

# LED LINE SMD W2 COMFORT TUNEABLE WHITE



## LED LINE SMD W2 COMFORT TUNEABLE WHITE

### MLC SC W2 TW G1

#### Typical Applications

Built-in luminaires/general illumination

- Office lighting
- Retail, corridor and shelf lighting
- T5/T8 replacement as built-in module
- Furniture lighting



#### LED Line SMD W2 Comfort Tuneable White

- **LONG SERVICE LIFE TIME: 93.000 H (L80, B10)**
- **HIGHLY EFFICIENT: UP TO 209 LM/W  
AT T<sub>p</sub> = 50 °C**
- **2 LENGTHS AVAILABLE: 280 / 560 MM**
- **2 DIFFERENT LUMEN PACKAGES**

## LED Line SMD W2 Comfort Tuneable White

### Technical Notes

- LED built-in module for integration into luminaires
- Dimensions (excl. optics) LxWxH  
24 LEDs: 280x20  
48 LEDs: 560x20
- Driving currents: 150mA / 250mA / 350mA / 500mA
- Push-in terminals for quick and simple wiring
- Beam angle: 120°

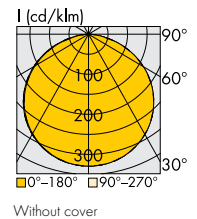


### Typical Light Distribution Curve

Data are available in .ldt format for download  
[under www.vossloh-schwabe.com](http://www.vossloh-schwabe.com)

### W2 optics

Please visit our homepage for details for suitable W2 optics  
<https://www.vossloh-schwabe.com/en/products/optics-reflectors/linear-optics/linear-optics-1r-for-smd-w2-backlight>



### Electrical Characteristics

at  $T_p = 50^\circ\text{C}$

| Type                                         | No. of      | Typ. voltage DC |        |        |        | Temperature | Typ. power consumption |        |        |        |
|----------------------------------------------|-------------|-----------------|--------|--------|--------|-------------|------------------------|--------|--------|--------|
|                                              | LEDs        | 150 mA          | 250 mA | 350 mA | 500 mA | coefficient | 150 mA                 | 250 mA | 350 mA | 500 mA |
|                                              | per channel | V               | V      | V      | V      | [mV/K]      | W                      | W      | W      | W      |
| LED Line SMD W2 Comfort Tuneable White - L28 |             |                 |        |        |        |             |                        |        |        |        |
| MLC SC W2/280 x/24/x27/x65 G1                | 12          | 10.5            | 10.7   | 10.8   | 11.1   | -4.03       | 1.6                    | 2.7    | 3.8    | 5.5    |
| LED Line SMD W2 Comfort Tuneable White - L56 |             |                 |        |        |        |             |                        |        |        |        |
| MLC SC W2/560 x/48/x27/x65 G1                | 24          | 20.9            | 21.3   | 21.7   | 22.2   | -8.07       | 3.1                    | 5.3    | 7.6    | 11.1   |

\* Per channel. Voltage and power consumption tolerance:  $\pm 10\%$ . 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 | 500                  | -20                                        | +75                   | -20                       | +70                   | 1440                                    |

### Operating Life

L80/B10

in hours at measured temperature at  $T_c$  point

|           | 150 mA              |                     |                     | 250 mA              |                     |                     | 350 mA              |                     |                     | 500 mA              |                     |                     |
|-----------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|           | 40 $^\circ\text{C}$ | 50 $^\circ\text{C}$ | 80 $^\circ\text{C}$ | 40 $^\circ\text{C}$ | 50 $^\circ\text{C}$ | 80 $^\circ\text{C}$ | 40 $^\circ\text{C}$ | 50 $^\circ\text{C}$ | 80 $^\circ\text{C}$ | 40 $^\circ\text{C}$ | 50 $^\circ\text{C}$ | 80 $^\circ\text{C}$ |
| All types | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >93.000             | >92.000             |

These values do not refer to the colour temperature. | Lx/Byy (lumen maintenance at xx%, failure rate yy%)

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# LED Line SMD W2 Comfort Tuneable White

## Optical Characteristics

at  $t_p = 50^\circ\text{C}$ , without secondary optics

$\text{CRI}^{**} \geq 80$

| Type | Ref. No.       |        | Colour | Correl.<br>colour | Luminous flux * (lm) and typ. efficiency (lm/W) |      |        |      |        |      |        |      | Photometric<br>code |
|------|----------------|--------|--------|-------------------|-------------------------------------------------|------|--------|------|--------|------|--------|------|---------------------|
|      | Connection "x" |        |        |                   | 150 mA                                          |      | 250 mA |      | 350 mA |      | 500 mA |      |                     |
|      | small top      | bottom |        |                   | typ.                                            | typ. | typ.   | typ. | typ.   | typ. | typ.   | typ. |                     |
|      | (S)            | (B)    |        |                   | K                                               | lm   | lm/W   | lm   | lm/W   | lm   | lm/W   | lm   |                     |

### LED Line SMD W2 Comfort Tuneable White - 24 LEDs

|                               |        |        |    |      |     |     |     |     |     |     |      |     |     |
|-------------------------------|--------|--------|----|------|-----|-----|-----|-----|-----|-----|------|-----|-----|
| MLC SC W2/280 x/24/827/865 G1 | 574949 | 574950 | WW | 2700 | 305 | 196 | 500 | 188 | 685 | 181 | 955  | 172 | 359 |
|                               |        |        | CW | 6500 | 330 | 209 | 535 | 201 | 735 | 193 | 1020 | 184 |     |

### LED Line SMD W2 Comfort Tuneable White - 48 LEDs

|                               |        |        |    |      |     |     |      |     |      |     |      |     |     |
|-------------------------------|--------|--------|----|------|-----|-----|------|-----|------|-----|------|-----|-----|
| MLC SC W2/560 x/48/827/865 G1 | 575016 | 575017 | WW | 2700 | 615 | 196 | 1000 | 188 | 1370 | 181 | 1910 | 172 | 359 |
|                               |        |        | CW | 6500 | 655 | 209 | 1070 | 201 | 1465 | 193 | 2045 | 184 |     |

\* Colour tolerance: 3 MacAdam | \*\* Production tolerance of luminous flux and efficiency:  $\pm 10\%$

## Optical Characteristics

at  $t_p = 50^\circ\text{C}$ , without secondary optics

$\text{CRI}^{**} \geq 90$

| Type | Ref. No.       |        | Colour | Correl.<br>colour | Luminous flux * (lm) and typ. efficiency (lm/W) |      |        |      |        |      |        |      | Photometric<br>code |
|------|----------------|--------|--------|-------------------|-------------------------------------------------|------|--------|------|--------|------|--------|------|---------------------|
|      | Connection "x" |        |        |                   | 150 mA                                          |      | 250 mA |      | 350 mA |      | 500 mA |      |                     |
|      | small top      | bottom |        |                   | typ.                                            | typ. | typ.   | typ. | typ.   | typ. | typ.   | typ. |                     |
|      | (S)            | (B)    |        |                   | K                                               | lm   | lm/W   | lm   | lm/W   | lm   | lm/W   | lm   |                     |

### LED Line SMD W2 Comfort Tuneable White - 24 LEDs

|                               |        |        |    |      |     |     |     |     |     |     |     |     |     |
|-------------------------------|--------|--------|----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| MLC SC W2/280 x/24/927/965 G1 | 575425 | 575426 | WW | 2700 | 245 | 155 | 395 | 149 | 545 | 143 | 760 | 137 | 359 |
|                               |        |        | CW | 6500 | 285 | 182 | 465 | 175 | 640 | 168 | 890 | 160 |     |

### LED Line SMD W2 Comfort Tuneable White - 48 LEDs

|                               |        |        |    |      |     |     |     |     |      |     |      |     |     |
|-------------------------------|--------|--------|----|------|-----|-----|-----|-----|------|-----|------|-----|-----|
| MLC SC W2/560 x/48/927/965 G1 | 575427 | 575304 | WW | 2700 | 485 | 155 | 795 | 149 | 1090 | 143 | 1515 | 137 | 359 |
|                               |        |        | CW | 6500 | 570 | 182 | 930 | 175 | 1280 | 168 | 1780 | 160 |     |

\* Colour tolerance: 3 MacAdam | \*\* Production tolerance of luminous flux and efficiency:  $\pm 10\%$

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# LED Line SMD W2 Comfort Tuneable White

**Tuneable Characteristics – CRI 80&90** - at  $t_c1 / t_c2 (t_p) = 50\text{ °C}$ ; without secondary optics

| CCT (K) for type MLC SC W2/280 x/24/827/865 G1 |        |      |        |        |        |        |        |        |        |
|------------------------------------------------|--------|------|--------|--------|--------|--------|--------|--------|--------|
| Channel 1 / 2700 K                             | 500 mA | 2755 | 3320   | 3475   | 3745   | 3860   | 3970   | 4070   | 4165   |
|                                                | 450 mA | 2755 | 3370   | 3535   | 3820   | 3940   | 4055   | 4160   | 4255   |
|                                                | 400 mA | 2750 | 3430   | 3610   | 3910   | 4040   | 4155   | 4265   | 4360   |
|                                                | 350 mA | 2750 | 3505   | 3695   | 4015   | 4150   | 4275   | 4385   | 4485   |
|                                                | 300 mA | 2750 | 3600   | 3810   | 4150   | 4290   | 4415   | 4530   | 4635   |
|                                                | 200 mA | 2745 | 3890   | 4140   | 4525   | 4675   | 4810   | 4925   | 5030   |
|                                                | 150 mA | 2720 | 4135   | 4410   | 4810   | 4960   | 5090   | 5205   | 5300   |
|                                                | 0 mA   | 0    | 6725   | 6725   | 6745   | 6745   | 6760   | 6760   | 6780   |
| Operating current                              |        | 0 mA | 150 mA | 200 mA | 300 mA | 350 mA | 400 mA | 450 mA | 500 mA |
| Channel 2 / 6500 K                             |        |      |        |        |        |        |        |        |        |

| CCT (K) for type MLC SC W2/560 x/48/827/865 G1 |        |      |        |        |        |        |        |        |        |
|------------------------------------------------|--------|------|--------|--------|--------|--------|--------|--------|--------|
| Channel 1 / 2700 K                             | 500 mA | 2755 | 3320   | 3475   | 3745   | 3860   | 3970   | 4070   | 4165   |
|                                                | 450 mA | 2755 | 3370   | 3535   | 3820   | 3940   | 4055   | 4160   | 4255   |
|                                                | 400 mA | 2750 | 3430   | 3610   | 3910   | 4040   | 4155   | 4265   | 4360   |
|                                                | 350 mA | 2750 | 3505   | 3695   | 4015   | 4150   | 4275   | 4385   | 4485   |
|                                                | 300 mA | 2750 | 3600   | 3810   | 4150   | 4290   | 4415   | 4530   | 4635   |
|                                                | 200 mA | 2745 | 3890   | 4140   | 4525   | 4675   | 4810   | 4925   | 5030   |
|                                                | 150 mA | 2720 | 4135   | 4410   | 4810   | 4960   | 5090   | 5205   | 5300   |
|                                                | 0 mA   | 0    | 6725   | 6725   | 6745   | 6745   | 6760   | 6760   | 6780   |
| Operating current                              |        | 0 mA | 150 mA | 200 mA | 300 mA | 350 mA | 400 mA | 450 mA | 500 mA |
| Channel 2 / 6500 K                             |        |      |        |        |        |        |        |        |        |

| CCT (K) for type MLC SC W2/280 x/24/927/965 G1 |        |      |        |        |        |        |        |        |        |
|------------------------------------------------|--------|------|--------|--------|--------|--------|--------|--------|--------|
| Channel 1 / 2700 K                             | 500 mA | 2755 | 3370   | 3535   | 3820   | 3940   | 4055   | 4155   | 4255   |
|                                                | 450 mA | 2750 | 3425   | 3600   | 3895   | 4025   | 4140   | 4250   | 4350   |
|                                                | 400 mA | 2750 | 3485   | 3675   | 3990   | 4125   | 4245   | 4355   | 4455   |
|                                                | 350 mA | 2750 | 3565   | 3770   | 4105   | 4240   | 4365   | 4480   | 4585   |
|                                                | 300 mA | 2750 | 3665   | 3885   | 4240   | 4385   | 4510   | 4630   | 4730   |
|                                                | 200 mA | 2745 | 3970   | 4230   | 4620   | 4775   | 4905   | 5020   | 5125   |
|                                                | 150 mA | 2745 | 4225   | 4505   | 4905   | 5055   | 5185   | 5295   | 5390   |
|                                                | 0 mA   | 0    | 6715   | 6725   | 6745   | 6750   | 6760   | 6770   | 6780   |
| Operating current                              |        | 0 mA | 150 mA | 200 mA | 300 mA | 350 mA | 400 mA | 450 mA | 500 mA |
| Channel 2 / 6500 K                             |        |      |        |        |        |        |        |        |        |

| CCT (K) for type MLC SC W2/560 x/48/927/965 G1 |        |      |        |        |        |        |        |        |        |
|------------------------------------------------|--------|------|--------|--------|--------|--------|--------|--------|--------|
| Channel 1 / 2700 K                             | 500 mA | 2755 | 3370   | 3535   | 3820   | 3940   | 4055   | 4155   | 4255   |
|                                                | 450 mA | 2750 | 3425   | 3600   | 3895   | 4025   | 4140   | 4250   | 4350   |
|                                                | 400 mA | 2750 | 3485   | 3675   | 3990   | 4125   | 4245   | 4355   | 4455   |
|                                                | 350 mA | 2750 | 3565   | 3770   | 4105   | 4240   | 4365   | 4480   | 4585   |
|                                                | 300 mA | 2750 | 3665   | 3885   | 4240   | 4385   | 4510   | 4630   | 4730   |
|                                                | 200 mA | 2745 | 3970   | 4230   | 4620   | 4775   | 4905   | 5020   | 5125   |
|                                                | 150 mA | 2745 | 4225   | 4505   | 4905   | 5055   | 5185   | 5295   | 5390   |
|                                                | 0 mA   | 0    | 6715   | 6725   | 6745   | 6750   | 6760   | 6770   | 6780   |
| Operating current                              |        | 0 mA | 150 mA | 200 mA | 300 mA | 350 mA | 400 mA | 450 mA | 500 mA |
| Channel 2 / 6500 K                             |        |      |        |        |        |        |        |        |        |

## Logistics Data

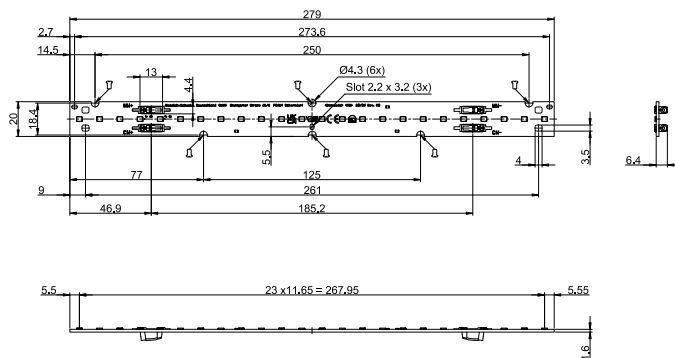
| Product                                             | Product description           | Packaging unit | Dimension of box mm | Pieces per box | Gross weight of box g | Weight per piece g | Box pieces per pallet | Pieces per pallet | Gross weight of pallet kg | Dimension of pallet mm |
|-----------------------------------------------------|-------------------------------|----------------|---------------------|----------------|-----------------------|--------------------|-----------------------|-------------------|---------------------------|------------------------|
| <b>LED Line SMD W2 Comfort Tuneable White - L28</b> |                               |                |                     |                |                       |                    |                       |                   |                           |                        |
| 280x20                                              | MLC SC W2/280 S/24/yzz/yzz G1 | Carton box     | 290x190x57          | 48             | 832.8                 | 15                 | 112                   | 5376              | 117.3                     | 1200x800x605           |
| 280x20                                              | MLC SC W2/280 B/24/yzz/yzz G1 | Carton box     | 290x190x57          | 24             | 472.8                 | 15                 | 182                   | 4368              | 110.0                     | 1200x800x890           |
| <b>LED Line SMD W2 Comfort Tuneable White - L56</b> |                               |                |                     |                |                       |                    |                       |                   |                           |                        |
| 560x20                                              | MLC SC W2/560 S/48/yzz/yzz G1 | Carton box     | 570x190x57          | 48             | 1619.2                | 30                 | 104                   | 4992              | 192.4                     | 1200x800x890           |
| 560x20                                              | MLC SC W2/560 B/48/yzz/yzz G1 | Carton box     | 570x190x57          | 24             | 899.2                 | 30                 | 104                   | 2496              | 117.5                     | 1200x800x890           |

yzz - CCT&CRI combination (827, 865...)

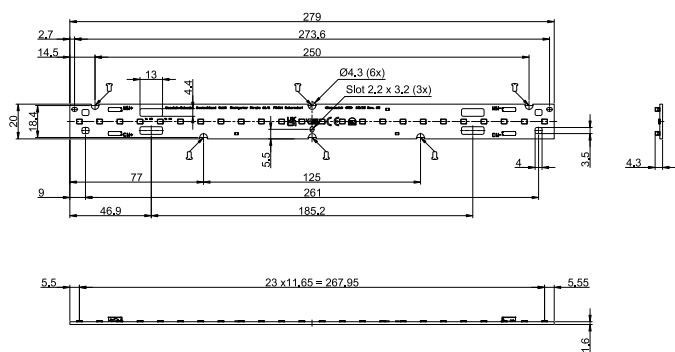
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## Mechanical Dimensions

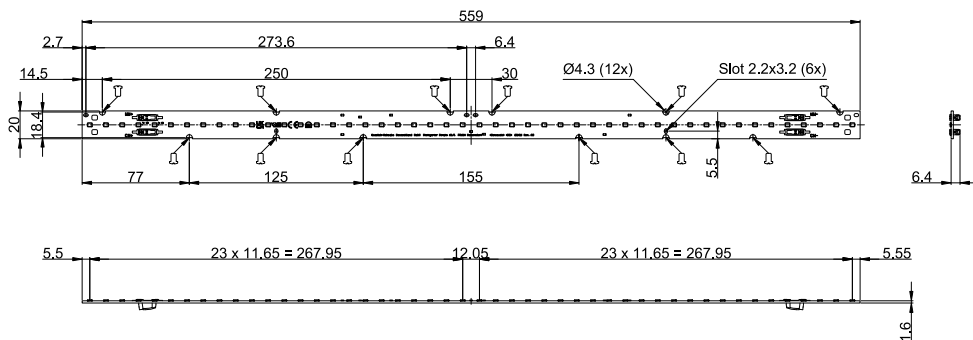
### MLC SC W2/280 B/24/yz/yz G1



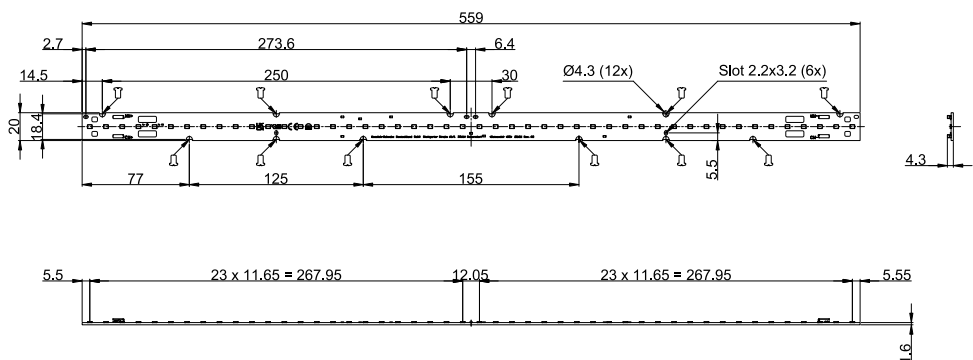
### MLC SC W2/280 S/24/yz/yz G1



### MLC SC W2/560 B/48/yz/yz G1



### MLC SC W2/560 S/48/yz/yz G1



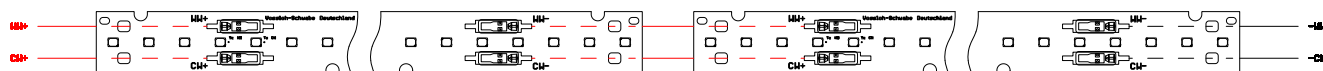
All holes 2.2 x 3.2 mm are fixing holes for optics. | All holes Ø 4.3 mm are fixing holes for PCB.

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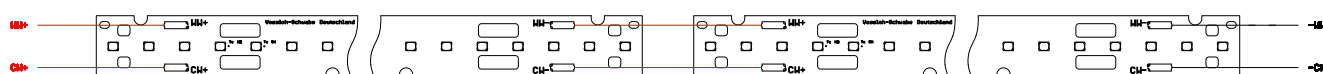
## Connection example

- The number of modules that can be connected in series depends on the available output voltage of the LED driver.
- The clearance and creepage distances are designed for working voltages up to 350 V DC (basic insulation) and 185 V DC (reinforced insulation).
- In case of assembly of the LED modules in profiles (e.g. aluminium) where the profile touches the top edge of the PCB the clearance and creepage distances are reduced to 175 V DC (basic insulation) and 50 V DC (reinforced insulation).
- Max. diameter of screw head (M4):  $\varnothing$  8 mm
- Only the marked holes  are fixing holes for screws M4. Please do not use other holes for fixation!

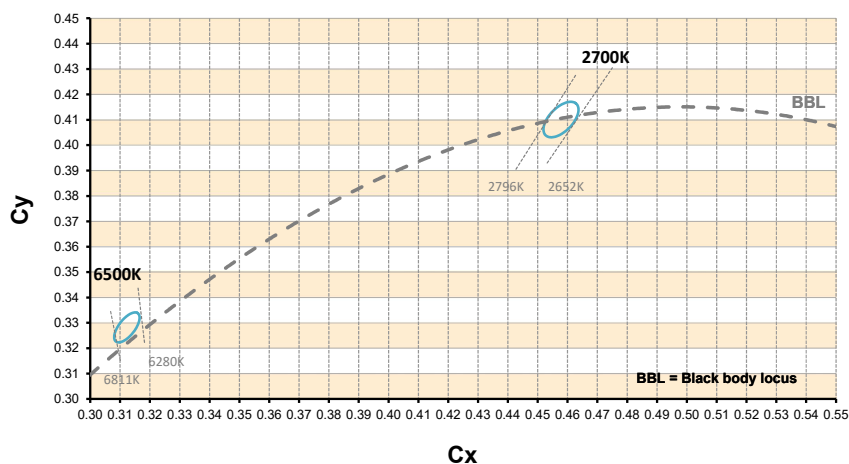
### For bottom connection (B)



### For small top connection (S)



## Bins



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## Nomenclature example

**MLC SC W2/280 S/24/827/865 G1**

Generation

CRI & CCT

8 = 80 CRI minimum

9 = 90 CRI minimum

27 = 2700 K

65 = 6500 K

Number of LEDs

Connection

S = Small top

B = Bottom

Shape

Check drawing

Technology

SC = SMD Constant Current

Product Line

C = Comfort

Product Area & Shape

ML = Module Linear

## 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. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains). The following advice must be observed; non-observance can result in the destruction of the LED assembly modules, fire and/or other hazards.

- Consider safety regulations acc. EN 60598 in the luminaire design, especially when the operating LED driver is not galvanic isolated.
  - In mode of operation regard to sufficient isolation.
  - Live parts must not be touched in operation mode.
-  Danger of death!!!
- ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED modules. See VS's application notes on ESD protection.
- Adequate anti-static electricity measures, including the use of conductive shoes, ionizers, work bench grounding, wrist straps, flooring and stools should be used.
- LED assembly modules must not be subjected to any undue mechanical stress, e. g.:
  - do not treat as bulk cargo
  - avoid shear and compressive forces during handling and installation
  - do not damage circuit paths
  - avoid any pressure on the light emitting surface
- Safe operation only possible by the use of external constant current sources ( $I_{max}$ , see table "Electrical Characteristics").
- Operation only with power supply units that feature the following protection:
  - Short-circuit protection
  - Overload protection
  - Overheating protection
- The module can be fixed with M4 screws. Fixation only with flat or cylinder head screws (M4) (no countersunk screws)  
Max. torque: 1.2 Nm (M4)
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- For interconnection the LED modules is equipped with push-in terminals. WAGO 2065 for S variant; BJB 46.111.1001.50 for B variant.
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- Measurement tolerances:
  - luminous flux:  $\pm 7\%$
  - voltage:  $\pm 3\%$
  - CRI:  $\pm 1$
- The following points must be observed when connecting LED modules in parallel:
  - All LED strings that are wired in parallel must contain the same number of LEDs (symmetrical loading).
  - Owing to differing forward biases, there can be a difference of up to 10% in brightness between modules connected in parallel.

- To ensure problem-free operation, the specified maximum temperature at the  $t_p$  point (see "Operating Life") must be observed (and measured in accordance with EN 60598-1). To satisfy this point, it may be necessary to put measures in place to ensure any heat is dissipated from the PCB to the environment.
- 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.
- Due to the manufacturing process, the PCBs of the LED assembly modules can have sharp edges and corners. Care must therefore be taken during handling and installation to avoid injury.
- 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.
- 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.  
Rating in accordance with IEC / TR 62778: risk group 1  
As long as subsequent table is fulfilled:

| Type                          | CCT         | E threshold for higher operating currents to be risk group 2 (lx) |
|-------------------------------|-------------|-------------------------------------------------------------------|
|                               | K           |                                                                   |
| MLC SC W2/280 x/24/y27/y65 G1 | $\leq 6500$ | 724.5                                                             |
| MLC SC W2/560 x/48/y27/y65 G1 | $\leq 6500$ | 724.5                                                             |

### Applied Standards

EN 62031

LED modules for general lighting – Safety specifications



EN 62471

Photobiological safety of lamps and lamp systems

### Product Guarantee

- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage ([www.vossloh-schwabe.com](http://www.vossloh-schwabe.com)). We will be happy to send you these conditions upon request.

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