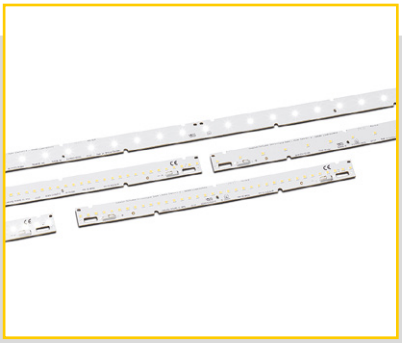
LED LINE SMD **EASY**
L14/28/56 W2

350 lm, 700 lm, 1400 lm



LED LINE SMD **EASY**
L14/28/56 W2
– 350 lm, 700 lm, 1400 lm

WU-M-622, WU-M-601/602, WU-M-603/604

Typical Applications

Built-in luminaires/general illumination

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

LED Line SMD Easy – L14/28/56 W2

- **LONG SERVICE LIFE TIME: 50,000 H (L70, B10)**
- **HIGHLY EFFICIENT: UP TO 170 LM/W AT T_P = 50 °C**
- **3 LENGTHS AVAILABLE: 140 / 280 / 560 MM**
- **3 DIFFERENT LUMEN PACKAGES**
- **ZHAGA-COMPLIANT DIMENSIONS**

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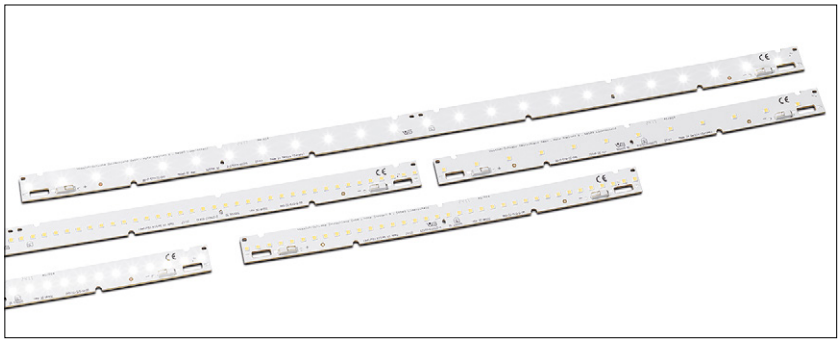
LED Line SMD Easy – 14/28/56 W2

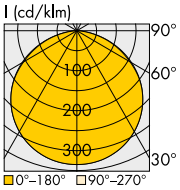


Technical Notes

- LED built-in module for integration into luminaires
- Dimensions
  WU-M-622: 140x20 mm
  WU-M-601/602: 280x20 mm
  WU-M-603/604: 560x20 mm
- Driving current: 200 mA / 250 mA / 300 mA / 350 mA / 500 mA / 700 mA
- On-board push-in terminals, optional on top or bottom
- Colour tolerance: 2-step MacAdam (per Bin)
- Beam angle: 120°

Typical Light Distribution Curves

Data are available in .ldt format for download under www.vossloh-schwabe.com.



Without cover

Light distribution curve for LED Line SMD modules **with covers** see page 6.

Light distribution curve for LED Line SMD modules **with optics** see page 7.

Electrical Characteristics

at t_p = 50 °C

Type	No. of SMDs	Typ. voltage DC 200 mA V	250 mA V	300 mA V	350 mA V	500 mA V	700 mA V	Typ. power consumption 200 mA W	250 mA W	300 mA W	350 mA W	500 mA W	700 mA W
LED Line SMD Easy – L14 W2													
WU-M-622	12	8.5	8.5	8.6	8.7	8.9	9.2	1.7	2.2	2.6	3.1	4.5	6.4
LED Line SMD Easy – L28 W2													
WU-M-601	12	17.5	17.8	18.0	18.3	–	–	3.5	4.4	5.4	6.4	–	–
WU-M-602	24	16.9	17.0	17.2	17.3	17.8	18.3	3.4	4.3	5.2	6.1	8.9	12.8
LED Line SMD Easy – L56 W2													
WU-M-603	24	35.0	35.5	36.0	36.6	–	–	7.0	8.9	10.8	12.8	–	–
WU-M-604	48	33.7	34.0	34.4	34.7	35.5	36.6	6.7	8.5	10.3	12.1	17.8	25.6

Voltage and power consumption tolerance: ± 10% | **Use of external LED constant current driver required.**

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the module.

Type	Operating current (mA)	Operation temperature range at t_c point °C min.	°C max.	Storage temperature range °C min.	°C max.	Max. allowed repetitive peak current mA
WU-M-622	all	–20	+75	–20	+80	800
WU-M-601/603						400
WU-M-602/604						800

Operating Life

L70/B10

in hours at measured temperature at t_p point

	200 mA 40 °C	50 °C	75 °C	250 mA 40 °C	50 °C	75 °C	300 mA 40 °C	50 °C	75 °C	350 mA 40 °C	50 °C	75 °C	500 mA 40 °C	50 °C	75 °C	700 mA 40 °C	50 °C	75 °C
WU-M-622	54,000			54,000			54,000			54,000	54,000	54,000	54,000			54,000	53,000	40,000
WU-M-601/603	54,000			54,000			54,000			54,000	53,000	40,000	–			–		
WU-M-602/604	54,000			54,000			54,000			54,000	54,000	54,000	54,000			54,000	53,000	40,000

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LED Line SMD Easy – L14/28/56 W2

Optical Characteristics

at t_p = 50 °C
CRI: R_a > 80

Type	Colour	Ref. No. Connection top (TC)	Ref. No. Connection bottom (BC)	CCT	Typ. luminous flux* and typ. efficiency * at 200 mA		250 mA		300 mA		350 mA		500 mA		700 mA		Photo-metric code
				K	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	
LED Line SMD Easy – L14 W2																	
WU-M-622-TC/BC-830	warm white	**on req.**	**on req.**	3000	268	159	330	153	393	151	450	148	620	139	820	128	830/479
WU-M-622-TC/BC-840	neutral white	**569079**	**on req.**	4000	283	166	350	163	413	159	475	156	653	147	865	135	840/479
WU-M-622-TC/BC-850	neutral white	**on req.**	**on req.**	5000	288	169	355	165	420	162	485	159	665	149	883	138	850/479
WU-M-622-TC/BC-865	cool white	**569080**	**on req.**	6500	278	164	343	160	405	156	468	153	643	144	850	133	865/479
LED Line SMD Easy – L28 W2																	
WU-M-601-TC/BC-830	warm white	**567485**	**567489**	3000	510	146	620	140	725	134	820	128	–	–	–	–	830/479
WU-M-601-TC/BC-840	neutral white	**567486**	**567490**	4000	535	153	655	147	765	142	865	135	–	–	–	–	840/479
WU-M-601-TC/BC-850	neutral white	**567487**	**567491**	5000	545	156	665	150	775	143	880	138	–	–	–	–	850/479
WU-M-601-TC/BC-865	cool white	**567488**	**567492**	6500	525	150	640	144	750	139	850	133	–	–	–	–	865/479
WU-M-602-TC/BC-830	warm white	**567493**	**567497**	3000	535	159	660	155	785	152	900	148	1240	140	1640	128	830/479
WU-M-602-TC/BC-840	neutral white	**567494**	**567498**	4000	565	168	700	165	825	160	950	157	1305	147	1730	135	840/479
WU-M-602-TC/BC-850	neutral white	**567495**	**567499**	5000	575	170	710	167	840	163	970	160	1330	150	1765	138	850/479
WU-M-602-TC/BC-865	cool white	**567496**	**567500**	6500	555	165	685	161	810	157	935	154	1285	145	1700	133	865/479
LED Line SMD Easy – L28 W2 – STC (Small Top Connector)																	
WU-M-602-STC-830	warm white	**569418**	**–**	3000	535	159	660	155	785	152	900	148	1240	140	1640	128	830/479
WU-M-602-STC-840	neutral white	**569419**	**–**	4000	565	168	700	165	825	160	950	157	1305	147	1730	135	840/479
LED Line SMD Easy – L56 W2																	
WU-M-603-TC/BC-830	warm white	**567501**	**567505**	3000	1020	146	1240	140	1445	134	1640	128	–	–	–	–	830/479
WU-M-603-TC/BC-840	neutral white	**567502**	**567506**	4000	1075	154	1305	147	1525	141	1730	135	–	–	–	–	840/479
WU-M-603-TC/BC-850	neutral white	**567503**	**567507**	5000	1095	157	1330	150	1555	144	1765	138	–	–	–	–	850/479
WU-M-603-TC/BC-865	cool white	**567504**	**567508**	6500	1055	151	1285	145	1500	139	1700	133	–	–	–	–	865/479
WU-M-604-TC/BC-830	warm white	**567509**	**567513**	3000	1070	159	1325	156	1565	152	1805	149	2480	140	3285	128	830/479
WU-M-604-TC/BC-840	neutral white	**567510**	**567514**	4000	1130	168	1395	164	1655	161	1905	157	2615	147	3465	135	840/479
WU-M-604-TC/BC-850	neutral white	**567511**	**567515**	5000	1150	170	1420	167	1685	163	1940	160	2660	150	3530	138	850/479
WU-M-604-TC/BC-865	cool white	**567512**	**567516**	6500	1110	165	1370	161	1625	158	1870	154	2565	144	3400	133	865/479
LED Line SMD Easy – L56 W2 – STC (Small Top Connector)																	
WU-M-604-STC-830	warm white	**569420**	**–**	3000	1070	159	1325	156	1565	152	1805	149	2480	140	3285	128	830/479
WU-M-604-STC-840	neutral white	**569421**	**–**	4000	1130	168	1395	164	1655	161	1905	157	2615	147	3465	135	840/479

* Production tolerance of luminous flux and efficiency: ±10% | CRI > 90 on request

Minimum order quantity (packaging unit): 150 pcs. (WU-M-601, -602); 120 pcs. (WU-M-603, -604); 100 pcs. (WU-M-622)

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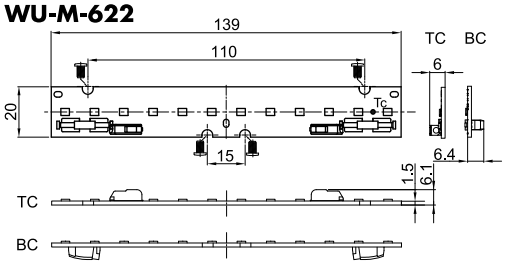
LED Line SMD Easy – L14/28/56 W2

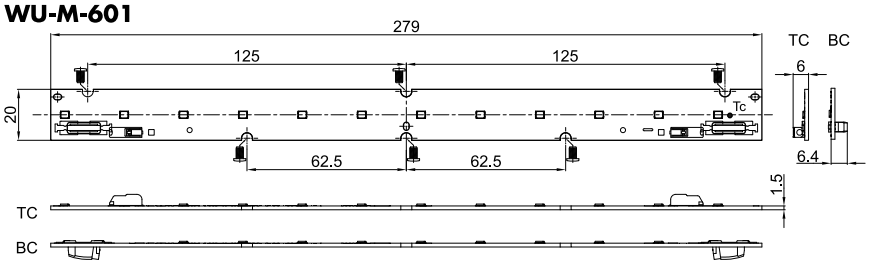
Mechanical Dimensions

WU-M-622

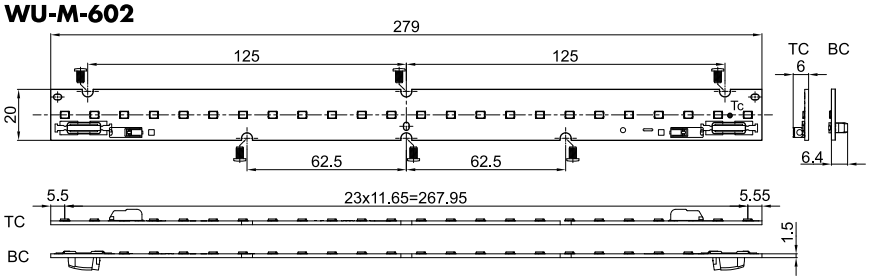


TC = Top Connection
BC = Bottom Connection
STC = Small Top Connection

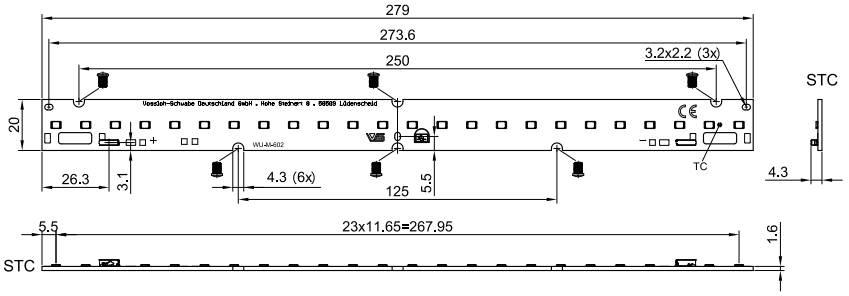
WU-M-601



WU-M-602



WU-M-602 STC



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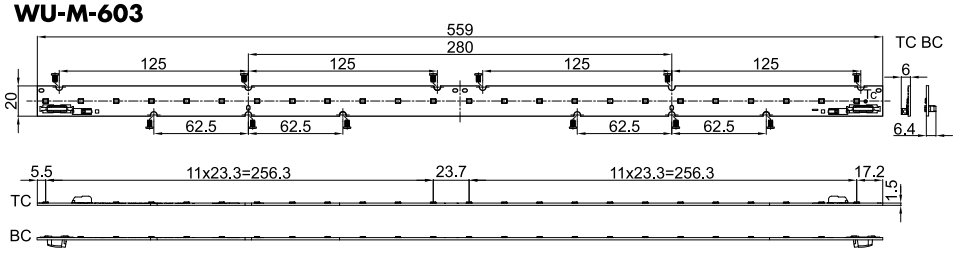
LED Line SMD Easy – L14/28/56 W2

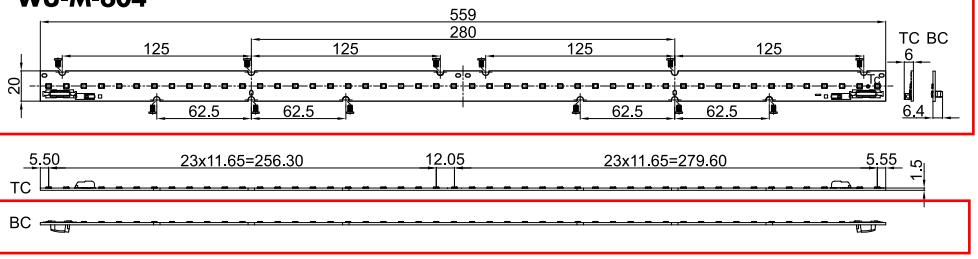
Mechanical Dimensions

WU-M-603

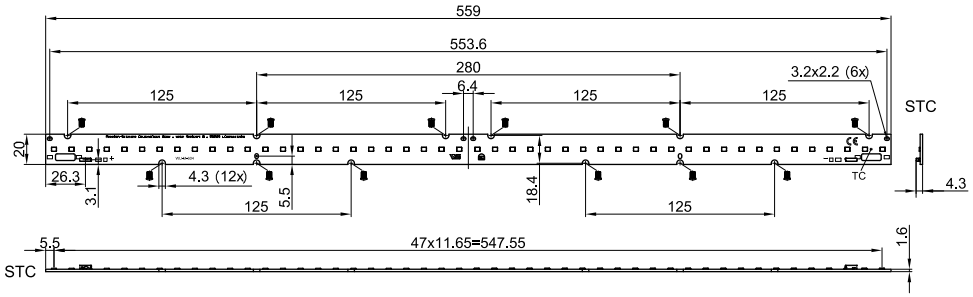


TC = Top Connection
BC = Bottom Connection
STC = Small Top Connection

WU-M-604



WU-M-604 STC



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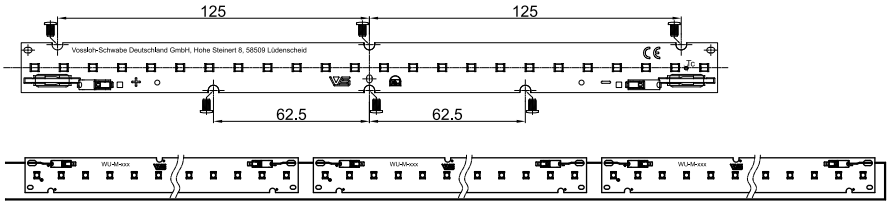
LED Line SMD Easy – L14/28/56 W2

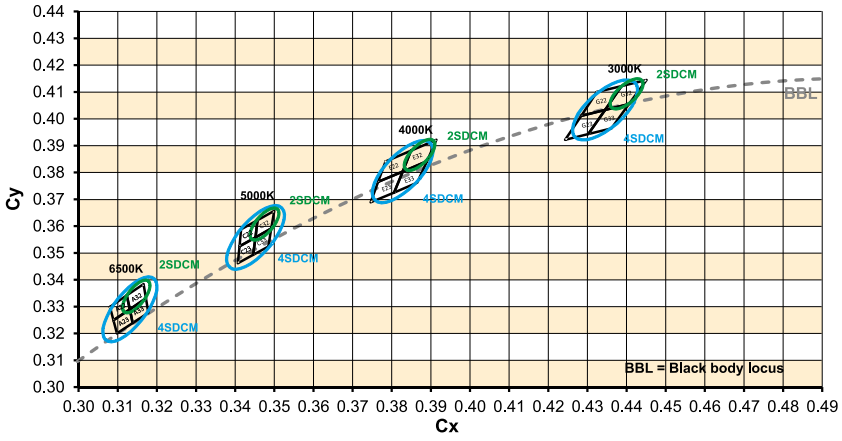
Connection Example

- 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): Ø 8 mm
- Only the marked holes are fixing holes for screws M4. Please do not use other holes for fixation!



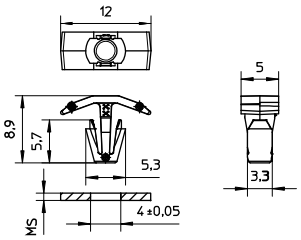
Bins

The standard shipping format regarding the reference numbers includes all chromaticity coordinate groups. The chromaticity coordinate groups of 2-step MacAdam distribution (E22, E32,...) can be identified on the product and packaging lable.



Fixing Clip

For fastening LED PCBs to luminaire sheets without needing screws
PCB hole dia.: 4.3–4.5 mm
Vibration resistant version
Material: PC, white (UL-94 V2)
Weight: 0.2 g, Packaging unit: 1000 pcs. (.11 = 10,000 pcs.)



Type	**Ref. No.**	For luminaire sheet thickness (MS) mm
98050	**562870**	0.5–1.0*

* PCB thickness: 1.6 mm

Linear LED Constant Current Drivers

Please visit our homepage for details for suitable LED constant current drivers: www.vossloh-schwabe.com

LED Line SMD Easy – L14/28/56 W2

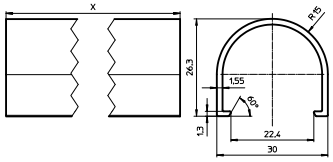
Cover W2 for clip fixing or tape fixing

A semi-transparent or a diffuse cover is available for the modules LED Line SMD W2 which protects the SMD board. The cover reduces glare and makes a homogeneous light distribution.

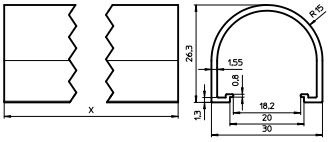
Easy assembly by clip fixing of the cover under the fixing screws of the SMD board or by tape fixing.

Technical Notes for Cover
Material: PMMA
High transmission:
92% semi-transparent
84% diffuse

For clip fixing
Recommended diameter of fixing screw head: 7 mm

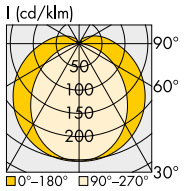


For tape fixing
No screws for PCB and cover fixing needed

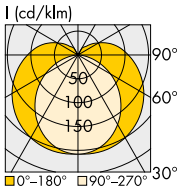


Type	**Ref. No. for clip fixing**	Type	**Ref. No. for tape fixing**	Length X mm	Version	Efficiency %	Weight g	Packaging unit pcs.
89830	**568591**	89800	**562549**	597	semi-transparent	92	81.8	240
89831	**568593**	89801	**562551**	1200	semi-transparent	92	164.4	192
89832	**568595**	89802	**562553**	1500	semi-transparent	92	205.5	192
89833	**568597**	89803	**562555**	1800	semi-transparent	92	246.6	192
89834	**568865**	–	**on request**	3000	semi-transparent	92	410	192
89830	**568592**	89800	**562550**	597	diffuse	84	81.8	240
89831	**568594**	89801	**562552**	1200	diffuse	84	164.4	192
89832	**568596**	89802	**562554**	1500	diffuse	84	205.5	192
89833	**568598**	89803	**562556**	1800	diffuse	84	246.6	192
89834	**568866**	–	**on request**	3000	diffuse	84	410	192

Length tolerance: 597 mm ± 1 mm (ends finished), 1200 / 1500 / 1800 / 3000 mm + 10 mm (ends raw)



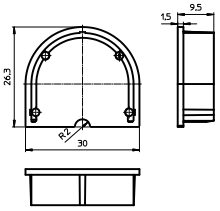
With semi-transparent cover



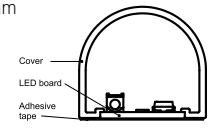
With diffuse cover

End caps for cover for clip fixing
End caps with or without wire hole for push-fit into the cover
Material: PC, transparent
Weight: 2 g, Packaging unit: 250 pcs.
Type: 898
Ref. No.: 562500 end cap with wire hole
Ref. No.: 562499 end cap without wire hole

End cap with wire hole



Preassembled module SMD board including W2 adhesive cover
The cover and PCB are fixed together with double-side adhesive assembled.
No screws for PCB and cover fixing needed!
Length: assembled 597 mm
Packaging unit: 242 pcs.



Type	**Ref. No.**	Cover	SMD board
89800	**on request**	semi-transparent	on request
89800	**on request**	diffus	on request

With W2 SMD boards (colour temperature and lengths) on request

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W2 Optics

For LED Line SMD Easy – L14/28/56 W2

Technical Notes

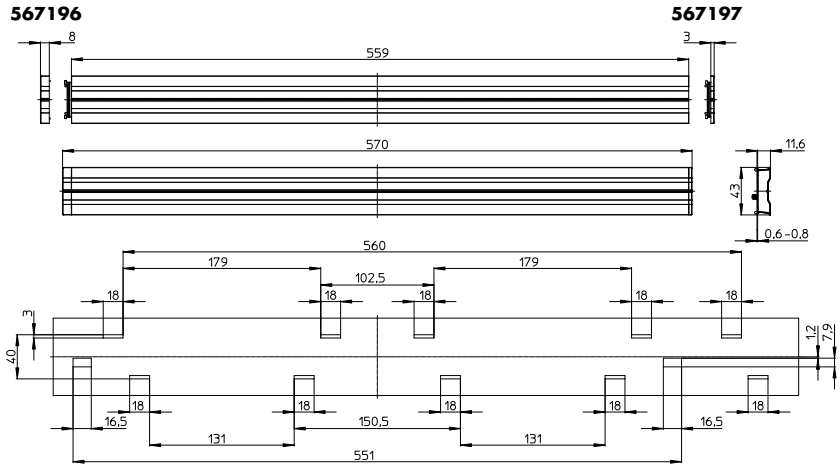
Highly efficient of up to 93%
Constant Light Colour (CLC): very low colour temperature deviations over beam angle
Extended Luminous Area (ELA): light emission over the entire surface of the optics
Material: PMMA, clear or translucent (TL)
Max. allowed temperature: 80 °C
Dimensions (LxWxH): 559x43x11.6 mm
Optics can be stringed together for module chains
Single lens version and tunnel lens version for WU-M-601/602/603/604 with bottom connection (BC) or small top connection (STC) only
Clip fixation for metal sheets with wall thickness of 0.6–0.8 mm or aluminium profiles

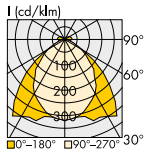
Light distribution	Optics type	**Ref. No.**	Weight g
Single lens			
Extra Wide 110°	97005	**568236**	124
Wide 90°	97000	**568075**	115
Wide 90° TL	97000	**568412**	115
Medium 60°	97003	**568238**	107
Medium 60° UGR	97007	**569721**	110
Narrow 30°	97002	**568239**	104
Retail SYM 1	97001	**568240**	108
Retail SYM 2	97001	**568413**	108
Retail ASYM	97004	**568237**	104
Tunnel lens			
Wide 90°	97100	**568243**	118
Wide 90° TL	97100	**568618**	118
Medium 60°	97103	**568246**	116
Retail SYM 1	97101	**568244**	118

End Caps

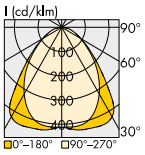
Lateral attachment on the optics (on the side of the groove or tongue)
Material: PC, clear or translucent (TL)

End cap type	For optics type	**Ref. No.**	Weight g
Tongue side	970	**567196**	1.85
Groove side	970	**567197**	1.45
Tongue side TL	970	**568601**	1.85
Groove side TL	970	**568602**	1.45

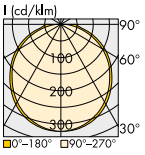




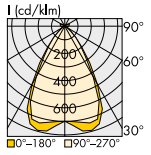
Single lens – 110° *



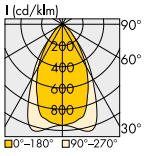
Single lens – 90°



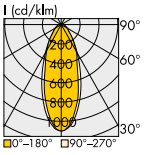
Single lens – 90° TL



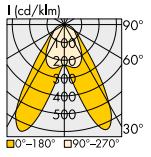
Single lens – 60°



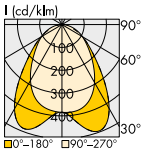
Single lens – 60° UGR



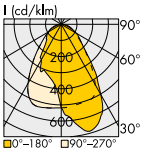
Single lens – 30°



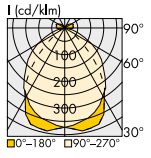
Single lens – Retail SYM 1



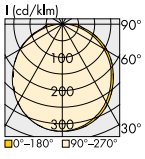
Single lens – Retail SYM 2



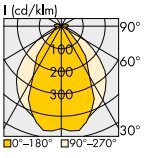
Single lens – Retail ASYM



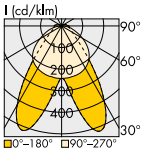
Tunnel lens – 90°



Tunnel lens – 90° TL



Tunnel lens – 60°



Tunnel lens – Retail SYM 1

LIGHTING SOLUTIONS
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 Line SMD Easy – L14/28/56 W2

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 luminair 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 in life!!!

- 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 sould 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 countersank 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.
- 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: ± 7%
  - voltage: ± 3%
  - CRI: ± 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
- 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

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

pending (except WU-M-622)

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). We will be happy to send you these conditions upon request.

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