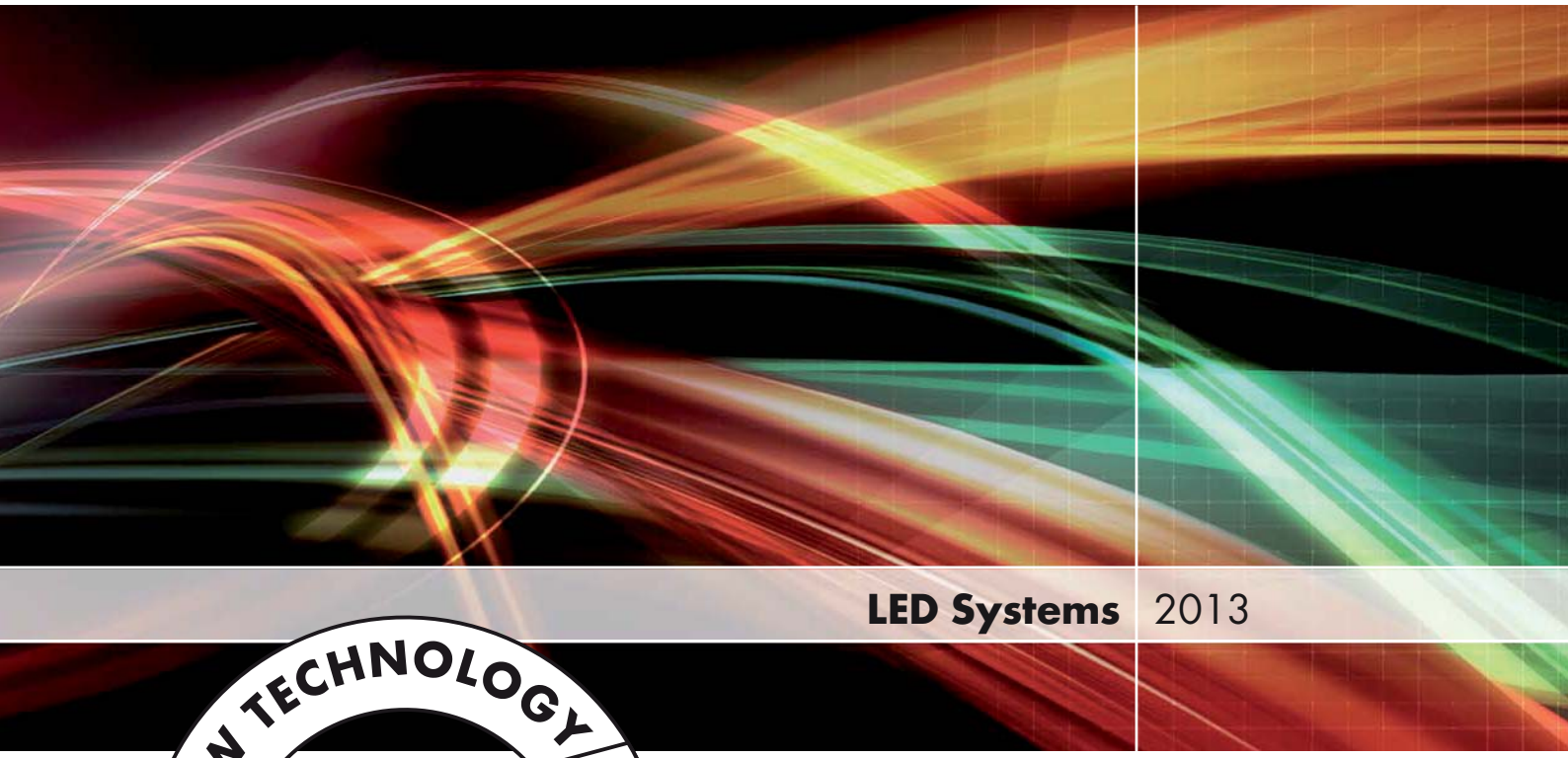
VOSSLOH SCHWABE



LED Systems 2013

NEW TECHNOLOGY
LED
HIGH QUALITY

LED lamps
Replacement for low-voltage and mains voltage halogen incandescent lamps

Constant-current systems
LED modules, constant-current drivers and connecting technology

LED modules for direct connections to mains voltage

DecoLEDs and LEDSpots

24 V LED systems
LED modules, converters, colour control units and connecting technology

Thermally Conductive Transfer Tapes

LIGHTING TECHNOLOGY PRODUCTS





Vossloh-Schwabe is not merely a manufacturer of top-quality components for the lighting industry, but above all makes a competent and innovative contribution to setting market trends in the field of LED lighting.

Numerous VS project solutions implemented on the basis of entire LED systems are currently satisfying the high requirements placed on energy-efficient lighting all over the world.

Employing approximately 1000 people in more than 20 countries, Vossloh-Schwabe is represented all over the world. As a subsidiary of the Japanese Panasonic Group, VS can draw on extensive resources for R&D as well as for international expansion activities.

A highly motivated workforce, comprehensive market knowledge, profound industry expertise as well as eco-awareness and environmental responsibility show Vossloh-Schwabe to be a reliable partner for the provision of optimum and cost-effective LED lighting solutions.
But Vossloh-Schwabe naturally also continues to provide all components needed in the field of conventional lighting technology.

Vossloh-Schwabe's dedication to delivering superior quality is reflected in its ISO 9001 certification.

Vossloh-Schwabe is ready to embark on a collaborative journey into an economically illuminated LED future.

Fullerton Bay Hotel, Singapore
VS products: LEDLine Flex modules encapsulated in aluminium profile
Photo: Vossloh-Schwabe



Sagrada Família



Warehouse

Sagrada Família, Barcelona

As different as each of the façades of the Sagrada Família are, they do have something in common: each is supremely symbolic. Rather than merely enclose space with walls, Gaudi intended his buildings to tell stories and be an experience in themselves. Gaudi's vision is now slowly being put into practice along with a number of additional modern elements, for instance the decision to use innovative lighting technology in the form of LED spots to perfectly set off the basilica's sacral symbolism.

The interior of the basilica, which has already been completed, soars up to an enormous vault supported by stone columns that branch off at the ceiling to form a lace-like canopy. At present these columns are fitted with a total of 40 luminaires, which in turn are equipped with daylight-white LED modules and matching control gear made by Vossloh-Schwabe.

Interior photos: José Tío
Consulting and luminaire design: Anoche Iluminación Arquitectónica
Glass artist: D. Fita

LiCS – The DALI Light Management System

More than ever before, present-day light management is expected to be flexible, save energy and be convenient to operate. The new all-round system made by Vossloh-Schwabe, consisting of a light controller, sensor, extender and push buttons, can be programmed without needing a PC or overriding bus system. Instead, the entire lighting system is configured using the controller's integrated display screen and rotary push key.

The DALI-based system can be used to control a max. of 64 luminaires, or luminaire groups, 6 independently configurable standard buttons and up to 16 MultiSensors using a single controller. By connecting an extender, the lighting system can then be extended by up to 64 luminaires per extender. The controller can be mounted on a 35-mm mounting rail. The wireless version of the controller (LW) substantially reduces the installation work required during refurbishment and with that also reduces installation costs. Up to 16 wireless modules can be connected, each with 4 independently configurable radio buttons.

Thanks to the VS LiCS system, the energy consumed by a warehouse (1,320 m², ceiling height of 7 m) can be almost halved from approx. 20,500 kWh p.a. down to 11,500 kWh p.a. by installing 169 luminaires 1x 49 W, a DALI-compliant electronic ballast and MultiSensors. Creating luminaire groups as well as positioning light- and motion-activated Multi-Sensors additionally provide the comfort and convenience of optimum light – any time you need it. If the sensor fails to register any movement, LiCS will switch the lighting system off, either in its entirety or only in certain sections, or dim it down to the specified minimum value. This removes the need to switch the lighting system on and off manually.

LED SYSTEM

LED MODULES, OPERATING DEVICES AND CONNECTING TECHNOLOGY





SYSTEMS AND COMPONENTS FOR LIGHTING APPLICATIONS WITH LEDs

Thanks to the characteristics and advantages of LED modules over conventional light sources, there is almost no limit to the ways in which LED modules can be used, and new applications are being found on a continuous basis.

The usefulness of LED modules stretches from architecture and furniture design right through to creating atmospheric lighting in homes, shops, bars and restaurants. LED modules can be integrated into existing lighting systems or integrated into the respective application as a separate light source. These LED modules are dimmable if used with a suitable LED ballast and a matching control unit.

Vossloh-Schwabe develops and manufactures LED modules in different performance classes and shapes on the basis of COB and SMD technology with a comparably minimal decrease in luminous flux over a module's service life and with extremely high colour stability.

The DigiLED series makes a high-performance range of colour-control modules for polychromatic control of LED modules using RGB technology available to users. The digital technology and user-friendly interfaces guarantee LED lighting is simple to use.

Vossloh-Schwabe's high-quality electronic LED control gear, which is available in various performance classes and designs, is designed to supply power to voltage- and constant-current-operated LED applications.

Vossloh-Schwabe's range of LED lighting systems and components is rounded off by connection components for integrating LED modules into lighting applications. Different joining elements to match the individual LED modules guarantee simple, low-cost and soldering-free assembly.

Torre Agbar, Barcelona
VS products: LED module 3000 K and LiCS Indoor
Photo: José Tío

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LED System Overview by Application Fields



LED modules


Roadway Light ME/S


Roadway Light ME/S Linear


Roadway Light ME 2x2


SMD 7000/10000 lm


LUGA 7000/10000 lm

LED constant current drivers

350 to 700 mA, 400/700 mA
42 to 150 W, IP20, IP66, IP67 versions,
1- or 2-channel version





LED modules


High Power 24 V CA
White / RGB


LEDLine Flex SMD
Professional
Indoor and Outdoor
White / RGB

LED colour control

DigiLED-Serie



LED converters

24 V, 50 to 130 W
IP20 and IP67





LED modules


Industrial Light
SYM I & SYM II


Industrial Light
SYM I & SYM II – Linear


Industrial Light
SYM I & SYM II – 2x2


SMD 2500–10000 lm


LUGA 7000/10000 lm

LED constant current drivers

350 to 700 mA, 400/700 mA
42 to 150 W, IP20, IP66, IP67 versions,
1- or 2-channel version





LED modules


LUGA Line HO


LED Line Fix
LUGA / SMD

LED constant current drivers

350 mA, 500/700 mA,
15 to 80 W
Standard and DALI,
1- or 2-channel version





LED modules


LUGA Shop 2013
2000 lm to 5000 lm
CRI > 80, CRI > 90




LUGA Shop Food

LED constant current drivers

700 to 1050 mA, 34 to 60 W
Standard and DALI,
with/without 12 V interface





LED modules – with mains connection


For direct connection to mains voltage

LED modules


PowerEmitter XP/XML,
TriplePowerEmitter XP


LEDSpots with heat sink,
with and without frame

LED constant current drivers

350 to 1050 mA, 8 to 22.4 W



System Overview for Voltage Driven LED Modules

LED modules
220–240 V



For direct connection to mains voltage without additional operating device

LED modules
24 V / CA



LEDLine Flex SMD Professional RGB/Mono Indoor/Outdoor



High Power 24 V CA White/RGB – Line



High Power 24 V CA White/RGB – Triple and Flood



AluLED IP20 / IP64

LED colour control
24 V CA

DigiLED series



Manual



Wireless IR



DALI



DMX



RF



Push



Mono

Slaves



Active



Passive



Passive PCB

LED converters

24 V DC



EDXe 120, 20 W



Built-in / independent:
EDXe 150, 50 W
EDXe 170, 70 W
EDXe 1130, 130 W



IP67:
EDXe 170, 70 W
EDXe 1130, 130 W

12 V DC



EDXe 112, 12 W



Built-in / independent:
EDXe 150, 50 W
EDXe 170, 70 W



IP67:
EDXe 170, 70 W

System Overview for Current Driven LED Modules

LED modules

350...1050 mA



PowerEmitter XP-G/XML



LUGA Shop 2013
2000 lm – 5000 lm

400...1050 mA



Roadway Light / Industrial Light SYM

500...1050 mA



LUGA Shop 2013
HE 5000 lm

700...1050 mA



LUGA Shop Food



Streetlight FlatEmitter LUGA

350...700 mA



PowerEmitter XP-E / TriplePowerEmitter



LUGA Industrial
10000 lm



LEDSpot ActiveLine
LUGA 1000 /
Quad / Triple
ActiveLine PRO



LEDSpot EffectLine /
LEDSpot DiscLine



LEDSpot IPLine IP54,
LEDSpot SmartLine

400...700 mA



Streetlight FlatEmitter
SMD 2500–10000 lm

350...500 mA



PowerEmitter XP-C



LUGA Line HO – 48 LED



LED Line Fix



LEDSpot ActiveLine 900,
ActiveLine PRO 900

350 mA



LEDSpot ActiveLine
800/600
ActiveLine PRO
800/600



LEDSpot EffectLine /
LEDSpot StartLine

LED constant current drivers LEDLine

350 mA



8 W

11 W

15 W

19.6 W

42 W

75 W, optional:
DALI

500 mA

16 W

20 W

700 mA

17 W

22.4 W

34 W, DALI

40 W

40 W, optional:
12 V interface,
DALI

75 W, 1–10 V,
IP67

1050 mA

20 W

60 W

60 W, optional:
12 V interface,
DALI

2x350 mA

40 (2x20) W

2x700 mA

150 W, 1–10 V,
IP67

Adjustable constant current drivers

700/400 mA

150 W, IP20/IP66

500/700 mA

80 (2x40) W

350, 500, 600, 700 mA

40 W, 1–10 V

LED LAMPS

MR16, AR111, PAR30, PAR38, GU10





LED – THE GREEN FUTURE LIGHTING

LEDs contain no mercury and are low on energy consumption, as a result of which they lead the field when it comes to "green lighting". Thanks to their eco-friendly properties, they can make a valid contribution to reducing your carbon footprint and countering the greenhouse effect. Moreover, LEDs start instantaneously at full brightness and are available in many colours.

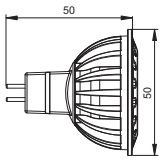
In addition to providing UV- and IR-free light, LEDs are vibration-proof and have a very long service life that further increases the overall efficiency of any lighting system. As LED lamps are now powerful enough to replace both incandescent and low-voltage halogen lamps, they are becoming increasingly popular beyond the field of decorative lighting.

LED Lamps

Replacement for low-voltage incandescent lamps

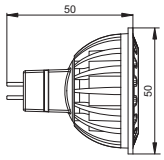
Suitable for 12 V AC magnetic transformers and
12 V DC electronic drivers
Not suitable for 12 V AC electronic converters

MR16, 4 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 12 V AC/DC
Not dimmable
Base: GU5.3





MR16, 6 W
Operating temperature: –30 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 12 V AC/DC
Not dimmable
Base: GU5.3





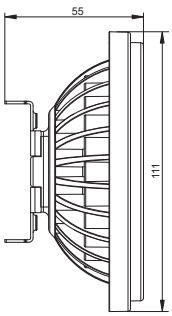
Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Typ. luminous flux lm	Light intensity cd	Beam angle °	Power W
MR16, 4 W								
MR16-4-2700-38-II	**549093**	warm white	2700	≥ 80	170	1300	38	4
MR16-4-3000-38-II	**549094**	warm white	3000	≥ 80	190	1500	38	4
MR16-4-4000-38-II	**549095**	neutral white	4000	≥ 75	200	1700	38	4
MR16-4-6000-38-II	**549096**	cool white	6000	≥ 70	240	1900	38	4
MR16, 6 W								
MR16-6-2700-58-II	**549097**	warm white	2700	≥ 80	300	1050	58	6
MR16-6-3000-58-II	**549098**	warm white	3000	≥ 80	330	1100	58	6
MR16-6-4000-58-II	**549099**	neutral white	4000	≥ 75	360	1150	58	6
MR16-6-6000-58-II	**549100**	cool white	6000	≥ 70	390	1200	58	6
MR16-6-2700-70-II	**549101**	warm white	2700	≥ 80	300	750	70	6
MR16-6-3000-70-II	**549102**	warm white	3000	≥ 80	330	800	70	6
MR16-6-4000-70-II	**549103**	neutral white	4000	≥ 75	360	850	70	6
MR16-6-6000-70-II	**549104**	cool white	6000	≥ 70	390	900	70	6

LED Lamps

Replacement for low-voltage incandescent lamps

Suitable for 12 V AC magnetic transformers and
12 V DC electronic drivers
Not suitable for 12 V AC electronic converters

AR111, 12 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 12 V AC/DC
Not dimmable
Base: G53



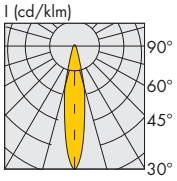


Type	Ref. No.	Colour	Colour temperature K	CRI R_a	Typ. luminous flux lm	Light intensity cd	Beam angle °	Power W
AR111-12-2700-38-II	**566031**	warm white	2700	≥ 80	450	3000	38	12
AR111-12-3000-38-II	**566032**	warm white	3000	≥ 80	500	3350	38	12
AR111-12-4000-38-II	**566033**	neutral white	4000	≥ 75	550	3800	38	12
AR111-12-6000-38-II	**566034**	cool white	6000	≥ 70	680	4800	38	12
AR111-12-2700-60-II	**566035**	warm white	2700	≥ 80	450	900	60	12
AR111-12-3000-60-II	**566036**	warm white	3000	≥ 80	500	1000	60	12
AR111-12-4000-60-II	**566037**	neutral white	4000	≥ 75	550	1100	60	12
AR111-12-6000-60-II	**566038**	cool white	6000	≥ 70	680	1360	60	12

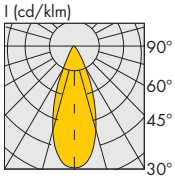
Typical luminance of MR16 and AR111 at 1, 2 and 3 meters

Intensity (lux)															
Colour temperature K	**MR16, 4 W 38°**			**MR16, 6 W 58°**			**70°**			**AR111, 12 W 38°**			**60°**		
	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm White 2700 K	1300	325	145	1050	263	117	750	188	84	3000	750	335	900	225	100
Warm White 3000 K	1500	375	167	1100	275	122	800	200	88	3350	837	372	1000	250	111
Neutral White 4000 K	1700	425	189	1150	287	127	850	212	95	3800	950	422	1100	275	122
Cool White 6000 K	1900	475	211	1200	300	133	900	225	100	4800	1200	533	1360	340	151

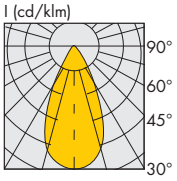
Typical light distribution curves



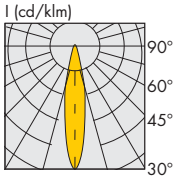
MR16, 4 W 38°



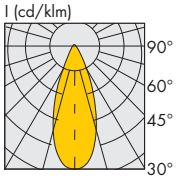
MR16, 6 W 58°



MR16, 6 W 70°



AR111, 12 W 38°



AR111, 12 W 60°

Electronic Converters for LED Lamps 12 V

You will find LED converters for the LED lamps MR16
and AR111 on page 100.

Important notice for LED lamps for replacement of low-voltage halogen incandescent lamps

- Unsuitable for use with electronic converters for halogen lamps. Only use magnetic transformers or LED converters
- Do not connect more than one unit to one transformer
- Do not use in ambient temperatures of more than 40 °C
- Unsuitable for installation in enclosed or airtight luminaires
- For indoor use only
- Unsuitable for use outdoors or in high-moisture environments
- Unsuitable for use with dimmers

Important notice for LED lamps for replacement of mains voltage incandescent lamps

- Unsuitable for operation with an additional driver
- Integrated high-frequency driver
- Do not use in ambient temperatures of more than 40 °C
- Unsuitable for installation in enclosed or airtight luminaires
- For indoor use only
- Unsuitable for use outdoors or in high-moisture environments
- Dimmable with phase-cut dimmers (E27 PAR lamps only); minimum dimmer load has to be respected.
  The compatibility of the lamp to the dimmer has to be confirmed prior to installation to avoid flickering and/or noises. VS PAR lamps are recommended to be used with LEGRAND Universal type 574008 or equivalent.

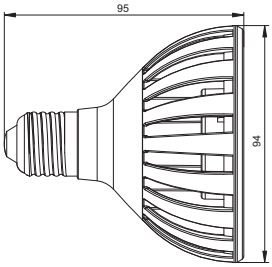
CAUTION
Always disconnect equipment from the mains before replacing lamps!

LED Lamps

With integrated driver for replacement of mains voltage halogen incandescent lamps

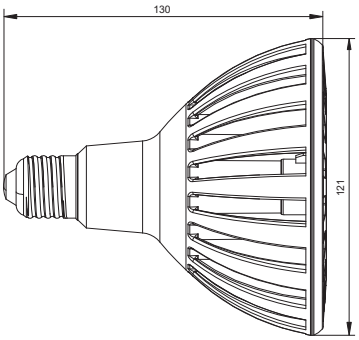
LED lamps made by Vossloh-Schwabe will fit most standard E27 bases. These low-power, high-brightness and highly eco-friendly lamps are sure to improve the overall efficiency of your lighting system.

PAR30, 12 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Dimming range: 20–100%
Base: E27





PAR38, 17 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Dimming range: 20–100%
Base: E27



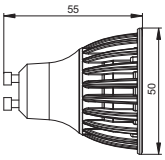


Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Typ. luminous flux lm	Light intensity cd	Beam angle °	Power W
PAR30, 12 W								
PAR30-12-2700-38-II	**549107**	warm white	2700	≥ 80	420	3320	38	12
PAR30-12-3000-38-II	**549108**	warm white	3000	≥ 80	460	3670	38	12
PAR30-12-4000-38-II	**549109**	neutral white	4000	≥ 75	570	4530	38	12
PAR30-12-6000-38-II	**549110**	cool white	6000	≥ 70	680	5400	38	12
PAR30-12-2700-60-II	**549111**	warm white	2700	≥ 80	420	980	60	12
PAR30-12-3000-60-II	**549112**	warm white	3000	≥ 80	460	1200	60	12
PAR30-12-4000-60-II	**549113**	neutral white	4000	≥ 75	570	1325	60	12
PAR30-12-6000-60-II	**549114**	cool white	6000	≥ 70	680	1580	60	12
PAR38, 17 W								
PAR38-17-2700-38-II	**549131**	warm white	2700	≥ 80	560	4425	38	17
PAR38-17-3000-38-II	**549133**	warm white	3000	≥ 80	630	5000	38	17
PAR38-17-4000-38-II	**549134**	neutral white	4000	≥ 75	720	5700	38	17
PAR38-17-6000-38-II	**549136**	cool white	6000	≥ 70	790	6300	38	17
PAR38-17-2700-60-II	**549138**	warm white	2700	≥ 80	560	1350	60	17
PAR38-17-3000-60-II	**549140**	warm white	3000	≥ 80	630	1500	60	17
PAR38-17-4000-60-II	**549141**	neutral white	4000	≥ 75	720	1770	60	17
PAR38-17-6000-60-II	**549142**	cool white	6000	≥ 70	790	1900	60	17

LED Lamps

With integrated driver for replacement of mains voltage halogen incandescent lamps

GU10, 6 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Not dimmable
Base: GU10



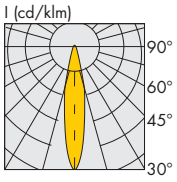


Type	Ref. No.	Colour	Colour temperature K	CRI R_a	Typ. luminous flux lm	Light intensity cd	Beam angle °	Power W
GU10-6-2700-50-II	**554575**	warm white	2700	≥ 80	260	1610	50	6
GU10-6-3000-50-II	**566028**	warm white	3000	≥ 80	290	1800	50	6
GU10-6-4000-50-II	**566029**	neutral white	4000	≥ 75	350	2170	50	6
GU10-6-6000-50-II	**566030**	cool white	6000	≥ 70	390	2420	50	6

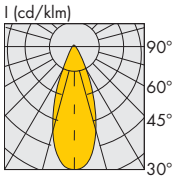
Typical luminance of PAR30, PAR38 and GU10 at 1, 2 and 3 meters

Intensity (lux)															
Colour temperature K	**PAR30, 12 W**						**PAR38, 17 W**						**GU10, 6 W**		
	38°			**60°**			**38°**			**60°**			**50°**		
	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm White 2700 K	3320	830	369	980	245	109	4425	1105	491	1350	338	150	1610	400	180
Warm White 3000 K	3670	918	408	1200	300	133	5000	1250	566	1500	375	167	1800	450	200
Neutral White 4000 K	4530	1133	503	1325	331	147	5700	1425	633	1770	443	197	2170	542	241
Cool White 6000 K	5400	1350	600	1580	395	176	6300	1575	700	1900	475	211	2420	605	268

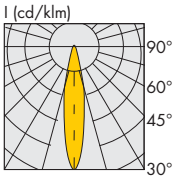
Typical light distribution curves



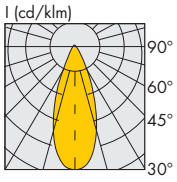
PAR30, 12 W 38°



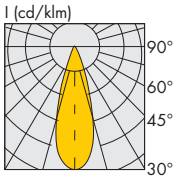
PAR30, 12 W 60°



PAR38, 17 W 38°



PAR38, 17 W 60°



GU10, 6 W 50°

CONSTANT CURRENT LED MODULES, DRIVERS AND ACCESSORIES





The LED modules dealt with in this chapter are constant-current-operated, built-in modules whose circuit board does not feature its own power-supply electronics. Circular and linear modules featuring various chip types are available.

Ensuring constant-current control of LED modules benefits permanent operation, efficiency (lm/Watt) and the service life of LEDs. Constant-current control is particularly important for high-performance LEDs, as a module brightness of up to 10,000 lm can be achieved.

Various brightness levels can be set by selecting the requisite operating current (350 mA, 500 mA, 700 mA, 1050 mA). In this regard, the maximum admissible current must never be exceeded and heat development must be monitored.

Typical applications

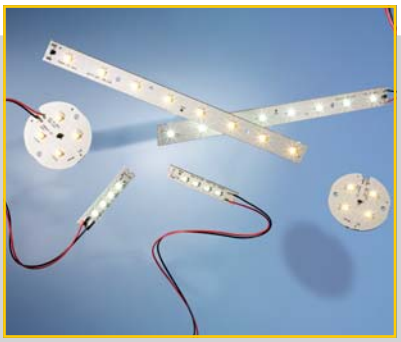
- Installation in luminaires for general lighting purposes
- Residential lighting
- Reading lamps and spots
- Entertainment
- Retail lighting
- Architectural lighting
- Street lighting

Supermarket Migros, Lucerne
VS products: LED module LUGA Shop 5500 lm, linear LUGA Line modules and linear LED driver

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

Please read the safety and installation instructions on the individual products as well as further technical information provided in the extensive product descriptions at **www.vossloh-schwabe.com.**





Constant-current LED modules for all applications

Vossloh-Schwabe's constant-current-operated LED modules are characterised by their extreme efficiency, long service life and colour brilliance. The extensive range of different designs and brightness levels results in a multitude of application options.

Whether they are used for indoor or outdoor applications: VS LED modules can be found as a decorative and functional lighting source in offices, homes, buildings and on our streets.
They are:
- highly efficient,
- characterised by a high CRI and
- extremely versatile.

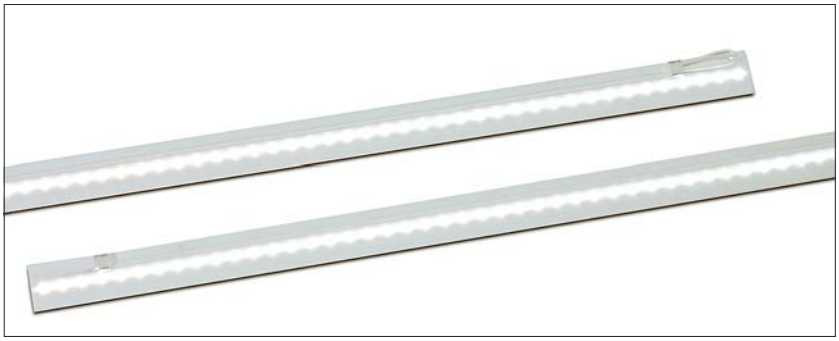
Constant-current drivers for current-operated LED modules

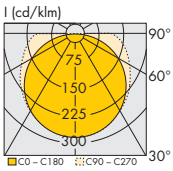
To ensure safe operation of LEDs that are connected in series, the operating current must be kept at a constant value by the ballast.

It is recommended to operate all high-performance LED modules in combination with an external constant-current driver.

To ensure the same current flows through every LED, high-performance LEDs can only be connected in series. For each respective application, the source of the constant-current must be selected to ensure the required current and sufficient voltage are supplied to the LED modules. The number of LED modules that can be connected to control gear is dependent on the forward bias of the respective modules.

LUGA Line HO





Built-in PCB lighting modules

The linear LED COB modules produce a very high lumen output. The flat, impact- and vibration-proof modules are available in warm white, neutral white and cool white; they can also be seamlessly connected (no gaps).

The ceramic PCB ensures optimum thermal management. Thanks to producing a homogeneous light field without any discernible individual light points, these LED modules are ideal for use in reflectors in luminaires constructed for T5 and T8 lamps.

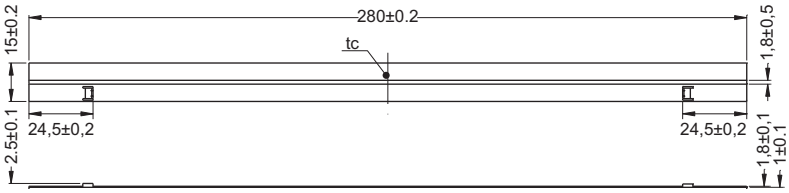
Technical notes

Dimensions: 280 x15 mm
On-board push terminal system
Allowed operating temperature at t_c point:
–40 to 85 °C
Use of external LED constant-current drivers required
Ceramic PCB for optimum thermal management
Colour rendering index R_a: min. 80
Colour accuracy initially: 3 SDCM per BIN;
after 50,000 hrs. operating time: 4 SDCM per BIN
ESD protection class 2
Packaging unit: 60 pcs.

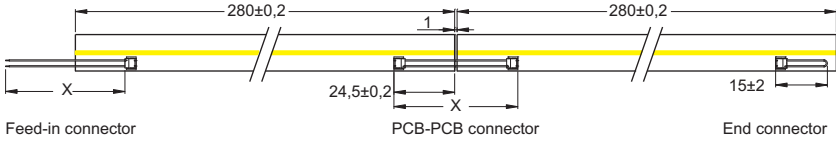
Typical applications

Office lighting
Shop design
T5/T8 replacement as built-in module
Furniture lighting

LUGA Line HO



Connection example

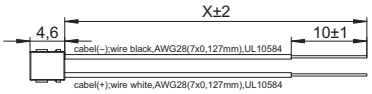


Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature*	Luminous flux* (lm) at 350 mA (P_{el} = 6.8 W)		500 mA (P_{el} = 10.3 W)		700 mA (P_{el} = 15.4 W)		Beam angle	CRI R_a	
		pcs.		K	min.	typ.	min.	typ.	min.	typ.	°	min.	typ.
LUGA Line HO with 48 LEDs													
DML62EL27LA	**549580**	48	warm white	2700 -75/+125	598	696	780	944	1045	1266	120	80	82
DML62EL30LA	**549581**	48	warm white	3000 -75/+165	624	737	816	1005	1095	1346	120	80	82
DML62EWLA	**549582**	48	neutral white	4000 -215/+185	686	784	882	1066	1195	1426	120	80	84
DML62ENLA	**550605**	48	cool white	5000 -200/+280	722	825	928	1122	1251	1507	120	80	84
DML62EDLA	**550164**	48	cool white	6500 -300/+400	696	799	908	1087	1216	1457	120	80	84

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 65 °C

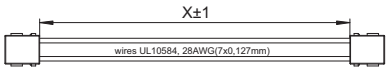
Accessories for LUGA Line Modules

Other lead lengths on request

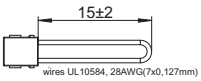




Feed-in connector
Feed in connector for power supply
Colour: – black
+ white
Max. permissible current: 1.5 A
Number of strands: 2
(Strand diameter: 0.09 mm²/AWG28))
Type: 893
Ref. No.: 551131 X = 310 mm
Ref. No.: 550952 X = 610 mm

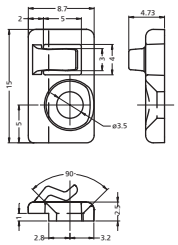






PCB–PCB connector
Max. permissible current: 1.5 A
Type: 893
Ref. No.: 551129 X = 43 mm
Ref. No.: 549993 X = 61 mm
Ref. No.: 549992 X = 220 mm

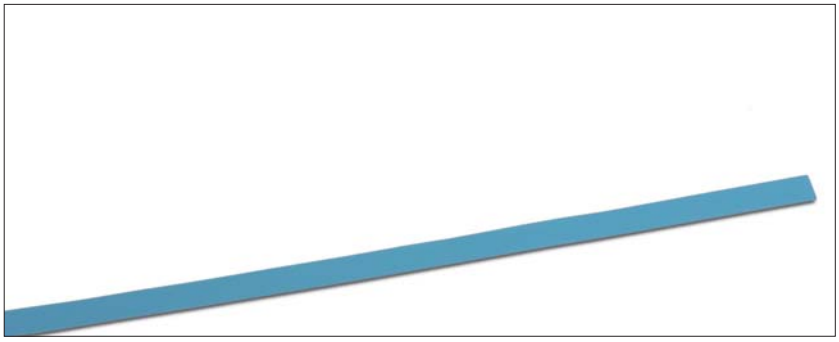
End connector
Type: 893
Ref. No.: 551132



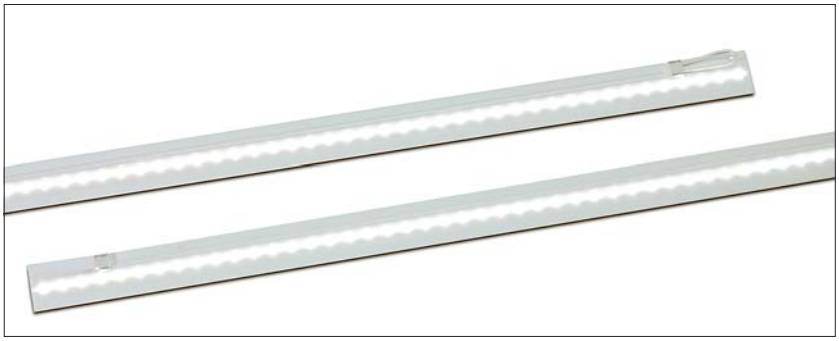


Plastic holder for LUGA Line modules
For fixing LUGA Line modules
Fixing hole for countersunk screw M3
With cable holder
Min. 2.5 pcs. per LUGA Line module needed
Ref. No.: 551039

Thermally conductive adhesive tape
Dimensions: 278×13 mm
Ref. No.: 548179



LED Line Fix LUGA HO



Equipped with LUGA Line LED modules

Technical notes LUGA Line modules

Dimensions: 280x15 mm
Driving current: up to 700 mA
Colour accuracy initially: 3 SDCM per BIN;
after 50,000 hrs. operating time: 4 SDCM per BIN

Electrical Characteristics

at t_c = 65 °C

Type	No. of LEDs	Voltage DC* (V) 350 mA min.	typ.	max.	500 mA min.	typ.	max.	700 mA min.	typ.	max.	Power consumption* (W) 350 mA min.	typ.	max.	500 mA min.	typ.	max.	700 mA min.	typ.	max.
For LED Line Fix LUGA HO 280 mm																			
All types	48	16.5	18	19.5	17.4	19	20.6	18.5	20.3	22	5.8	6.3	6.8	8.7	9.5	10.3	13	14.2	15.4
For LED Line Fix LUGA HO 560 mm (2 wired LED modules per holder)																			
All types	2x48	33	36	39	34.8	38	41.2	37	40.6	44	11.6	12.6	13.6	17.4	19	20.6	26	28.4	30.8

* Measurement tolerance: ± 3%

Use of external LED constant current driver with max. 700 mA required.

Maximum Ratings

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

Type	No. of LEDs	Operation temperature range °C min.	°C max.	Storage temperature range °C min.	°C max.	Max. current mA	Max. junction temperature °C
All types	48	-40	+85	-40	+100	1050	125

Optical Characteristics

at t_c = 65 °C

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

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

Type	No. of LEDs	Colour	Correlated colour temperature* K	Luminous flux* (lm) at 350 mA min.	typ.	500 mA min.	typ.	700 mA min.	typ.	CRI* R_a min.	typ.	Radiation angle* °
For LED Line Fix LUGA HO 280 mm												
DML62EL27LA	48	warm white	2700 -75/+125	598	696	780	944	1045	1266	80	82	120
DML62EL30LA	48	warm white	3000 -75/+165	624	737	816	1005	1095	1346	80	82	120
DML62EWLA	48	neutral white	4000 -215/+185	686	784	882	1066	1195	1426	80	84	120
For LED Line Fix LUGA HO 560 mm (2 wired LED modules per holder)												
DML62EL27LA	2x48	warm white	2700 -75/+125	1196	1392	1560	1888	2090	2532	80	82	120
DML62EL30LA	2x48	warm white	3000 -75/+165	1248	1474	1632	2010	2190	2692	80	82	120
DML62EWLA	2x48	neutral white	4000 -215/+185	1372	1568	1764	2132	2390	2852	80	84	120

* Measurement tolerance: ± 3% | Colour temperatures 3500 K, 5000 K and 6500 K available on request.

LED Line Fix LUGA HO

Equipped with LUGA Line LED modules
Consisting of at least one energy-efficient LED line module, a thermally conductive basic holder and an optional cover, this LED Line Fix constitutes an ideal way of facilitating direct conversion to modern LED technology.

Enabling fast, reliable and flexible fixing inside the luminaire via
- adhesive tape,
- clip fitting or
- screw fitting (Zhaga-compliant),

the unit constitutes an ideal solution for indoor linear lighting applications

100% of the efficiency levels of the LUGA Line HO modules can be achieved when using no cover;
with transparent cover: 97%,
with opaque cover: 90%



Typical Applications
Built-in luminaires/general illumination
- Office and school lighting
- Retail lighting
- Furniture lighting
- For replacement of T5 and T8 lamps

LED Line Fix LUGA HO 280 mm – Type: 89300 / 89301 / 89302

Fixing	**For tape fixing** - Type: 89300			**For screw fixing** - Type: 89301			**For clip fixing** - Type: 89302	
Cover	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
Drawing	A	B	B	C	D	D	E	E
LED module type	Ref. No. LED Line Fix							
DML62EL27LA	**550791**	**550794**	**550797**	**550801**	**550804**	**550807**	**550810**	**550813**
DML62EL30LA	**550792**	**550795**	**550798**	**550802**	**550805**	**550808**	**550811**	**550814**
DML62EWLA	**550793**	**550796**	**550799**	**550803**	**550806**	**550809**	**550812**	**550815**

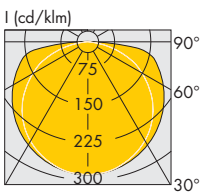
Packaging unit: 4 pcs.

LED Line Fix LUGA HO 560 mm (2 wired LED modules per holder) – Type: 89350 / 89351 / 89352

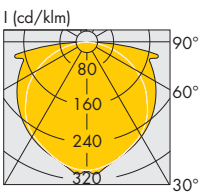
Fixing	**For tape fixing** - Typ: 89350			**For screw fixing** - Typ: 89351			**For clip fixing** - Typ: 89352	
Cover	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
Drawing	F	G	G	H	J	J	K	K
LED module type	Ref. No. LED Line Fix							
DML62EL27LA	**550845**	**550848**	**550851**	**550854**	**550857**	**550860**	**550863**	**550866**
DML62EL30LA	**550846**	**550849**	**550852**	**550855**	**550858**	**550861**	**550864**	**550867**
DML62EWLA	**550847**	**550850**	**550853**	**550856**	**550859**	**550862**	**550865**	**550868**

Packaging unit: 4 pcs.

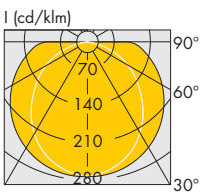
LED Line Fix LUGA HO



without cover



with transparent cover



with diffuse cover

LED Line Fix LUGA HO 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 for tape fixing
Without cover
Dimensions (LxWxH): 280 x 23.2 x 4.5 mm
With base thermal tapes
Weight: 43 g, unit: 4 pcs.
Type: 89300, drawing A

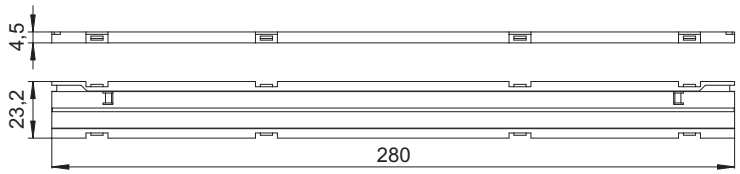
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 23.2 x16.1 mm
With base thermal tapes
Weight: 67 g, unit: 4 pcs.
Type: 89300, drawing B

LED Line Fix for screw fixing
Without cover
Dimensions (LxWxH): 280 x 40 x 4.5 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 43 g, unit: 4 pcs.
Type: 89301, drawing C

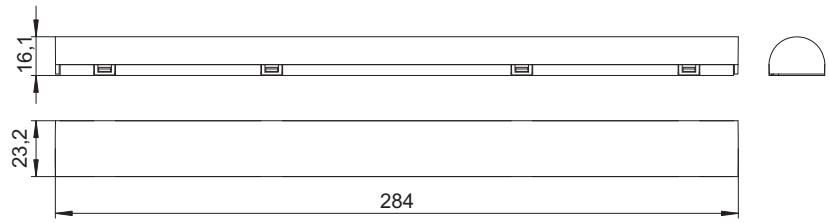
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 67 g, unit: 4 pcs.
Type: 89301, drawing D

LED Line Fix for clip fixing
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 23.2 x 16.1 mm
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes
Weight: 67 g, unit: 4 pcs.
Type: 89302, drawing E

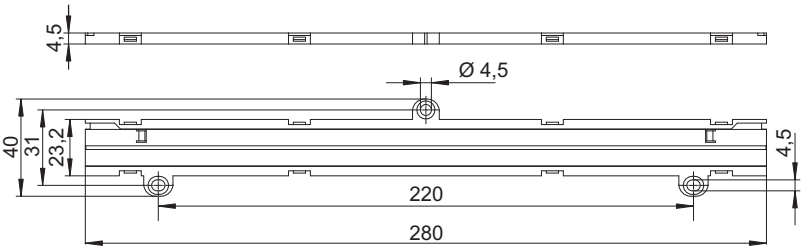
A – For tape fixing – Type 89300 – LED Line Fix LUGA HO 280



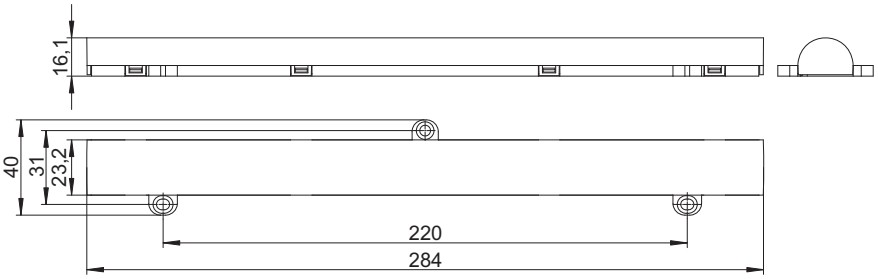
B – For tape fixing – Type 89300 – LED Line Fix LUGA HO 280



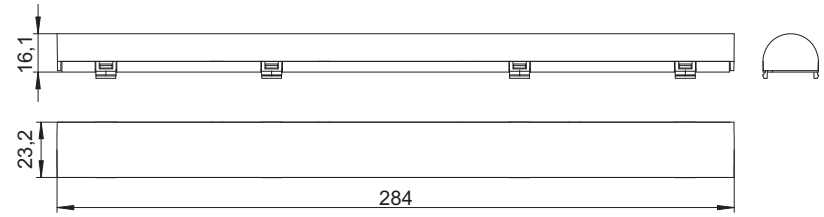
C – For screw fixing – Type 89301 – LED Line Fix LUGA HO 280



D – For screw fixing – Type 89301 – LED Line Fix LUGA HO 280



E – For clip fixing – Type 89302 – LED Line Fix LUGA HO 280



LED Line Fix LUGA HO 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 for tape fixing
Without cover
Dimensions (LxWxH): 561x 23.2 x 4.5 mm
With base thermal tapes
Weight: 86 g, unit: 4 pcs.
Type: 89350, drawing F

With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 23.2 x16.1 mm
With base thermal tapes
Weight: 135 g, unit: 4 pcs.
Type: 89350, drawing G

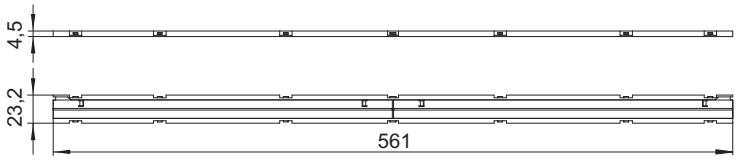
LED Line Fix for screw fixing
Without cover
Dimensions (LxWxH): 561x 40 x 4.5 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 86 g, unit: 4 pcs.
Type: 89351, drawing H

With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 135 g, unit: 4 pcs.
Type: 89351, drawing J

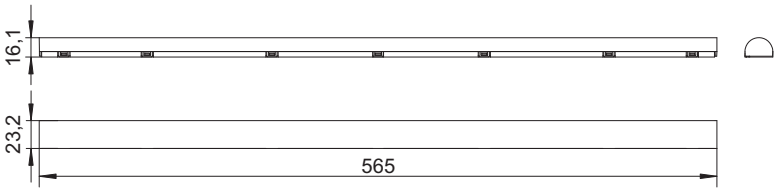
LED Line Fix for clip fixing
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 23.2 x16.1 mm
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes
Weight: 135 g, unit: 4 pcs.
Type: 89352, drawing K



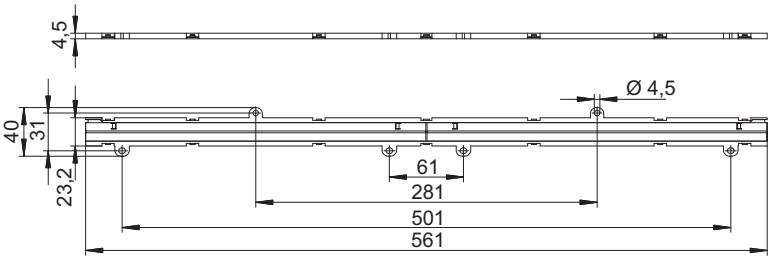
F – For tape fixing – Type 89350 – LED Line Fix LUGA HO 560



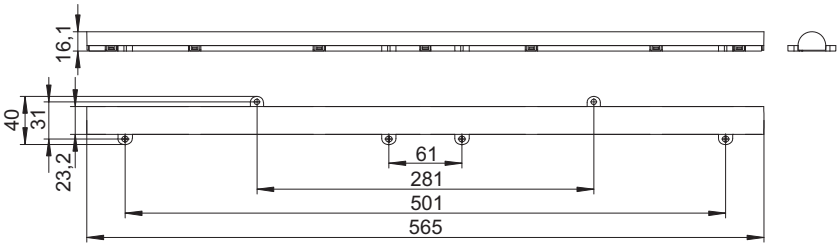
G – For tape fixing – Type 89350 – LED Line Fix LUGA HO 560



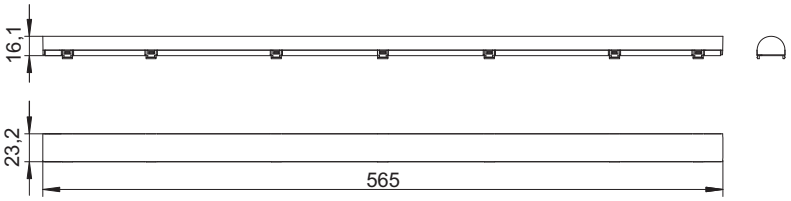
H – For screw fixing – Type 89351 – LED Line Fix LUGA HO 560



J – For screw fixing – Type 89351 – LED Line Fix LUGA HO 560



K – For clip fixing – Type 89352 – LED Line Fix LUGA HO 560



Covers

Technical notes LED Line Fix Cover
Cover: PC, clear or diffuse
Efficency 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

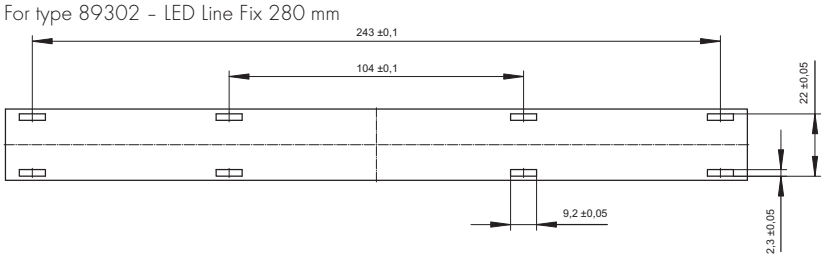
Covers for LED Line Fix
for clip fixing
Longer fixing clips of cover for fixing the holder into the luminaire sheet
For wall thickness 0.4–1 mm
For type: 89302, LED Line Fix 280 mm
Ref. No.: 549994 clear
Ref. No.: 549995 diffuse

For type: 89352, LED Line Fix 560 mm
Ref. No.: 550914 clear
Ref. No.: 550915 diffuse

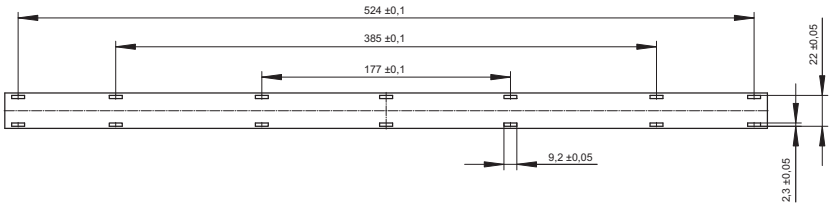
Thermally conductive adhesive transfer tape
Dimensions: 278x13 mm
Ref. No.: 548179 without picture



For type 89302 – LED Line Fix 280 mm



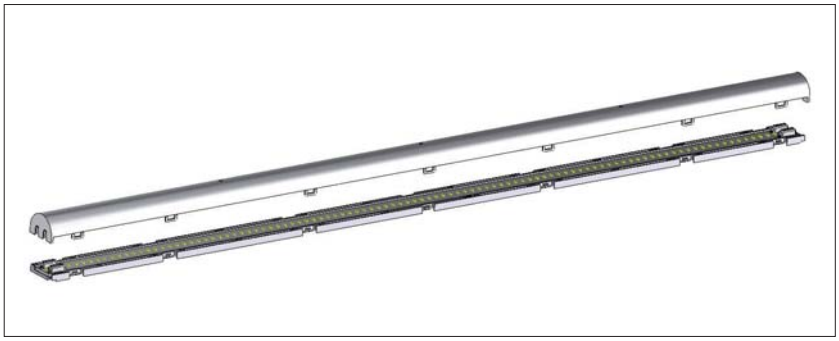
For type 89352 – LED Line Fix 560 mm



Connectors

You will find connectors for the LED Line Fix LUGA HO on page 17.

LED Line Fix SMD



Equipped with SMD Line LED modules
Consisting of one energy-efficient LED line module, a thermally conductive basic holder and an optional cover, this LED Line Fix constitutes an ideal way of facilitating direct conversion to modern LED technology.

Enabling fast, reliable and flexible fixing inside the luminaire via
- adhesive tape,
- clip fitting or
- screw fitting (Zhaga-compliant),

the unit constitutes an ideal solution for indoor linear lighting applications.

100% of the efficiency levels of the LED Line Fix SMD modules can be achieved when using no cover;
with transparent cover: 97%,
with opaque cover: 90%

Technical notes SMD Line modules
Dimensions: 560x15 mm
On-board push terminal system
Allowed operating temperature at t_c point:
-20 to 80 °C
Use of external LED constant-current drivers required
Aluminium PCB for optimum thermal management
Colour rendering index R_a: min. 80
Colour accuracy initially: 4 SDCM per BIN
Packaging unit: 4 pcs.

Typical Applications
Built-in luminaires/general illumination
- Office and school lighting
- Retail lighting
- Furniture lighting
- For replacement of T5 and T8 lamps

Type	Number of LEDs	Colour	Correlated colour temperature	Luminous flux* (lm) at 350 mA (P_{el} = 8.3 W)		500 mA (P_{el} = 12.1 W)		700 mA (P_{el} = 17.5 W)		CRI R_a		Beam angle
	pcs.		K	min.	typ.	min.	typ.	min.	typ.	min.	typ.	°
SMD1043000	104	warm white	3000 -150/+50	710	745	1014	1064	1420	1490	80	82	120
SMD1044000	104	neutral white	4000 -200/+100	800	840	1143	1200	1600	1680	80	84	120

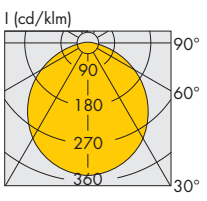
* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 60 °C

LED Line Fix SMD – Type: 89500 / 89501 / 89502

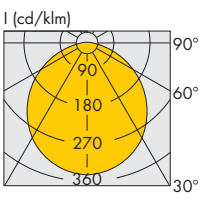
Fixing	**For tape fixing** - Type: 89500			**For screw fixing** - Type: 89501			**For clip fixing** - Type: 89502	
Cover	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
Drawing	A	B	B	C	D	D	E	E
LED module type	Ref. No. LED Line Fix							
SMD1043000	**551539**	**551543**	**551547**	**551549**	**551553**	**551557**	**551559**	**551563**
SMD1044000	**551540**	**551544**	**551548**	**551550**	**551554**	**551558**	**551560**	**551564**

Packaging unit: 4 pcs.

Without cover

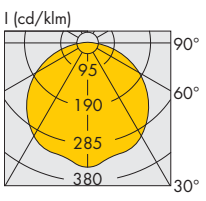


90° - 270°

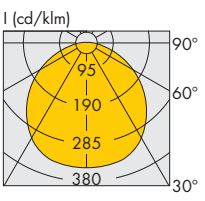


0° - 180°

With clear cover

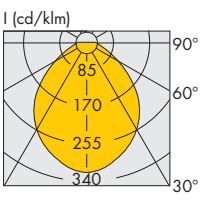


90° - 270°

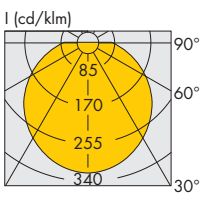


0° - 180°

With diffuse cover



90° - 270°



0° - 180°

LED Line Fix SMD

Technical notes LED Line Fix Holder
Holder material: thermo-conductive resin
When joining linear modules in a row, a minimum clearance of 1 mm between the fixing units must be observed due to thermal expansion.



LED Line Fix for tape fixing
Without cover
Dimensions (LxWxH): 561x 23.2 x 4.5 mm
With base thermal tapes
Weight: 95 g, unit: 4 pcs.
Type: 89500, drawing A

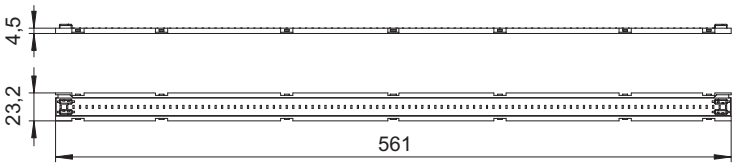
With cover
Degree of protection: IP20
Dimensions (LxWxH): 565 x 23.2 x16.1 mm
With base thermal tapes
Weight: 142 g, unit: 4 pcs.
Type: 89500, drawing B

LED Line Fix for screw fixing
Without cover
Dimensions (LxWxH): 561x 40 x 4.5 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 96 g, unit: 4 pcs.
Type: 89501, drawing C

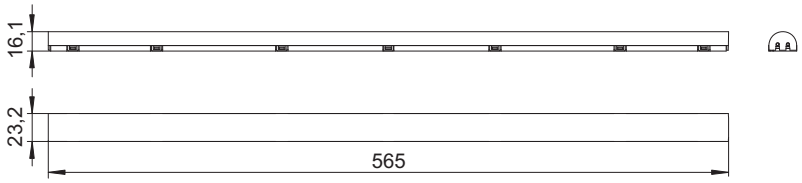
With cover
Degree of protection: IP20
Dimensions (LxWxH): 565 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 143 g, unit: 4 pcs.
Type: 89501, drawing D

LED Line Fix for clip fixing
With cover
Degree of protection: IP20
Dimensions (LxWxH): 565 x 23.2 x16.1 mm
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes
Weight: 142 g, unit: 4 pcs.
Type: 89502, drawing E

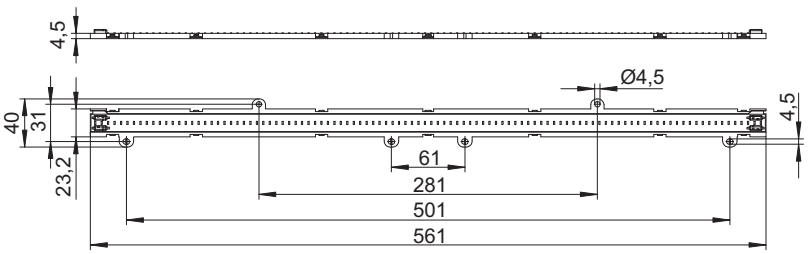
A – For tape fixing – Type 89500



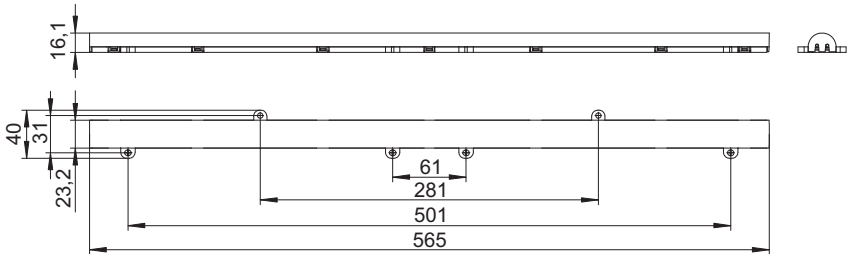
B – For tape fixing – Type 89500



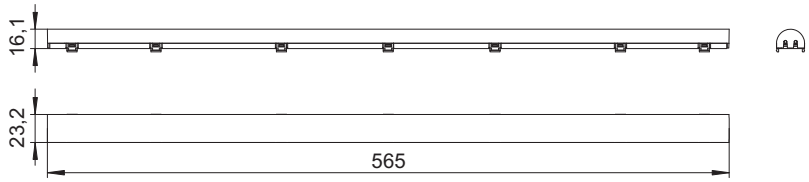
C – For screw fixing – Type 89501



D – For screw fixing – Type 89501



E – For clip fixing – Type 89502



Covers

Technical notes LED Line Fix Cover
Cover: PC, clear or diffuse
Lead exit: lateral push-in holes
Efficency covers: clear 97%, diffuse 90%

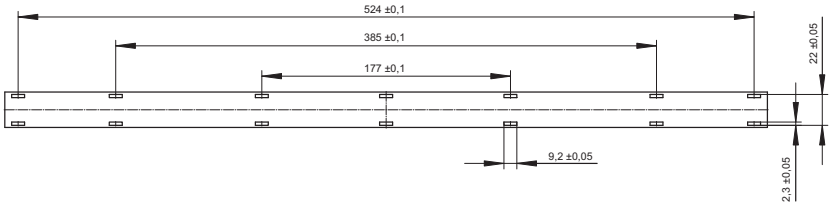
Covers for LED Line Fix
for tape and screw fixing
For type: 89500/89501
Ref. No.: 551588 clear
Ref. No.: 551589 diffuse

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: 89502
Ref. No.: 551590 clear
Ref. No.: 551591 diffuse

Thermally conductive adhesive transfer tape
Dimensions: 278x13 mm
Ref. No.: 548179 without picture



For type 89502 – LED Line Fix 560 mm



PRELIMINARY

LUGA Shop 2013
2000 lm to 5000 lm



Built-in lighting modules

These LED modules are suitable for use in all retail areas – from shop windows, through refrigerated counters right up to mobile food units at markets. The COB technology on the ceramic PCB guarantees excellent light quality in combination with a very long service life. The stable casing protects the PCB from mechanical stress and ensures high compatibility with numerous reflectors and cooling solutions.
VS LED COB modules are available in various tones of white (2700 K, 3000 K, 3500 K, 4000 K). Push-in connectors enable simple, low-cost and solder-free terminal connections.

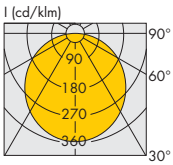
Technical notes

Dimensions: Ø 50 mm
On-board push-in connector
Casing material: PET
Allowed operating temperature at t_c point:
–25 to 85 °C (WU-M-461, -462)
0 to 85 °C (WU-M-464)
Fixing pillars: Ø 3.2 mm
Temperature fail-safe circuit:
activation temperature $t_c \approx 105$ °C
Use of external LED constant-current drivers required
Colour rendering index R_a: typ. 82/85
CRI R_a > 90 see www.vossloh-schwabe.com
Colour accuracy initially: 3 SDCM per BIN;
after 50,000 hrs. operating time: 4 SDCM per BIN
ESD protection class 2
Packaging unit: 20 pcs.

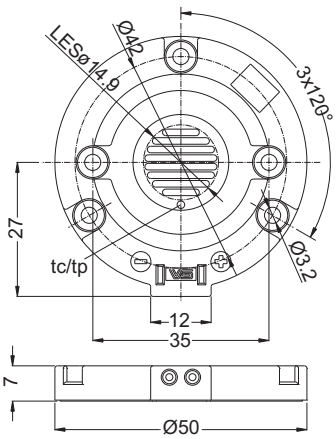
Typical applications

Integration in
- Reflector luminaires (20/35/50/70 W HIT replacement)
- Flat surface-mounting luminaires
- Cladding illumination
- Suspended luminaire with external control gear

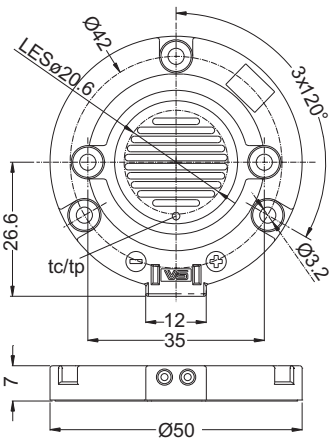
For use in
- Shop design
- Furniture lighting
- Stairway and corridor illumination



WU-M-461



WU-M-462, WU-M-464



Preliminary data at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temperature* K	Typ. luminous flux** and efficiency at 350 mA lm	lm/W	500 mA lm	lm/W	700 mA lm	lm/W	1050 mA lm	lm/W	Typ. beam angle °	CRI R_a typ.
WU-M-461				(P_{el} = 8.7 W)		(P_{el} = 12.9 W)		(P_{el} = 18.8 W)		(P_{el} = 28.9 W)			
WU-M-461-827	**552120**	warm white	2700	1080	124	1480	115	1945	103	2640	91	120	82
WU-M-461-830	**552122**	warm white	3000	1115	128	1515	117	2000	106	2720	94	120	85
WU-M-461-835	**552124**	neutral white	3500	1150	132	1565	121	2050	109	2825	98	120	85
WU-M-461-840	**552126**	neutral white	4000	1185	136	1615	125	2110	112	2935	102	120	85
WU-M-462				(P_{el} = 12.6 W)		(P_{el} = 18.6 W)		(P_{el} = 27.0 W)		(P_{el} = 42.0 W)			
WU-M-462-827	**552128**	warm white	2700	1615	128	2255	121	2915	108	3895	93	120	82
WU-M-462-830	**552130**	warm white	3000	1675	133	2310	124	3000	111	4035	96	120	85
WU-M-462-835	**552132**	neutral white	3500	1735	138	2380	128	3080	114	4230	101	120	85
WU-M-462-840	**552134**	neutral white	4000	1780	141	2455	132	3180	118	4395	105	120	85
WU-M-464				(P_{el} = 16.5 W)		(P_{el} = 24.3 W)		(P_{el} = 34.9 W)		(P_{el} = 54.4 W)			
WU-M-464-827	**552137**	warm white	2700	2055	125	2865	118	3735	107	4910	90	120	82
WU-M-464-830	**552139**	warm white	3000	2120	128	2940	121	3800	109	5045	93	120	85
WU-M-464-835	**552141**	neutral white	3500	2200	133	3035	125	3920	112	5225	96	120	85
WU-M-464-840	**552143**	neutral white	4000	2260	137	3120	128	4015	115	5405	99	120	85

* Colour tolerance: 3 MacAdams | ** Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 80
ZHAGA Flux Category: WU-M-461 at 700 mA: C20, WU-M-462 at 700 mA: C30, WU-M-462 at 1050 mA: C40
Suitable thermal tapes for these LED modules see page 103.

PRELIMINARY

LUGA Shop 2013
HE 5000 lm



Built-in lighting modules
These LED modules are suitable for use in all retail areas – from shop windows, through refrigerated counters right up to mobile food units at markets.

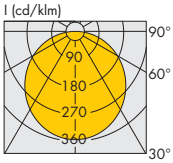
The COB technology on the ceramic PCB guarantees excellent light quality in combination with a very long service life. The stable casing protects the PCB from mechanical stress and ensures high compatibility with numerous reflectors and cooling solutions.

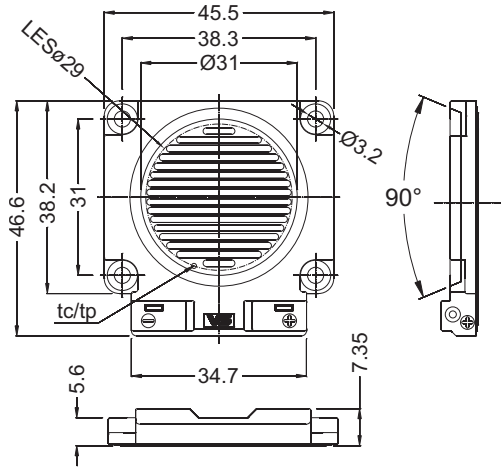
VS LED COB modules are available in various tones of white (2700 K, 3000 K, 3500 K, 4000 K). Push-in connectors enable simple, low-cost and solder-free terminal connections.

Technical notes
Dimensions: 46,6×45,5 mm
On-board push-in connector
Casing material: PET
Allowed operating temperature at t_c point:
–25 to 85 °C
Fixing pillars: Ø 3.2 mm
Temperature fail-safe circuit:
activation temperature $t_c \approx 105$ °C
Use of external LED constant-current drivers required
Colour rendering index R_a: typ. 82/85
CRI R_a > 90 see www.vossloh-schwabe.com
Colour accuracy initially: 3 SDCM per BIN;
after 50.000 hrs. operating time: 4 SDCM per BIN
ESD protection class 2
Packaging unit: 20 pcs.

Typical applications
Integration in
- Reflector luminaires (50/70/100 W HIT replacement)
- Flat surface-mounting luminaires
- Cladding illumination
- Suspended luminaire with external control gear

For use in
- Shop design
- Furniture lighting
- Stairway and corridor illumination





Preliminary data at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temperature*	Typ. luminous flux** and efficiency at 500 mA (P_{el} = 18.9 W)		700 mA (P_{el} = 26.9 W)		1050 mA (P_{el} = 41.7 W)		Typ. beam angle	CRI R_a
			K	lm	lm/W	lm	lm/W	lm	lm/W	°	typ.
WU-M-466-827	**552157**	warm white	2700	2650	140	3485	130	4820	116	120	82
WU-M-466-830	**552159**	warm white	3000	2730	144	3575	133	4955	119	120	85
WU-M-466-835	**552162**	neutral white	3500	2770	146	3695	137	5155	123	120	85
WU-M-466-840	**552164**	neutral white	4000	2785	147	3800	141	5335	128	120	85

* Colour tolerance: 3 MacAdams | ** Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 80
Suitable thermal tapes for these LED modules see page 103.

LUGA Shop FOOD



Built-in lighting modules

These LED modules are suitable for use in all retail areas – especially for fresh food (bread, fruits, vegetables, meat, fish).

The COB technology on the ceramic PCB guarantees excellent light quality in combination with a very long service life. The stable casing protects the PCB from mechanical stress and ensures high compatibility with numerous reflectors and cooling solutions.

VS LED COB modules are available in various tones of white.
Push-in connectors enable simple, low-cost and solder-free terminal connections.

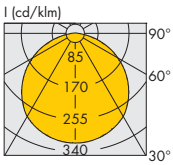
Technical notes

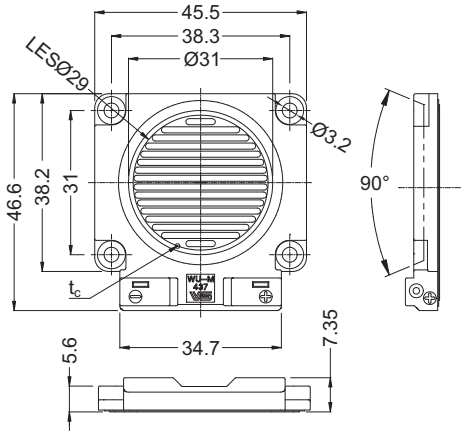
Dimensions: 46.6 x 45.5 mm
On-board push-in connector
Casing material: PET
Allowed operating temperature at t_c point:
0 to 85 °C
Fixing pillars: Ø 3.2 mm
Temperature fail-safe circuit:
activation temperature $t_c \approx 105$ °C
Use of external LED constant-current drivers required
Colour accuracy initially: 3 SDCM per BIN;
after 50.000 hrs. operating time: 4 SDCM per BIN
ESD protection class 2
Packaging unit: 20 pcs.

Typical applications

Integration in
- Reflector luminaires
- Flat surface-mounting luminaires
- Cladding illumination
- Suspended luminaire with external control gear

For use in
- Shop lighting especially for fresh food (bread, fruits, vegetables, meat)



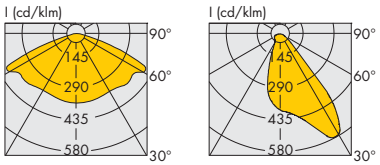


Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 700 mA (P_{el} = 35.3 W) min.	typ.	1050 mA (P_{el} = 55.3 W) min.	typ.	Typ. beam angle (°)	Typical applications
LUGA Shop FOOD									
WU-M-437-30K HiGa	**550497**	warm white	3000 -115/+125	2150	2392	2933	3268	120	Bread, fruits, vegetables, cheese
WU-M-437-40K HiGa	**550498**	neutral white	4000 -195/+225	2221	2473	3036	3376	120	Fish, drugstore, textiles
WU-M-437-Meat	**551263**	neutral white	4000 -225/+250	1989	2211	2716	3021	120	Meat
WU-M-437-Special Meat	**551262**	–	2000 -95/+40	1666	1852	2273	2529	120	Meat

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 65 °C;
Suitable thermal tapes for these LED modules see page 103.

LED Roadway Light ME/S





0°/180° 90°/270°

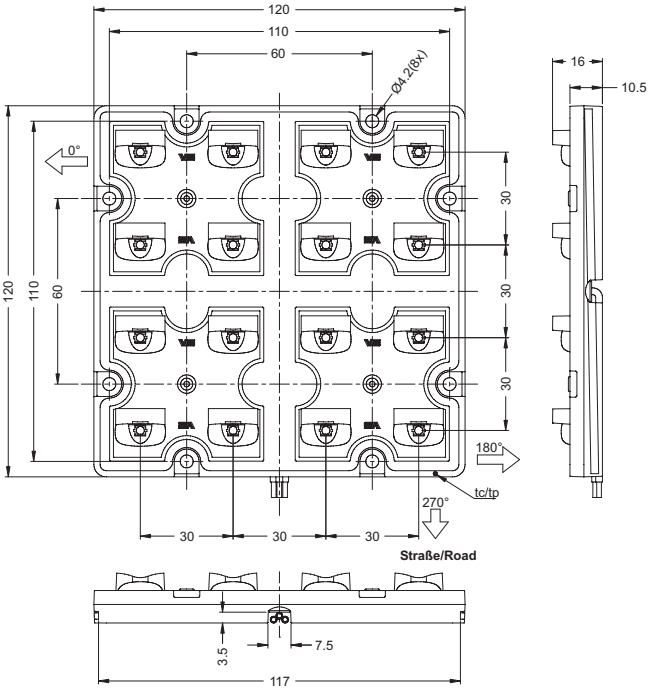
Built-in lighting modules
These LED modules are suitable for standard-compliant street lighting in accordance with EN 13201.

The combination of a robust aluminium base and the IP67 degree of protection enables a simpler, modular luminaire design. The optics attachments guarantee optimum illumination given an installation ratio of 4.5:1 (distance between luminaire poles to height of the luminaire pole).

The VS ECXd 700/150 W LED driver enables power reduction via phase inversion.

The modules are available in three white tones and are both impact- and vibration-proof.

Technical notes
Dimensions incl. optics (LxWxH): 120x120x16 mm
Encapsulated for outdoor applications with degree of protection IP67
16 high-efficient High Power LEDs, serial connected
Pre-assembled leads, length: 500 mm
2 leads: + (red); – (blue)
for luminaires of protection class II;
3 leads: + (red); – (blue); earth (green/yellow)
for luminaires of protection class I
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70 or > 80
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 18 pcs.



Typical applications
Integration in outdoor luminaires
Street lighting for class ME and S (acc. EN 13201)

Type	**Ref. No.** Number of leads: **2**	**Ref. No.** Number of leads: **3**	Colour	Correlated colour temperature K	Luminous flux * (lm) at 400 mA (P_{el} = 18.7 W) min.	typ.	700 mA (P_{el} = 35 W) min.	typ.	1050 mA (P_{el} = 56.6 W) min.	typ.	Spacing pole distance to pole height	CRI R_a typ.
WU-M-425-WW	**547230**	**547233**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	4.5:1 asymmetric	> 80
WU-M-425-NW	**547229**	**547232**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	4.5:1 asymmetric	> 80
WU-M-425-NW-CRI70	**549836**	**549837**	neutral white	4000 -290/+260	2020	2185	3235	3485	4325	4660	4.5:1 asymmetric	> 70
WU-M-425-CW	**547228**	**547231**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	4.5:1 asymmetric	> 80
WU-M-425-CW-CRI70	**549056**	**549057**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	4.5:1 asymmetric	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 60 °C; Suitable thermal tapes for these LED modules see page 103.

LED Roadway Light ME/S Linear

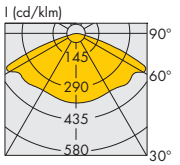


Built-in lighting modules
These LED modules are suitable for standard-compliant street lighting in accordance with EN 13201.

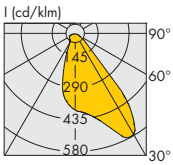
The combination of a robust aluminium base and the IP67 degree of protection enables a simpler, modular luminaire design. The optics attachments guarantee optimum illumination given an installation ratio of 4.5:1 (distance between luminaire poles to height of the luminaire pole).

The VS ECXd 700/150 W LED driver enables power reduction via phase inversion.

The modules are available in three white tones and are both impact- and vibration-proof.



0°/180°

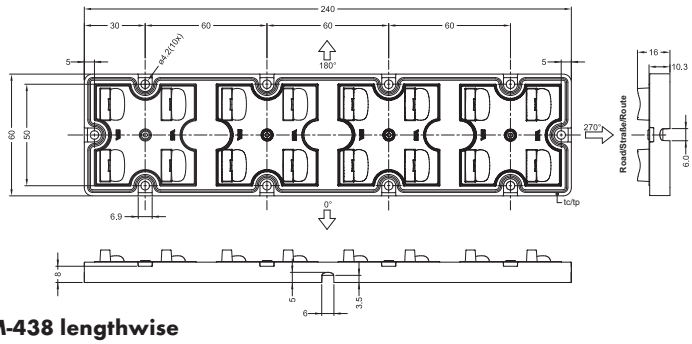


90°/270°

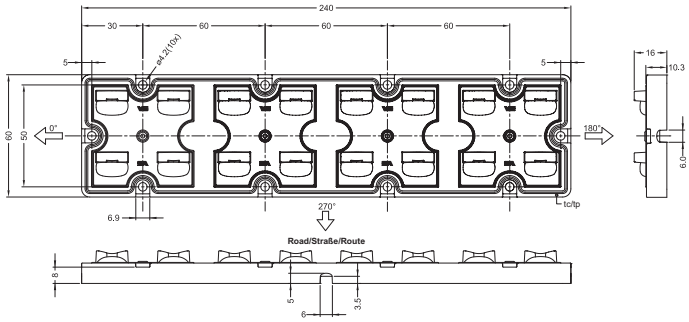
Technical notes
Dimensions incl. optics (LxWxH): 240x60x16 mm
Encapsulated for outdoor applications with degree of protection IP67
16 high-efficient High Power LEDs, serial connected
Pre-assembled 2 leads, length: 500 mm:
+ (red); - (blue) for luminaires of protection class II
Allowed operating temperature at t_c point
at I_F = 700 mA: -20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70 or > 80
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 16 pcs.

Typical applications
Integration in outdoor luminaires
Street lighting for class ME and S (acc. EN 13201)

WU-M-438 crosswise



WU-M-438 lengthwise



Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) 400 mA (P_{el} = 18.7 W) min.	typ.	700 mA (P_{el} = 35 W) min.	typ.	1050 mA (P_{el} = 56.6 W) min.	typ.	Spacing pole distance to pole height	CRI R_a typ.
Modules with optics crosswise											
WU-M-438-WW	**548568**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	4.5:1 asymmetric	> 80
WU-M-438-NW	**548567**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	4.5:1 asymmetric	> 80
WU-M-438-NW-CRI70	**549838**	neutral white	4000 -290/+260	2020	2185	3235	3485	4325	4660	4.5:1 asymmetric	> 70
WU-M-438-CW	**548566**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	4.5:1 asymmetric	> 80
WU-M-438-CW-CRI70	**549145**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	4.5:1 asymmetric	> 70
Modules with optics lengthwise											
WU-M-438WW	**548506**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	4.5:1 asymmetric	> 80
WU-M-438-NW	**548505**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	4.5:1 asymmetric	> 80
WU-M-438-NW-CRI70	**549839**	neutral white	4000 -290/+260	2020	2185	3235	3485	4325	4660	4.5:1 asymmetric	> 70
WU-M-438CW	**548504**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	4.5:1 asymmetric	> 80
WU-M-438-CW-CRI70	**549146**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	4.5:1 asymmetric	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 60 °C

LED Roadway Light ME 2x2 LEDs

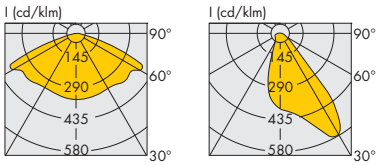


Built-in lighting modules
These LED modules are suitable for standard-compliant street lighting in accordance with EN 13201.

Using differing numbers of modules enables flexible and simple implementation of different lumen packages for the various lighting classes (ME1–ME6).

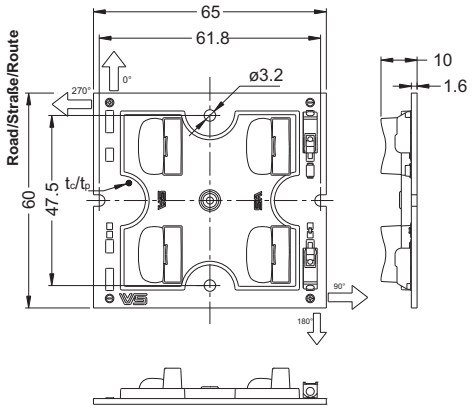
Technical notes
Dimensions incl. optics (LxWxH): 60x65x10 mm
4 high-efficient High Power LEDs, serial connected
Pre-assembled with two WAGO push-in terminals
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70
ESD protection class 2
Packaging unit: 40 pcs.

Typical applications
Integration in outdoor luminaires
Street lighting for class ME (acc. EN 13201)



0°/180°

90°/270°

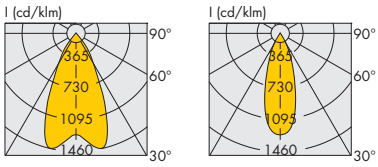


Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 4.7 W) min.	typ.	700 mA (P_{el} = 8.75 W) min.	typ.	1050 mA (P_{el} = 14.2 W) min.	typ.	Spacing pole distance to pole height	CRI** R_a typ.
WU-M-444-WW-M-Class	**549341**	warm white	3000 -130/+220	450	480	700	750	910	970	4.5:1 asymmetric	> 70
WU-M-444-NW-M-Class	**549340**	neutral white	4000 -290/+260	490	530	790	850	1075	1150	4.5:1 asymmetric	> 70
WU-M-444-CW-M-Class	**549339**	cool white	5000 -255/+310	490	530	790	850	1075	1150	4.5:1 asymmetric	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 65 °C
** Colour rendering index CRI R_a > 80 on request

LED Industrial Light SYM I





WU-M-425 0°/180°

WU-M-425 90°/270°

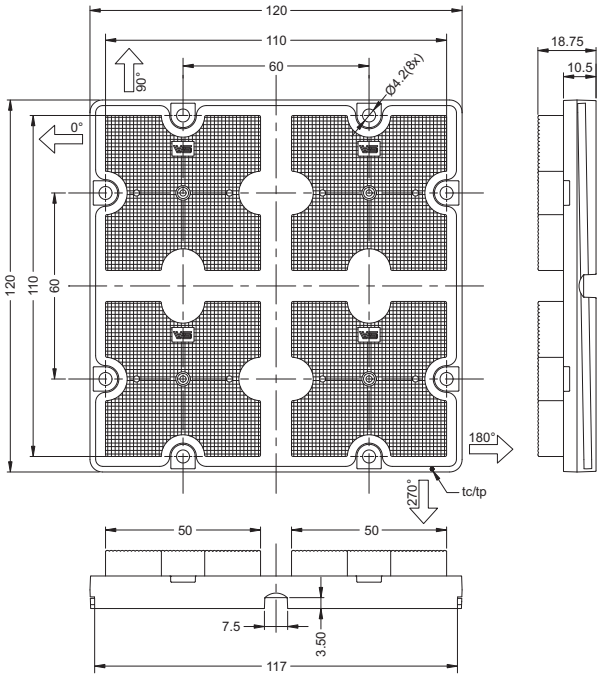
Built-in lighting modules
These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities as well as for installation in floodlight systems.

The combination of a robust aluminium base and the IP67 degree of protection enables a simpler, modular luminaire design. The optics attachments guarantee optimum illumination given an installation ratio of 1:1 in the 0–180° lengthwise layer and 5:8 in the 90–270° crosswise layer (ratio of height to the distance between luminaires).

The modules are available in three white tones.

Technical notes
Dimensions incl. optics (LxWxH): 120x120x18,75 mm
Encapsulated for outdoor applications with degree of protection IP67
16 high-efficient High Power LEDs, serial connected
Pre-assembled leads, length: 500 mm
- 2 leads: + (red); – (blue)
  for luminaires of protection class II
- 3 leads: + (red); – (blue); earth (green/yellow)
  for luminaires of protection class I

Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70 or > 80
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 18 pcs.



Typical applications
Integration in outdoor luminaires
Indoor lighting
Industrial lighting for:
- Production halls
- Warehouses

Petrol station lighting
Lighting for sports facilities

Type	**Ref. No.** Number of leads: **2**	**Ref. No.** Number of leads: **3**	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 18.7 W) min.	typ.	700 mA (P_{el} = 35 W) min.	typ.	1050 mA (P_{el} = 56.6 W) min.	typ.	CRI R_a typ.
WU-M-425-WW SYM I	**549352**	**549353**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	> 80
WU-M-425-NW SYM I	**549350**	**549351**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	> 80
WU-M-425-NW SYM I CRI70	**550242**	**550390**	neutral white	4000 -290/+600	2020	2185	3235	3485	4325	4660	> 70
WU-M-425-CW SYM I	**549348**	**549349**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	> 80
WU-M-425-CW SYM I CRI70	**549726**	**549727**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 60 °C
Suitable thermal tapes for these LED modules see page 103.

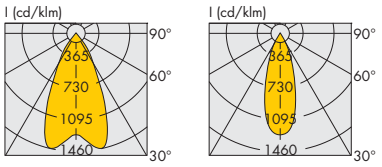
LED Industrial Light SYM I Linear



Built-in lighting modules
These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities as well as for installation in floodlight systems.

The combination of a robust aluminium base and the IP67 degree of protection enables a simpler, modular luminaire design. The optics attachments guarantee optimum illumination given an installation ratio of 1:1 in the 0–180° lengthwise layer and 5:8 in the 90–270° crosswise layer (ratio of height to the distance between luminaires).

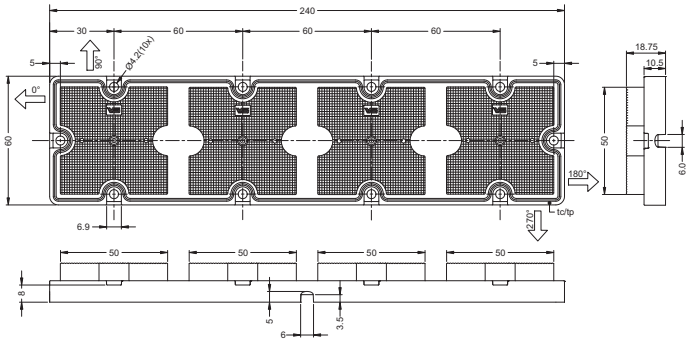
The modules are available in three white tones.



WU-M-438 0°/180°

WU-M-438 90°/270°

Technical notes
Dimensions incl. optics (LxWxH): 240x60x18.75 mm
Encapsulated for outdoor applications with degree of protection IP67
16 high-efficient High Power LEDs, serial connected
Pre-assembled 2 leads, length: 500 mm:
+ (red); – (blue)
for luminaires of protection class II
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70 or > 80
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 16 pcs.



Typical applications
Integration in outdoor luminaires
Indoor lighting
Industrial lighting for:
- Production halls
- Warehouses

Petrol station lighting
Lighting for sports facilities

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 18.7 W) min.	typ.	700 mA (P_{el} = 35 W) min.	typ.	1050 mA (P_{el} = 56.6 W) min.	typ.	CRI R_a typ.
WU-M-438-WW SYM I	**549356**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	> 80
WU-M-438-NW SYM I	**549355**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	> 80
WU-M-438-NW SYM I CRI70	**549840**	neutral white	4000 -290/+260	2020	2185	3235	3485	4325	4660	> 70
WU-M-438-CW SYM I	**549354**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	> 80
WU-M-438-CW SYM I CRI70	**549731**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 60 °C

LED Industrial Light SYM I 2x2 LEDs



Built-in lighting modules
These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities as well as for installation in floodlight systems.

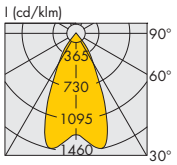
Using differing numbers of modules enables flexible and simple implementation of different lumen packages.

The modules are available in three white tones.

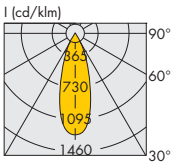
Technical notes
Dimensions incl. optics (LxWxH): 60x65x12 mm
4 high-efficient High Power LEDs, serial connected
Pre-assembled with two WAGO push-in terminals
Allowed operating temperature at t_c point
at I_F = 700 mA: -20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 40 pcs.

Typical applications
Integration in outdoor luminaires
Indoor lighting
Industrial lighting for:
- Production halls
- Warehouses

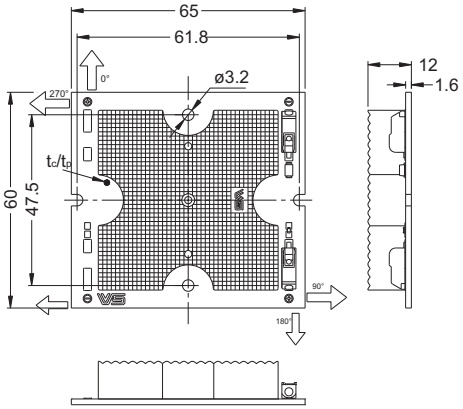
Petrol station lighting
Lighting for sports facilities



WU-M-444 0°/180°



WU-M-444 90°/270°



Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 4.7 W) min.	typ.	700 mA (P_{el} = 8.75 W) min.	typ.	1050 mA (P_{el} = 14.2 W) min.	typ.	CRI** R_a typ.
WU-M-444-WW SYM I	**549494**	warm white	3000 -130/+220	450	480	700	750	910	970	> 70
WU-M-444-NW SYM I	**549493**	neutral white	4000 -290/+260	490	530	790	850	1075	1150	> 70
WU-M-444-CW SYM I	**549492**	cool white	5000 -255/+310	490	530	790	850	1075	1150	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 65 °C
** Colour rendering index CRI R_a > 80 on request

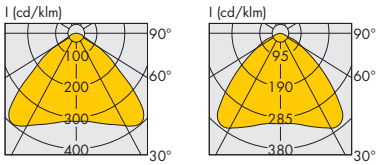
LED Industrial Light SYM II



Built-in lighting modules
Although these LED modules were specifically designed for illuminating petrol stations, they are equally suitable for lighting industrial, production, sports and warehouse facilities.

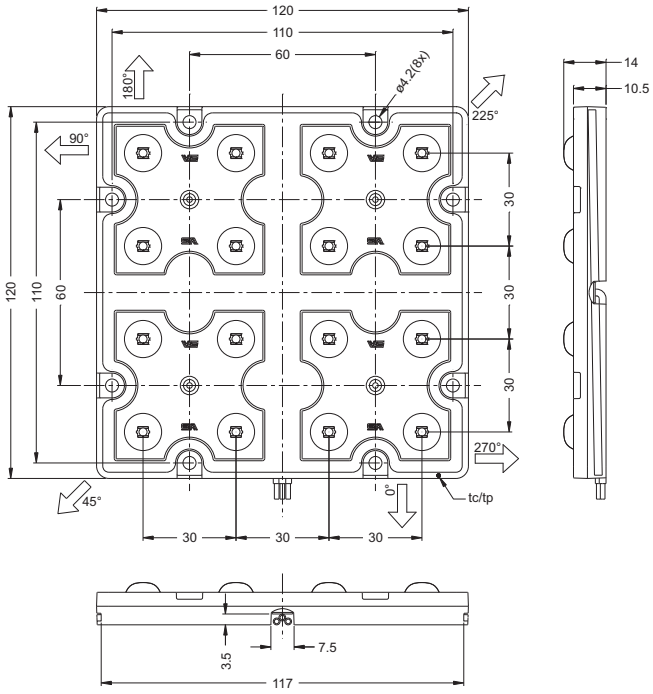
The combination of a robust aluminium base and the IP67 degree of protection enables a simpler, modular luminaire design. The optics attachments guarantee optimum illumination given an installation ratio of 1:2 (ratio of height to the distance between luminaires).

The modules are available in three white tones and are both impact- and vibration-proof.



WU-M-425 45°/225° WU-M-425 90°/270°

Technical notes
Dimensions incl. optics (LxWxH): 120x120x14 mm
Encapsulated for outdoor applications with degree of protection (in preparation): IP66/(IP67)/IK05
16 high-efficient High Power LEDs, serial connected
Pre-assembled 2 leads, length: 500 mm:
+ (red); – (blue)
for luminaires of protection class II
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70 or > 80
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 18 pcs.



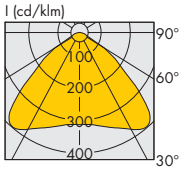
Typical applications
Integration in luminaires
Indoor lighting
Industrial lighting for:
• Production halls
• Warehouses
Petrol station lighting
Lighting for sports facilities

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 18.7 W) min.	typ.	700 mA (P_{el} = 35 W) min.	typ.	1050 mA (P_{el} = 56.6 W) min.	typ.	CRI R_a typ.
WU-M-425-WW SYM II	**on request**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	> 80
WU-M-425-NW SYM II	**551068**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	> 80
WU-M-425-NW SYM II CRI70	**552507**	neutral white	4000 -290/+600	2020	2185	3235	3485	4325	4660	> 70
WU-M-425-CW SYM II	**on request**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	> 80
WU-M-425-CW SYM II CRI70	**550009**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	> 70

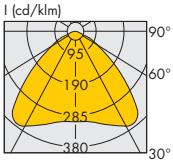
* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 60 °C
Suitable thermal tapes for these LED modules see page 103.

LED Industrial Light SYM II Linear





WU-M-438 45°/225°



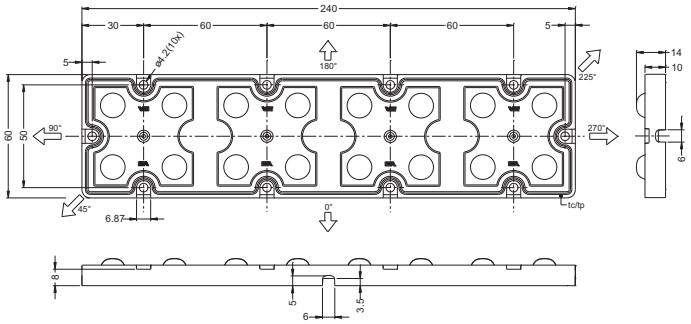
WU-M-438 90°/270°

Built-in lighting modules
Although these LED modules were specifically designed for illuminating petrol stations, they are equally suitable for lighting industrial, production, sports and warehouse facilities.

The combination of a robust aluminium base and the IP67 degree of protection enables a simpler, modular luminaire design. The optics attachments guarantee optimum illumination given an installation ratio of 1:2 (ratio of height to the distance between luminaires).

The modules are available in three white tones and are both impact- and vibration-proof.

Technical notes
Dimensions incl. optics (LxWxH): 240x60x14 mm
Encapsulated for outdoor applications with degree of protection (in preparation): IP66/(IP67)/IK05
16 high-efficient High Power LEDs, serial connected
Pre-assembled 2 leads, length: 500 mm:
+ (red); – (blue)
for luminaires of protection class II
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70 or > 80
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 16 pcs.



Typical applications
Integration in luminaires
Indoor lighting
Industrial lighting for:
• Production halls
• Warehouses
Petrol station lighting
Lighting for sports facilities

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 18.7 W) min.	typ.	700 mA (P_{el} = 35 W) min.	typ.	1050 mA (P_{el} = 56.6 W) min.	typ.	CRI R_a typ.
WU-M-438-WW SYM II	**551121**	warm white	3000 -130/+220	1540	1700	2450	2700	3300	3630	> 80
WU-M-438-NW SYM II	**on request**	neutral white	4000 -290/+260	1700	1875	2700	2950	3630	3960	> 80
WU-M-438-NW SYM II CRI70	**on request**	neutral white	4000 -290/+260	2020	2185	3235	3485	4325	4660	> 70
WU-M-438-CW SYM II	**on request**	cool white	5000 -255/+310	1700	1875	2700	2950	3630	3960	> 80
WU-M-438-CW SYM II CRI70	**551076**	cool white	5000 -255/+310	2020	2185	3235	3485	4325	4660	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 60 °C

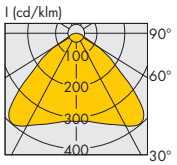
LED Industrial Light SYM II 2x2 LEDs



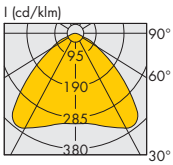
Built-in lighting modules
Although these LED modules were specifically designed for illuminating petrol stations, they are equally suitable for lighting industrial, production, sports and warehouse facilities.

Using differing numbers of modules enables flexible and simple implementation of different lumen packages.

The modules are available in three white tones.

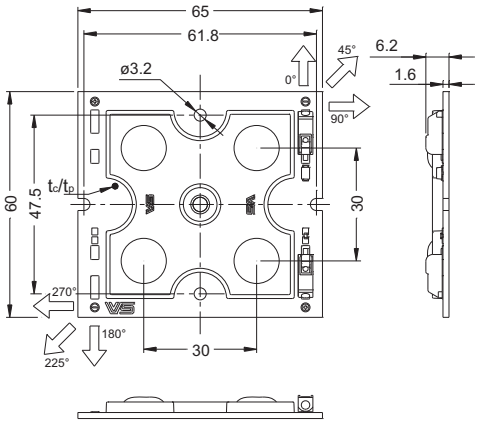


WU-M-444 45°/225°



WU-M-444 90°/270°

Technical notes
Dimensions incl. optics (LxWxH): 60x65x6.2 mm
4 high-efficient High Power LEDs, serial connected
Pre-assembled with two WAGO push-in terminals
Allowed operating temperature at t_c point
at I_F = 700 mA: -20 to 85 °C
Use of external LED constant-current drivers required
Design for optimum thermal management
Colour rendering index R_a: > 70
Surge protection: 4 kV
ESD protection class 2
Packaging unit: 40 pcs.



Typical applications
Integration in luminaires
Indoor lighting
Industrial lighting for:
- Production halls
- Warehouses

Petrol station lighting
Lighting for sports facilities

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA (P_{el} = 4.7 W) min.	typ.	700 mA (P_{el} = 8.75 W) min.	typ.	1050 mA (P_{el} = 14.2 W) min.	typ.	CRI** R_a typ.
WU-M-444-WW SYM II	**on request**	warm white	3000 -130/+220	450	480	700	750	910	970	> 70
WU-M-444-NW SYM II	**on request**	neutral white	4000 -290/+260	490	530	790	850	1075	1150	> 70
WU-M-444-CW SYM II	**551047**	cool white	5000 -255/+310	490	530	790	850	1075	1150	> 70

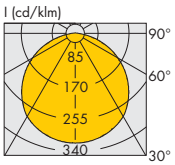
* Measurement tolerance of luminous flux: ± 7% | Emission data at t_p = 65 °C
** Colour rendering index CRI R_a > 80 on request

LUGA Industrial 10,000 lm

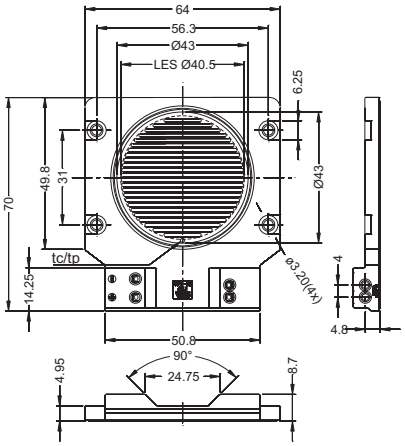


Built-in lighting modules
The 10,000 lm LED COB modules are suitable for use both in street lighting as well as high-bay and industrial lighting.

Technical notes
Dimensions (LxWxH): 64 x 70 x 8.7 mm
Push-in terminals (WAGO 2060 series)
LED module is operated at high voltage (up to 160 V).
Safety must be considered acc. EN 60598.
Allowed operating temperature at t_c point:
-40 to 85 °C
Allowed ambient temperature: -40 to 40 °C
Use of external LED constant current driver
Packaging unit: 12 pcs.



Typical applications
Integration in luminaires
Indoor lighting
Industrial lighting for:
• Production halls
• Warehouses
Petrol station lighting
Lighting for sports facilities



Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux* and efficiency at 350 mA (P_{el} = 48.9 W) lm	lm/W	700 mA (P_{el} = 101.7 W) lm	lm/W	Typ. beam angle °	CRI R_a typ.
WU-M-443-3000K	**549265**	warm white	3000 $^{-75/+165}$	5680	116	10075	99	120	82
WU-M-443-4000K	**549266**	neutral white	4000 $^{-215/+185}$	5870	120	10420	102	120	82
WU-M443-5000K	**549264**	cool white	5000 $^{-200/+280}$	5935	121	10525	103	120	82

* Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 80
Suitable thermal tapes for these LED modules see page 103.

Streetlight FlatEmitter SMD 2500–10,000 lm

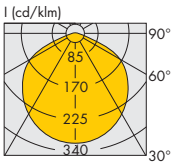


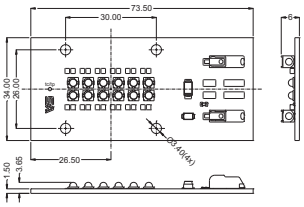
Built-in lighting modules

These LED modules are suitable for use both in street lighting as well as high-bay and industrial lighting.

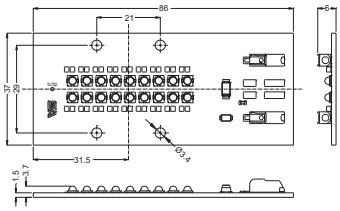
Technical notes

Dimensions (LxWxH)
with 12 LEDs: 73.5x34x6 mm
with 18 LEDs: 86x36.5x6 mm
with 27 or 42 LEDs: 108x44x6 mm
LEDs on the module are serial connected
Push-in terminals (WAGO 2060 series)
LED modules (WU-M-433) is operated at high voltage (up to 160 V)
Safety must be considered acc. EN 60598
Allowed operating temperature at t_c point:
–20 to 95 °C
Use of external LED constant-current drivers required
Colour rendering index R_a: > 70
Surge protection: 3 kV
ESD protection class 1
NTC-resistor (type: NCP18XH103J03RB) for external driver feedback of module temperature (optional)

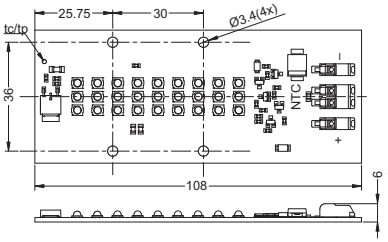




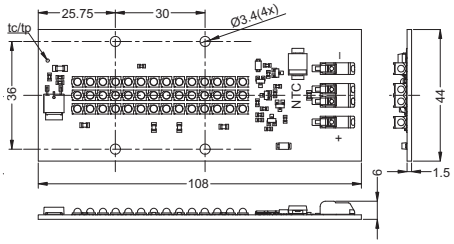
WU-M-452-12



WU-M-452-18



WU-M-433-27



WU-M-433-42

Type	Ref. No.	Number of LEDs pcs.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 400 mA min.	400 mA typ.	700 mA min.	700 mA typ.	CRI R_a typ.
LED modules with 12 LEDs					(P_{el} = 14.2 W)		(P_{el} = 26.9 W)		
WU-M-452-12	**551436**	12	warm white	3000 -130/+220	1441	1535	2191	2334	> 70
WU-M-452-12	**551145**	12	neutral white	4000 -300/+260	1622	1747	2569	2767	> 70
WU-M-452-12	**551437**	12	cool white	5000 -255/+310	1675	1803	2626	2828	> 70
LED modules with 18 LEDs					(P_{el} = 21.2 W)		(P_{el} = 40.3 W)		
WU-M-452-18	**551951**	18	warm white	3000 -130/+220	2161	2302	3286	3501	> 70
WU-M-452-18	**551952**	18	neutral white	4000 -300/+260	2433	2620	3854	4150	> 70
WU-M-452-18	**551953**	18	cool white	5000 -255/+310	2512	2705	3940	4243	> 70
LED modules with 27 LEDs					(P_{el} = 31.9 W)		(P_{el} = 60.5 W)		
WU-M-433-27	**548728**	27	warm white	3000 -130/+220	3241	3454	4929	5252	> 70
WU-M-433-27	**548729**	27	neutral white	4000 -300/+260	3649	3930	5781	6226	> 70
WU-M-433-27	**548730**	27	cool white	5000 -255/+310	3768	4058	5909	6364	> 70
LED modules with 42 LEDs					(P_{el} = 49.6 W)		(P_{el} = 94.1 W)		
WU-M-433-42	**548731**	42	warm white	3000 -130/+220	5042	5372	7668	8170	> 70
WU-M-433-42	**548732**	42	neutral white	4000 -300/+260	5677	6113	8993	9684	> 70
WU-M-433-42	**548733**	42	cool white	5000 -255/+310	5861	6312	9192	9900	> 70

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 65 °C
Suitable thermal tapes for these LED modules see page 103.

Streetlight FlatEmitter LUGA LES III



Built-in lighting modules

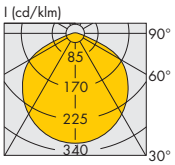
The 10,000 lm LED COB modules are suitable for use both in street lighting as well as high-bay and industrial lighting.

Technical notes

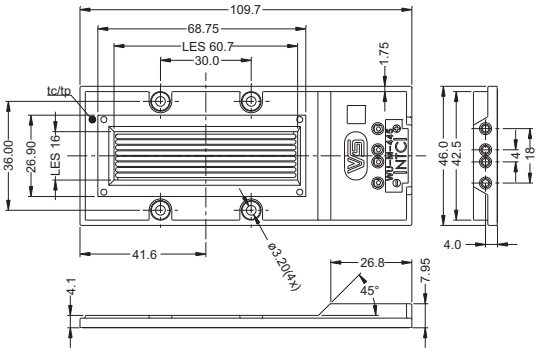
Dimensions (LxWxH): 110 x 46 x 8 mm
Push-in terminals (WAGO 2060 series)
LED module is operated at high voltage (up to 120 V).
Safety must be considered acc. EN 60598.
Reverse polarity protection (up to 180 V)
Allowed operating temperature at t_c point:
–40 to 75 °C
Surge protection: 3 kV
NTC-resistor for external driver feedback of module temperature
Packaging unit: 12 pcs.

Typical applications

Integration in outdoor luminaires
Street lighting
High-bay lighting



WU-M-445



Type	Ref. No.	Number of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux* and efficiency at 700 mA (P_{el} = 73.7 W) lm	lm/W	1050 mA (P_{el} = 112.1 W) lm	lm/W	CRI R_a typ.
WU-M-445-3000K	**550198**	288	warm white	3000 $^{-75/+165}$	7540	102	9600	86	74
WU-M-445-4000K	**550199**	288	neutral white	4000 $^{-215/+185}$	7800	106	10000	89	74
WU-M-445-5000K	**550200**	288	cool white	5000 $^{-200/+280}$	8670	118	11100	99	70

* Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 70

PowerEmitter XP and XML



Built-in PCB lighting modules
Thanks to the use of highly efficient LEDs, PowerEmitter modules guarantee an extremely high lumen output of up to 731 lm at max. 1050 mA.

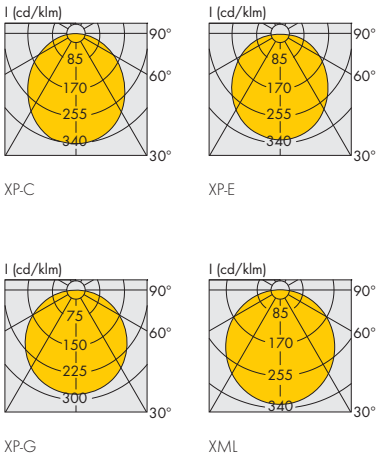
The modules can be safely operated with various constant-current converters (350 mA, 500 mA, 700 mA, 1050 mA). Sufficient cooling must be ensured.

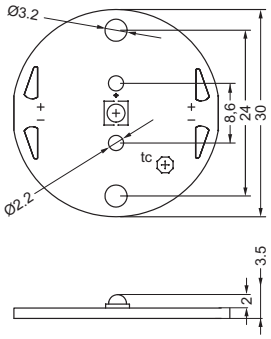
Cables have to be soldered onto the solder pads of PowerEmitter modules, which are available in white, neutral white and warm white, to enable terminal connections to be made. The colours of red, green and blue can be made available on request.

To enable the creation of unique light solutions, VS also provides PowerOptics attachments with a variety of beam angle characteristics (see pages 44–46).

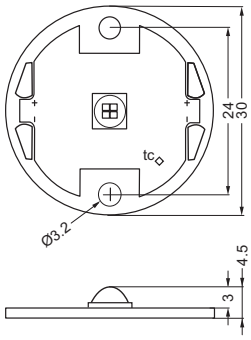
Technical notes
PCB diameter: 30 mm
Allowed operating temperature at t_c point:
–20 to 60 °C for luminaires PowerEmitter XP
–20 to 65 °C for luminaires PowerEmitter XML
Use of external LED constant-current drivers required
FR4-PCB with thermal ducts (PowerEmitter XP)
or aluminium PCB (PowerEmitter XML)
for optimum thermal management
Colour rendering index:
white R_a = 75, warm white R_a = 80
ESD protection class 2
Minimum order quantity: 144 pcs.

Typical applications
Integration in luminaires
Architectural lighting
Marking paths, stairs, etc.
Furniture lighting
Light advertising
Entertainment, shop design





PowerEmitter XP



PowerEmitter XML

PowerEmitter XP

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA min.	typ.	500 mA min.	typ.	700 mA min.	typ.	1050 mA min.	typ.	Beam angle °
PowerEmitter XP-C				(P_{el} = 1.19 W)		(P_{el} = 1.75 W)		–		–		
WU-M-421-XPC-WW	**546676**	warm white	2870...3200	67.2	80.6	87.4	104.8	not allowed		not allowed		110
WU-M-421-XPC-NW	**546671**	neutral white	3700...4260	73.9	87.4	96.1	113.6	not allowed		not allowed		110
WU-M-421-XPC-CW	**546673**	cool white	5650...6950	100.0	114.0	130.0	148.2	not allowed		not allowed		110
PowerEmitter XP-E				(P_{el} = 1.12 W)		(P_{el} = 1.65 W)		(P_{el} = 2.38 W)		–		
WU-M-421-XPE-WW	**546684**	warm white	2870...3200	80.6	93.9	104.8	122.1	137.0	159.6	not allowed		115
WU-M-421-XPE-NW	**546685**	neutral white	3700...4260	93.9	107.0	122.1	139.1	159.6	181.9	not allowed		115
WU-M-421-XPE-CW	**546680**	cool white	5650...6950	107.0	122.0	139.1	158.6	181.9	207.4	not allowed		115
PowerEmitter XP-G				(P_{el} = 1.05 W)		(P_{el} = 1.56 W)		(P_{el} = 2.24 W)		(P_{el} = 3.47 W)		
WU-M-421-XPG-WW	**546688**	warm white	2870...3200	100.0	114.0	140.0	159.6	180.0	205.2	250.0	250.0	125
WU-M-421-XPG-NW	**546687**	neutral white	3700...4260	107.0	122.0	149.8	170.8	192.6	219.6	267.5	267.5	125
WU-M-421-XPG-CW	**546686**	cool white	5300...7050	122.0	139.0	170.8	194.6	219.6	250.2	305.0	347.5	125

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 25 °C
Suitable thermal tapes for these LED modules see page 102.

PowerEmitter XML

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 4 W) min.	typ.	500 mA (P_{el} = 6 W) min.	typ.	700 mA (P_{el} = 8.7 W) min.	typ.	1050 mA (P_{el} = 12.7 W) min.	typ.	Beam angle °
PowerEmitter XML												
WU-M-424-27K	**548032**	warm white	2650...2790	260	300	325	375	442	510	560	645	115
WU-M-424-30K	**548031**	warm white	2950...3125	280	320	350	400	476	544	602	688	115
WU-M-424-40K	**548030**	neutral white	3835...4110	300	340	375	425	510	578	645	731	115

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C
Suitable thermal tapes for these LED modules see page 102.

TriplePowerEmitter XP

Built-in PCB lighting modules
Thanks to the use of highly efficient LEDs, TriplePowerEmitter modules guarantee an extremely high lumen output of up to 622 lm at max. 700 mA.

The modules can be safely operated with various constant-current drivers (350 mA, 500 mA or 700 mA). Sufficient cooling must be ensured.

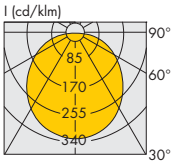
The TriplePowerEmitter modules are available in white, neutral white and warm white.

The modules are available without an optical attachment or with a fixed 10°,20°, 30° or 40° optical attachment to enable the creation of different lighting scenes.

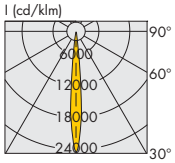
Technical notes
PCB diameter: 45 mm
Allowed operating temperature at t_c point:
-20 to 65 °C
Use of external LED constant-current drivers required
Aluminium PCB for optimum thermal management
Colour rendering index:
white R_a = 75, warm white R_a = 80
ESD protection class 2
Minimum order quantity: 120 pcs.



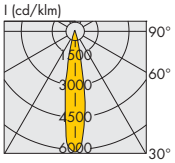
Typical applications
Integration in luminaires
Architectural lighting
Marking paths, stairs, etc.
Furniture lighting
Light advertising
Entertainment, shop design



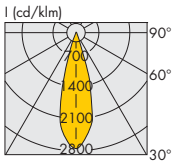
Without optics



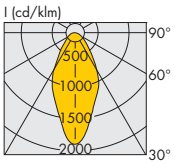
10°



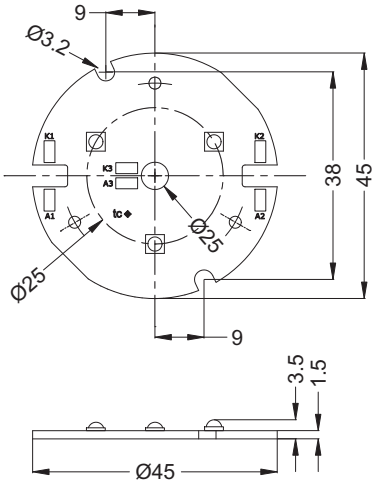
20°



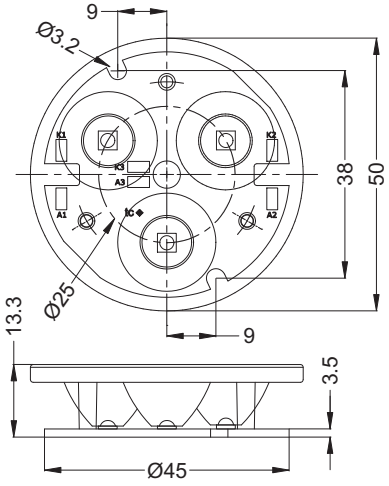
30°



40°



Module without optics



Module with optics

TriplePowerEmitter XP

Type	Ref. No.	Colour	Correlated colour temperature	Luminous flux* (lm) at 350 mA (P_{el} = 3.36 W)		500 mA (P_{el} = 4.95 W)		700 mA (P_{el} = 7.14 W)		Beam angle
			K	min.	typ.	min.	typ.	min.	typ.	°
Without optics										
WU-M-422-XPE-WW	**546733**	warm white	2870...3200	242	282	314	366	411	479	115
WU-M-422-XPE-NW	**546727**	neutral white	3700...4260	282	321	366	417	479	546	115
WU-M-422-XPE-CW	**546729**	cool white	5650...6950	321	366	417	476	546	622	115
TriplePowerEmitter XP 10°										
WU-M-422-XPE-WW-10°	**546741**	warm white	2870...3200	218	254	283	330	370	431	10
WU-M-422-XPE-NW-10°	**546736**	neutral white	3700...4260	254	289	330	376	431	491	10
WU-M-422-XPE-CW-10°	**546735**	cool white	5650...6950	289	329	376	428	491	560	10
TriplePowerEmitter XP 20°										
WU-M-422-XPE-WW-20°	**546749**	warm white	2870...3200	218	254	283	330	370	431	20
WU-M-422-XPE-NW-20°	**546750**	neutral white	3700...4260	254	289	330	376	431	491	20
WU-M-422-XPE-CW-20°	**546748**	cool white	5650...6950	289	329	376	428	491	560	20
TriplePowerEmitter XP 30°										
WU-M-422-XPE-WW-30°	**548090**	warm white	2870...3200	218	254	283	330	370	431	30
WU-M-422-XPE-NW-30°	**548089**	neutral white	3700...4260	254	289	330	376	431	491	30
WU-M-422-XPE-CW-30°	**548088**	cool white	5650...6950	289	329	376	428	491	560	30
TriplePowerEmitter XP 40°										
WU-M-422-XPE-WW-40°	**546757**	warm white	2870...3200	218	254	283	330	370	431	40
WU-M-422-XPE-NW-40°	**546756**	neutral white	3700...4260	254	289	330	376	431	491	40
WU-M-422-XPE-CW-40°	**546755**	cool white	5650...6950	289	329	376	428	491	560	40

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 25 °C
Suitable thermal tapes for these LED modules see page 102.

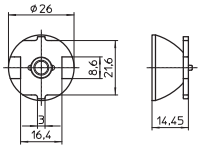
PowerOptics3 for XP / XT Modules

PowerOptics3 were specially developed to supplement VS PowerEmitter making it possible for users to put unique lighting solutions into practice. Use of high-grade optical PMMA enables high efficiency factors of up to 90%.

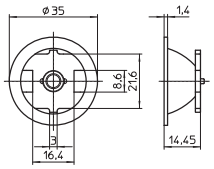
To guarantee easy mounting on PowerEmitter module, the PowerOptics3 are backed with self-adhesive tape. However, depending on the type of application and ambient conditions, the Power-Optics3 module may require additional fixing to ensure secure mounting.

For fixation of PowerOptics3 on Star LED modules use self-tapping screws acc. to ISO 1481/7049-ST2,9-C/F.

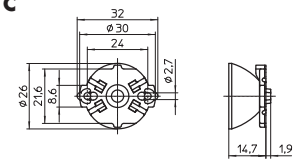
A



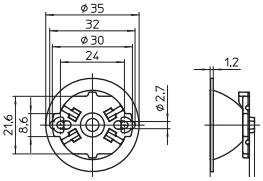
B



C



D





PowerOptics3 – Ø 26 mm

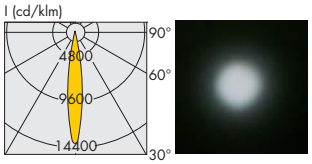


PowerOptics3 – Ø 35 mm

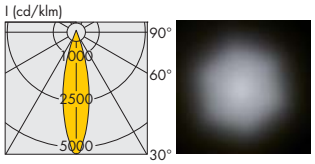


PowerOptics3 – Star

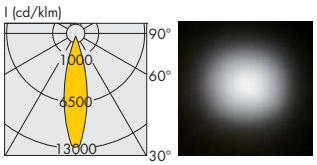
Light distribution curves PowerOptics3



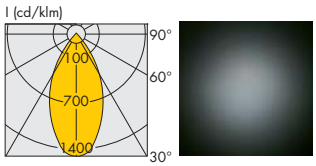
8°



26°



16°



45°

Type	Beam angle* (°)	Ref. No.	Drawing	Dimensions* (mm) diameter/module height	Ref. No.	Drawing	Dimensions* (mm) diameter/module height
Optics Ø 26 mm – For VS PowerEmitter XP					**Optics Ø 35 mm – For VS PowerEmitter XP**		
PowerOptics3	8	**547716**	A	26/14.6	**548868**	B	35/14.6
PowerOptics3	16	**547717**	A	26/14.6	**548869**	B	35/14.6
PowerOptics3	26	**547718**	A	26/14.6	**548870**	B	35/14.6
PowerOptics3	45	**547719**	A	26/14.6	**548871**	B	35/14.6
Optics Ø 26 mm – For Star XP / XT					**Optics Ø 35 mm – For Star XP / XT**		
PowerOptics3	8	**550967**	C	26/14.6	**550971**	D	35/14.6
PowerOptics3	16	**550968**	C	26/14.6	**550972**	D	35/14.6
PowerOptics3	26	**550969**	C	26/14.6	**550973**	D	35/14.6
PowerOptics3	45	**550970**	C	26/14.6	**550974**	D	35/14.6

* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

PowerOptics for XP Modules

Various attachable optics are available for XP modules to enable different beam characteristics and illumination levels.

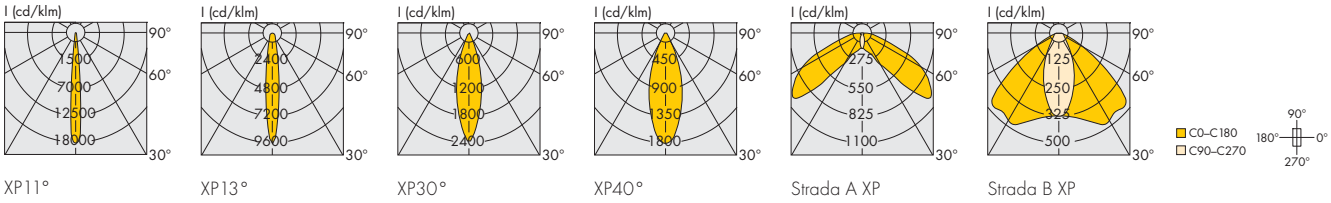
VS PowerOptics are made of PMMA, a material of high optical efficiency, and therefore achieve efficiencies of up to 92%.

The optics are available in various beam angles and are easily attached to the modules using self-adhesive tape. Depending on the type of application or the expected ambient conditions, it may be necessary to supplement this method of fastening to ensure the optics are securely mounted.



PowerOptics XP

Light distribution curves



XP11° XP13° XP30° XP40° Strada A XP Strada B XP

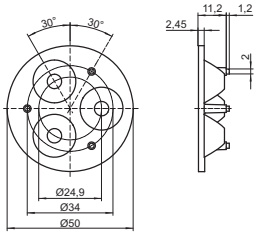
Type	Ref. No.	Beam angle* °	Dimensions* (mm) diameter x height / width x depth x height
Optics for LED modules of XP series			
PowerOptics XP 11°	**543422**	11	16.1 x 10.1
PowerOptics XP 13° diff	**543423**	12	16.1 x 10.1
PowerOptics XP 30°	**543424**	30	16.1 x 10.1
PowerOptics XP 40°	**543425**	40	16.1 x 10.1
PowerOpticsStrada A XP	**544036**	100 x 20	19.6 x 15.4 x 10.5
PowerOpticsStrada B XP	**544038**	116 x 44	20.0 x 15.5 x 5.3

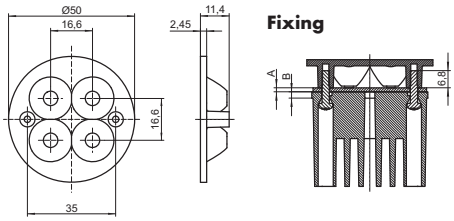
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

PowerOptics for XP Modules

For TriplePowerEmitter and Spot modules
Various attachable optics are available for TriplePowerEmitter and the Spot modules of the XP series to enable different beam characteristics and illumination levels.

VS PowerOptics are made of PMMA, a material of high optical efficiency, and therefore achieve efficiencies of up to 92%
Fixing
PowerOptics 3 XP: with glue
PowerOptics 4 XP: by self tapping screw 2.9 mm x H (H = 6.8 mm + A + B)

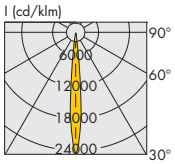




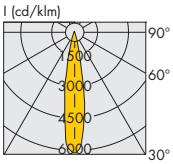

PowerOptics 3XP


PowerOptics 4XP

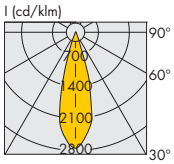
Light distribution curves PowerOptics 3XP



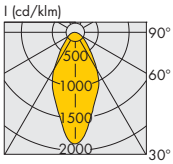
3XP 10°



3XP 20°

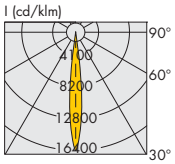


3XP 30°

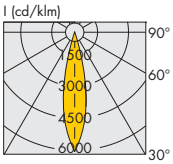


3XP 40°

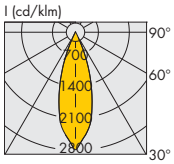
Light distribution curves PowerOptics 4XP



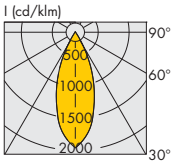
4XP 10°



4XP 20°



4XP 30°

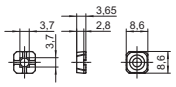


4XP 40°

Type	Ref. No.	Beam angle* °	Dimensions* (mm) diameter x height
Optics for TriplePowerEmitter XP modules			
PowerOptics 3XP 10°	**547591**	10	50 x 11.6
PowerOptics 3XP 20°	**547589**	20	50 x 11.6
PowerOptics 3XP 30°	**547587**	30	50 x 11.6
PowerOptics 3XP 40°	**547510**	40	50 x 11.6
Optics for Spot XP modules			
PowerOptics 4XP 10°	**547592**	10	50 x 11.4
PowerOptics 4XP 20°	**547590**	20	50 x 11.4
PowerOptics 4XP 30°	**547588**	30	50 x 11.4
PowerOptics 4XP 40°	**547511**	40	50 x 11.4

* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

Reflectors for PowerEmitter XP modules
Reflectors generate a high efficiency, round spot with homogeneous light distribution
Material: PC, with reflective aluminium coating
The reflectors are available in two various beam angles and are easily attached to the modules using self-adhesive tape.
Depending on the type of application or the expected ambient conditions, it may be necessary to supplement this method of fastening to ensure the reflectors are securely mounted.
Ref. No.: 548781 20°
Ref. No.: 546370 45°



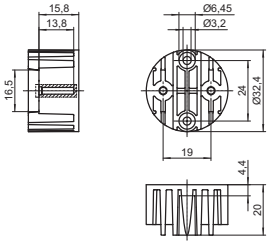


Heat Sinks for LED Modules XP and XML

Under no circumstances may LEDSpots ever be covered by insulation material or similar. Air ventilation must be ensured.

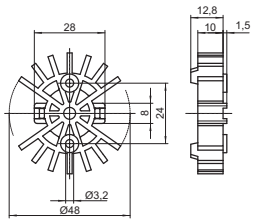
Heat sinks for PowerEmitter XP and XML modules
For LED modules with one XP LED up to 700 mA
For LED modules with one XML LED up to 350 mA
Material: thermoconductive resin
Dimensions: (Ø x depth):
32.4x20 mm / 48x12.8 mm
Fixing: with screws
Weight: 16.4 g
Unit: 250 pcs.
Ref. No.: 548739 Drawing/photo A
Ref. No.: 544804 Drawing/photo B

A



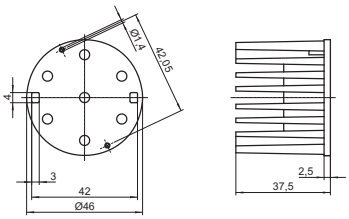


B





Heat sink for TriplePowerEmitter XP
For LED modules up to 700 mA
Material: thermoconductive resin
Dimensions (Ø x depth): 46x37.5 mm
Fixing: with screws
Weight: 51 g
Unit: 225 pcs.
Ref. No.: 544805





LEDLINE ECX

DIMMABLE AND NON-DIMMABLE ELECTRONIC STABILISED POWER SUPPLIES





LED CONSTANT CURRENT DRIVERS

Electronic converters for LED modules operated with constant current drivers

To ensure the safe operation of LEDs that are wired in series, the operating current must be limited to a constant value by the ballast.

Light-emitting diodes are semiconductor devices with a light-emitting p-n junction. Due to the specific diode characteristics, the current can only flow through an LED in one direction. Coupled with the special properties of a semiconductor, this non-linear behaviour can increase the current and power uptake of an LED as it heats up.

If this effect is not limited, uncontrolled heating can finally destroy the semiconductor junction. For this reason, VS recommends using an external constant current driver to operate all constant current driven LED modules. To ensure that the same current flows through every LED, constant current driven LED modules can only be wired in series.

The constant current source has to be selected to suit the respective application, i.e. it must supply the required current and also provide sufficient voltage for the LED string.

The number of VS LED modules that can be connected to a single operating device is dependent on the forward voltage of the respective modules.

LEDLine ECX

- **OVERLOAD PROTECTION**
- **SHORT CIRCUITING PROTECTION**
- **SELV OR SELV EQUIVALENT**
- **35,000 HRS OR 50,000 HRS SERVICE LIFE TIME**

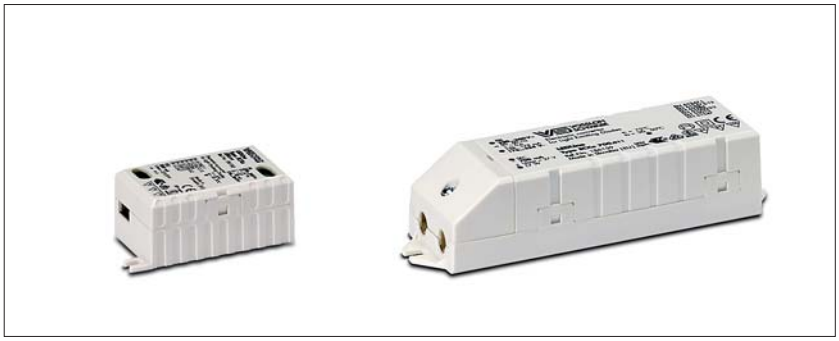
LED Constant Current Drivers

350 mA / 8 W to 1050 mA / 20 W

The electronic constant current drivers are optimised to operate constant current driven LED modules.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

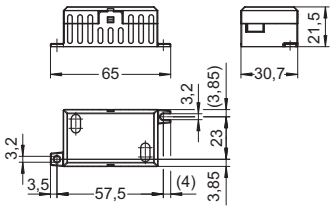
Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class II
SELV equivalent
Power factor: 0.6
Screw terminals: 2.5 mm²
Quantity of screw terminals:
- 1x2-poles primary
- 1x2-poles secondary

With integrated cord grip (except 186180)

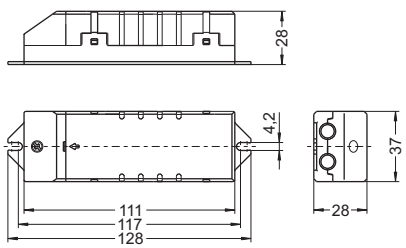


The converters are designed for DC-operation (mains frequency: 0 Hz) and can be used for emergency power supplies.

A



B



Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Drawing	Weight g
Dimensions: 65 x 30.7 x 21.5 mm											
8	ECXe 350.018	**186180**	176/264 220/240	60/40 91/88	350 ±5%	2–24	25	–20 to 50	80	A	33
Dimensions: 128 x 37 x 28 mm											
11	ECXe 350.009	**186157**	176/264 220/240	75/51 122/117	350 ±5%	2–32	34	–20 to 50	70	B	71
16	ECXe 500.010	**186158**	176/264 220/240	106/72 160/155	500 ±5%	2–32	34	–20 to 50	75	B	71
17	ECXe 700.011	**186159**	176/264 220/240	117/79 188/178	700 ±5%	2–25	27	–20 to 50	75	B	71
20	ECXe 1050.012	**186160**	176/264 220/240	137/92 210/202	1050 ±5%	2–19	21	–20 to 45	75	B	71

LED Constant Current Drivers

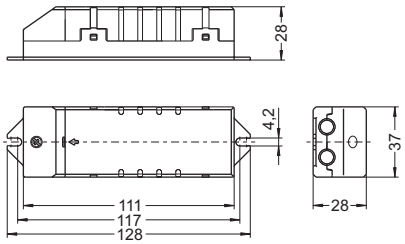
For cooker hood applications, according EN 60335

The electronic stabilised power supplies ECXe are optimised to drive VS High Power LED modules. Primary side switching only. Before connecting LED modules ensure that the power supplier is isolated.



Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20, protection class II
SELV-equivalent
Power factor: 0.6
Screw terminals: 2.5 mm²
Quantity of screw terminals:
- 1x2-poles primary
- 1x2-poles secondary

With integrated cord grip



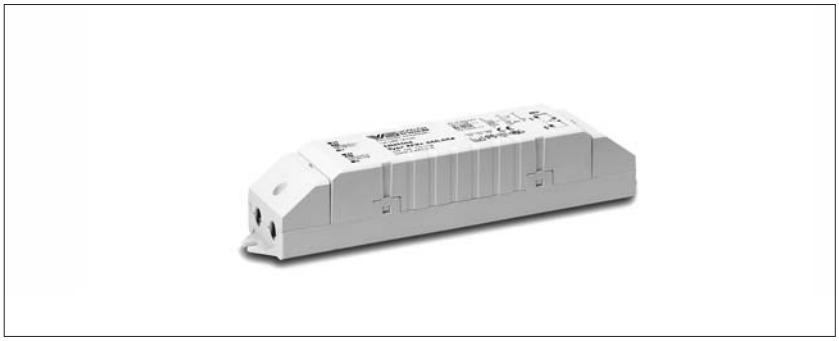
Service life time: 50,000 hrs permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

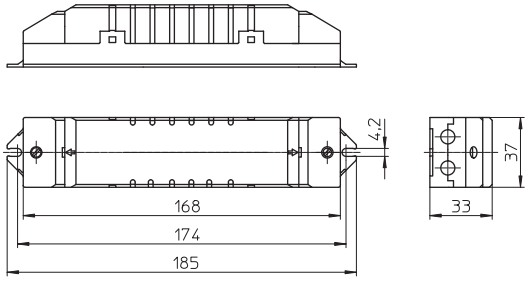
Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50-60 Hz V	Mains current mA	Output current mA	Voltage output V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
Dimensions: 128x37x28 mm									
17	ECXe 700.041	**186277**	176/264 220/240	119-80 188-178	700 ±5%	2 - 25	- 20 to 50	75	81

LED Constant Current Drivers

350 mA / 19.6 W to 700 mA / 22.4 W

The electronic constant current drivers are optimised to operate constant current driven LED modules.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.





Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class II
With integrated throuh-wiring
SELV
Power factor: > 0.9
Screw terminals: 2.5 mm²
Quantity of screw terminals:
2 x 2-poles primary
1 x 2-poles secondary
With integrated cord grip

Service life time: 50,000 hrs permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
Dimensions: 185 x 37 x 33 mm										
19.6	ECXe 350.054	**186294**	220/240	98/108	350 ±5%	15–54	56	-25 to 50	70	102
20	ECXe 500.055	**186295**	220/240	100/110	500 ±5%	12–40	42.5	-25 to 50	70	102
22.4	ECXe 700.056	**186296**	220/240	110/120	700 ±5%	12–31	32	-25 to 50	70	102

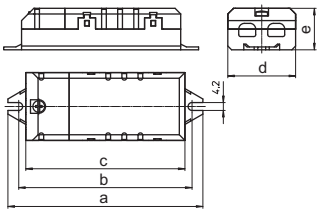
Dimmable LED Constant Current Drivers

350–700 mA / 10–36 W



The constant current driver of the ECXd series features a dimming range of 1 to 100%. If no dimming interface is connected, brightness will stay at 100%.

Dimmable with phase-cutting leading- and trailing-edge dimmer (phase-cutting trailing-edge is recommended). Minimum dimmer load has to be observed.
The compatibility of the driver and the dimmer has to be confirmed prior to installation to avoide flickering and/or noises.



Service life time: 35,000 hrs permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.3% per 1000 hrs

Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class II
SELV
Power factor: > 0.9
Screw terminals: 2.5 mm²
Quantity of screw terminals:
- 2x2-poles primary
- 2x2-poles secondary

Products under development; preliminary technical datas

Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Dimensions mm a	b	c	d	e	Weight g	Efficiency
10	ECXd 350.048	**186286**	220–240	70	330–350	25–35	35	–10 to 45	80	110	103	95	40	24	71	78
	ECXd 500.050	**186288**	220–240	60	470–500	12–20	22	–10 to 50	80	110	103	95	40	24	69	78
15	ECXd 350.049	**186287**	220–240	90	330–350	45–55	48	–10 to 40	80	120	112	105	42	27	101	81
18	ECXd 700.051	**186289**	220–240	100	660–700	15–23	27	–10 to 40	80	120	112	105	42	27	101	81
27	ECXd 700.052	**186290**	220–240	120	660–700	25–35	41	–10 to 40	80	120	112	105	42	27	102	83
36	ECXd 700.053	**186291**	220–240	160	660–700	35–45	54	–10 to 40	80	122	115	109	50	29	135	85

LED Constant Current Drivers

350 mA / 42 W

The electronic constant current drivers are optimised to operate constant current driven LED modules.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

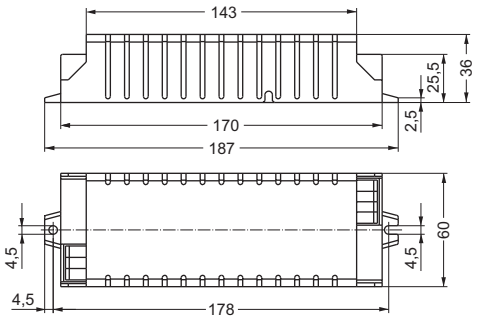
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
SELV equivalent
Power factor: 0.97
Efficiency: > 0.9
Push-in terminals: 2.5 mm²
Quantity of push-in terminals:
- 1x2-poles + earth terminal primary
- 1x2-poles secondary

When using ECXe 350mA/42W together with LED modules in luminaires care must be taken to ensure safety according to EN 60598.



Additional Technical Features

The electronic converter is protected against transient main peaks up to 3 kV (between L and N) and up to 4 kV (between L, N and PE).



Service life time: 50,000 hrs permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

Max. output W	Type	**Ref. No.**	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
Dimensions: 187 x 60 x 36 mm										
42	ECXe 350.015	**186175**	220/240	210/190	350 ±5%	40–115	120	-30 to 60	65	270

LED Constant Current Drivers

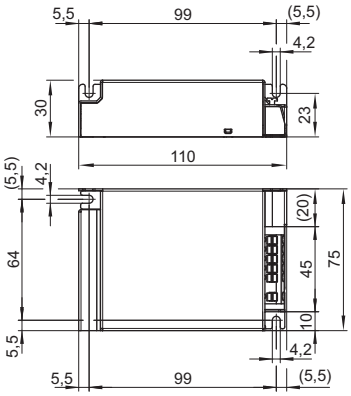
700 mA/ 40 W and 1050 mA / 60 W

The electronic constant current drivers are optimised to operate constant current driven LED modules.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

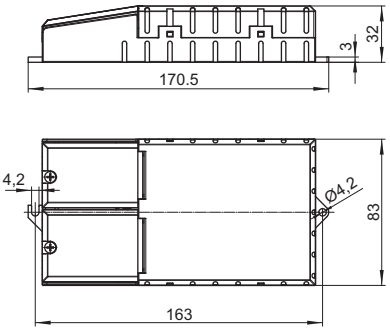
Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
With integrated throuh-wiring
SELV equivalent
Power factor: 0.98
Efficiency: > 0.88
Push-in terminals: 0.2–1.5 mm²
Quantity of push-in terminals:
- 6x1-poles primary (L, N, PE)
- 2x1-poles secondary



M3



K34 with cord grip



Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

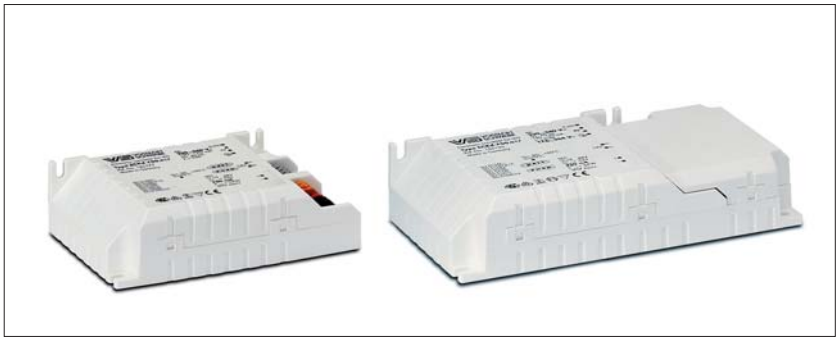
Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50-60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M3 – Dimensions: 110x75x30 mm										
40	ECXe 700.022	**186200**	176/264 220/240	250/160 200/180	700 ±5%	20–57	60	-20 to 60	75	210
60	ECXe 1050.021	**186198**	176/264 220/240	391/261 308/286	1050 ±5%	20–58	60	-20 to 60	80	226
K34 with cord grip – Dimensions: 170.5x83x32 mm										
40	ECXe 700.022	**186201**	176/264 220/240	250/160 200/240	700 ±5%	20–57	60	-20 to 60	75	257
60	ECXe 1050.021	**186199**	176/264 220/240	391/261 308/286	1050 ±5%	20–58	60	-20 to 50	80	273

LED Constant Current Drivers

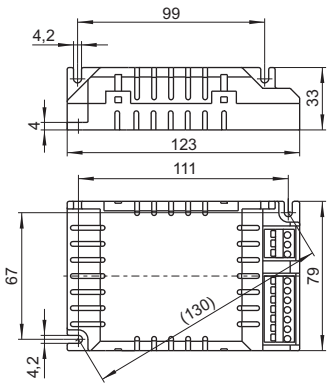
700 mA/ 40 W and 1050 mA / 60 W
With 12 V interface

The electronic constant current drivers are optimised to operate constant current driven LED modules.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

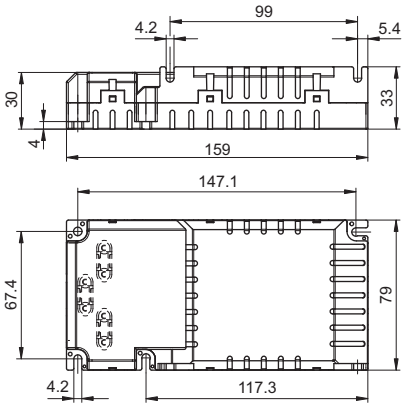
Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
SELV equivalent
Power factor: 0.98
Efficiency: > 0.85
Push-in terminals: 0.5–1.5 mm²
(12 V interface: 0.2–0.5 mm²)
Quantity of push-in terminals:
1x3-poles primary
1x2-poles secondary
1x2-poles 12 V interface



K3



K3 with cord grip

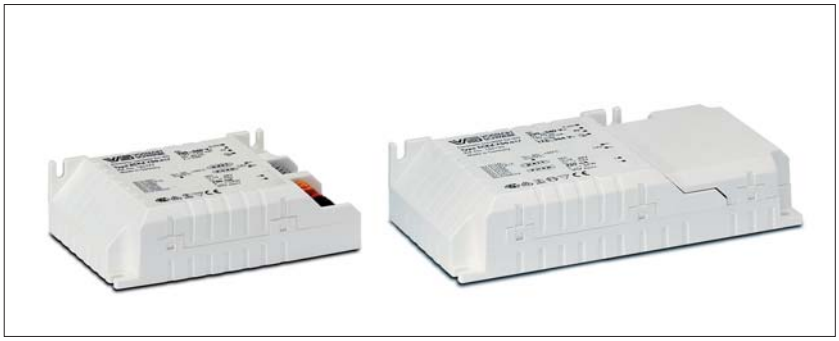


Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	12 V interface max. 2 W	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3 – Dimensions: 123x79x33 mm											
40	ECXe 700.034	**186266**	176/264 220/240	280/185 230/200	700 ±5%	20–57	60	yes	-20 to 50	75	182
60	ECXe 1050.035	**186268**	176/264 220/240	380/252 305/275	1050 ±5%	20–57	60	yes	-20 to 50	80	213
K3 with cord grip – Dimensions: 159x79x33 mm											
40	ECXe 700.034	**186267**	176/264 220/240	280/185 230/200	700 ±5%	20–57	60	yes	-20 to 50	75	220
60	ECXe 1050.035	**186269**	176/264 220/240	380/252 305/275	1050 ±5%	20–57	60	yes	-20 to 50	80	248

Dimmable LED Constant Current Drivers

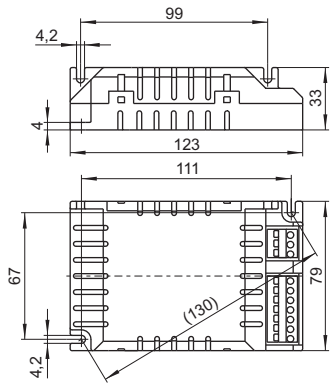
700 mA / 34 W and 40 W,
1050 mA / 60 W



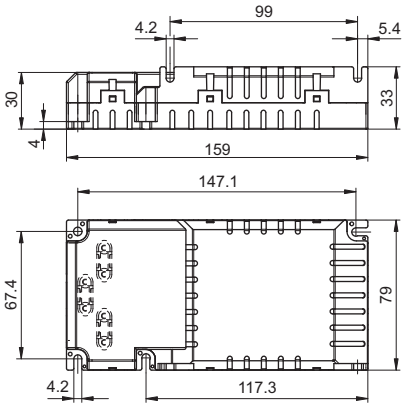
The constant current driver of the ECXd series features a dimming range of 0.5 to 100%. The driver will be in stand-by mode at a setting of under 0.5%. Primary side switching only. Before connecting LED modules ensure that the power supply is disconnected from mains. During dimming operations, the driver can be controlled via DALI-compatible controllers or conventional light switches (PUSH). The dimming function is achieved by applying a PWM signal to the nominal current. If no DALI interface is connected, brightness will stay at 100%.

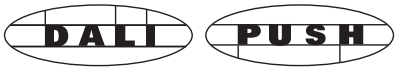
Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
SELV-equivalent
Power factor: 0.97
Efficiency: > 0.85
Stand-by losses: < 0.5 W
Push-in terminals: 0.5–1.5 mm²
(12 V interface: 0.2–0.5 mm² for 1050 mA)
Quantity of push-in terminals:
1x3-poles primary
(1x1-pole PUSH, 1x2-poles DALI)
1x2-poles secondary
1x2-poles 12 V interface (ECXd 700.026 und ECXd 1050)

K3



K3 with cord grip

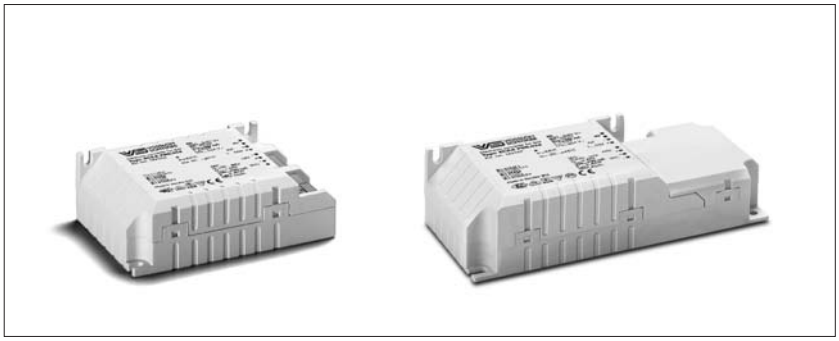




Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	12 V interface max. 2 W	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3 – Dimensions: 123x79x33 mm											
34	ECXd 700.017	**186177**	176/264 220/240	230/160 190/170	700 ±5%	9–48	52	no	-20 to 50	75	180
40	ECXd 700.026	**186221**	176/264 220/240	280/185 230/200	700 ±5%	20–57	60	yes	-20 to 50	75	186
60	ECXd 1050.020	**186196**	176/264 220/240	380/252 305/275	1050 ±5%	20–57	60	yes	-20 to 50	80	220
K3 with cord grip – Dimensions: 159x79x33 mm											
34	ECXd 700.017	**186195**	176/264 220/240	230/160 190/170	700 ±5%	9–48	52	no	-20 to 50	75	215
40	ECXd 700.026	**186222**	176/264 220/240	280/185 230/200	700 ±5%	20–57	60	yes	-20 to 50	75	223
60	ECXd 1050.020	**186197**	176/264 220/240	380/252 305/275	1050 ±5%	20–57	60	yes	-20 to 50	80	250

Adjustable and Dimmable LED Constant-current Drivers

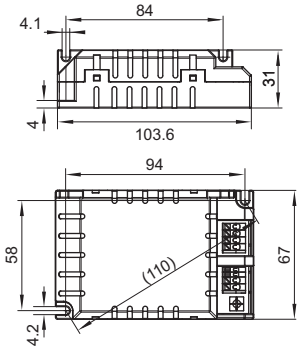


350, 500, 600, 700 mA / 40 W

The constant-current drivers of the ECXd series feature a dimming range of 0.5 to 100%.
The dial can be used set the nominal current to 350 mA, 500 mA, 600 mA or 700 mA.
The dimming function is achieved by the use of a PWM signal. If no 1–10 V interface is connected, brightness will stay at 100%.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached.

Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20
Protection class II
SELV
Power factor: 0.95
Efficiency: > 0.85
Push-in terminals: 0.5–1.5 mm²
(NTC interface: 0.2–0.5 mm²)
Quantity of push-in terminals:
1x2-poles primary
1x2-poles 1–10 V
1x2-poles secondary
1x2-poles NTC connection

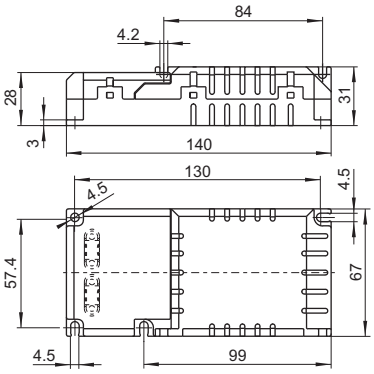
K2





Adjustment	Nominal current mA
1	350
2	500
3	600
4	700

K2 with cord grip



Service life time: 50,000 hrs permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

NTC of LED module 220 kΩ	
R (kΩ)	Nominal current (%)
20,7	100
17,3	60
14,6	0 (off)

Max. output W	Type	Ref. No.	Voltage 0 Hz, 50/60 Hz V	Mains current mA	Output current DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2 – Dimensions: 103.6x67x31 mm										
40	ECXd 700.024	**186326**	176/264 220/240	265/175 220/200	350 +5/-10% 500 +5/-10% 600 +5/-10% 700 +5/-10%	20–57	60	-20 to 50	75	190
K2 with cord grip – Dimensions: 140x67x31 mm										
40	ECXd 700.024	**186327**	176/264 220/240	265/175 220/200	350 +5/-10% 500 +5/-10% 600 +5/-10% 700 +5/-10%	20–57	60	-20 to 50	75	220

LED Constant Current Drivers

2 x 700 mA / 150 W (2-channel)
1 x 700 mA / 75 W



These electronic constant current sources are especially designed for use in street lighting systems.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Electronic short-circuit protection
Asymmetrical load possible
Overload protection
Protection against "no load" operation
Degree of proteciton: IP67
Protection class II
SELV
Power factor: > 0.96
Efficiency: > 0.88

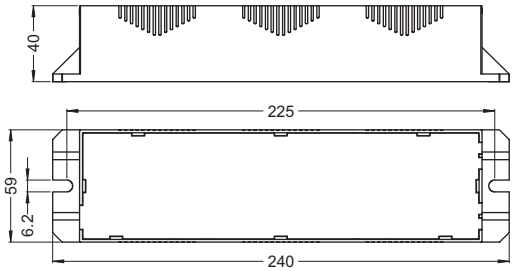
Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

IP67-Version
Pre-assembled connection leads:
primary: 2x0.75 mm²
secondary: 2x0.75 mm²

Dimmable version
The dimming function is achieved by applying a PWM signal to the nominal current. If no 1–10 V interface is connected, brightness will stay at 100%.

Additional Technical Features

The electronic converter is protected against transient main peaks up to 4 kV (between L and N).



1–10V

*** Products under development; preliminary technical datas**

Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
Dimensions: 240 x 59 x 40 mm										
75	ECXe 700.065	**186309***	198–264	400–360	700 ±5%	60–110	120	–10 to 50	70	710
150	ECXe 700.036	**186270**	198–264	760–690	700 ±5%	60–110	120	–10 to 50	75	650
Dimmable Version – Dimensions: 240 x 59 x 40 mm										
75	ECXd 700.066	**186310***	198–264	400–360	700 ±5%	60–110	120	–10 to 50	70	770
150	ECXd 700.040	**186274**	198–264	760–690	700 ±5%	60–110	120	–10 to 50	75	650

LED Constant Current Drivers

400, 700 mA / 150 W

These electronic constant current sources are especially designed for use in street lighting systems. They provide a simple power-reduction option by connecting a further phase, which makes it possible to switch between 400 mA and 700 mA.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

Mains voltage: 220–277 V ±10%
Mains frequency: 50–60 Hz
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of proteciton: IP20 or IP66
Protection class I
Power factor: 0.95
Efficiency: > 0.9

Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

IP20 version
Push-in terminals: 0.75–2.5 mm²
Quantity of push-in terminals:
5x1-poles primary
2x1-poles secondary

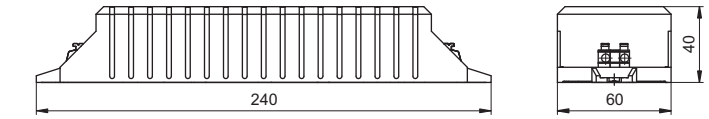
IP66 version
Pre-assembled connection leads:
primary: 5x1 mm², 200 mm
secondary: 2x1,5 mm², 200 mm
Suitable for independent operation when capable connector acc. to EN 60598 is used.

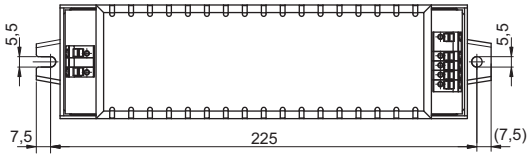


Additional Technical Features

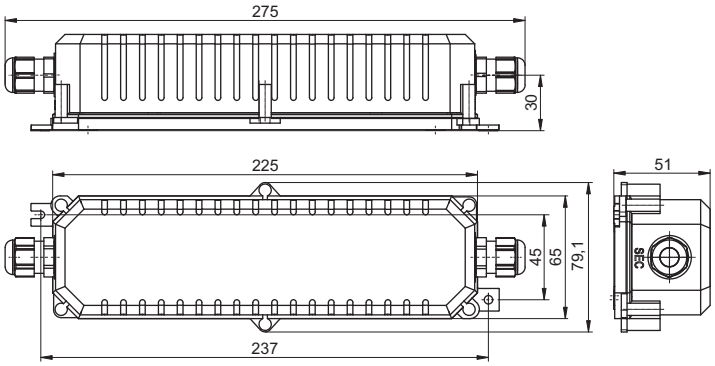
The electronic converter is protected against transient main peaks up to 3 kV (between L and N) and up to 4 kV (between L, N and PE).

IP20





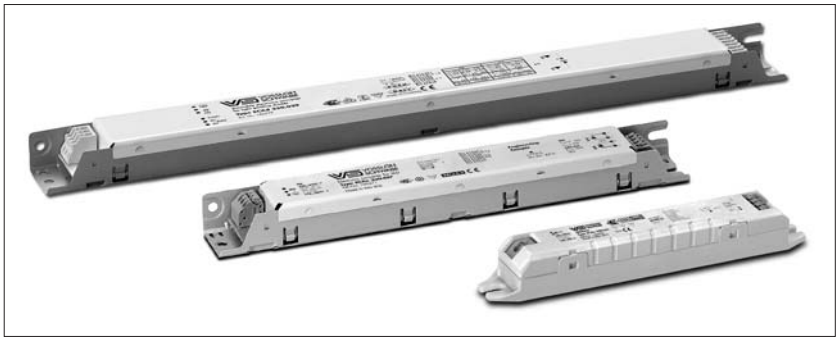
IP66



Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
IP20 – Dimensions: 240x60x40 mm										
150	ECXd 700.023	**186202**	220–277	735/585	700 +5/–10% 400 +5/–10%	48–215 48–375	445	–40 to 60	75	440
IP66 – Dimensions: 275x79.1x51mm										
150	ECXd 700.023	**186203**	220–277	735/585	700 +5/–10% 400 +5/–10%	48–215 48–375	445	–40 to 60	75	560

Linear LED Constant Current Drivers

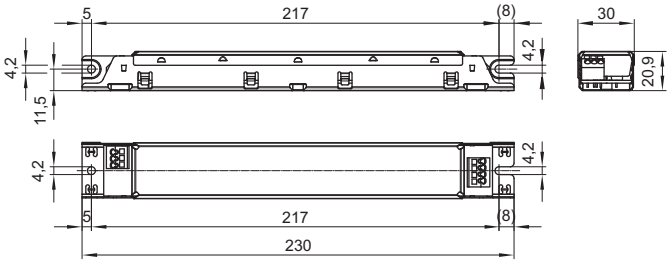
350 mA / 15 W, 2x20 W, 75 W
500/700 mA / 2x40 W
4x60 mA / 4x9 W



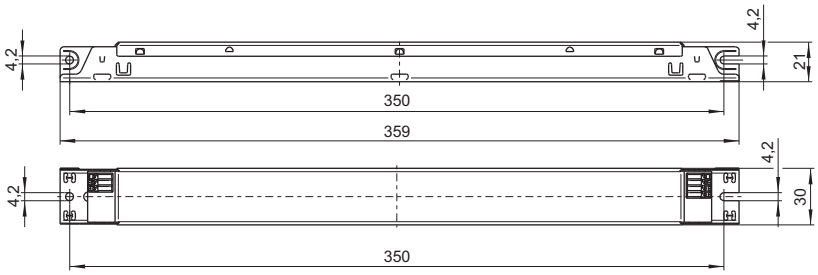
The linear LED constant-current drivers are designed for use in office and retail lighting. The linear design is particularly suitable for luminaire concepts to replace T5/T8 fluorescent lamps with LEDs.
Primary side switching only.
Before connecting LED modules ensure that the power supply is disconnected from mains.

Mains voltage: 220–240 V ±10%
Mains frequency: 0 Hz, 50–60 Hz
Electronic short-circuit protection
Overload protection, Protection against "no load" operation, Degree of proteciton: IP20
Push-in terminals: 0.5–1.5 mm²
Service life time: 50,000 hrs
permanent operation when maximum temperature $t_{cmax.}$ at t_c point will not be exceeded;
failure rate: < 0.2% per 1000 hrs

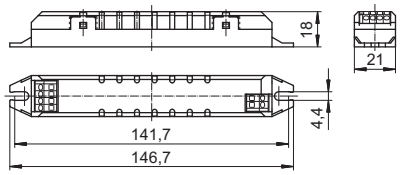
M6.1



M10



K21



*** Products under development; preliminary technical datas**

Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Protection class	SELV	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K21 – Dimensions: 146.7x21x18 mm												
15	ECXe 350.031	**186229**	176/264 220/240	140	350 +5/-10%	2-40	42	II	SELV	-20 to 50	80	49
M6.1 – Dimensions: 230x30x20.9 mm												
2x20	ECXe 2350.037	**186271**	198/264 220/240	210-190	350 +5/-10%	17-56	60	I	SELV	-20 to 50	75	160
4x9	ECXd 460.061	**186305**	– 220/240	180-165	60+5/-10%	110-150	450	I	–	-25 to 60	70	156
M10 – Dimensions: 359x30x21 mm												
75	ECXe 350.028	**186226**	176/264 220/240	364-334	350 +5/-10%	90-215	420	I	–	-20 to 50	70	215
2x40	ECXe 2700.038	**186272***	198/264 220/240	405-370	500 +5/-10% 700 +5/-10%	17-56	60	I	SELV	-20 to 50	75	280
M10 DALI – Dimensions: 359x30x21 mm												
75	ECXd 350.029	**186227**	176/264 220/240	364-334	350 +5/-10%	90-215	420	I	–	-20 to 50	70	215

LED MODULES FOR MAINS VOLTAGE

RETROFIT UNIT FOR CONVENTIONAL TECHNOLOGIES



ADVANTAGES OF RECTANGULAR LED MODULES WITH HEAT SINK

- **JUST ONE SINGLE UNIT: LED MODULE, DRIVER AND HEAT SINK**
- **VERY COMPACT SHAPE: IDENTICAL MOUNTING HOLE LAYOUT AND LAMP FOCUS LIKE FOR CONVENTIONAL BALLAST WITH MOUNTED LAMPHOLDER**
- **HIGH EFFICENT: POWER FACTOR > 0.9**
- **FOR LUMINAIRES OF PROTECTION CLASS II**
- **LATERAL OR BASE FIXING OPTIONS**
- **CONNECTION WITH PUSH-IN TERMINALS WITH CORD GRIP**

Luminaire Examples



LED MODULES FOR OPERATION AT MAINS VOLTAGE 220–240 V

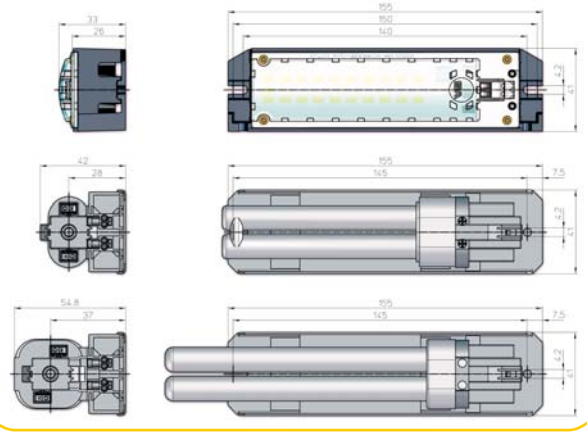
Luminaires of slim and flat design often provide little or no room for additional control gear. Examples of devices that pose a major design challenge are, in particular, small wall, corridor, hall and ceiling luminaires as well as special applications such as lighting of restaurant menus.

Up to now, incandescent or energy-saving lamps with an Edison base or compact fluorescent lamps with an integrated ballast were often used for such lighting projects. But in line with the ErP Directive, 2-pin-based compact fluorescent lamps are also set to be taken off the EU market with effect from 2017.

LED Solutions – Made by Vossloh-Schwabe
Vossloh-Schwabe's new 220–240 V LED modules now provide a perfect opportunity to switch to LED well ahead of time – and without requiring any time-consuming or expensive redesign work on already existing luminaires. Refitting existing installations with these LED modules is equally possible – and equally problem-free.

The dimensions of the rectangular model (with an integrated heat sink) and the lamp focus are comparable to the specifications of a magnetic ballast with an integrated lampholder for compact fluorescent lamps. The circular module is particularly suitable for installation in simple luminaire systems that would more usually be fitted with angled Edison lampholders.

Perfect Retrofit Unit



LED Modules ReadyLine S

Built-in LED modules with integrated driver for mains voltage



Technical notes

Mains voltage: 220–240 V, 50/60 Hz
Dimensions:
- with heat sink 155x41x32 mm
- without heat sink 132x37.4x9.2 mm

Power factor: > 0.95
Aluminium PCB for optimum thermal management
Heat sink made of thermoconductive resin
Protection cover: PC, UV-glued
- or rivetted (module with heat sink)

Push-in terminals with push-button:
- 0.2–0.75 mm² (24–18AWG)

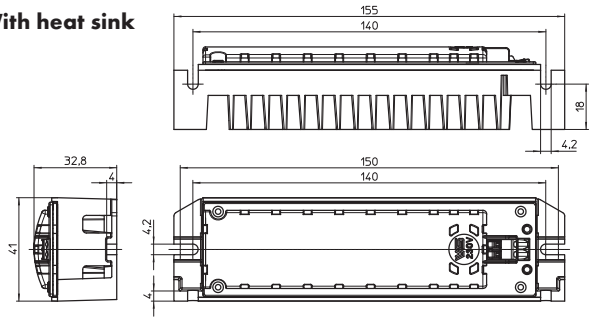
Fixation for modules
- with heat sink: fixing holes for screws M4 or self-tapping screws 3.9
- with cover: fixing holes for screws M3 or self-tapping screws 2.9

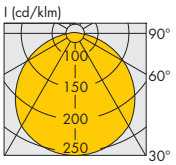
For luminaires of protection class II
RFI suppressed
Weight: 35/140 g (without/with heat sink)
Packaging unit: 80/40 pcs. (without/with heat sink)

Typical applications

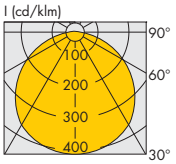
Integration in luminaires
Residential lighting
Architectural lighting
Shop lighting
Furniture lighting

With heat sink



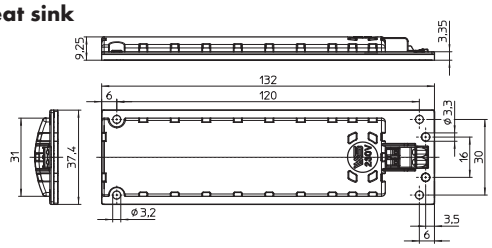


8.7 W



13 W

Without heat sink



Type	Ref. No. with heat sink	Ref. No. without heat sink	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.	Luminous flux lm typ.	CRI R_a	Max. output W
LUT33	**550439**	**550441**	220–240	21	warm white	2900...3200	clear	590	630	> 80	8.7
LUT33	**551983**	**551989**					diffuse	470	505	> 80	8.7
LUT33	**551984**	**551990**	220–240	21	neutral white	3700...4200	clear	600	640	> 80	8.7
LUT33	**551985**	**551991**					diffuse	480	515	> 80	8.7
LUT33	**550438**	**550440**	220–240	30	warm white	2900...3200	clear	910	940	> 80	13
LUT33	**551986**	**551992**					diffuse	730	750	> 80	13
LUT33	**551987**	**551993**	220–240	30	neutral white	3700...4200	clear	920	960	> 80	13
LUT33	**551988**	**551994**					diffuse	735	770	> 80	13

Accessories		
–	**552039**	Cord grip with 2 screws for LED modules with heat sink
–	**550436**	Thermally conductive adhesive transfer tapes 130x36 mm – Tape thickness: 2.5 mm – Thermal conductive R_{th}: 0.7 K/W

LED Modules ReadyLine C

Built-in LED modules with integrated driver for mains voltage

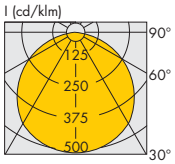


Technical notes

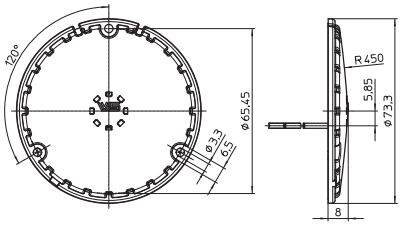
Mains voltage: 220–240 V, 50/60 Hz
Dimensions: Ø 73.3 mm
Power factor: > 0.95
Aluminium PCB for optimum thermal management
Protection cover: PC, UV-glued
or rivetted (module with heat sink)
Screw terminals for LED module with heat sink:
2.5 mm²
Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit
Fixing holes for screws M3 or self-tapping screws 2.9
For luminaires of protection class II
RFI suppressed
Weight: 40/140 g (without/with heat sink)
Packaging unit: 72/45 pcs. (without/with heat sink)

Typical applications

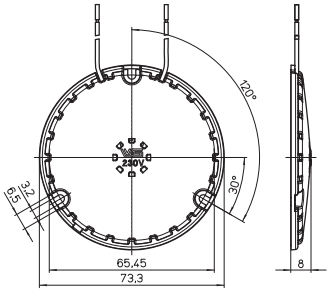
Integration in luminaires
Residential lighting
Architectural lighting
Shop lighting
Furniture lighting



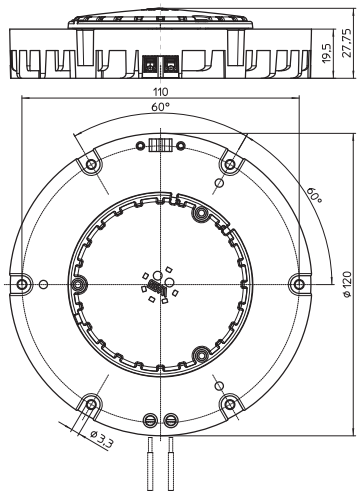
With central lead exit



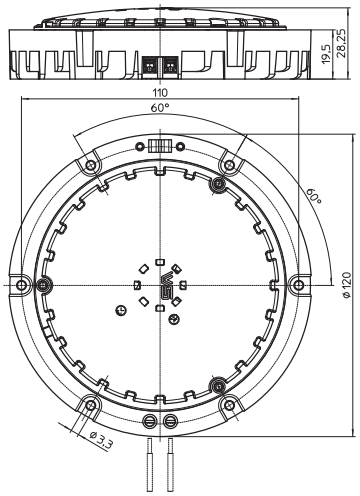
With lateral lead exit



A – With heat sink and protection cover Ø 70 mm



B – With heat sink and protection cover Ø 100 mm



Type	Ref. No. Version A – with heat sink	Ref. No. Version B – with heat sink	Ref. No. without heat sink	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.	Luminous flux lm typ.	CRI R_a	Max. output W	Lead exit
LR42	**552019**	**553373**	**550382**	220–240	42	warm white	2900...3200	clear	1260	1300	> 80	17.5	central
LR42	**on request**	**on request**	**550958**										lateral
LR42	**552020**	**553374**	**552015**	220–240	42	warm white	2900...3200	diffuse	1000	1040	> 80	17.5	central
LR42	**on request**	**on request**	**552016**										lateral
LR42	**552021**	**553375**	**551448**	220–240	42	neutral white	3700...4200	clear	1300	1340	> 80	17.5	central
LR42	**on request**	**on request**	**550959**										lateral
LR42	**552022**	**553376**	**552018**	220–240	42	neutral white	3700...4200	diffuse	1040	1070	> 80	17.5	central
LR42	**on request**	**on request**	**552017**										lateral

Accessories

–	**552039**	Cord grip with 2 screws for LED modules with heat sink
–	**551265**	Thermally conductive adhesive transfer tapes Ø 70 mm – Tape thickness: 0.25 mm – Thermal conductive R_{th}: 0.7 W/mK
–	**553422**	Thermally conductive transfer tape, non-adhesive Ø 70 mm – Tape thickness: 0.25 mm – Thermal conductive R_{th}: 2.7 W/mK

DecoLED

A NEW GENERATION OF DECORATION





DecoLED – ECO-FRIENDLY LIGHTING FOR INDOOR APPLICATIONS

DecoLED, a highly efficient LED downlight, is the perfect solution for commercial and residential applications. The die-cast casing is fitted with an easy adjustment function that allows the light to be positioned at the desirable angle. The adaptable spring clip makes installation quick, easy and hassle-free, and is suitable for all types of ceiling.

Thanks to the high light output of DecoLED, a 5 W downlight can now replace a 35 W halogen lamp. DecoLED 15 W is an ideal replacement for a PAR38 lamp 120 W and the reflector design of DecoLED 7 W is a perfect 50 W dichroic halogen retrofit. This results in an energy saving of more than 87% and reduces CO_2 emissions, all of which makes DecoLED the more environmentally sustainable option.

VS DecoLED comes in different beam angles, wattages and white colours to suit any application.

Going greener has never been easier – for further energy-efficient and highly eco-friendly lighting options, VS provides a full range of LED modules to suit your every need.

Typical applications

- Commercial lighting
- Showcase lighting
- Bathroom and kitchen lighting
- Residential lighting
- Entertainment lighting

VS DecoLED

A slim and compact design with integrated thermal management and high-efficiency output, making it ideal for many lighting applications.

Allowed operating temperature: –20 to 40°C
Allowed storage temperature: –40 to 60°C
Dimmable (dimmable LED drivers see page 52)
Protection class III
Degree of protection: IP20
Service life time: > 35,000 hrs (L50)



DecoLED 5 W **DecoLED 7 W** **DecoLED 15 W**

DecoLED, 5 W
Design style: lens
Current supply: 350 mA DC
Beam angle: 20° and 40°
Adjustable angle: 0 to 45°

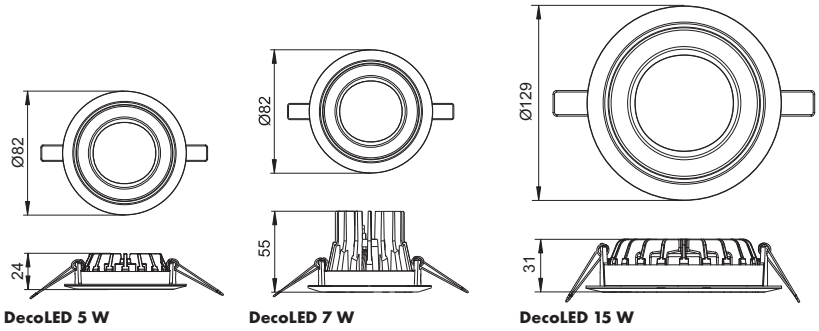


DecoLED, 7 W
Design style: reflector
Current supply: 350 mA DC
Beam angle: 36°
Adjustable angle: 0 to 30°

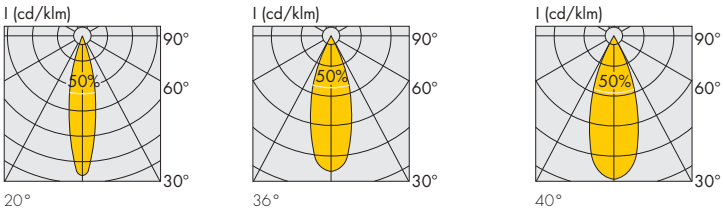


DecoLED, 15 W
Design style: lens
Current supply: 700 mA DC
Beam angle: 20° and 40°
Adjustable angle: 0 to 45°





DecoLED 5 W **DecoLED 7 W** **DecoLED 15 W**



Type	Ref. No.	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Light intensity cd	Beam angle °	Field angle °	Power W	Energy efficiency
DecoLED, 5 W										
DecoLED-5-2700-38-II	**549143**	warm white	2700	80	285	2250	20	38	5	A
DecoLED-5-3000-38-II	**554576**	warm white	3000	80	315	2450	20	38	5	A+
DecoLED-5-4000-38-II	**554577**	neutral white	4000	75	360	2850	20	38	5	A+
DecoLED-5-6000-38-II	**554578**	cool white	6000	70	475	3750	20	38	5	A+
DecoLED-5-2700-60-II	**554579**	warm white	2700	80	285	750	40	60	5	A
DecoLED-5-3000-60-II	**554580**	warm white	3000	80	315	800	40	60	5	A+
DecoLED-5-4000-60-II	**554581**	neutral white	4000	75	360	950	40	60	5	A+
DecoLED-5-6000-60-II	**554582**	cool white	6000	70	475	1250	40	60	5	A+
DecoLED, 7 W										
DecoLED-7-2700-36	**552096**	warm white	2700	85	600	1150	36	72	7	A+
DecoLED, 15 W										
DecoLED-15-2700-38-II	**554583**	warm white	2700	80	700	5250	20	38	15	A
DecoLED-15-3000-38-II	**554584**	warm white	3000	80	780	5850	20	38	15	A
DecoLED-15-4000-38-II	**566041**	neutral white	4000	75	900	6750	20	38	15	A
DecoLED-15-6000-38-II	**566042**	cool white	6000	70	1150	8650	20	38	15	A
DecoLED-15-2700-60-II	**566043**	warm white	2700	80	700	1750	40	60	15	A
DecoLED-15-3000-60-II	**566044**	warm white	3000	80	780	1950	40	60	15	A
DecoLED-15-4000-60-II	**566045**	neutral white	4000	75	900	2250	40	60	15	A
DecoLED-15-6000-60-II	**566046**	cool white	6000	70	1150	2875	40	60	15	A

Typical Luminance

Of DecoLEDs at 1, 2 and 3 meters

Intensity (lux)															
Colour temperature	**DecoLED 5 W**						**DecoLED 7 W**			**DecoLED 15 W**					
	20°			**40°**			**36°**			**20°**			**40°**		
K	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm White 2700 K	1600	400	178	580	145	65	1200	300	133	4500	1125	500	1500	375	165
Warm White 3000 K	1800	450	200	650	163	72	–	–	–	5000	1250	556	1650	413	183
Neutral White 4000 K	2500	625	278	750	188	83	–	–	–	6500	1625	722	2300	575	256
Cool White 6000 K	3000	750	333	940	235	104	–	–	–	7000	1750	778	2550	638	283

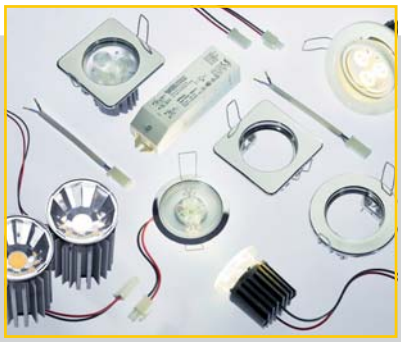
DecoLED in comparison

Type	**DecoLED 5 W**	**Halogen lamp 35 W**
Brightness at 1 m	2,500 lux	2,400 lux
Service life time	35,000 hrs. (L50)	2,000 hrs.
System power (incl. driver/transformer)	7 W	40 W
12 hrs operation per day	31 kWh/year	175 kWh/year
Energy savings	144 kWh/year	

LED Constant Current Drivers

You will find LED drivers for the DecoLED modules on pages 49 and 52.

FOR RESIDENTIAL AND FURNITURE LIGHTING





CONVENIENT LED TECHNOLOGY

As the perfect replacement for halogen lamps, the new LED modules made by VS are ideal for use in furniture, false ceilings as well as cooker hoods.

These LED modules are available with high-power LEDs and different optics attachments. The circular or square metal frame is available i a white, silver, matt silver or gold finish. Furthermore, flexible snap-in fasteners make it extremely easy and quick to exchange halogen spots, which are still in widespread use.

The package is rounded off by a matching LED driver housed in a compact VS LiteLine transformer casing plus a set of cables with pre-assembled plugs for connecting up to two LED modules.

Typical applications for LEDSpots

- MR16 replacement
- Integration in luminaires (except PRO series)
- Marking paths, stairs, etc.
- Furniture lighting (IP54 version for humid rooms)
- Light advertising
- Entertainment, shop design

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

Please read the safety and installation instructions on the individual products as well as further technical information provided in the extensive product descriptions at **www.vossloh-schwabe.com.**

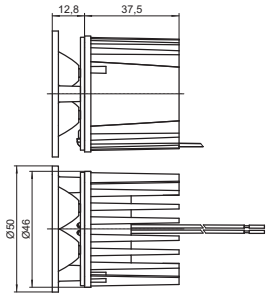
Technical Features of LEDSpots at a Glance

The use of LEDs offers many advantages in comparison to conventional lighting solutions.

LEDSpot		Brief description	White tones*	Beam angle	Degree of protection	Typ. luminous flux (lm)	Frame for cut-out	Replacement for halogen spots
Built-in LEDSpot								
ActiveLine	Quad	SMD built-in spot, 4 LEDs, optics, thermoplastic heat sink	WW, NW, CW	10°, 20°, 30°, 40°	IP20	700	–	GU/GZ10, 35 W GU5.3, 50 W (MR16)
ActiveLine	Triple	SMD built-in spot, 3 LEDs, optics, thermoplastic heat sink	WW, NW	10°, 20°, 30°, 40°	IP20	600	–	GU/GZ10, 35 W GU5.3, 35 W (MR16)
ActiveLine	LUGA	COB built-in spot LUGA, reflector, aluminium heat sink	WW, NW	25°, 40°	IP20	1000	–	GU/GZ10, 35 W GU5.3, 50 W (MR16)
ActiveLine	900	COB built-in spot, reflector, aluminium heat sink	WW, NW	25°, 40°	IP20	900	–	GU/GZ10, 35 W GU5.3, 50 W (MR16)
ActiveLine	800	COB built-in spot, reflector, aluminium heat sink	WW, NW, CW	20°, 40°	IP20	800	–	GU/GZ10, 35 W GU5.3, 50 W (MR16)
ActiveLine	600	COB built-in spot, reflector, aluminium heat sink	WW, NW	20°, 40°	IP20	600	–	GU/GZ10, 35 W GU5.3, 35 W (MR16)
Complete LEDSpots with frame								
ActiveLine PRO		Complete LEDSpots of series ActiveLine with frame	see built-in spots	see built-in spots	IP20	see built-in spots	round, square, Ø 75 mm	GU/GZ10, GU5.3 (MR16) 35–50 W
IPLine		LEDSpot, degree of protection IP54, thermoplastic heat sink	WW, NW, CW		IP54	200/300	round, Ø 56 mm	G9, G4/G(Y)6.35 20–35 W
SmartLine	COB	LEDSpot COB, 1 LED, for built-in into ceilings or luminaire sheets, thermoplastic heat sink	WW, NW	45°	IP40	300	round, square, Ø 56 mm	G9, G4/G(Y)6.35 20–35 W
SmartLine	XT	LEDSpot XT, 1 LED, for built-in into ceilings or luminaire sheets, thermoplastic heat sink	WW, NW, CW	50°	IP40	200	round, square, Ø 56 mm	G9, G4/G(Y)6.35 20–35 W
DiscLine		LEDSpot, 1 LED, for built-in into ceilings or luminaire sheets, thermoplastic heat sink	WW, NW, CW	20°, 50°	IP40	200	round, Ø 56 mm	G9, G4/G(Y)6.35 20–35 W
StartLine		LEDSpot, 1 LED, for built-in into luminaire sheets, thermoplastic heat sink	WW, NW, CW	50°	IP20	170	round, Ø 56 mm	G9, G4/G(Y)6.35 20–35 W
EffectLine		LEDSpot, 1 LED, for built-in into ceilings, thermoplastic heat sink	WW, NW	26°, 45°	IP20	200	round, square, Ø 37 mm	G9, G4/G(Y)6.35 20–35 W

* WW = warm white (2800...3200 K), NW = neutral white (3700...4200 K), CW = cool white (5500...6500 K)

LEDSpot ActiveLine Quad

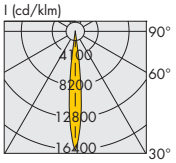




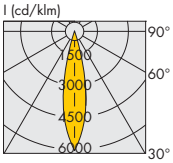
Built-in LEDSpot equipped with optics, heat sink and leads

Thanks to the use of four highly efficient LEDs XTE, LEDSpot Quad modules guarantee an extremely high lumen output of more than 700 lm at max. 700 mA.

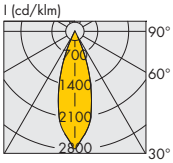
The LEDSpot ActiveLine Quad modules are available in cool white, neutral white and warm white. The modules are available with a fixed 10°, 20°, 30° or 40° optical attachment to enable the creation of different lighting scenes.



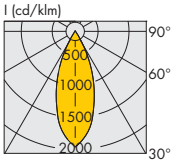
10°



20°



30°



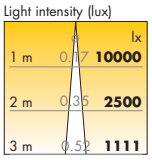
40°

Technical notes

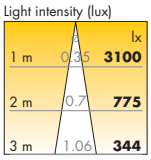
Lens diameter: 50 mm
Heat sink material: thermoconductive resin
Pre-assembled leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 300 mm
Allowed operating temperature at t_c point: –20 to 80 °C
Use of external LED constant-current drivers required
Aluminium PCB for optimum thermal management
Colour rendering index: white R_a = 75, warm white R_a = 80
ESD protection class 2
Weight: 90 g
Packaging unit: 45 pcs.

Luminous intensity distribution

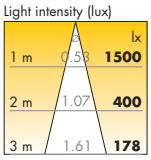
3000 K at 700 mA



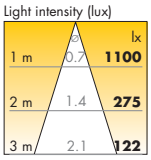
10°



20°



30°



40°

Type	Description	Ref. No. without plug	Ref. No. with plug	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 3.99 W) min.	typ.	500 mA (P_{el} = 5.8 W) min.	typ.	700 mA (P_{el} = 8.5 W) min.	typ.	Beam angle °	Light intensity 700 mA Candela
LEDSpot ActiveLine Quad 10°													
LR4W	XTE 3000K bin Q3	**547790**	**547794**	warm white	2870...3200	338	373	450	496	601	663	10	10000
LR4W	XTE 4000K bin Q4	**548864**	**549917**	neutral white	3700...4260	360	398	479	529	640	707	10	10600
LR4W	XPE 6300K bin Q4	**547798**	**547802**	cool white	5650...6950	360	398	468	517	612	676	10	10200
LEDSpot ActiveLine Quad 20°													
LR4W	XTE 3000K bin Q3	**547789**	**547793**	warm white	2870...3200	338	373	450	496	601	663	20	3100
LR4W	XTE 4000K bin Q4	**547940**	**549916**	neutral white	3700...4260	360	398	479	529	640	707	20	3300
LR4W	XPE 6300K bin Q4	**547797**	**547801**	cool white	5650...6950	360	398	468	517	612	676	20	3150
LEDSpot ActiveLine Quad 30°													
LR4W	XTE 3000K bin Q3	**547788**	**547792**	warm white	2870...3200	338	373	450	496	601	663	30	1600
LR4W	XTE 4000K bin Q4	**548863**	**549915**	neutral white	3700...4260	360	398	479	529	640	707	30	1700
LR4W	XPE 6300K bin Q4	**547796**	**547800**	cool white	5650...6950	360	398	468	517	612	676	30	1630
LEDSpot ActiveLine Quad 40°													
LR4W	XTE 3000K bin Q3	**547726**	**547791**	warm white	2870...3200	338	373	450	496	601	663	40	1100
LR4W	XTE 4000K bin Q4	**547837**	**549914**	neutral white	3700...4260	360	398	479	529	640	707	40	1180
LR4W	XPE 6300K bin Q4	**547795**	**547799**	cool white	5650...6950	360	398	468	517	612	676	40	1130

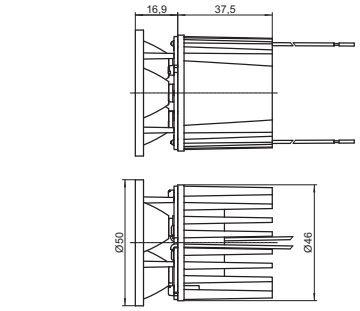
* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C

LEDSpot ActiveLine Triple

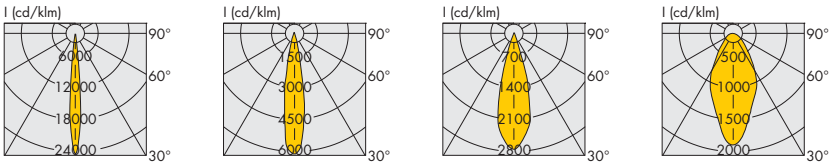
Built-in LEDSpot equipped with optics, heat sink and leads

Thanks to the use of three highly efficient LEDs XTE, LEDSpot Triple modules guarantee an extremely high lumen output of more than 500 lm at max. 700 mA.

The LEDSpot ActiveLine Triple modules are available in neutral white and warm white. The modules are available with a fixed 10°, 20°, 30° or 40° optical attachment to enable the creation of different lighting scenes.







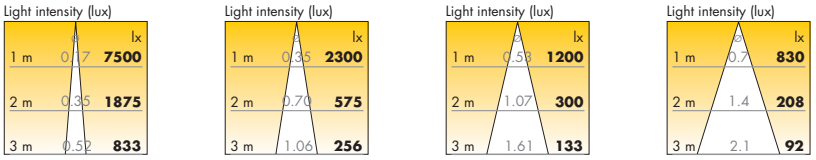
10° 20° 30° 40°

Technical notes

Lens diameter: 50 mm
Heat sink material: thermoconductive resin
Pre-assembled leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 300 mm
Allowed operating temperature at t_c point: –20 to 65 °C
Use of external LED constant-current drivers required
Aluminium PCB for optimum thermal management
Colour rendering index: white R_a = 75, warm white R_a = 80
ESD protection class 2
Weight: 90 g
Packaging unit: 45 pcs.

Luminous intensity distribution

3000 K at 700 mA



10° 20° 30° 40°

Type	Description	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 2.99 W) min.	typ.	500 mA (P_{el} = 4.35 W) min.	typ.	700 mA (P_{el} = 6.38 W) min.	typ.	Beam angle °	Light intensity 700 mA Candela
LEDSpot ActiveLine Triple 10°												
LR3W	XTE 3000K min Q3	**548875**	warm white	2870...3200	254	280	337	372	451	497	10	7500
LR3W	XTE 4000K min Q4	**548879**	neutral white	3700...4260	270	298	359	397	480	531	10	8000
LEDSpot ActiveLine Triple 20°												
LR3W	XTE 3000K min Q3	**548874**	warm white	2870...3200	254	280	337	372	451	497	20	2300
LR3W	XTE 4000K min Q4	**548878**	neutral white	3700...4260	270	298	359	397	480	531	20	2450
LEDSpot ActiveLine Triple 30°												
LR3W	XTE 3000K min Q3	**548873**	warm white	2870...3200	254	280	337	372	451	497	30	1200
LR3W	XTE 4000K min Q4	**548877**	neutral white	3700...4260	270	298	359	397	480	531	30	1290
LEDSpot ActiveLine Triple 40°												
LR3W	XTE 3000K min Q3	**548872**	warm white	2870...3200	254	280	337	372	451	497	40	830
LR3W	XTE 4000K min Q4	**548876**	neutral white	3700...4260	270	298	359	397	480	531	40	890

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C
Suitable thermal tapes for these LED modules see page 102.

LEDSpot ActiveLine LUGA

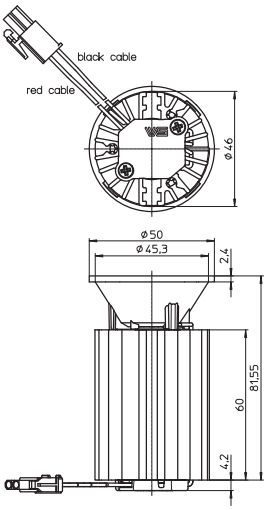


Built-in LEDSpot equipped with a reflector, heat sink, leads and optional plug

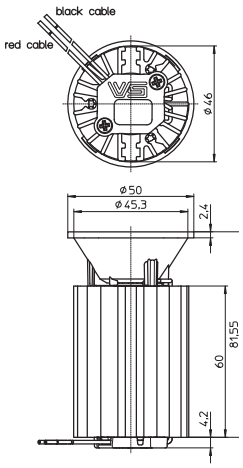
Technical notes

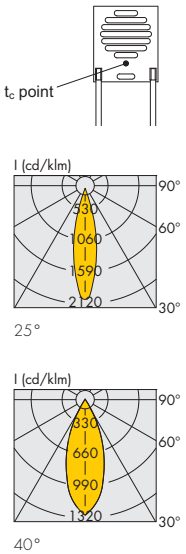
Reflector diameter: 50 mm
Heat sink material: aluminium
Allowed operating temperature at t_c point:
–40 to 80 °C (L90/B10)
Use of external LED constant-current drivers required
The ceramic PCB ensures optimum thermal management
Plastic clear cover to protect reflector (opaque cover on request)
Leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 200 mm, with or without plug
With integrated cord grip
Weight: 145 g
Packaging unit: 45 pcs.

With plug

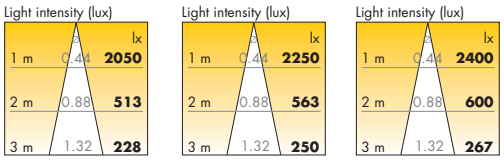


Without plug



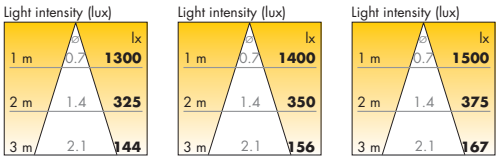


Luminous intensity distribution at 700 mA
Beam angle: 25°



2700 K 3000 K 4000 K

Luminous intensity distribution at 700 mA
Beam angle: 40°



2700 K 3000 K 4000 K

Typ	Ref. No. without plug	Ref. No. with plug	Colour	Correlated colour temperature K	CRI R_a	Luminous flux* (lm) at 350 mA (P_{el} = 4.9 W) min.	typ.	500 mA (P_{el} = 7.1 W) min.	typ.	700 mA (P_{el} = 10.2 W) min.	typ.	Light intensity 700 mA Candela	Beam angle °
Narrow beam angle: 25°													
LugaSpot COB 1000lm 2700K	**551309**	**551310**	warm white	2700 -75/+125	> 80	489	536	671	734	932	1015	2050	25
LugaSpot COB 1000lm 3000K	**551311**	**551312**	warm white	3000 -75/+165	> 80	505	562	692	770	953	1062	2250	25
LugaSpot COB 1000lm 4000K	**551313**	**551314**	neutral white	4000 -215/+185	> 80	520	578	718	796	995	1098	2400	25
Medium beam angle: 40°													
LugaSpot COB 1000lm 2700K	**550046**	**550348**	warm white	2700 -75/+125	> 80	489	536	671	734	932	1015	1300	40
LugaSpot COB 1000lm 3000K	**550047**	**550349**	warm white	3000 -75/+165	> 80	505	562	692	770	953	1062	1400	40
LugaSpot COB 1000lm 4000K	**550048**	**550350**	neutral white	4000 -215/+185	> 80	520	578	718	796	995	1098	1500	40

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C
CRI > 90 on request

LEDSpot ActiveLine 900

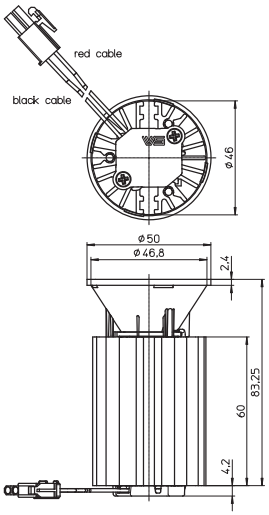


Built-in LEDSpot equipped with a reflector, heat sink, leads and optional plug

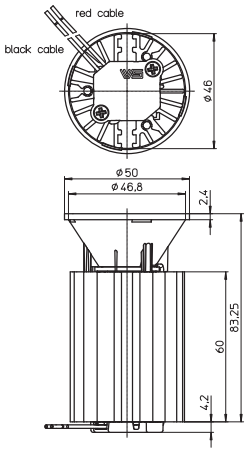
Technical notes

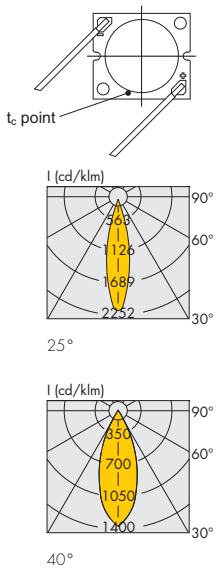
Reflector diameter: 50 mm
Heat sink material: aluminium
Allowed operating temperature at t_c point:
–40 to 85 °C (L70/B30)
Use of external LED constant-current drivers required
Plastic clear cover to protect reflector
(opaque cover on request)
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm,
with or without plug
With integrated cord grip
Weight: 145 g
Packaging unit: 45 pcs.

With plug

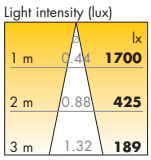


Without plug

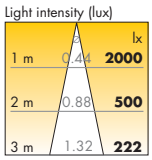




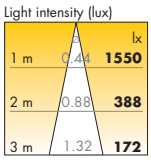
Luminous intensity distribution at 500 mA
Beam angle: 25 °



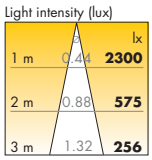
2700 K



3000 K

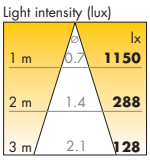


3000 K, CRI > 90

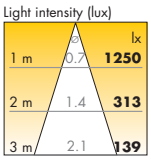


4000 K

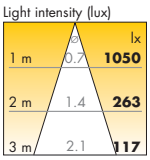
Luminous intensity distribution at 500 mA
Beam angle: 40 °



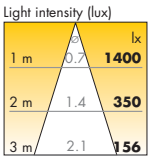
2700 K



3000 K



3000 K, CRI > 90



4000 K

Type	**Ref. No.** without plug	**Ref. No.** with plug	Colour	Correlated colour temperature K	CRI R_a	Luminous flux* (lm) at 350 mA (P_{el} = 7.11 W) min.	typ.	500 mA (P_{el} = 10.5 W) min.	typ.	Light intensity 500 mA Candela	Beam angle °
Narrow beam angle: 25°											
Spot COB 900lm 2700K	**551384**	**551385**	warm white	2580...2870	> 80	560	600	780	840	1700	25
Spot COB 900lm 3000K	**552044**	**551386**	warm white	2870...3220	> 80	590	635	820	890	2000	25
Spot COB 900lm 3000K	**551387**	**551388**	warm white	2870...3220	> 90	521	560	730	785	1550	25
Spot COB 900lm 4000K	**552040**	**552041**	neutral white	3700...4250	> 80	648	735	958	1030	2300	25
Medium beam angle: 40°											
Spot COB 900lm 2700K	**550049**	**551084**	warm white	2580...2870	> 80	560	600	780	840	1150	40
Spot COB 900lm 3000K	**550050**	**551085**	warm white	2870...3220	> 80	590	635	820	890	1250	40
Spot COB 900lm 3000K	**550051**	**551086**	warm white	2870...3220	> 90	521	560	730	785	1050	40
Spot COB 900lm 4000K	**552042**	**552043**	neutral white	3700...4250	> 80	648	735	958	1030	1400	40

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 70 °C

LEDSpot ActiveLine 800

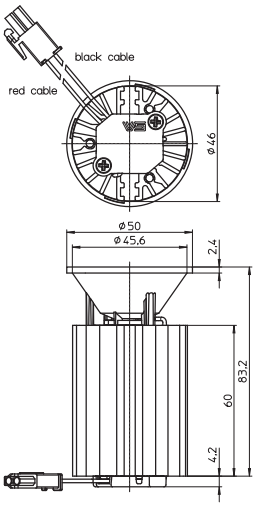


Built-in LEDSpot equipped with a reflector, heat sink, leads and optional plug

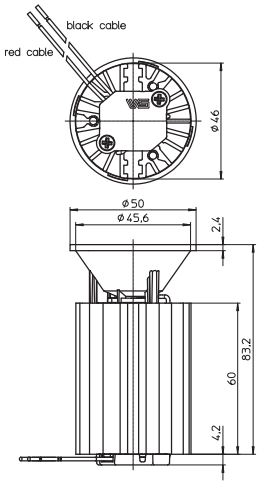
Technical notes

Reflector diameter: 50 mm
Heat sink material: aluminium
Allowed operating temperature at t_c point:
–40 to 85 °C (L70/B30)
Use of external LED constant-current drivers required
Plastic clear cover to protect reflector
(opaque cover on request)
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm,
with or without plug
With integrated cord grip
Weight: 145 g
Packaging unit: 45 pcs.

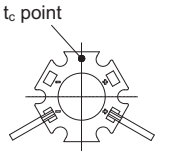
With plug

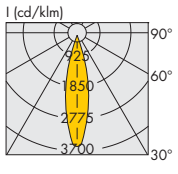


Without plug

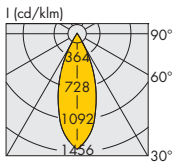


t_c point



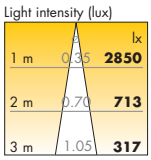


20°

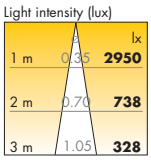


40°

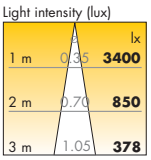
Luminous intensity distribution at 350 mA
Beam angle: 20°



3000 K

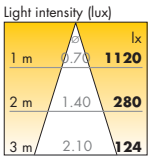


4000 K

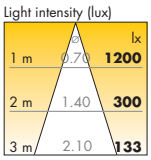


5600 K

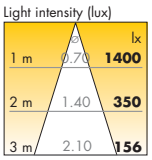
Luminous intensity distribution at 350 mA
Beam angle: 40°



3000 K



4000 K



5600 K

Type	Ref. No. without plug	Ref. No. with plug	Colour	Correlated colour temperature K	CRI R_a	Luminous flux* (lm) at 350 mA (P_{el} = 9.84 W) min.	typ.	Light intensity 350 mA Candela	Beam angle °
Narrow beam angle: 20°									
Spot COB 800lm 3000K	**551246**	**551247**	warm white	2870...3220	> 80	716	770	2850	20
Spot COB 800lm 4000K	**551250**	**551251**	neutral white	3700...4250	> 80	800	860	2950	20
Spot COB 800lm 5600K	**551254**	**551255**	cool white	5310...6020	> 70	930	1000	3400	20
Medium beam angle: 40°									
Spot COB 800lm 3000K	**551248**	**551249**	warm white	2870...3220	> 80	716	770	1120	40
Spot COB 800lm 4000K	**551252**	**551253**	neutral white	3700...4250	> 80	800	860	1200	40
Spot COB 800lm 5600K	**551256**	**551257**	cool white	5310...6020	> 70	930	1000	1400	40

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 70 °C

LEDSpot ActiveLine 600

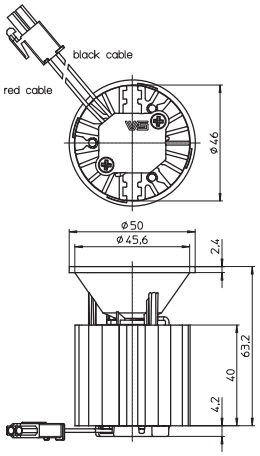


Built-in LEDSpot equipped with a reflector, heat sink, leads and optional plug

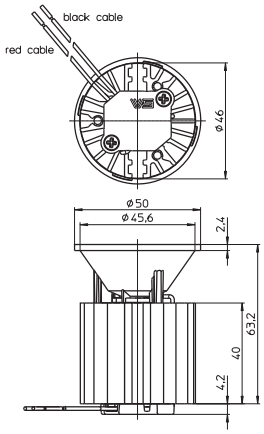
Technical notes

Reflector diameter: 50 mm
Heat sink material: aluminium
Allowed operating temperature at t_c point:
–40 to 85 °C (L70/B30)
Use of external LED constant-current drivers required
Plastic clear cover to protect reflector
(opaque cover on request)
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm,
with or without plug
With integrated cord grip
Weight: 107 g
Packaging unit: 45 pcs.

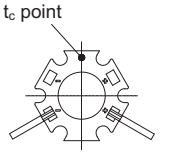
With plug

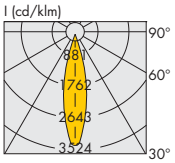


Without plug

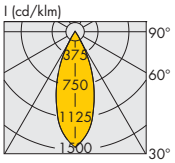


t_c point



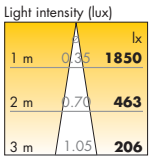


20°

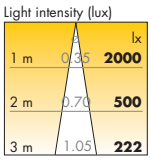


40°

Luminous intensity distribution at 350 mA
Beam angle: 20°

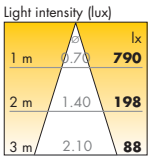


3000 K

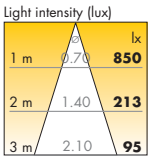


4000 K

Luminous intensity distribution at 350 mA
Beam angle: 40°



3000 K



4000 K

Type	Ref. No. without plug	Ref. No. with plug	Colour	Correlated colour temperature K	CRI Ra	Luminous flux* (lm) at 350 mA (P_{el} = 6.6 W) min.	typ.	Light intensity 350 mA Candela	Beam angle °
Narrow beam angle: 20°									
Spot COB 600lm 3000K	**551258**	**551259**	warm white	2870...3220	> 80	489	525	1850	20
Spot COB 600lm 4000K	**551379**	**551380**	neutral white	3700...4250	> 80	521	560	2000	20
Medium beam angle: 40°									
Spot COB 600lm 3000K	**551260**	**551261**	warm white	2870...3220	> 80	489	525	790	40
Spot COB 600lm 4000K	**551381**	**551382**	neutral white	3700...4250	> 80	521	560	850	40

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 70 °C

LEDSpots ActiveLine PRO

Complete LEDSpot equipped with a reflector or optics, heat sink, leads with plug and metal frame



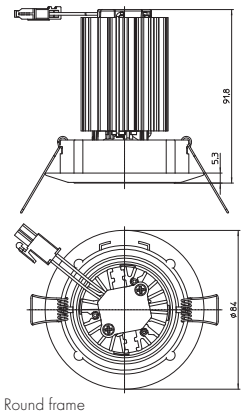
Technical notes

Adjustable metal frame, round or square
For cut-out: Ø 75 mm
Medium beam angle: 40°
Leads: Cu tinned, stranded conductors 0.5 mm², PVC-insulation, length: 100 mm, with connector
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP20
For other colour temperatures or beam angles see:
LED Spot ActiveLine Quad (page 69),
LED Spot ActiveLine LUGA (page 71),
LED Spot ActiveLine 800 (page 73),
LED Spot ActiveLine 600 (page 74)
Packaging unit: 45 pcs.

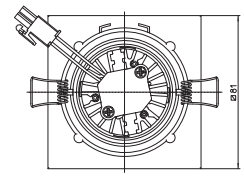
Luminous intensity distribution

Please see on pages 69 to 74

ActiveLine PRO LUGA / 800

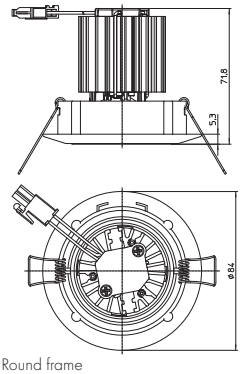


Round frame

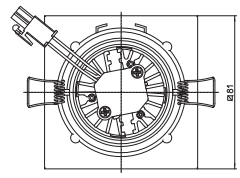


Square frame

ActiveLine PRO 600

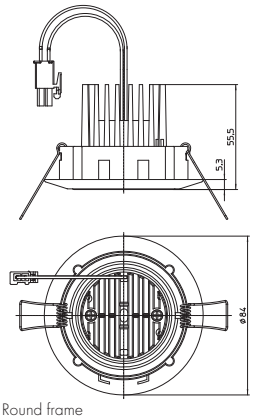


Round frame

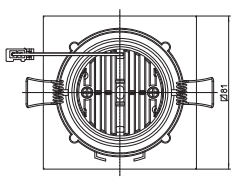


Square frame

ActiveLine PRO Quad



Round frame



Square frame

Typ	LEDSpot version	Colour	Correlated colour temperature K	CRI R_a	Luminous flux* (lm) at 350 mA min.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	Light intensity Candela	Beam angle °
LEDSpot ActiveLine												
LugaSpot COB 1000lm 3000K	**A**	warm white	3000 $^{-75/+165}$	> 80	505	562	692	770	953	1062	1400	40
Spot COB 800lm 3000K	**B**	warm white	2870...3220	> 80	716	770	–	–	–	–	1120	40
Spot COB 600lm 3000K	**C**	warm white	2870...3220	> 80	489	525	–	–	–	–	790	40
LR4W - XTE 3000K bin Q3	**D**	warm white	2870...3200	> 80	338	373	450	496	601	663	1100	40

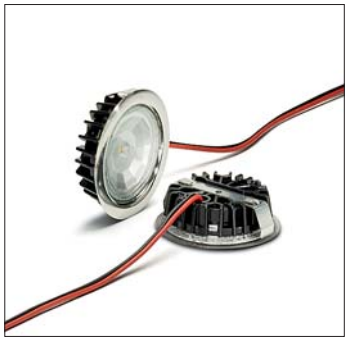
*Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C (A, D), t_c = 70 °C (B, C)

	LEDSpot ActiveLine LUGA		**LEDSpot ActiveLine 800**		**LEDSpot ActiveLine 600**		**LEDSpot ActiveLine Quad**	
Frame colour	**Ref. No. A**		**Ref. No. B**		**Ref. No. C**		**Ref. No. D**	
	round	square	round	square	round	square	round	square
silver	**552415**	**552417**	**552419**	**552421**	**552423**	**552425**	**550337**	**550341**
white	**552416**	**552418**	**552420**	**552422**	**552424**	**552426**	**550338**	**550342**

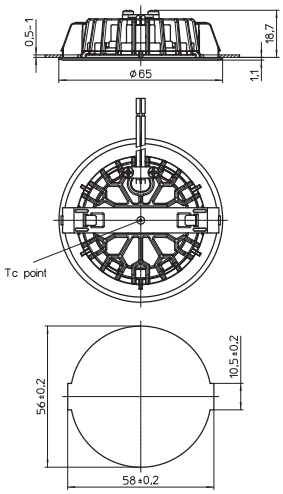
LEDSpot IPLine

Complete LEDSpot IP54 equipped with an optic, heat sink, leads and metal frame

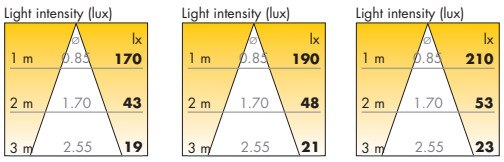
Technical notes
Metal frame, round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Reflector with clear glass (opaque glass on request)
Beam angle: 50°/45°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP54
Packaging unit: 90 pcs.



LCH-022 / LCH-023

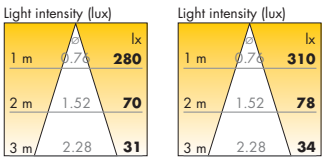


Luminous intensity distribution at 700 mA
Beam angle: 50°



3000 K 4500 K 6300 K

Luminous intensity distribution at 350 mA
Beam angle: 45°



3000 K 4000 K

Type	Description	LEDSpot version	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA min.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	Light intensity Candela	Beam angle °
LEDSpot IPLine					(P_{el} = 0.98 W)		(P_{el} = 1.48 W)		(P_{el} = 2.17 W)		700 mA	
LCH-022	XTE 3000K bin min Q3	**A**	warm white	2920...3070	79.8	88	103.7	114.4	135.7	149.6	170	50
LCH-022	XTE 4500K bin min Q5	**B**	neutral white	3850...4650	91	100.3	121	133.4	161.7	178.3	190	50
LCH-022	XTE 6300K bin min R3	**C**	cool white	5450...6950	103.7	114.3	139.7	152.1	184.4	203.3	210	50
LEDSpot IPLine COB					(P_{el} = 3.5 W)		–		–		350 mA	
LCH-023	XTE 3000K bin min Q3	**D**	warm white	2920...3070	250	285	–	–	–	–	280	45
LCH-023	XTE 4500K bin min Q5	**E**	neutral white	3850...4650	263	300	–	–	–	–	310	45

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C

	LEDSpot IPLine			**LEDSpot IPLine COB**	
Frame colour	**Ref. No.** **A** warm white)	**Ref. No.** **B** neutral white)	**Ref. No.** **C**	**Ref. No.** **D** warm white)	**Ref. No.** **E** (neutral white)
silver	**552083**	**552085**	**552087**	**552089**	**552091**
white	**552082**	**552084**	**552086**	**552088**	**552090**

LEDSpot SmartLine COB

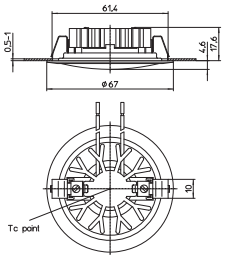
Complete LEDSpot equipped with an optic, heat sink, leads and metal frame



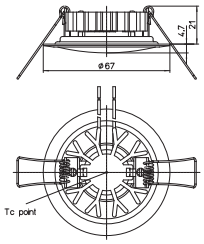
Technical notes

Metal frame, round or square
For cut-out: Ø 56 mm
LEDSpot with one LED and with an aluminium heat sink
Beam angle: 45°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
for luminaire sheets (type LCH-017 and -020)
for ceilings (type LCH-019 and -021)
Degree of protection: IP40
Packaging unit:
90 pcs. (type LCH-017 and -020),
40 pcs. (type LCH-019 and -021)

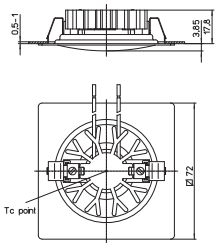
LCH-017



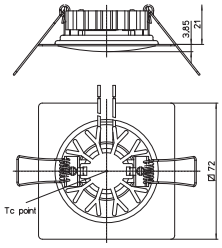
LCH-019



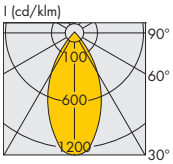
LCH-020



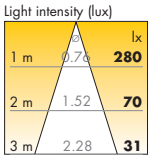
LCH-021



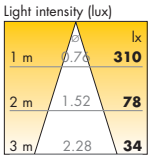
Luminous intensity distribution



45°



3000 K



4200 K

Type	Description	LEDSpot version for luminaire sheets	LEDSpot version for ceiling	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 3.5 W) min.	typ.	Light intensity 350 mA Candela	Frame shape round	square
All types	COB 3000K 45°	**A**	**C**	warm white	2920...3070	250	285	280	round	square
All types	COB 4200K 45°	**B**	**D**	neutral white	3850...4650	263	300	310	round	square

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_c = 25 °C

Frame colour	**For luminaire sheets** (LCH-017 and LCH-020) **Ref. No.** **A** warm white) round	square	**Ref. No.** **B** neutral white) round	square	**For ceilings** (LCH-019 and LCH-021) **Ref. No.** **C** warm white) round	square	**Ref. No.** **D** (neutral white) round	square
silver	**548912**	**548928**	**548916**	**548932**	**548920**	**548936**	**548924**	**548940**
silver mat	**548913**	**—**	**548917**	**—**	**548921**	**—**	**548925**	**—**
gold	**548914**	**—**	**548918**	**—**	**548922**	**—**	**548926**	**—**
white	**548915**	**548931**	**548919**	**548935**	**548923**	**548939**	**548927**	**548943**

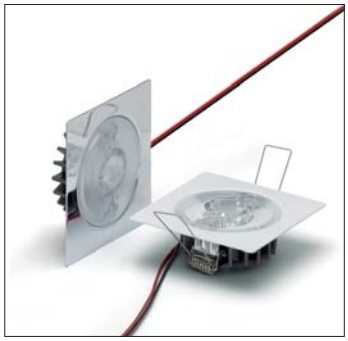
LEDSpot SmartLine XT

Complete LEDSpot equipped with an optic, heat sink, leads and metal frame

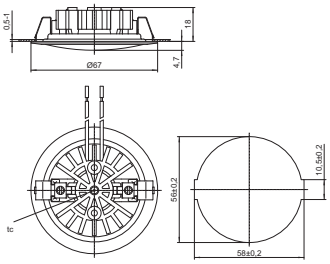
Technical notes

Metal frame, round or square
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 50°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
for luminaire sheets (type LCH-002 and -008)
for ceilings (type LCH-004 and -009)
Degree of protection: IP40
Packaging unit:
90 pcs. (type LCH-002 and -008),
40 pcs. (type LCH-004 and -009)

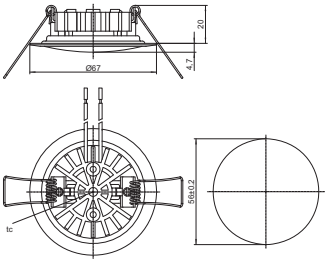




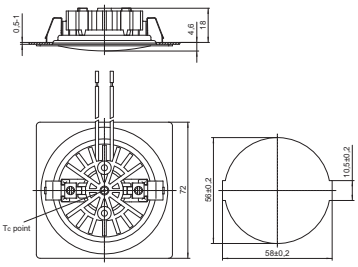
LCH-002



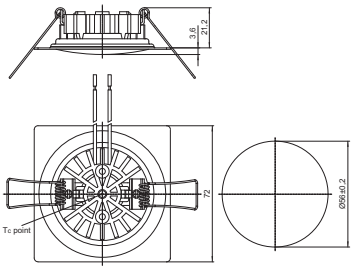
LCH-004



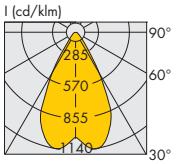
LCH-008

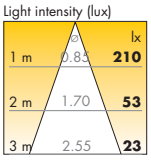


LCH-009

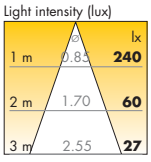


Luminous intensity distribution

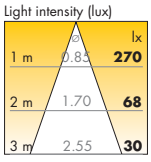




3000 K



4000 K



5000 K

Type	Description	**LEDSpot version** for luminaire sheets	**LEDSpot version** for ceiling	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 0.98 W) min.	typ.	500 mA (P_{el} = 1.48 W) min.	typ.	700 mA (P_{el} = 2.17 W) min.	typ.	Light intensity 700 mA Candela	Frame shape round	square
All types	XTE 3000K bin Q3	**A**	**D**	warm white	2870...3200	79.8	88.0	103.7	114.4	135.7	149.6	210	round	square
All types	XTE 4500K bin Q5	**B**	**E**	neutral white	4250...4750	91.0	100.3	121.0	133.4	161.7	178.3	240	round	square
All types	XTE 6300K bin R3	**C**	**F**	cool white	5000...6950	103.7	114.3	139.7	152.1	184.4	203.3	270	round	square

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C

	For luminaire sheets (LCH-002 and LCH-008)						**For ceilings** (LCH-004 and LCH-009)					
Frame colour	**Ref. No. A** warm white)		**Ref. No. B** neutral white)		**Ref. No. C** cool white)		**Ref. No. D** warm white)		**Ref. No. E** (neutral white)		**Ref. No. F** cool white)	
	round	square	round	square	round	square	round	square	round	square	round	square
silver	**548898**	**548363**	**548902**	**548369**	**548906**	**548375**	**548886**	**548418**	**547838**	**548429**	**548894**	**548435**
silver mat	**548899**	**—**	**548903**	**—**	**548907**	**—**	**548887**	**—**	**548891**	**—**	**548895**	**—**
gold	**548900**	**—**	**548904**	**—**	**548908**	**—**	**548888**	**—**	**548892**	**—**	**548896**	**—**
white	**548901**	**548366**	**548905**	**548372**	**548909**	**548378**	**548889**	**548424**	**548893**	**548432**	**548897**	**548438**

LEDSpot DiscLine

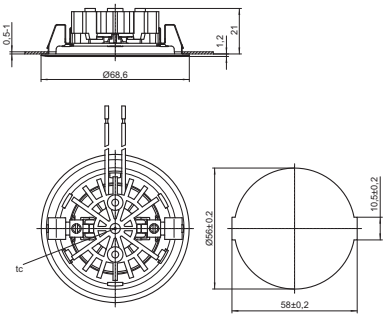


Comlete LEDSpot equipped with an optic, heat sink, leads and metal frame

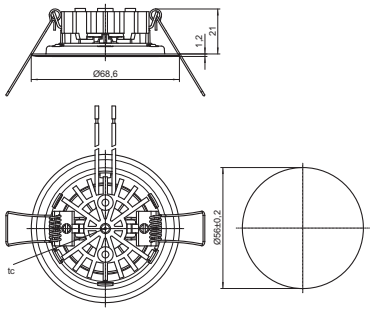
Technical notes

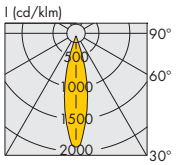
Metal frame, round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Reflector with clear glass (opaque glass on request)
Beam angle: 20° or 50°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
for luminaires sheets (type LCH-006)
for ceilings (type LCH-007)
Degree of protection: IP40
Packaging unit:
90 pcs. (type LCH-006), 40 pcs. (type LCH-007)

LCH-006

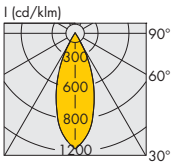


LCH-007



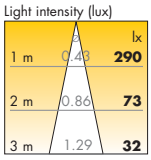


25°

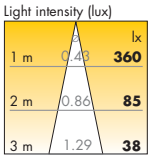


50°

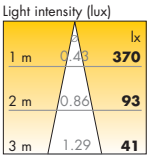
Luminous intensity distribution at 700 mA
Beam angle: 25°



3000 K

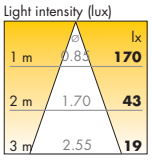


4500 K

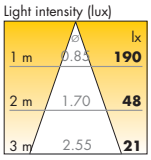


6300 K

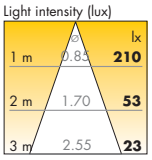
Luminous intensity distribution at 700 mA
Beam angle: 50°



3000 K



4500 K



6300 K

Type	Description	**LEDSpot version** for luminaire sheet	**LEDSpot version** for ceiling	Colour	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 0.98 W) min.	typ.	500 mA (P_{el} = 1.48 W) min.	typ.	700 mA (P_{el} = 2.17 W) min.	typ.	Light intensity 700 mA Candela 25°	50°
All types	XTE 3000K min Q3	**A**	**D**	warm white	2870...3200	79.8	88.0	103.7	114.4	135.7	149.6	290	170
All types	XTE 4500K min Q5	**B**	**E**	neutral white	4250...4750	91.0	100.3	121.0	133.4	161.7	178.3	360	190
All types	XTE 6300K min R3	**C**	**F**	cool white	5000...6950	103.7	114.3	139.7	152.1	184.4	203.4	370	210

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C

	For luminaire sheets (LCH-006)						**For ceilings** (LCH-007)					
Frame colour	**Ref. No. A** (warm white)		**Ref. No. B** (neutral white)		**Ref. No. C** (cool white)		**Ref. No. D** (warm white)		**Ref. No. E** (neutral white)		**Ref. No. F** (cool white)	
	25°	50°	25°	50°	25°	50°	25°	50°	25°	50°	25°	50°
silver	**548769**	**548782**	**548944**	**548948**	**548775**	**548788**	**548794**	**548806**	**548952**	**548956**	**548800**	**548812**
silver mat	**548770**	**548783**	**548945**	**548949**	**548776**	**548789**	**548795**	**548807**	**548953**	**548957**	**548801**	**548813**
gold	**548774**	**548787**	**548946**	**548950**	**548780**	**548793**	**548799**	**548811**	**548954**	**548958**	**548805**	**548817**
white	**548772**	**548785**	**548947**	**548951**	**548778**	**548791**	**548797**	**548809**	**548955**	**548959**	**548803**	**548815**

LEDSpot StartLine

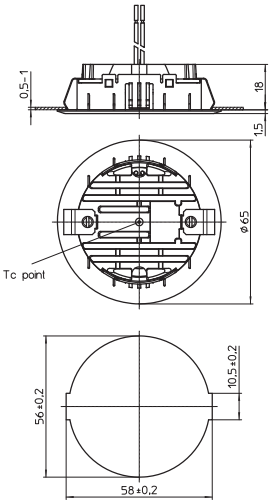


Complete LEDSpot equipped with an optic, heat sink, leads and frame

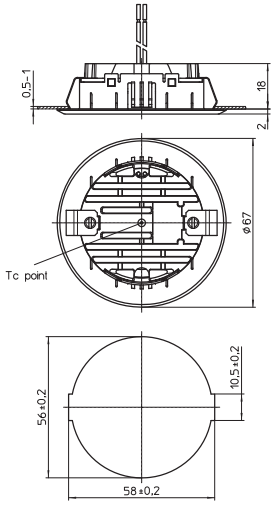
Technical notes

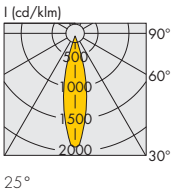
Frame, round: resin (LCH-015) or steel (LCH-016)
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 25°/50°
Leads: Cu tinned, stranded conductors 0.5 mm², PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP20
Packaging unit: 90 pcs.

LCH-015

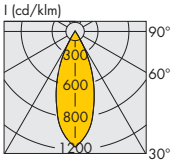


LCH-016



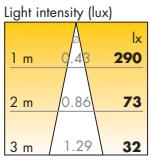


25°

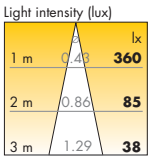


50°

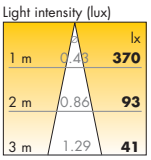
Luminous intensity distribution at 700 mA
Beam angle: 25°



3000 K

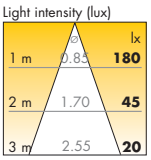


4000 K

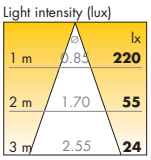


5750 K

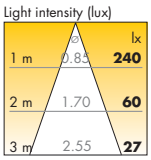
Luminous intensity distribution at 700 mA
Beam angle: 50°



3000 K



4400 K



5750 K

Type	Description	**LEDSpot version**	Farbe	Correlated colour temperature K	Luminous flux* (lm) at 350 mA (P_{el} = 1.02 W) min.	typ.	500 mA (P_{el} = 1.49 W) min.	typ.	700 mA (P_{el} = 2.17 W) min.	typ.	Light intensity 700 mA Candela 25°	50°
All types	XBD Min Q2	**A**	warm white	2870...3200	74.3	82.5	96.6	107.2	127.8	141.8		180
All types	XBD Min Q4	**B**	neutral white	3850...4250	85	93.9	110.5	122.1	146.2	161.6		220
All types	XBD Min Q5	**C**	cool white	5250...6250	91	100.3	118.2	130.2	156.4	172.5		240

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C

	With resin frame (LCH-015)						**With steel frame** (LCH-016)					
Frame colour	**Ref. No.** **A** (warm white)		**Ref. No.** **B** (neutral white)		**Ref. No.** **C** (cool white)		**Ref. No.** **A** (warm white)		**Ref. No.** **B** (neutral white)		**Ref. No.** **C** (cool white)	
	25°	50°	25°	50°	25°	50°	25°	50°	25°	50°	25°	50°
silver	**553424**	**553426**	**553429**	**553431**	**553433**	**553435**	**553442**	**551758**	**553444**	**551748**	**553446**	**551750**
white	**553423**	**553425**	**553428**	**553430**	**553432**	**553434**	**553441**	**551757**	**553443**	**551747**	**553445**	**551749**

LEDSpot EffectLine XTE

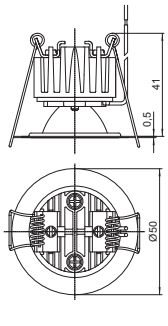
Complete LEDSpot equipped with an optic, heat sink, leads and metal frame



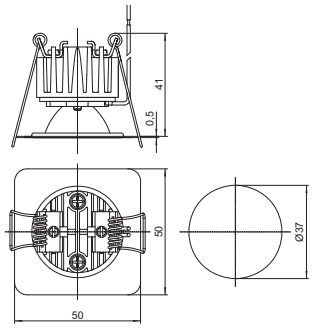
Technical notes

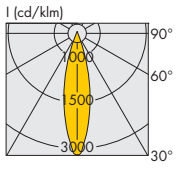
Metal frame, round or square
For cut-out: Ø 37 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 26° or 45°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP20
Packaging unit: 45 pcs.

LCH-010

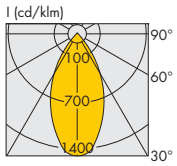


LCH-011



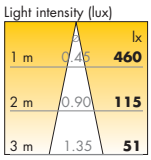


26°

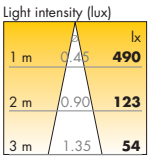


45°

Luminous intensity distribution at 700 mA
Beam angle: 26°

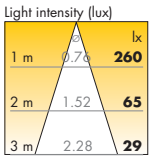


3000 K

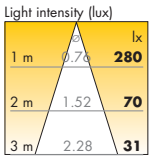


4500 K

Luminous intensity distribution at 700 mA
Beam angle: 45°



3000 K



4500 K

Type	Description	**LEDSpot version**	Colour	Correlated colour temperature	Luminous flux* (lm) at 350 mA (P_{el} = 0.98 W)		500 mA (P_{el} = 1.48 W)		700 mA (P_{el} = 2.17 W)		Light intensity 700 mA Candela	
				K	min.	typ.	min.	typ.	min.	typ.	26°	45°
Alle Typen	XTE 3000K bin Q3	**A**	warm white	2870...3200	84.5	93.2	109.9	121.1	163.7	158.4	460	260
Alle Typen	XTE 4500K bin Q4	**B**	neutral white	4250...4750	90.0	99.4	117.0	129.3	153.0	169.0	490	280

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 85 °C

Frame colour	**Ref. No. A** (warm white) round 26°	round 45°	square 26°	square 45°	**Ref. No. B** (neutral white) round 26°	round 45°	square 26°	square 45°
silber	**548964**	**548960**	**548966**	**548962**	**548965**	**548961**	**548967**	**548963**
white	**552398**	**552399**	**552406**	**552407**	**552400**	**552401**	**552408**	**552409**

Lead sets

For LEDSpots with connectors

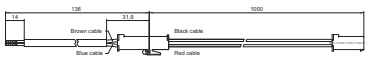
Lead sets with connector
for easy and fast connection
Connector material: PA, natural, UL94V-0
Leads: Cu tinned, stranded conductors 0.5 mm²,
PVC-insulation, with connector,
lead ends: ferrules on bare end of core

Lead sets

Lead sets with connector and lead ends for
LED constant current drivers in LiteLine casing
Weight: 18/36/58/90 g, unit: 10 pcs.

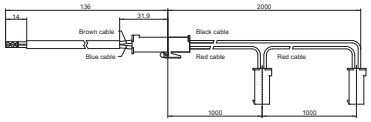
Ref. No.: 545029 with 1 connector
Ref. No.: 546388 with 2 connectors
Ref. No.: 545315 with 3 connectors
Ref. No.: 545316 with 5 connectors

545029

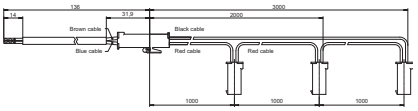




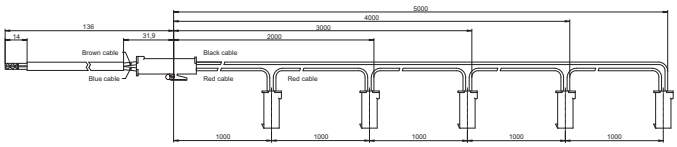
546388



545315



545316



LEDSpot Sets

On request, you will receive complete sets that contain the desired number of LEDSpots, a respective number of cable sets and the required LED drivers. Several examples of such sets can be seen to the right.

Contact us – we will gladly support you when it comes to dimensioning your lighting application.



LEDSpot set 1 – Ref. No. 550346



LEDSpot set 2 – Ref. No. 550347



LEDSpot set 3 – Ref. No. 550345

LED COMPONENTS FOR 24 V SYSTEMS





With its high-power 24 V system, Vossloh-Schwabe is responding to the trend towards market harmonisation and simplification of LED control technology.

The modules are operated at 24 V DC and constant-current control of 350 mA min. is effected on the circuit board. The module is connected using on-board push-in terminals and matching connecting cables. This enables modular and highly flexible LED systems.

The RGB system is based on the "common anode" principle.
The DigiLED CA series permits the operation of high-power RGB modules and low-power modules of "common anode" design.

Typical applications

- General lighting
- Architectural lighting
- Lighting of complex structures
- Entertainment
- Shop design

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

Please read the safety and installation instructions on the individual products as well as further technical information provided in the extensive product descriptions at **www.vossloh-schwabe.com.**

LED PROFILE



LEDProfile IP67

Light modules for IP67-compliant outdoor lighting

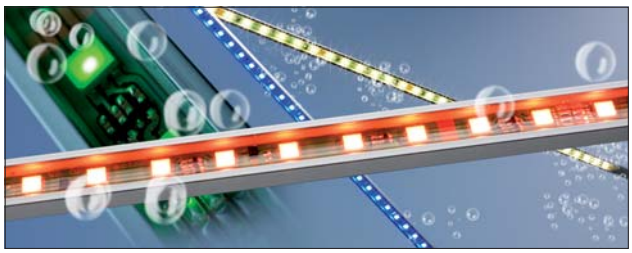
Vossloh-Schwabe provides an IP67-compliant encapsulation for LED frames destined for outdoor lighting projects (e.g. architectural lighting).

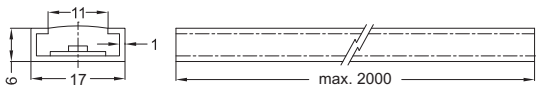
On request, these frames can be fitted and encapsulated with flexible modules (WU-M-456). Depending on the respective LED module, the length of the frame can be extended by several times the by the length of the LED module (100 mm). The maximum frame length is 2 m.

The LED arrays can be supplied in white, warm white or RGB.

Please contact your VS sales representative for further details.







High Power 24 V CA Modules White and RGB



Built-in PCB lighting modules
The High Power 24 V CA modules are available in white and warm white or RGB with a very high luminous flux.

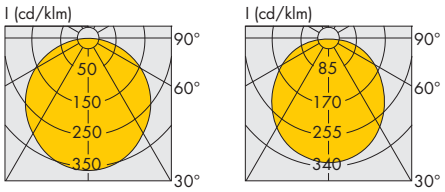
The round design with 3 or 10 High Power LEDs is particularly suitable for installation in luminaires and spots. The linear design with 6 LEDs is, for instance, suitable for wall-washing and linear luminaires, etc.

To enable easy understanding of the system, the modules are operated at 24 V DC. Constant-current control of the LEDs is on the circuit board. Contacts are made using an on-board push terminal with matching connection cables.

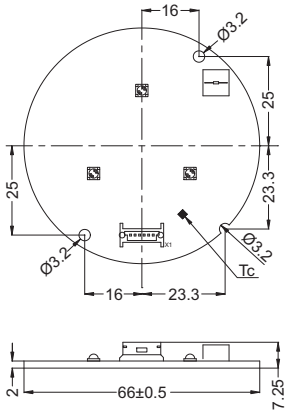
Additional suitable dimming modules (DigiLED CA series) and optics attachments (see pages 44–46) are available to create individual lighting solutions.

Technical notes
Triple WU-M-440: Ø 66 mm, 3 LEDs
Line WU-M-441: 300x26 mm, 6 of LEDs
Flood WU-M-442: Ø 110 mm, 10 of LEDs
Allowed operating temperature at t_c point:
–10 to 85 °C
Aluminium PCB
For improved thermal management VS recommends an additional cooling element, which is suitable for the application.
Colour rendering index: > 80
Increased ESD protection
Voltage supply: 24 V
Packaging unit: 50 pcs.

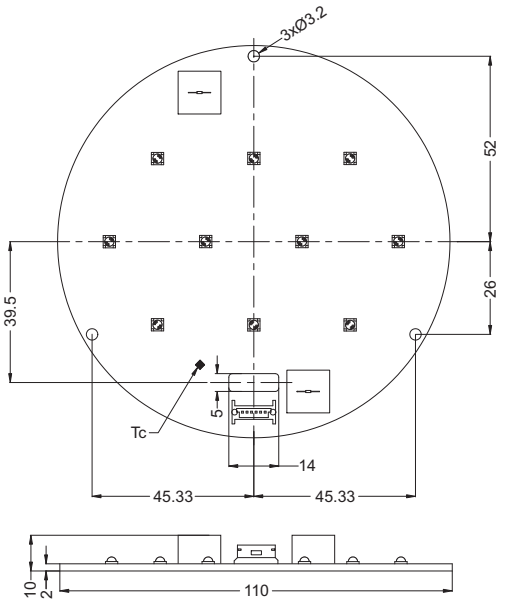
Typical applications
General lighting
Architectural lighting
Entertainment, shop design
Decorative lighting
Light advertising



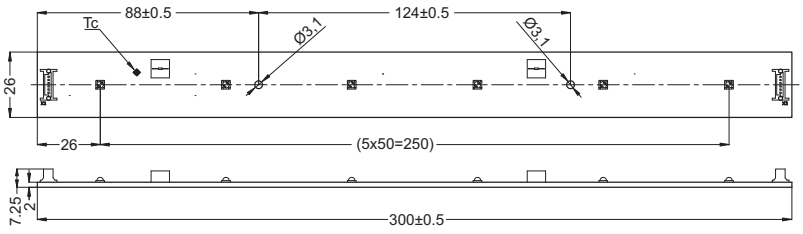
White RGB



Triple



RGB Flood



Line

High Power 24 V CA Modules – White

Type	Ref. No.	Number of LEDs	Colour	Colour temperature* K	Inrush current* A	Nominal current* A	Typ. luminous flux* (lm) min.	typ.	Beam angle* (°)	Max. power* W
Mono Triple										
WU-M-440-WW	**548520**	3	warm white	3000 -130/+220	0.86	0.35	565	610	115	10
WU-M-440-NW	**548519**	3	neutral white	4000 -300/+260	0.86	0.35	565	610	115	10
Mono Line										
WU-M-441-WW	**548523**	6	warm white	3000 -130/+220	1.66	0.70	1130	1220	115	20
WU-M-441-NW	**548522**	6	neutral white	4000 -300/+260	1.66	0.70	1130	1220	115	20
Mono Flood										
WU-M-442-WW	**548526**	10	warm white	3000 -130/+220	1.10	0.70	1400	1550	115	20
WU-M-442-NW	**548525**	10	neutral white	4000 -300/+260	1.10	0.70	1400	1550	115	20

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 25 °C
Suitable thermal tapes for these LED modules see page 102.

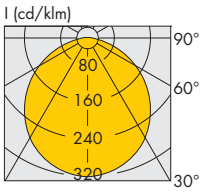
High Power 24 V CA Modules – RGB

Type	Ref. No.	Number of LEDs	Colour	Dom. wavelength (nm) red	green	blue	Inrush current* A	Nominal current* A	Typ. luminous flux* (lm) red	green	blue	Beam angle* (°)	Max. power* W
RGB Triple													
WU-M-440-RGB	**548518**	3	RGB	620 - 630	520 - 535	465 - 485	0.54	0.22	60	115	40	130	5
RGB Line													
WU-M-441-RGB	**548521**	6	RGB	620 - 630	520 - 535	465 - 485	1.10	0.65	180	315	115	130	15
RGB Flood													
WU-M-442-RGB	**548524**	10	RGB	620 - 630	520 - 535	465 - 485	1.40	1.10	215	500	135	130	25

* Measurement tolerance of luminous flux: ± 7% | Emission data at t_j = 25 °C
Suitable thermal tapes for these LED modules see page 102.

LEDLine Flex SMD Professional RGB CA Indoor

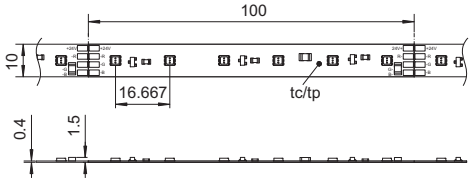




Built-in PCB lighting modules

The LEDLine Flex SMD Professional RGB CA is a "common anode" design variant. This permits the user to operate high-power RGB modules together with the new LEDLine Flex SMD Professional RGB CA.

The LEDLine Flex SMD Professional RGB CA is fitted with SMD LEDs on a flexible printed circuit board of only approx. 0.4 mm thickness. Even the most complex structures can be illuminated thanks to the use of an extremely pliable foil. LEDLine Flex SMD Professional can be separated into segments of 100 mm without loss of function.
This product is available in continuous lengths of 4.5 m. Installation is achieved via double-sided adhesive tape affixed to the rear of the PCB.



Technical notes

Dimensions of LEDLine Flex SMD Professional RGB CA

LxW mm	SMDs pcs.	Single steps	Length mm	SMDs pcs.
4500x10	270	45	100	6

Allowed operating temperature at t_c point:
–20 to t.b.d. °C
Wide beam angle (115°)
Voltage supply: 24 V DC
Power consumption per step (100 mm): 1.08 W
Each SMD contains 3 LED-Chips
in the colours red, green and blue

Typical applications

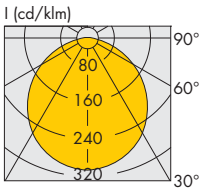
Architectural lighting
Lighting of complex structures
Entertainment, shop design
Marking paths, stairs, etc.
Furniture lighting
Light advertising

Type	**Ref. No.**	Colour	Dom. wavelength* nm			Current* A			Typ. luminous flux* lm			Beam angle* °	Power* W		
			red	green	blue	red	green	blue	red	green	blue		red	green	blue
WU-M-456-RGB-CA	**550536**	RGB	622	528	469	0.68	0.68	0.68	590	1250	235	115	16.3	16.3	16.3

* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes.
The values do not necessarily correspond exactly to the actual parameters of every single product, which can vary from the typical specifications.
Preliminary data

LEDLine Flex SMD Professional RGB CA Outdoor

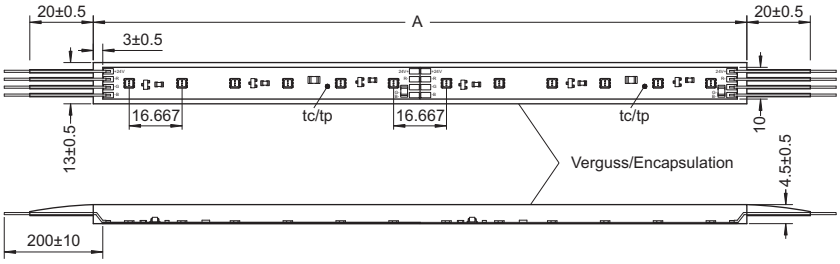




Built-in PCB lighting modules

The LEDLine Flex SMD Professional RGB CA Outdoor is an extremely flexible linear module for applications with high moisture or dust burden conditions.
Due to the flexible and compact design, the illumination of complex structures and flat designs can be realised. The IP67 protected LEDLine Flex SMD Professional RGB CA Outdoor is available in 3 different lengths (see below). The installation is achieved via double-sided adhesive tape affixed to the rear of the PCB.

The colour blend of LEDLine Flex SMD Professional RGB CA Outdoor can be adjusted using DigiLED control modules. To increase the number of LED modules DigiLED-Slave can be used.



Technical notes

Dimensions of PCB: 200x10 mm,
500x10 mm, 2000x10 mm
Encapsulated dimensions (see drawing)
PCB 200 mm: A = 206 $^{+3/-2}$ mm
PCB 500 mm: A = 506 $^{+3/-2}$ mm
PCB 2000 mm: A = 2006 $^{+4/-3}$ mm
Degree of protection: IP67
Allowed operating temperature at t_c point:
–20 to t.b.d. °C
Allowed handling temperature:
10 to 50 °C
Minimum bend radius: 70 mm,
flexible in longitudinal direction only
Pre-assembled with 4 wires on either side
Voltage supply: 24 V DC

Typical applications

Lighting of complex structures
with high moisture or dust burden
Outdoor marking of paths, stairs, etc.
Outdoor light advertising
Outdoor entertainment, shop design
Architectural lighting
Outdoor border lighting

Type	Ref. No.	Number of SMDs	Colour	Dom. wavelength* nm			Current* mA			Typ. luminous flux* (lm)			Beam angle*	Max. power* W		
		pcs.		red	green	blue	red	green	blue	red	green	blue	°	red	green	blue
WU-M-456-RGB-CA-Outdoor 200mm	**550529**	12	RGB	622	528	469	30	30	30	23	50	9	115	0.72	0.72	0.72
WU-M-456-RGB-CA-Outdoor 500mm	**550530**	30	RGB	622	528	469	75	75	75	59	125	23	115	1.8	1.8	1.8
WU-M-456-RGB-CA-Outdoor 2000mm	**550531**	120	RGB	622	528	469	300	300	300	236	500	94	115	7.24	7.24	7.24

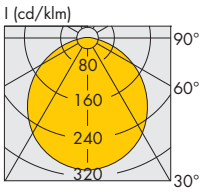
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes.
The values do not necessarily correspond exactly to the actual parameters of every single product, which can vary from the typical specifications.
Preliminary data

LEDLine Flex SMD Professional Indoor White



Built-in PCB lighting modules

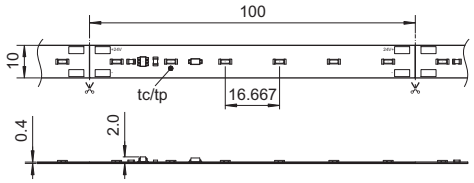
The LEDLine Flex SMD Professional Indoor is fitted with SMD LEDs on a flexible printed circuit board of only approx. 0.4 mm thickness. Even the most complex structures can be illuminated thanks to the use of an extremely pliable foil. LEDLine Flex SMD Professional Indoor can be separated into segments of 100 mm lengths without loss of function. This product is available in a continuous length of up to 10 m. Installation is achieved via double-sided adhesive tape affixed to the rear of the PCB.



Technical notes

Dimensions LEDLine Flex SMD Professional Indoor

LxW mm	LEDs pcs.	Single steps	Length mm	SMDs pcs.
10000x10	600	100	100	6



Allowed operating temperature at t_c point:
–20 to 85 °C
Wide beam angle (120°)
Voltage supply: 24 V
Power consumption per step (100 mm): 0.53 W

Typical applications

Architectural lighting
Illumination of complex structures
Entertainment, shop design
Marking paths, stairs, etc.
Furniture lighting
Light advertising

Type	Ref. No.	Colour	Correlated colour temperature K	Current A	Typ. luminous flux* lm	Beam angle* °	Max. power W	CRI R_a
WU-M-456-27K	**551700**	warm white	2700 -120/+170	2.2	4100	120	53	> 80
WU-M-456-30K	**550532**	warm white	3000 -130/+220	2.2	4200	120	53	> 80
WU-M-456-40K	**550533**	neutral white	4000 -290/+260	2.2	4600	120	53	> 80
WU-M-456-50K	**550534**	cool white	5000 -255/+310	2.2	4900	120	53	> 80
WU-M-456-65K	**550535**	cool white	6500 -480/+540	2.2	5200	120	53	> 80

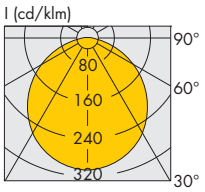
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

LEDLine Flex SMD Professional Outdoor White



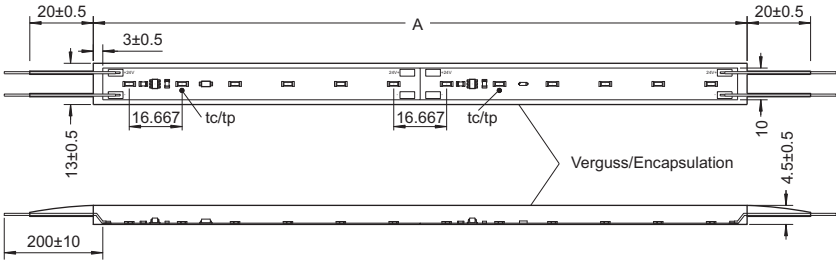
Built-in PCB lighting modules

The LEDLine Flex SMD Professional Outdoor is an extremely flexible linear module for applications with high moisture or dust burden conditions. Due to the flexible and compact design, the illumination of complex structures and flat designs can be realised. The IP67 protected LEDLine Flex SMD Professional Outdoor is available in 3 different lengths (see below). The installation is achieved via double-sided adhesive tape affixed to the rear of the PCB.



Technical notes

Dimensions of PCB: 200x10 mm,
500x10 mm, 2000x10 mm
Encapsulated dimensions (see drawing)
PCB 200 mm: A = 206 $^{+3/-2}$ mm
PCB 500 mm: A = 506 $^{+3/-2}$ mm
PCB 2000 mm: A = 2006 $^{+4/-3}$ mm
Degree of protection: IP67
Allowed operating temperature at t_c point:
–20 to 50 °C
Minimum bend radius: 70 mm,
flexible in longitudinal direction only
Pre-assembled each with 2 strands on either side
Voltage supply: 24 V



Typical applications

Illumination of complex structures
with high moisture or dust burden
Outdoor marking of paths, stairs, etc.
Outdoor Light advertising
Outdoor entertainment, shop design, architectural illumination
Outdoor border lighting

Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature* (K)	Current* mA	Typ. luminous flux* (lm)	Beam angle* °	Max. power* W
WU-M-456-33K-Outdoor 200mm	**550517**	12	warm white	3300 -130/+220	44	67	120	1.06
WU-M-456-33K-Outdoor 500mm	**550518**	30	warm white	3300 -130/+220	110	168	120	2.65
WU-M-456-33K-Outdoor 2000mm	**550519**	120	warm white	3300 -130/+220	440	670	120	10.6
WU-M-456-40K-Outdoor 200mm	**550520**	12	neutral white	4000 -290/+260	44	74	120	1.06
WU-M-456-40K-Outdoor 500mm	**550521**	30	neutral white	4000 -290/+260	110	184	120	2.65
WU-M-456-40K-Outdoor 2000mm	**550522**	120	neutral white	4000 -290/+260	440	740	120	10.6
WU-M-456-48K-Outdoor 200mm	**on request**	12	cool white	4800 -255/+310	44	79	120	1.06
WU-M-456-48K-Outdoor 500mm	**on request**	30	cool white	4800 -255/+310	110	195	120	2.65
WU-M-456-48K-Outdoor 2000mm	**on request**	120	cool white	4800 -255/+310	440	785	120	10.6
WU-M-456-62K-Outdoor 200mm	**550526**	12	cool white	6200 -480/+540	44	83	120	1.06
WU-M-456-62K-Outdoor 500mm	**550527**	30	cool white	6200 -480/+540	110	210	120	2.65
WU-M-456-62K-Outdoor 2000mm	**550528**	120	cool white	6200 -480/+540	440	830	120	10.6

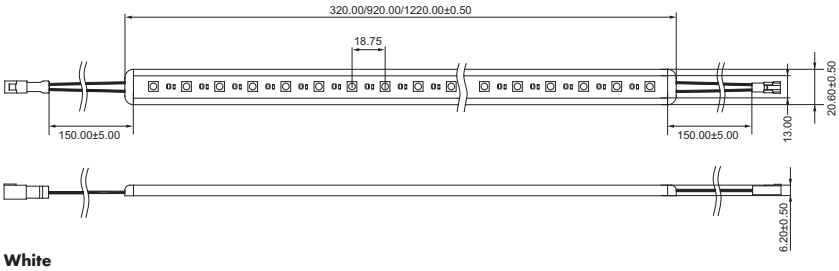
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.
Preliminary data

AluLED IP20

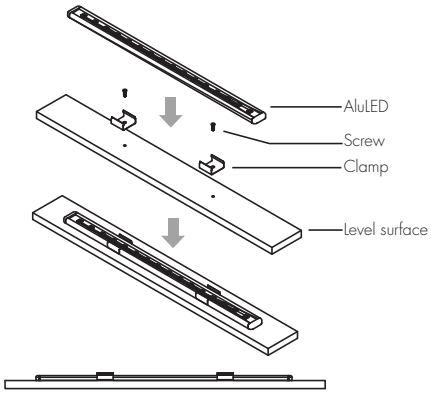
AluLED IP20 is ideal for indoor applications and the slim & flat design is extremely convenient for low profile lighting design mounting.
It is available in neutral white (4000 K). Further white tones on request.

Technical notes
Voltage supply: 24 V DC
Beam angle: 120°
Allowed ambient temperature: –20 to 40 °C
Allowed storage temperature: –40 to 85 °C
Degree of protection: IP20
Maximum bridging current load: 3 A





White



White Modules											
Type	**Ref. No.**	Length mm	No. of LEDs	Current mA	Colour	Colour temperature K	Luminous flux lm	Beam angle °	Power W	Cover	Packing unt pcs.
AluLED-320-4000-IP20 - D	**552092**	320	18	180	neutral white	4000	220	120	4.3	Diffuse	1
AluLED-320-4000-IP20 - C	**552093**	320	18	180	neutral white	4000	240	120	4.3	Clear	1
AluLED-1220-4000-IP20 - D	**552094**	1220	72	720	neutral white	4000	870	120	17.3	Diffuse	1
AluLED-1220-4000-IP20 - C	**552095**	1220	72	720	neutral white	4000	950	120	17.3	Clear	1

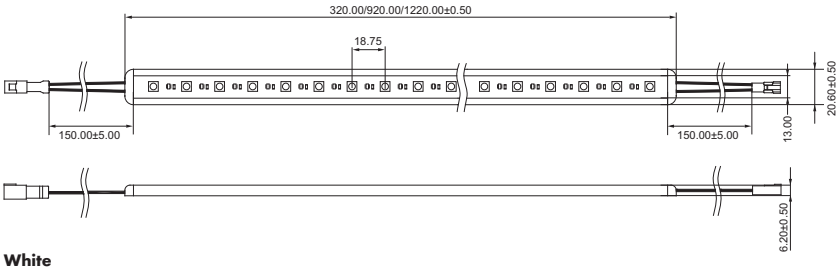
Note: Further colours for AluLED are available on request

AluLED IP64

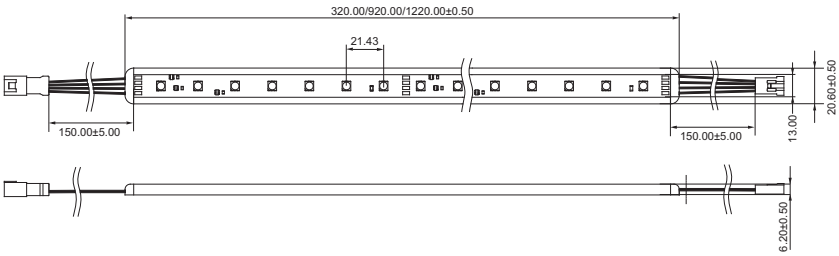
AluLED IP64 is ideal for outdoor protected applications under humid conditions (excluding direct UV and water exposure) and the slim & flat design is extremely flexible for low profile lighting design mounting.
It is available in different CCTs and RGB to suit different application needs.



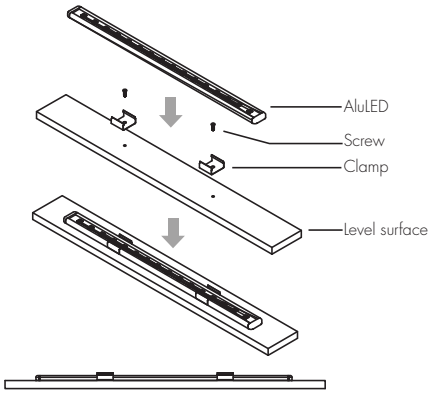
Technical notes
Voltage supply: 24 V DC
Beam angle: 120°
Allowed ambient temperature: -30 to 85 °C
Allowed storage temperature: -40 to 85 °C
Degree of protection: IP64
Maximum bridging current load: 3 A



White



RGB



White Modules										
Type	**Ref. No.**	Length mm	No. of LEDs	Current mA	Colour	Colour temperature K	Luminous flux lm	Beam angle °	Power W	Packing unit pcs.
AluLED-320-3000	**543314**	320	16	160	warm white	3000	160	120	3.8	1
AluLED-920-3000	**543315**	920	48	480	warm white	3000	490	120	11.5	1
AluLED-1220-3000	**543316**	1220	64	640	warm white	3000	630	120	15.3	1
AluLED-320-6000	**543317**	320	16	160	cold white	6000	192	120	3.8	1
AluLED-920-6000	**543318**	920	48	480	cold white	6000	576	120	11.5	1
AluLED-1220-6000	**543319**	1220	64	640	cold white	6000	768	120	15.3	1

RGB Modules												
Type	**Ref. No.**	Length mm	No. of LEDs	Current mA	Luminous flux (lm)			Dom. wavelength (nm)			Beam angle °	Power W	Packing unit pcs
					red	green	blue	red	green	blue			
AluLED-320-RGB	**543320**	320	14	120	16.8	38.1	11.2	620-630	520-535	465-475	120	2.8	1
AluLED-920-RGB	**543321**	920	42	360	50.4	114.2	33.6	620-630	520-535	465-475	120	8.6	1
AluLED-1220-RGB	**543322**	1220	56	480	67.2	152.3	44.8	620-630	520-535	465-475	120	11.5	1

Note: Further colours for AluLED are available upon request

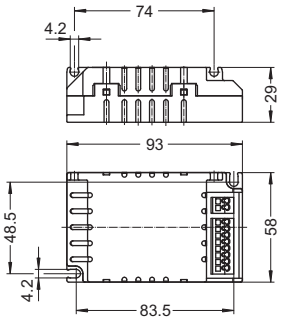
Colour Control Modules – DigiLED CA

The DigiLED CA series is based on a system design that combines simplicity, flexibility and reliability. The DigiLED CA series is suitable for operating both high-power RGB CA modules and low-power RGB CA modules.
In the simplest case, a keypad enables manual colour control. In addition to custom colour control, it is also possible to call up pre-set colour programs for example colour sequences.

The CA series of VS colour control modules are available with both a manual operating pad and a DALI interface or "PUSH" or DMX variant.

Furthermore the DigiLED Mono is available. The DigiLED Mono enables the dimming of single-colour (e. g. white) LED modules.

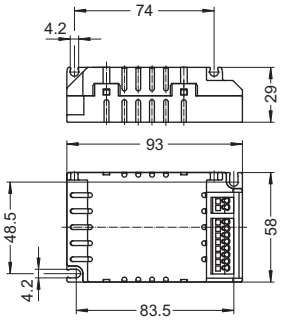
Technical notes
Dimensions: 93 x 58 x 29 mm
Ambient temperature t_a: 0 to 45 °C
Operating voltage: 24 V
Max. current on the supply line: 5 A
Push-in terminals: 0.25–1.5 mm²,
grid: 3.5 mm
All DigiLED not suitable for the US market





DigiLED Manual CA

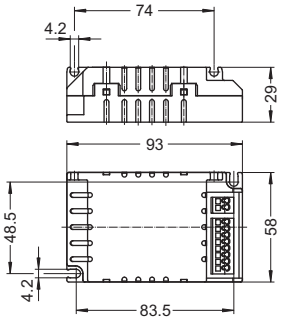
DigiLED Manual CA
Colour controls via key pads (6 keys)
Individual colour control or selection of pre-set programs
t_c = 55 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-001-Digi-manuell-CA
Ref. No.: 186136





DigiLED DALI CA

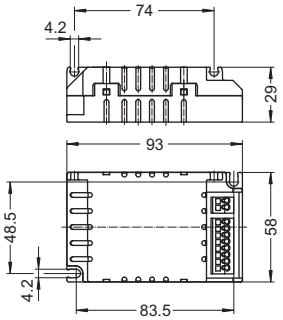
DigiLED DALI CA
Digital colour controls via DALI light management
t_c = 60 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-004-Digi-DALI-CA
Ref. No.: 186138





DigiLED DMX CA

DigiLED DMX CA
Digital colour controls via DMX light management
t_c = 60 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-003-Digi-DMX-CA
Ref. No.: 186153

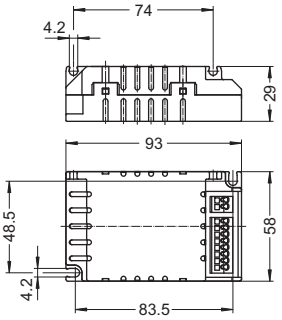




DigiLED IR CA

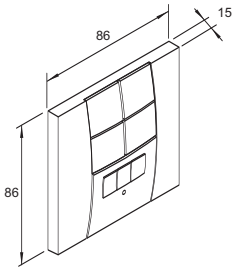
DigiLED IR CA
Colour adjustment by a portable remote control
Call up of pre-adjusted setting possible
Data transfer via infra-red
t_c = 55 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-005-Digi-IR-CA
Ref. No.: 186154

DigiLED RF CA
Easy operation possible via radio frequency (RF) and a keypad with 7 buttons. The operation via radio frequency (RF) enables a flexible installation. Optical "line of sight" or cables are not necessary due to RF operation.
Dimensions: 93 x 58 x 29 mm
Ambient temperature t_a: –20 to 45 °C
Operating voltage: 24 V DC
Max. current per control channel: 1.25 A
Type: WU-ST-012-DigiLED-RF CA
Ref. No.: 186181



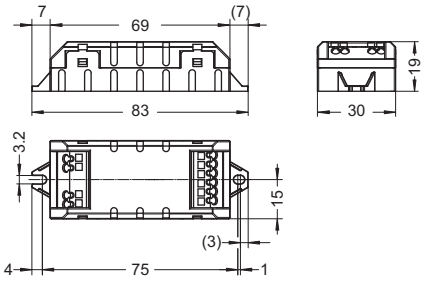

DigiLED RF CA

Walltransmitter
Required to activate the programs in the DigiLED RF
Dimensions: 86 x 86 x 15 mm
Colour: white
Type: WU-ST-009-Walltransmitter
Ref. No.: 536843



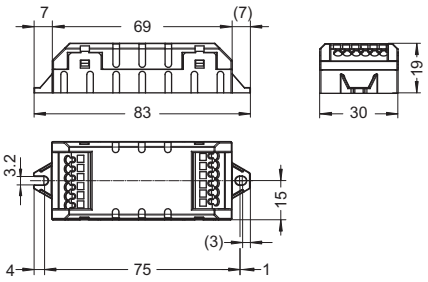

Walltransmitter

DigiLED Push CA
Colour adjustment by separate push button
Permits retrieval of pre-set programs
t_c = 55 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-006-DigiLED-Push CA
Ref. No.: 186144



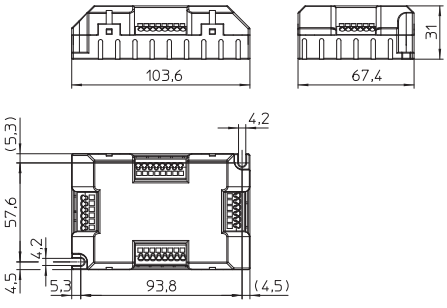

DigiLED Push CA

DigiLED Mono CA
For dimming of single-colour LED modules
Dimming via 1–10 V interface or external PWM signal
t_c = 55 °C max.
Max. current per control channel: 5 A
Type: WU-ST-010-DigiLED-Mono CA
Ref. No.: 186155



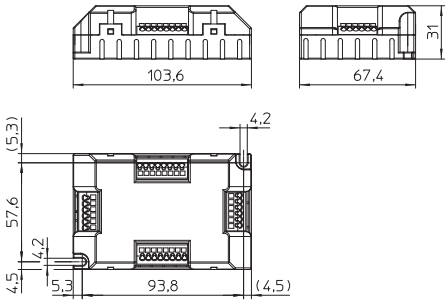

DigiLED Mono CA

DigiLED Slave CA
Increase of the system performance for 24 V CA LED built-in system
Signal amplification on channels RGB(W)
t_c = 65 °C max.
Max. current per control channel per slave: 1.25
Type: WU-ST-002-DigiLED-Slave CA
Ref. No.: 186142




DigiLED Slave CA

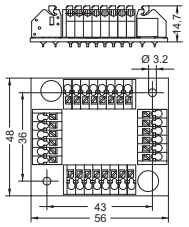
Passive Slave CA
Increase of the system performance
for 24 V CA LED built-in system
No signal amplification on channels RGB(W)
t_c = 65 °C max.
Type: WU-ST-011-Passive-Slave CA
Ref. No.: 186172





Passive Slave CA

Passive Slave PCB CA
PCB for increase of the system performance
for 24 V CA LED built-in system
Without casing
No signal amplification on channels RGB(W)
t_c = 65 °C max.
Type: WU-VB-004-Slave-PCB CA
Ref. No.: 186140





Passive Slave PCB CA

Table 1: Terminal connection

Pole	Colour coding	Function	Max. current-carrying capacity	Colour coding System flatband cable
1	red	supply line for LED built-in modules (+24 V)	5 A	blue
2	orange	PWM signal line for channel 1	1.25 A	grey
3	green	PWM signal line for channel 2	1.25 A	grey
4	blue	PWM signal line for channel 3	1.25 A	grey
5	light grey	PWM signal line for channel 4	1.25 A	grey
6	black	supply line for LED built-in modules (GND)	5 A	grey

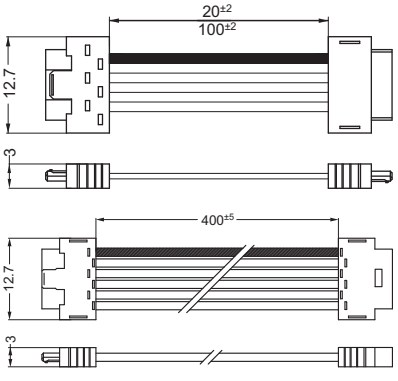
LED Connection Technology for 24 V CA System

Various connection methods like flatband cables, feed-in cables, PCB distributors and slaves can be used to effect electrical connections between LED assembly modules and DigiLED CA colour control units.

Flatband and feed-in cables are designed to ensure that LED built-in modules can be connected to a DigiLED CA colour control unit or a PCB distributor or slave board up to the maximum current-carrying capacity specified in Table 1.

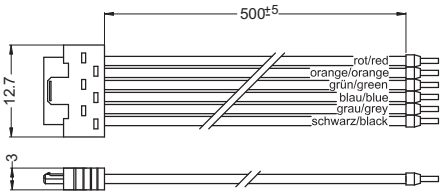
When setting up a 24 V CA system, it must be ensured that the minimum supply voltage stated in the data sheets of the LED built-in modules is attained through the combination of lead lengths.

Flatband system cables
For reverse-polarity protected connections between LED built-in modules and/or groups and for connection to PCB distributors. The six-strand flatband cable is fitted with pre-assembled connectors that plug directly in to the sockets of the LED built-in modules and PCB distributors.
Type: WU-VB-002-HP-20mm
Ref. No.: 539476 cable length: 20 mm
Type: WU-VB-002-HP-100mm
Ref. No.: 539475 cable length: 100 mm
Flatband extension cable
Type: WU-VB-008-HP-extension-400mm
Ref. No.: 543187 cable length: 400 mm



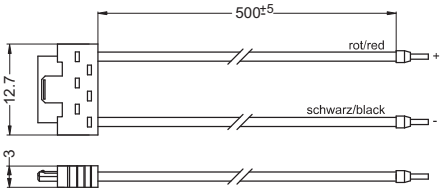


Feed-in cable
For connecting LED built-in modules and groups to a DigiLED CA colour control unit or slave board. The reverse-polarity protected connector attached to the feed-in cable is plugged on the LED built-in module. The other side of the cable is then connected to the slave board or DigiLED CA colour control unit while ensuring correct polarity (colour coding)
Type: WU-VB-002-HP-Feed-in-500mm
Ref. No.: 535900 cable length: 500 mm



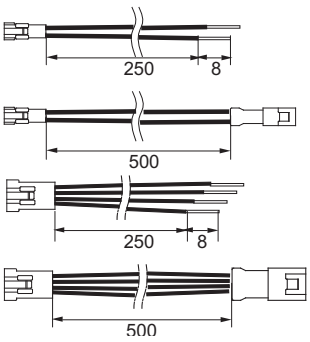


Feed-in cable Mono
For reverse polarity protected connection between monochromatic LED built-in modules and 24 V voltage supply. The dimming function is not supported.
Type: WU-VB-006-HP-Feed-in-500mm mono
Ref. No.: 542267 cable length: 500 mm



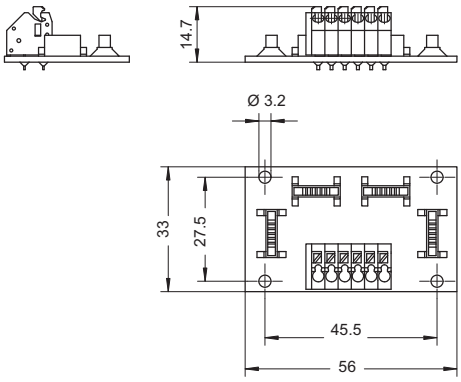


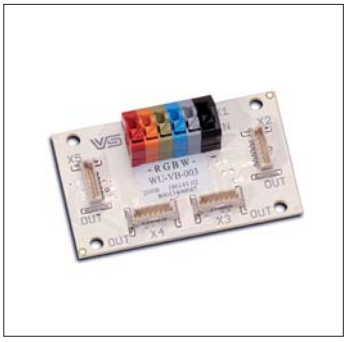
EasyConnect Cable for AluLED
Max. permissible current: 3 A
Number of strands: 2/4
(Strand diameter: 0.35 mm²/22 AWG)
For monochrome modules with 2 strands
Ref. No.: 543426 25 cm, male connector
Ref. No.: 543427 50 cm, male/female connector
For RGB modules with 4 strands
Ref. No.: 543428 25 cm, male connector
Ref. No.: 543429 50 cm, male/female connector





PCB distributor
For connecting up to four LED built-in modules or groups to a DigiLED CA colour control unit or slave board. The maximum current-carrying capacity per contact is 5 A on the input side (terminal) and as detailed in Table 1 (page 96) on the output side (connector). A standard six-strand conductor (e.g. LIYY 6X0.75 mm²) and up to four flatband cables can be used.
Type: WU-VB-003-DistriPCB CA
Ref. No.: 186141





Electronic Converters for LED Modules 24 V

If LED modules are used that are connected in parallel, the voltage-stabilising system is activated. The advantages include easy extendibility and system safety on account of the low voltage.

The electronic converters made by Vossloh-Schwabe guarantee a broad output range at a voltage of 24 V. Typical areas of application are architectural and general lighting, the replacement of halogen lamps as well as furniture lighting.

Devices with the particularly high IP67 degree of protection are designed for use in outdoor applications.

General technical notes
Short-circuit protection: electronic
Overload and temperature protection: reversible
Protection against "no load" operation
Protection class I (EDXe 120: protection class II)

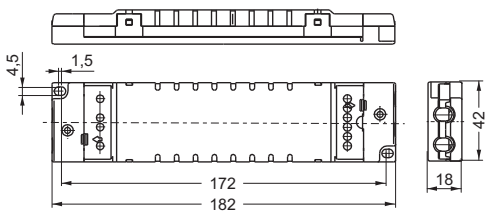
Output W	Type	**Ref. No.**	Mains voltage 50, 60 Hz V	Voltage output V	Mains current mA	Output current A	Ambient temperature t_a °C	Casing temperature t_c °C	Power factor	Drawing/ photo	With cord grip	Weight g
0.1 - 20	EDXe 120	**186129**	220 - 240	24 $^{\pm 0,5}$	230/210	0.85	- 20 to 45	75	0.5	A	–	155
0.0 - 50	EDXe 150/24 V	**186218**	220 - 240	24 $^{\pm 0,72}$	260/235	0.0 - 2.1	- 40 to 45	70	0.97	B	–	290
0.0 - 50	EDXe 150/24 V	**186219**	220 - 240	24 $^{\pm 0,72}$	260/235	0.0 - 2.1	- 40 to 45	70	0.97	C	yes	320
0.0 - 70	EDXe 170/24 V	**186103**	220 - 240	24 $^{\pm 0,48}$	360/310	0.0 - 2.9	- 20 to 45	70	0.97	B	–	340
0.0 - 70	EDXe 170/24 V	**186104**	220 - 240	24 $^{\pm 0,48}$	360/310	0.0 - 2.9	- 20 to 45	70	0.97	C	yes	360
0.0 - 130	EDXe 1130/24 V	**186131**	220 - 240	24 $^{\pm 0,48}$	640/585	0.0 - 5.4	- 20 to 45	75	0.98	B	–	370
0.0 - 130	EDXe 1130/24 V	**186132**	220 - 240	24 $^{\pm 0,48}$	640/585	0.0 - 5.4	- 20 to 45	75	0.98	C	yes	390
Degree of protection: IP67												
0.0 - 70	EDXe 170/24 V IP67	**186105**	220 - 240	24 $^{\pm 0,48}$	360/330	0.0 - 2.9	- 20 to 45	70	0.97	D	–	515
0.0 - 130	EDXe 1130/24 V IP67	**186133**	220 - 240	24 $^{\pm 0,48}$	640/585	0.0 - 5.4	- 20 to 45	70	0.97	D	–	545

Converter EDXe 120
Degree of protection: IP20, SELV-equivalent
Dimensions (LxWxH): 182x42x18 mm
(Drawing: A)
Connections/leads:
prim.: mains connection cable
sec.: screw terminals 1.5 mm²
Ref. No.: 186129



A – EDXe 120

A



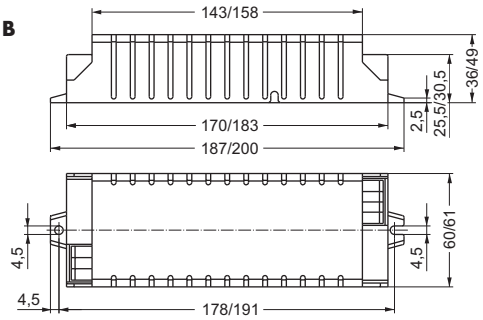
Converters EDXe 150, 170 and 1130/24 V
Degree of protection: IP20, SELV
Push-in terminals with push button:
2.5 mm² solid lead

Without cord grip
Dimensions (LxWxH): 187x60x36 mm
Fixing centres: 178 mm (Drawing: B)
Type: EDXe 150/24 V
Ref. No.: 186218 output: 0–50 W
Dimensions (LxWxH): 200x61x49 mm
Fixing centres: 191 mm (Drawing: B)
Type: EDXe 170/24 V
Ref. No.: 186103 output: 0–70 W
Type: EDXe 1130/24 V
Ref. No.: 186131 output: 0–130 W

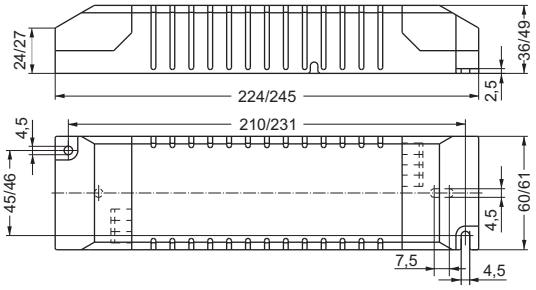
With cord grip
Cord grip approved for mains leads:
H03W-F 3X0.75 mm² or NYM 3X1.5 mm²
Cord grip approved fo routput leads:
SIHY-Cu 4X1 mm² or SIHSI-Cu 4X1 mm²
Dimensions (LxWxH): 224x60x36 mm
Fixing centres: 210 mm (Drawing: C)
Type: EDXe 150/24 V
Ref. No.: 186219 output: 0–50 W
Dimensions (LxWxH): 245x61x49 mm
Fixing centres: 231 mm (Drawing: C)
Type: EDXe 170/24 V
Ref. No.: 186104 output: 0–70 W
Type: EDXe 1130/24 V
Ref. No.: 186132 output: 0–130 W


B and C – EDXe 150 / EDXe 170 / EDXe 1130

B



C – With cord grip

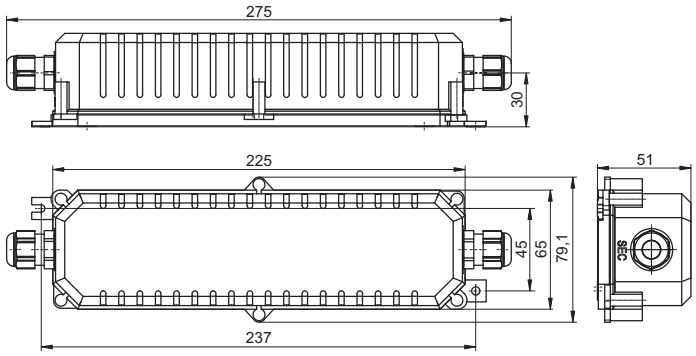


Converter EDXe 170 IP67/24 V
Degree of protection: casing IP67, SELV
Dimensions (LxWxH): 268x71.6x51 mm
Fixing centres: 235 mm (Drawing: D)
Pre-assembled connection:
prim.: 3X1 mm², H05RN-F, length: 500 mm
sec.: 2X2 mm², S07RN-F, length: 500 mm
Ref. No.: 186105 output: 0–70 W


D – EDXe 170 IP67 / EDXe 1130 IP67

Converter EDXe 1130 IP67/24 V
Degree of protection: casing IP67, SELV
Dimensions (LxWxH): 268x71.6x51 mm
Fixing centres: 235 mm (Drawing: D)
Pre-assembled connection:
prim.: 3X1 mm², H05RN-F, length: 500 mm
sec.: 2X2 mm², S07RN-F, length: 500 mm
Ref. No.: 186133 output: 0–130 W

D



Electronic Converters for LED Modules 12 V

If LED modules are used that are connected in parallel, the voltage-stabilising system is activated. The advantages include easy extendibility and system safety on account of the low voltage.

The electronic converters made by Vossloh-Schwabe guarantee a broad output range at a voltage of 12 V. Typical areas of application are architectural and general lighting, the replacement of halogen lamps as well as furniture lighting.

Devices with the particularly high IP67 degree of protection are designed for use in outdoor applications.

General technical notes
Short-circuit protection: electronic
Overload and temperature protection: reversible
Protection against "no load" operation
protection class I (EDXe 112: protection class II)

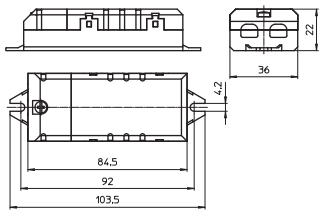
Output W	Type	**Ref. No.**	Mains voltage 50, 60 Hz V	Voltage output V	Mains current mA	Output current A	Ambient temperature t_a °C	Casing temperature t_c °C	Power factor	Drawing/ photo	With cord grip	Weight g
0.1 - 12	EDXe 112/12 V	**186204**	220-240	12 $^{\pm 0,6}$	120	1	- 20 to 50	75	0,57	A	–	60
0.0-50	EDXe 150/12 V	**186216**	220-240	12,1 $^{\pm 0,24}$	260/230	0,0-4,2	- 40 to 45	70	0,97	B	–	375
0.0-50	EDXe 150/12 V	**186217**	220-240	12,1 $^{\pm 0,24}$	250/240	0,0-4,2	- 40 to 45	70	0,97	C	yes	425
0.0-70	EDXe 170/12 V	**186112**	220-240	12,1 $^{\pm 0,24}$	365/335	0,0-5,8	- 20 to 45	70	0,97	B	–	340
0.0-70	EDXe 170/12 V	**186113**	220-240	12,1 $^{\pm 0,24}$	365/335	0,0-5,8	- 20 to 45	70	0,97	C	yes	360
Degree of protection: IP67												
0.0-70	EDXe 170/12V IP67	**186114**	220-240	12,1 $^{\pm 0,24}$	365/335	0,0-5,8	- 20 to 45	70	0,97	D	–	515

Converter EDXe 112/12 V
Degree of protection: IP20, SELV-equivalent
Dimensions (LxWxH): 103.5x36x22 mm
Fixing centres: 92 mm (Drawing: A)
Prim. and sec. connections:
each with 2x2.5 mm² screw terminals
Ref. No.: 186204



A – EDXe 112

A



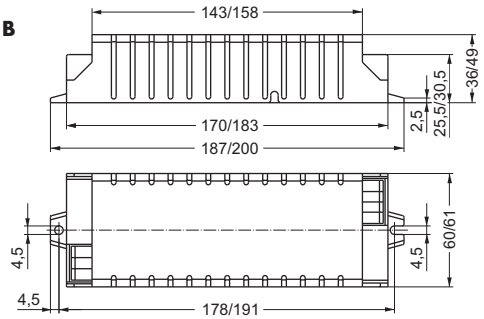
Converter EDXe 150 and 170/12 V
Degree of protection: IP20, SELV
Push-in terminals with push button:
2.5 mm² solid lead

Without cord grip
Dimensions (LxWxH): 187x60x36 mm
Fixing centres: 178 mm (Drawing: B)
Type: EDXe 150/12 V
Ref. No.: 186216 output: 0–50 W
Dimensions (LxWxH): 200x61x49 mm
Fixing centres: 191 mm (Drawing: B)
Type: EDXe 170/12 V
Ref. No.: 186112 output: 0–70 W

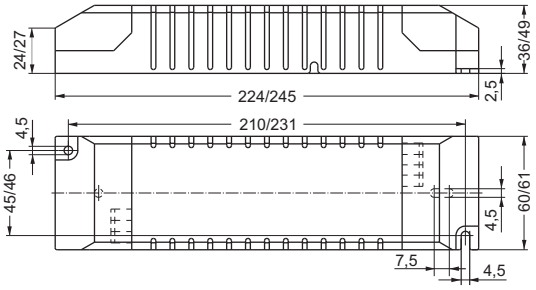
With cord grip
Cord grip approved for mains leads:
H03W-F 3X0.75 mm² or NYM 3X1,5 mm²
Cord grip approved fo routput leads:
SIHY-Cu 4X1 mm² or SIHSI-Cu 4X1 mm²
Dimensions (LxWxH): 224x60x36 mm
Fixing centres: 210 mm (Drawing: C)
Type: EDXe 150/12 V
Ref. No.: 186217 output: 0–50 W
Dimensions (LxWxH): 245x61x49 mm
Fixing centres: 231 mm (Drawing:C)
Type: EDXe 170/12 V
Ref. No.: 186113 output: 0–70 W


B and C – EDXe 150 / EDXe 170

B



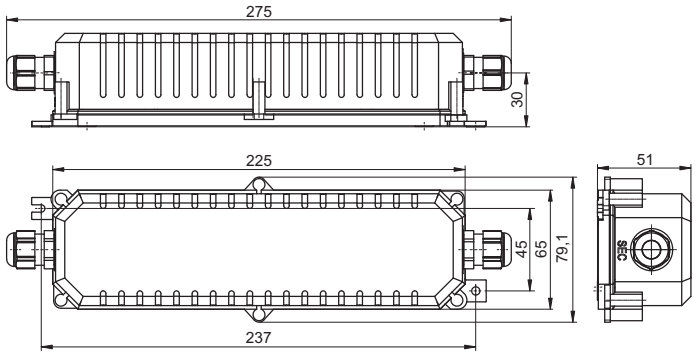
C – With cord grip



Converter EDXe 170 IP67/12 V
Degree of protection:casing IP67, SELV
Dimensions (LxWxH): 268x71.6x51 mm
Fixing centres: 235 mm (Drawing: D)
Pre-assembled connection:
prim.: 3X1 mm², H05RN-F, length: 500 mm
sec.: 2X2 mm², S07RN-F, length: 500 mm
Ref. No.: 186114 output: 0–70 W

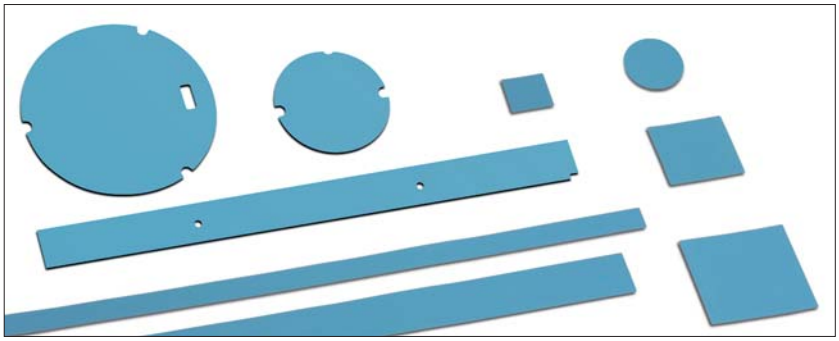

EDXe 170 IP67

D



Thermally Conductive Adhesive Transfer Tapes for LED Modules

3M™ type 8810 and Bergquist Bond-Ply® 100



Thermally Conductive Adhesive Transfer Tapes are designed to provide a preferential heat-transfer path between heat-generating components and heat-sinks or other cooling devices.

These tapes are tacky pressure sensitive adhesives loaded with thermally conductive ceramic fillers that do not require a heat cure cycle to form an excellent bond to many substrates. Only pressure is needed to form an excellent bond and thermal interface.

The specialized chemistry renders them modestly soft and able to wet to many surfaces, allowing them to conform well to non-flat substrates, provide high adhesion, and act as a good thermal interface.

The specialized acrylic chemistry of the tapes provides for excellent thermal stability of the base polymer. The thermally conductive tapes are provided on a silicone treated polyester release liner for ease of handling and die cutting. The tapes offer excellent adhesive performance with good wetting and flow onto many substrate surfaces.

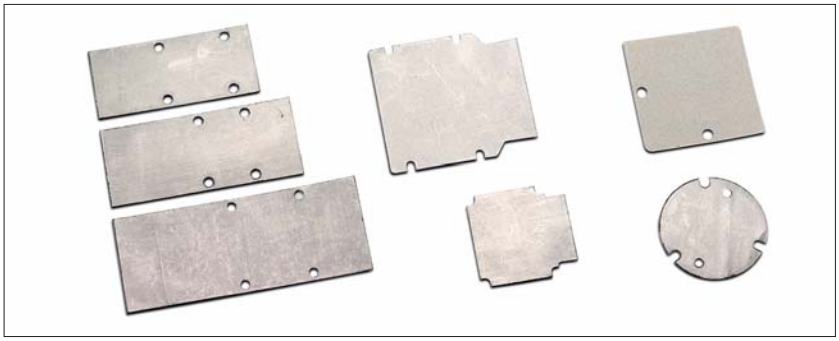
Depending on the type of application and/or the expected ambient conditions, the modules must be additionally secured to ensure optimum fixing.

For detailed information and application guidelines see 3M or Bergquist datasheet for thermally conductive adhesive transfer taper (8805; 8810; 8815; 8820; www.3m.com or Bergquist Bond-Ply® 100; www.bergquistcompany.com).

Type	**Ref. No.**	Size mm	Tape thickness mm	Liner thickness µm	Thermal conductive R_{th} K/W	For VS LED modules	Catalogue page
For round LED modules							
Adhesive pad Ø28	**536248**	Ø28	0.25	37.5 - 30	1.0	PowerEmitter	41 - 42
Adhesive pad Ø43	**536977**	Ø43	0.20	76	0.5	TriplePowerEmitter Ø45mm, Ø50mm	42 - 43
Adhesive pad Ø63	**539625**	Ø63	0.25	37.5 - 50	0.5	High Power 24V RGB Triple	86 - 87
Adhesive pad Ø107	**539624**	Ø107	0.25	37.5 - 50	0.1	High Power 24V RGB Flood	86 - 87
For square LED modules							
Adhesive pad 49x49	**529157**	49x49	0.25	37.5 - 50	0.3	TriplePowerEmitter Ø50mm	42 - 43
For linear LED modules							
Adhesive pad 278x13	**548179**	278x13	0.25	35.5 - 50	0.3	LUGA Line	16 - 17
Adhesive pad 320x35	**533815**	320x35	0.20	76	0.1	LEDLine High Power	–
Adhesive pad 297x23	**539626**	297x23	0.25	37.5 - 50	0.1	High Power 24V RGB Line	86 - 87

This technical information for 3M™ Thermally Conductive Adhesive Transfer Tape 8810 or Bergquist Bond-Ply® 100 should be considered representative or typical only and should not be used for specification purposes.

Thermal Tapes for LED Modules



Type	Ref. No.	Size mm	Thermal conductive R_{th} K/W	For VS LED modules	Catalogue page
For LED modules for shop design					
Thermal conductive graphite tape	**549501**	Ø 47.2	≤ 0.04	WU-M-461/-462/-464	26
Thermal conductive graphite tape	**549502**	42x40.7	≤ 0.04	WU-M-437/-466	27, 28
For LED modules WU-M-425 (ME/S, SYM I, SYM II)					
Thermal conductive tape, adhesive on one side	**548252**	54x54	≤ 0.04	WU-M-425	29, 32, 35
For LED modules LUGA Industrial 10,000 lm					
Thermal conductive graphite tape	**552463**	67.25x61	≤ 0.04	WU-M-443	38
For LED modules Streetlight FlatEmitter SMD					
Thermal conductive graphite tape, adhesive on one side	**552788**	73x33.5	≤ 0.04	WU-M-452-12	39
Thermal conductive graphite tape, adhesive on one side	**552787**	85.5x36.5	≤ 0.04	WU-M-452-18	39
Thermal conductive graphite tape, adhesive on one side	**550224**	107.5x43.5	≤ 0.04	WU-M-433	39

General information on LED technology

Thanks to the constant developmental progress made in LED semiconductor technology, the fields of application for LEDs are growing continuously. Mood and architectural lighting, for instance, are already benefiting from the saturated colours of and possibilities afforded by RGB colour control. Ever higher light efficiency levels at higher currents are making white LEDs increasingly attractive for general lighting. Among others, further decisive advantages are great longevity, low energy consumption, neither UV or IR beam nor any hazardous substances.

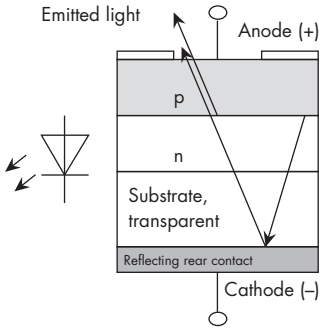
The key basis of modern optoelectronics is the availability of high-performance LEDs in the three primary colours red, green and blue as well as white and warm white. By assembling these on circuit boards and in combination with converters and control systems, lighting systems can be created for the most diverse areas of use.

Vossloh-Schwabe's production of LED modules is based on tried-and-tested COB and SMD technology. This makes it possible to design modules in various dimensions and performance classes. COB (Chip On Board) technology enables super-flat designs with very high chip densities. SMD (Surface Mounted Device Technology) enables convenient, quick and simultaneous assembly of LED and electronics devices.

Working principle of light emitting diodes (LEDs)

An LED semiconductor chip is a semiconductor component that is made up of two differently doped crystal-layers, one of which positive (p) and the other negative (n). Light is emitted at the depletion-layer pn boundary for a current flow in forward direction.

An LED converts applied electric energy into visible electromagnetic radiation. The construction and doping of a semiconductor depends on the desired wavelength λ (colour), which can only be monochromatic (red, orange, yellow, green or blue). Colour blends are created by varying the number of LEDs in the individual colours. By adding certain converter materials, LEDs can also produce white and warm white light. This type of light generation using a semiconductor is generally referred to as luminescence, i.e. the generation of cold light whose rays contain no warmth and are emitted without infrared (IR).



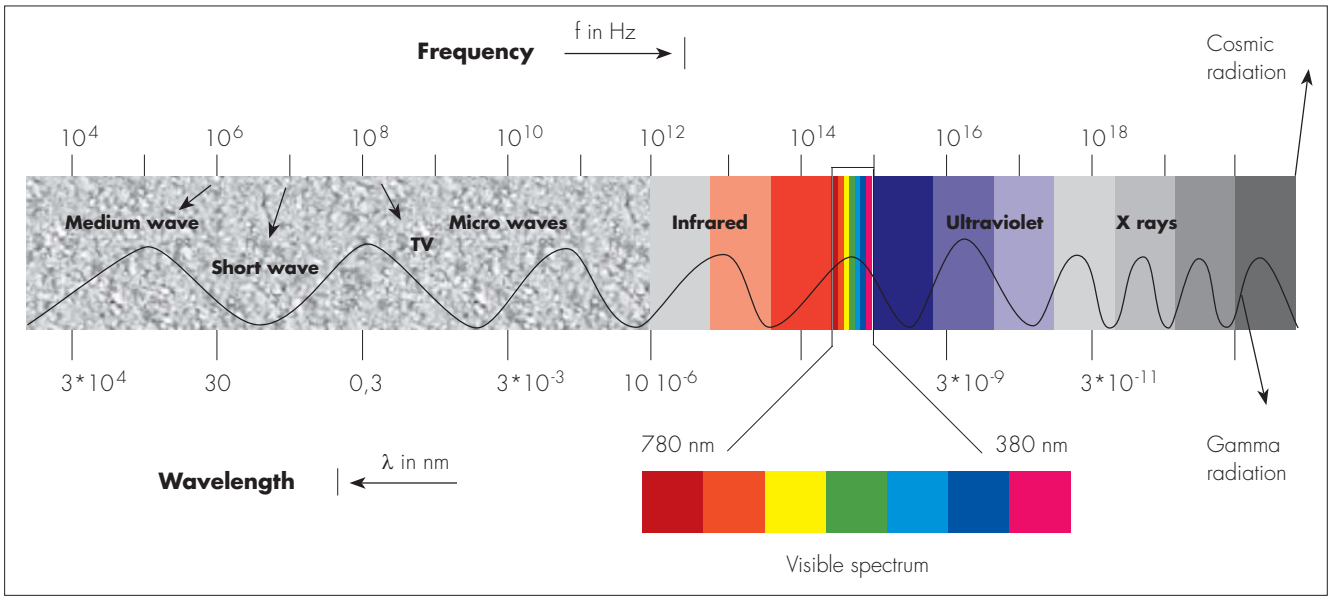
Cross-sectional Detail
Cross-section of an LED semi-conductor chip
Light emission at the pn depletion layer

Semiconductor materials for LED chips

Irrespective of the specific model, an LED always consists of the following components: leadframe, LED chip and contacting using conductive adhesive and bonding.
While the leadframe can be made of a PCB or ceramics, plastics and other materials, the LED chips are mounted on a die-cut reflector (cathode) using conductive adhesive to achieve higher light intensities with a focused beam of light. The anode is connected using bonding wire.
The optical viewing angle (φ) of an LED is determined by the geometry of the casing including reflector and the position of the chip within the casing.
Small in size and highly resistant against mechanical impact/stress, LEDs are an ideal component for lighting applications. Special modular solutions are also available for applications involving differing ambient conditions (humidity, ambient temperature, etc.).

Visible light within the electromagnetic spectrum

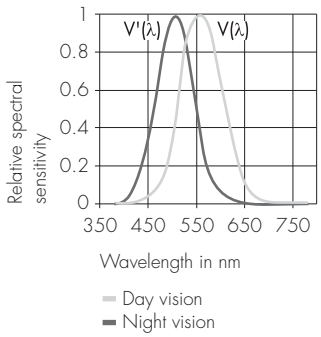
Visible light only accounts for a small part of the electromagnetic spectrum. The part of the electromagnetic spectrum that is visible for humans ranges from ultraviolet (λ = 380 nm) to dark red (λ = 780 nm).



Light sensitivity of the human eye

By day, the maximum light sensitivity (Km) of the human eye for green is at λ = 555 nm and drops to λ = 510 nm by night. Light sensitivity falls off sharply for both higher and lower wavelengths and only totals 1% of day vision for blue at λ = 430 nm and dark red at λ = 720 nm. Thus, in order for the human eye to perceive light of these wavelengths at the same intensity as yellow-green light, its luminance LV needs to be 100 times greater.

Degree of spectral light sensitivity



Service life of LEDs

The service life of an LED is determined by various factors:

- the degradation rate of the semiconductor material and the encapsulation material
- the applied operating current I_F
- the ambient temperature t_a during operation and
- the thermal resistance

The term degradation describes the decrease in brightness of an LED chip as a result of the applied forward current during normal operation. Given normal operating conditions (t_a = 25°C at I_F = 10–30 mA), LEDs will provide a service life of up to 100,000 operating hours (typically 50,000 hours for High Power applications), after which time the brightness of the LED will have dropped to 70% of its original value.

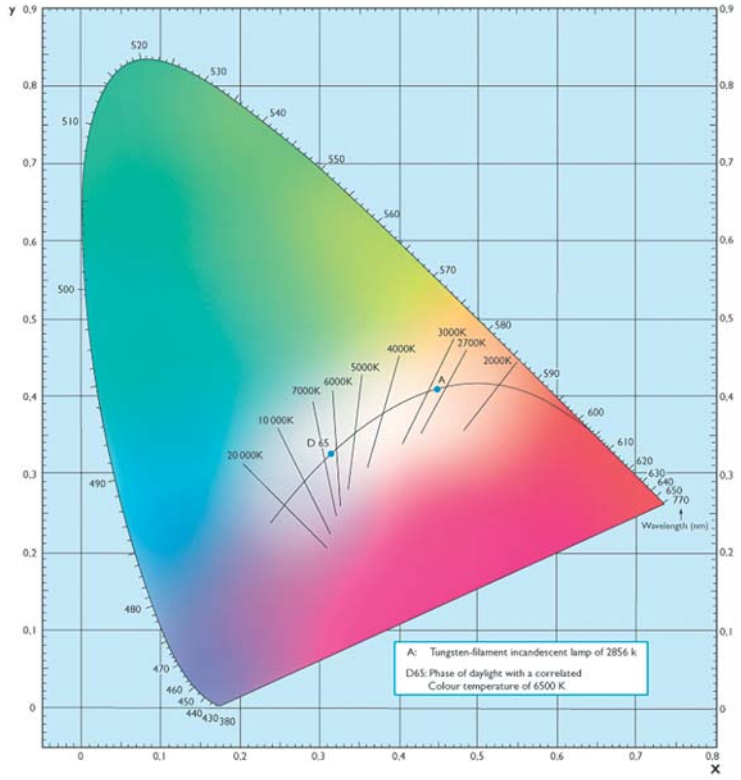
LED efficiency

In theory, the internal efficiency of an LED chip is 90%, meaning that 90% of the applied electrical energy is converted into visible light at the pn junction layer.

However, a part of the light emitted at the pn junction layer cannot pass through the semiconductor structure and it remains a major technological challenge to optimise the coupling of light out of the chip with the help of innovative designs. These processes determine the external degree of LED efficiency, which denotes the magnitude of visible output that can pass through the semiconductor structure when, for instance, 1 W of electrical power is applied to an LED.

Colour design with LEDs

CIE Chromaticity Chart (CIE 1931 according to DIN 5033)



The CIE chromaticity triangle (standardised CIE 1931 chromaticity chart according to DIN 5033) makes it possible to precisely plot the colours of light sources and objects using two standardised (and previously gauged) chromaticity coordinates, the x and y values. Every point in this chart represents the chromaticity location of a certain chroma. Colours of the same chromaticity only differ from each other in terms of their intensity (colour saturation). The so-called "no-colour point" (white, grey and black, depending on brightness) is situated in the middle of the chart at x = 0.33 and y = 0.33.

The boundary of the chromaticity chart is made up of the gamut of spectral colours from 380 nm (blue-violet) to 780 nm (dark red) and the so-called purple boundary. As a result of additive mixing of two or more coloured light sources the chromaticity coordinates are always along a direct line between the starting coordinates.

When using LED lighting, different colours can be created using additive colour mixing (RGB) or by transforming the wavelengths a diode emits by adding a luminescent material in a manner similar to fluorescent lamps. In the case of additive colour mixing/control, appropriate control devices are used to adjust the brightness of the individual LED colours (RGB) to create the desired light colour.

LED system components

- LED light modules
- LED operating devices
- LED control modules
- LED connection technology

When selecting LED components, it is important to take account of their technical specifications, especially with regard to voltage range, current and temperature. VS provides a large range of components for the various areas that all go to build a perfectly matched system. The technical specifications of the various components can be found on the product pages. All VS LED operating devices work with a safety extra-low voltage (SELV) or SELV equivalent on the output side.

Assembly Instructions for LEDs

For mounting and installing LED components

Mandatory regulations

DIN VDE 0100	Erection of low voltage installations
EN 60598-1	Luminaires – part 1: general requirements and tests
EN 60838-2-2	Miscellaneous lampholders – part 2-2: particular requirements – connectors for LED-modules
EN 61347-1	Lamp controlgear – part 1: general and safety requirements
EN 61347-2-11	Controlgear – part 2-11: particular requirements for miscellaneous electronic circuits used with luminaires
EN 61347-2-13	Lamp controlgear – part 2-13: particular requirements for DC or AC supplied electronic controlgear for LED modules
EN 62031	LED modules for general lighting – safety specifications
EN 62384	DC or AC supplied control gear for LED modules – performance requirements
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 61000-3-2	Electromagnetic compatibility (EMC) – part 3-2: limits – limits for harmonic current emissions (equipment input current = 16 A per phase)
EN 61000-3-3	Electromagnetic compatibility (EMC) – part 3-3: limits – limitation of voltage fluctuations and flicker (equipment input current = 16 A per phase)
EN 61547	Equipment for general lighting purposes – EMC immunity requirements
EN 62471	Photobiological safety of lamps and lamp systems

Mechanical mounting of LED operating devices

Surface
Solid, flat surface for good heat discharge required.
Avoid mounting protruding surfaces.

Mounting location
Converters must be protected against moisture and heat.

Installation in external luminaires
Luminaire requires water protection rate of = 4 (e.g. IP54).

Heat transfer
If the converter is destined for installation in a luminaire, sufficient heat transfer must be ensured between the converter and the luminaire casing. Converters should be mounted with the greatest possible clearance to sources of heat.
During operation, the temperature measured at the t_c point of the converter must not exceed the specified maximum value.

Additional mounting instructions for independent LED operating devices

Mounting position Any

Clearance
Min. of 0.10 m from walls, ceilings, insulation
Min. of 0.10 m from other electronic ballasts
Min. of 0.25 m from sources of heat (LEDs or other lamps)

Surface
Solid; device must not be allowed to sink into insulation materials

Safety information for LED modules

Warning
The installation of LED modules may only be undertaken by qualified staff. Installation must be conducted at zero potential after disconnection from the line. Modules can have sharp edges or corners. Please take special care during installation to avoid injury. The High Power 24 V Triple, Line and Flood, the HighPerformance, Power Emitter, TriplePowerEmitter and LEDLine High Power modules can get hot. Please provide warning notices at the luminaire body if necessary.

Assembly and handling information for LED modules

LED modules and all PCB components must not be subjected to undue mechanical stress:
- LED modules must not be handled as bulk cargo.
- Shear and pressure stress must be avoided on SMD LEDs and the grouting material of COB LEDs during assembly and handling.

The circuit path must not be damaged or interrupted. We recommend using clips or plastic screws for installation purposes to avoid short circuits and damage to the modules.

The LED modules are not protected against short-circuiting, overloading or overheating. The use of Vossloh-Schwabe electronic power supply units is therefore absolutely essential. Using other power supply units is not recommended. Please ensure you choose the correct electronic power supply unit for the module in question and that the respective output parameters (current, voltage, wattage) are correct (see www.vossloh-schwabe.com).

Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.

Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.

The modules are not protected against dust or moisture (except LEDLine Flex SMD Outdoor). When LED modules are operated in unduly moist or dusty environments, care must be taken to ensure each module is built into a protective casing in compliance with the correct IP classification or provided with corrosion protection. Damage caused by moisture and/or corrosion will not be recognised as a material or manufacturing defect.

To ensure smooth module operation, care must be taken that module temperatures at the t_c point never exceed the maximum values stipulated in the data on catalogue pages.

Due to the numerous installation options and differing operating conditions, no precise installation guidelines can be provided that will ensure the maximum temperature values are never exceeded. In principle, the High Power 24 V Triple, Line and Flood, the HighPerformance, PowerEmitter, TriplePowerEmitter and LEDLine High Power can be mounted on a flat metal surface that must, however, provide a large enough surface area to ensure the generated heat can be dissipated to the surroundings.

Please ensure adhesive pads or other products with adhesive areas (LEDLine Flex SMD, LEDLine Flex SMD Outdoor) are only used on dry and clean surfaces that are free of grease, oil, silicone and dirt particles. Owing 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.

Assembly and safety information for LEDSpots and LED modules with heat sink

Installation and maintenance must always be performed by a qualified fitter in accordance with relevant legislation. The following instructions must be strictly observed. Vossloh-Schwabe Deutschland GmbH accepts no liability for any possible inaccuracies during installation, any non-compliance with these instructions or for any possible omissions in this publication.

In addition, Vossloh-Schwabe Deutschland GmbH reserves the right to make modifications at any time and without prior notification. This data sheet is an integral part of the equipment and its safety devices and should therefore be kept in a safe place for easy reference. The equipment must always be disconnected from the mains prior to undertaking any maintenance work. The safety instructions on the type plate of the components must be strictly observed.
Safe operation is only possible by the use of external constant-current sources.
Power supply units must be used for operation, in which the following protective measures are ensured:

- Short-circuit protection
- Overload protection
- Overheating protection
- SELV equiv. (Safety Extra Low Voltage)

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.

ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED modules.

The modules are not protected against dust or moisture. When modules are operated in unduly moist or dusty environments, care must be taken to ensure each module is built into a protective casing in compliance with the correct IP classification or provided with corrosion protection. Damage caused by moisture and/or corrosion will not be recognised as a material or manufacturing defect.

Under no circumstances may LED modules ever be covered by insulation material or similar. Air ventilation must be ensured.

For optimal load of used constant-current driver the LEDSpots can only be connected in series. The quantity of LEDSpots is limited by the sum of forward voltage and the capacity of used constant-current driver. Under no circumstances may the sum of the forward bias exceed 60 V DC.

A parallel connection of the modules is not allowed.

Tests have shown the following chemicals to be harmful to LEDs used on the modules. It is recommended not to use the under-mentioned chemicals anywhere in an LED system. The fumes from even small amounts of these chemicals may damage the LEDs.

- Chemicals that might outgas aromatic hydrocarbons (e.g., toluene, benzene, xylene)
- Methyl acetate or ethyl acetate (i.e., nail polish remover)
- Cyanoacrylates (i.e., "Superglue")
- Glycol ethers
  (including Radio Shack®, Precision Electronics Cleaner – dipropylene glycol monomethyl ether)
- Formaldehyde or butadiene (including Ashland PLIOBOND® adhesive)
- Dymax 984-LVUF conformal coating
- Loctite Sumo glue
- Gorilla glue
- Clorox bleach
- Clorox Clean-Up cleaner spray
- Loctite 384 adhesive
- Loctite 7387 activator
- Loctite 242 threadlocker

Photobiological safety of lamps and lamp systems; German version EN 62471:2008 General lighting: exempt group

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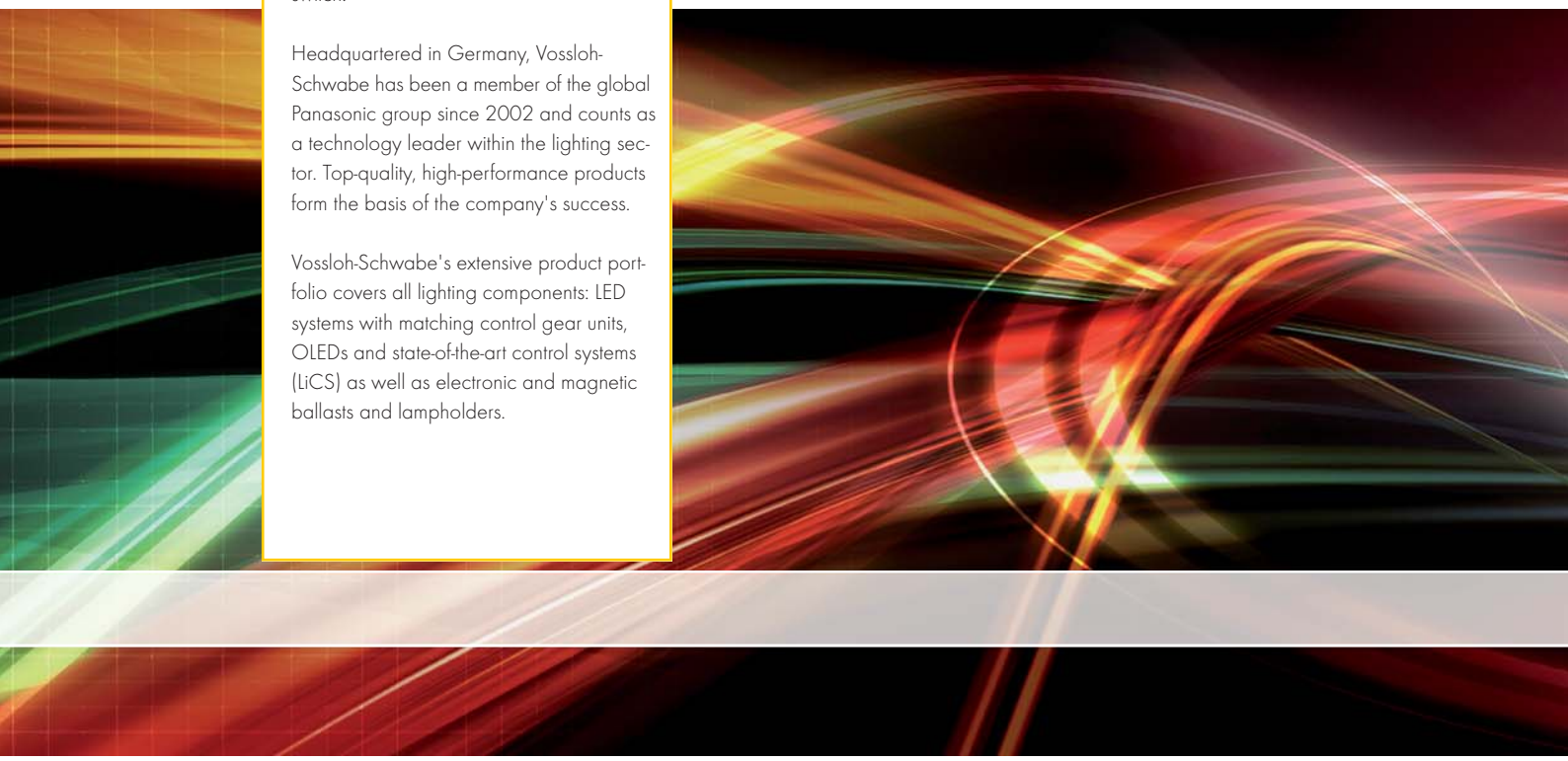
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552406	81
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552408	81
552409	81
552415	75
552416	75
552417	75
552418	75
552419	75
552420	75
552421	75
552422	75
552423	75
552424	75
552425	75
552426	75
552463	103
552507	35
552787	103
552788	103
554575	13
554576	65
554577	65
554578	65
554579	65
554580	65
554581	65
554582	65
554583	65
554584	65
566028	13
566029	13
566030	13
566031	10
566032	10
566033	10
566034	10
566035	10
566036	10
566037	10
566038	10
566041	65
566042	65
566043	65
566044	65
566045	65
566046	65

Notes

Whenever an electric light goes on around the world, Vossloh-Schwabe is likely to have made a key contribution to ensuring that everything works at the flick of a switch.

Headquartered in Germany, Vossloh-Schwabe has been a member of the global Panasonic group since 2002 and counts as a technology leader within the lighting sector. Top-quality, high-performance products form the basis of the company's success.

Vossloh-Schwabe's extensive product portfolio covers all lighting components: LED systems with matching control gear units, OLEDs and state-of-the-art control systems (LiCS) as well as electronic and magnetic ballasts and lampholders.



A member of the Panasonic group Panasonic

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