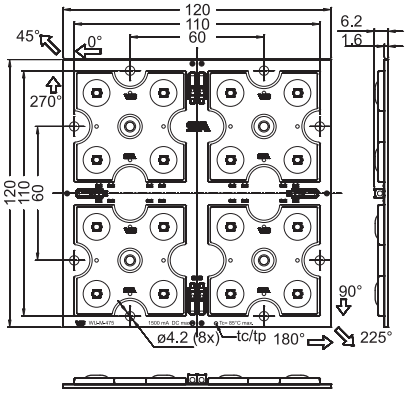
### Reference Numbers

| Type | Ref. No. |
|---|---|
| WU-M-475-C-830 | **561905** |
| WU-M-475-C-840 | **561910** |
| WU-M-475-C-850 | **561915** |

### Typical Light Distribution Curve




### Mechanical Dimensions



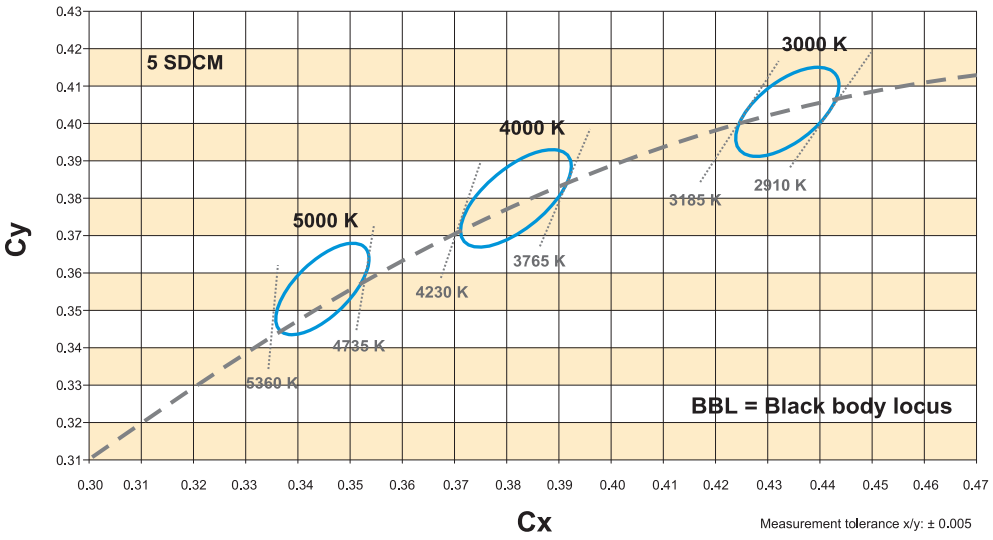





LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
**Vossloh-Schwabe Deutschland GmbH** · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

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

**Bin**




Measurement tolerance x/y: ± 0.005





LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
**Vossloh-Schwabe Deutschland GmbH** · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

# 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
- 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 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





LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
**Vossloh-Schwabe Deutschland GmbH** · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com