

LED LINE FIX LUGA 2016

LIGHTING MODULES WITH
HOLDER AND COVER



LED LINE FIX LUGA 2016

LED Line Fix LUGA consists of an energy-efficient linear COB module, a holder with various attachment options and a cover. The module was designed for integration into indoor luminaires providing direct or indirect light.

The fast, safe and flexible adhesive-based, click on (ZHAGA-compliant L28/L56W4 hole spacing) or screw-based options for fixing the module within the luminaire constitute an ideal solution for linear lighting applications.

The light module forms a single unit consisting of a holder made of a thermoconductive polymer plus a clear or diffuse cover that protects the LED module and electrically isolates it from the luminaire.

The diffuse cover reduces glare and distributes light in a similar manner to a fluorescent lamp.

Typical applications

- Office and school lighting
- Retail lighting
- Industrial lighting
- For replacement of T5 and T8 lamps



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Technical notes LUGA Line module

On-board push terminal system: Electrical connection with lateral connection leads 28AWG

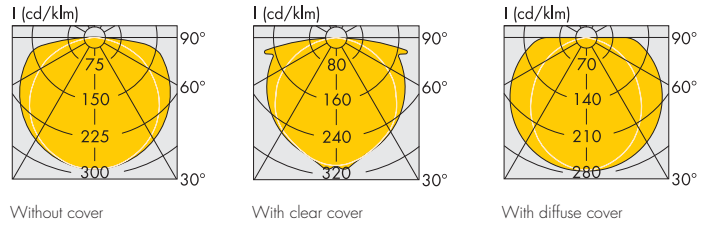
Allowed operating temperature at t_c point:
-40 to 85 °C

Efficiency up to 163 lm/W

Colour rendering index R_a : > 80

Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM

Lumen maintenance L90/B10:
50,000 hrs. (If 700 mA)



Optical characteristics

at $t_p = 65$ °C

The specified values apply only to the version of the LED module without a cover.

The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

Type	Number of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})*								Beam angle °	Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
280 mm				$P_{el} = 5.2$ W $U_{typ.} = 14.9$ V		$P_{el} = 7.9$ W $U_{typ.} = 15.7$ V		$P_{el} = 11.7$ W $U_{typ.} = 16.7$ V		$P_{el} = 19.3$ W $U_{typ.} = 18.3$ V			
DML059C27FC	45	warm white	2700	770	148	1080	137	1470	126	2105	109	120	82
DML059C30FC	45	warm white	3000	800	154	1120	142	1530	131	2185	113	120	82
DML059C40FC	45	neutral white	4000	850	163	1185	150	1625	139	2325	120	120	84
560 mm (2 wired LED modules per holder)				$P_{el} = 10.4$ W $U_{typ.} = 29.8$ V		$P_{el} = 15.8$ W $U_{typ.} = 31.4$ V		$P_{el} = 23.4$ W $U_{typ.} = 33.4$ V		$P_{el} = 38.6$ W $U_{typ.} = 36.6$ V			
DML059C27FC	2x45	warm white	2700	1540	148	2160	137	2940	126	4210	109	120	82
DML059C30FC	2x45	warm white	3000	1600	154	2240	142	3060	131	4370	113	120	82
DML059C40FC	2x45	neutral white	4000	1700	163	2370	150	3250	139	4650	120	120	84

* Production tolerance of luminous flux, efficiency, voltage and power consumption: $\pm 10\%$

Reference numbers – Module length: 280 mm

Fixing Cover	For tape fixing – type: 89300			For screw fixing – type: 89301			For clip fixing – type: 89302	
	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
DML059C27FC	563773	563776	563779	563784	563787	563790	563794	563798
DML059C30FC	563774	563777	563780	563785	563788	563791	563796	563799
DML059C40FC	563775	563778	563781	563786	563789	563792	563797	563800

Reference numbers – Module length: 560 mm (2 wired LED modules per holder)

Fixing Cover	For tape fixing – type: 89350			For screw fixing – type: 89351			For clip fixing – type: 89352	
	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
DML059C27FC	563801	563804	563807	563810	563813	563816	563819	563822
DML059C30FC	563802	563805	563808	563811	563814	563817	563820	563823
DML059C40FC	563803	563806	563809	563812	563815	563818	563821	563824

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LED Line Fix LUGA 2016 – 280 mm

Technical notes LED Line Fix holder

Holder material: thermo-conductive resin
Lead exit: lateral or base wiring
When joining linear modules in a row, a minimum clearance of 1 mm between the fixing units must be observed due to thermal expansion.
The LED modules of versions with a cover are already fully wired. Additional connectors must be ordered separately for versions without a cover.

LED Line Fix LUGA for tape fixing

Without cover

Dimensions (LxWxH): 280x23.2x4.5 mm
With base thermal tapes pre-assembled
Weight: 43 g, packaging unit: 4 pcs.
Type: 89300, drawing A

With cover

Degree of protection: IP40
Dimensions (LxWxH): 284x23.2x16.1 mm
With base thermal tapes pre-assembled
Weight: 67 g, packaging unit: 4 pcs.
Type: 89300, drawing B

LED Line Fix LUGA for screw fixing

Without cover

Dimensions (LxWxH): 280x40x4.5 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 43 g, packaging unit: 4 pcs.
Type: 89301, drawing C

With cover

Degree of protection: IP40
Dimensions (LxWxH): 284x40x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 67 g, packaging unit: 4 pcs.
Type: 89301, drawing D

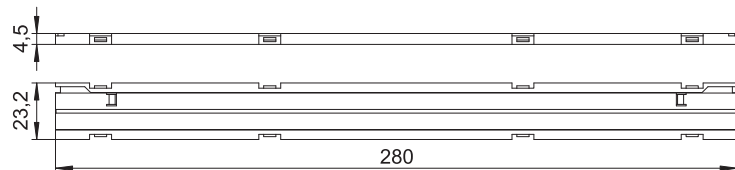
LED Line Fix LUGA for clip fixing

With cover

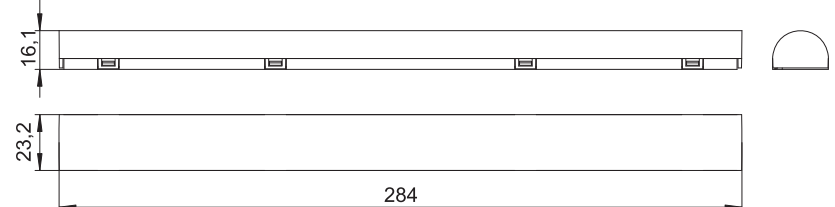
Degree of protection: IP40
Dimensions (LxWxH): 284x23.2x16.1 mm
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes pre-assembled
Weight: 67 g, packaging unit: 4 pcs.
Type: 89302, drawing E



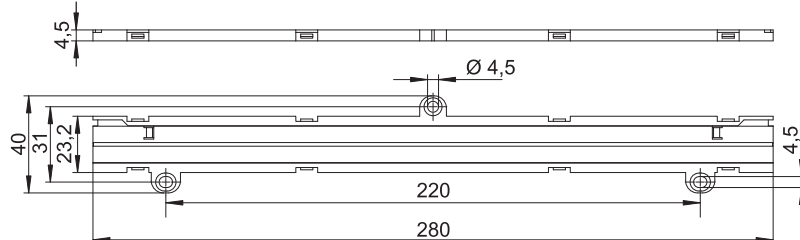
A – For tape fixing – type 89300 – LED Line Fix LUGA 2016 – 280



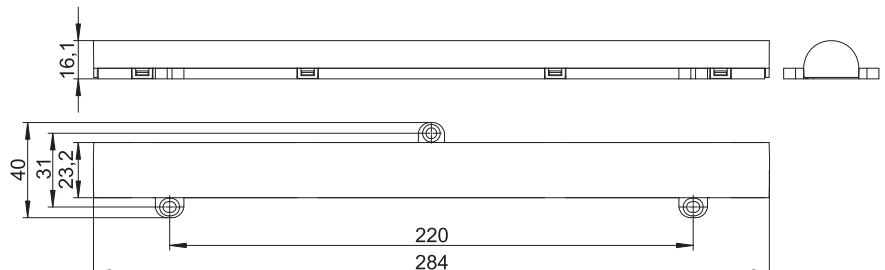
B – For tape fixing – type 89300 – LED Line Fix LUGA 2016 – 280



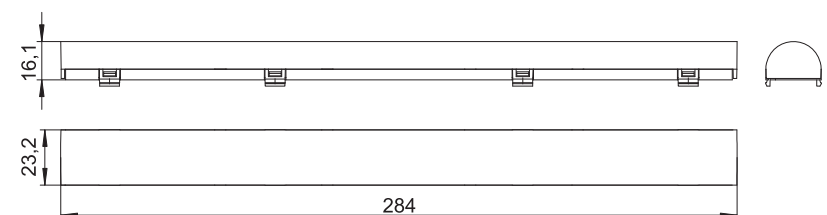
C – For screw fixing – type 89301 – LED Line Fix LUGA 2016 – 280



D – For screw fixing – type 89301 – LED Line Fix LUGA 2016 – 280



E – For clip fixing – type 89302 – LED Line Fix LUGA 2016 – 280



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LED Line Fix LUGA 2016 – 560 mm

Technical notes LED Line Fix holder

Holder material: thermo-conductive resin
Lead exit: lateral or base wiring
When joining linear modules in a row, a minimum clearance of 1 mm between the fixing units must be observed due to thermal expansion.
The LED modules of versions with a cover are already fully wired. Additional connectors must be ordered separately for versions without a cover.

LED Line Fix LUGA for tape fixing

Without cover
Dimensions (LxWxH): 561x23.2x4.5 mm
With base thermal tapes pre-assembled
Weight: 86 g, packaging unit: 4 pcs.
Type: 89350, drawing F

With cover
Degree of protection: IP40
Dimensions (LxWxH): 565x23.2x16.1 mm
With base thermal tapes pre-assembled
Weight: 135 g, unit: 4 pcs.
Type: 89350, drawing G

LED Line Fix LUGA for screw fixing

Without cover
Dimensions (LxWxH): 561x40x4.5 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 86 g, packaging unit: 4 pcs.
Type: 89351, drawing H

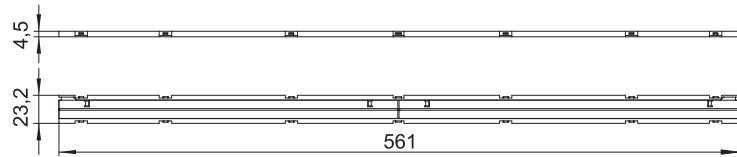
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565x40x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 135 g, packaging unit: 4 pcs.
Type: 89351, drawing J

LED Line Fix LUGA for clip fixing

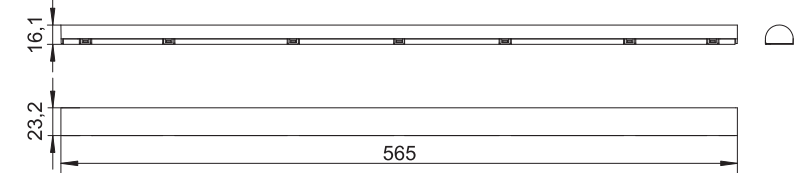
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565x23.2x16.1 mm
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes pre-assembled
Weight: 135 g, packaging unit: 4 pcs.
Type: 89352, drawing K



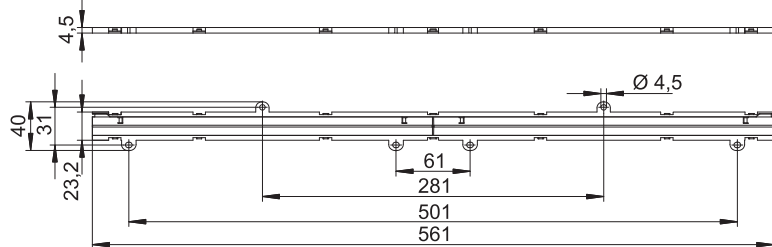
F – For tape fixing – type 89350 – LED Line Fix LUGA 2016 – 560



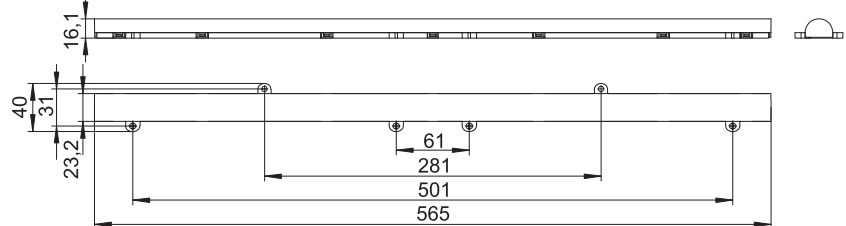
G – For tape fixing – type 89350 – LED Line Fix LUGA 2016 – 560



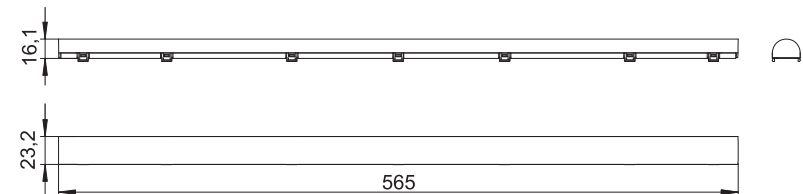
H – For screw fixing – type 89351 – LED Line Fix LUGA 2016 – 560



J – For screw fixing – type 89351 – LED Line Fix LUGA 2016 – 560



K – For clip fixing – type 89352 – LED Line Fix LUGA 2016 – 560



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Covers

Technical notes LED Line Fix cover

Material: PC, clear or diffuse
Efficiency covers: clear 97%, diffuse 90%

Covers for LED Line Fix for tape and screw fixing

For type: 89300/89301, LED Line Fix 280 mm

Ref. No.: 549585 clear

Ref. No.: 549586 diffuse

For type: 89350/89351, LED Line Fix 560 mm

Ref. No.: 550912 clear

Ref. No.: 550913 diffuse

Covers for LED Line Fix for clip fixing

Longer fixing clips of cover for fixing the holder into the luminaire sheet

For wall thickness 0.4–1 mm

For type: 89302, LED Line Fix 280 mm

Ref. No.: 549994 clear

Ref. No.: 549995 diffuse

For type: 89352, LED Line Fix 560 mm

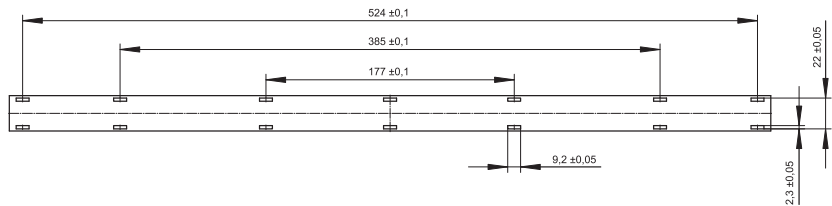
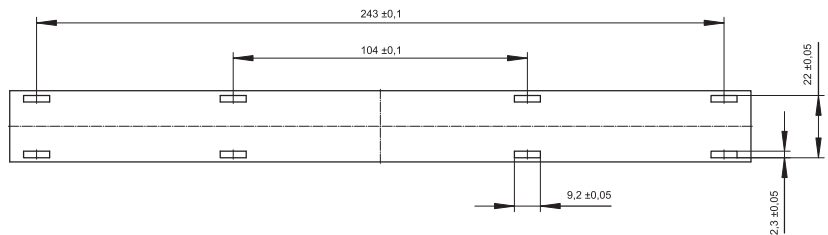
Ref. No.: 550914 clear

Ref. No.: 550915 diffuse



Luminaire cut-outs for clip fixing

For type 89302 – LED Line Fix 280 mm



Connectors

Other lead lengths on request

Feed-in connector

Feed in connector for power supply

Colour: – black / + white

Max. permissible current: 1.5 A

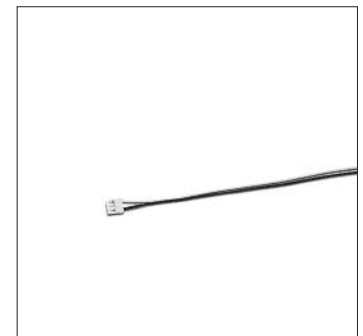
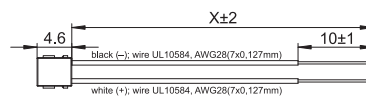
Number of strands: 2

(Strand diameter: 0.09 mm²/AWG28)

Type: 893

Ref. No.: 551131 X = 310 mm

Ref. No.: 550952 X = 610 mm



PCB-PCB connector

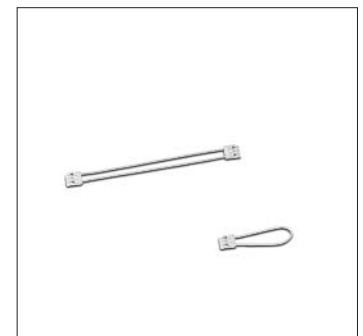
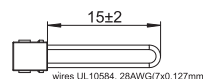
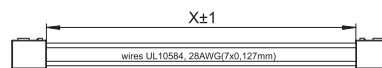
Max. permissible current: 1.5 A

Type: 893

Ref. No.: 551129 X = 43 mm

Ref. No.: 549993 X = 61 mm

Ref. No.: 549992 X = 220 mm



End connector

Type: 893

Ref. No.: 551132

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LED Constant Current Drivers

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

Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. The LED Line Fix 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 fixing units, fire and/or other hazards.

- ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED Line Fix. 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 fixing units 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").
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- Power supply units must be used for operation, in which the following protective measures are ensured:
 - Short-circuit protection
 - Overload protection
 - Overheating protection
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- For interconnection of the LED modules three different connectors are available:
 - Feed-in cable (Ref. No. 550952, 551131)
 - PCB-PCB-connector (Ref. No. 551129, 549992, 549993)
 - End-connector (Ref. No. 551132)Connectors with other lead lengths on request.

- Max. number of modules connected in series: 5
Please note that the 560 mm version already contains 2 LUGA Line 2016 modules.
- The following points must be observed when connecting LED fixing units in parallel:
 - All LED strings that are wired in parallel must contain the same number of LED Line Fix (symmetrical loading).
 - Owing to differing forward biases, there can be a difference of up to 10% in brightness between modules connected in parallel.
 - All modules that are wired in parallel must be thermally connected (same temperatures at all LED Line Fix).
- To ensure problem-free operation, the specified maximum temperature at the t_c 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.
- Products equipped with adhesive transfer tape must only be applied to dry and clean surfaces that are free from grease, oil, silicone or other soiling. It is therefore recommended to clean the substrate with isopropyl alcohol (IPA). Please ensure a full-surface bond over the entire contact area when sticking the module to the substrate. The following substances are regarded as critical for creating an adhesive bond:
 - Polyefins (polyethylene, polypropylene)
 - Rubber
 - Powder-coated materials
 - Silicone rubber
 - TeflonOwing to the varying application options and different types of surface as well as ambient conditions, VS accepts no liability for the quality of the adhesive bond achieved when mounting these products. Prior to sticking a VS product care must be taken to check whether the material in question is actually suitable for the intended purpose under consideration of all possible application-relevant influences.
- M4 screws are required to fix the holder for the screw fitting (countersunk screws must not be used for this purpose). A torque of 0.6–0.7 Nm is recommended. Plate thicknesses of 0.4–1 mm are permissible for fixing the clip fitting.

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Assembly and Safety Information

- To avoid damage during subsequent mounting of a cover, care must be taken that cables are fed through the special slits provided at the front of the holders.
- If an adhesive pad is additionally fixed to the bottom of the holder of the screw fixing, care must be taken to reduce the torque since the holder could otherwise be damaged.
- When linking up the linear LED Line Fix in a row, care must be taken to ensure that the module connections are always on the same side and are not crossed.
- In the event of outdoor applications or applications in damp locations, care must be taken to protect LED Line Fix 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. Linear LED Line Fix with a cover feature an IP40 degree of protection. 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 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 photobiological safety of the LED Line Fix must be classified into risk groups in accordance with EN 62471: 2008.
 - general lighting: exempt group
 - other applications: exempt group

Further detailed safety and installation instructions on VS LED modules and LED drivers can be found in the product data sheets at www.vossloh-schwabe.com.

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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