LIGHTING SOLUTIONS

Innovative Systems 2015

NEW TECHNOLOGY
LED/LiCS
HIGH QUALITY

[UPDATE!]

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

LED Modules for Direct Connections to Mains Voltage

Downlights, DecoLEDs and LEDSpots

Components for Luminaire Protection and Power Adjustment

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

Emergency Lighting Devices for LED Applications

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

LiCS Indoor
Lighting control systems for indoor applications

LiCS Outdoor
Lighting control systems for outdoor applications

06/2015 | www.vossloh-schwabe.com

LIGHTING TECHNOLOGY PRODUCTS

Vossloh-Schwabe

Vossloh-Schwabe is not merely a provider of top-quality system solutions 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.

Some lighting applications continue to rely on conventional technologies.

Please see our separate Standard Technology Catalogue for product details.

Contents

LED SYSTEM

LED MODULES, OPERATING DEVICES AND CONNECTING TECHNOLOGY

Vossloh-Schwabe is not merely a provider of top-quality system solutions 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.

Maryling, Milan
VS products: LUGA Shop COB and LED drivers
Photographer/Architect: Casonato

Giordano, Jakarta

Foyer of the Torre Agbar tower

Giordano in the Living World Mall, Jakarta

The entire Living World Mall in Jakarta is illuminated solely using LEDs. The mall is located in Jakarta's Serpong business park and features a large selection of international brands, including the fashion outlet Giordano.

Due to the increase in energy costs in Indonesia, retailers and tenants in the Living World Mall were encouraged to convert to LED lamps and with that ensure a reduction in power consumption.

The choice was easy to make: Vossloh-Schwabe's highly efficient PAR38 LED lamps with their service life of up to 45,000 hours and a correspondingly low need for maintenance proved to be ideal for the project. Thanks to the E27 base and 38° radiation angle of the PAR38 lamps, exchanging the previously installed 70 W HID lamps required only minimal effort. Apart from the expected energy savings, these new LED lamps have also resulted in a decisive reduction in CO_2 emissions in the interest of countering global warming.

Available in different colour temperatures and with various angles of radiation, these dimmable LED lamps are mercury-free, energy-saving and will not impair products (IR- and UV-free). In addition, their energy efficiency, eco-friendliness and high light output have set standards for other Giordano outlets. LED lamps are set to feature in further Giordano branches in the future.

Photos: Giordano, Serpong, Jakarta, Indonesia

Torre Agbar, Barcelona

With its height of 142 metres, 34 floors above ground level and a usable floor space totalling 39,000 square metres, the Torre Agbar – Catalan for "Agbar Tower" – is one of Catalonia's tallest buildings and the new symbol of the 22@Barcelona technology centre.

Designed by architect Jean Nouvel in cooperation with the b720 Arquitectos company, the tower's dazzling, 16,000 square metre façade lets the tower appear like a water fountain. The outer aluminium shell of the tower resembles the skin of a reptile or a large, fluid, organic mass. The mountains of Montserrat and the works of the Catalan architect, Antoni Gaudí, served as inspiration for the shape of the tower.

The special colours of the tower were also chosen for a reason. As the client, Grupo Agbar, is Barcelona's municipal waterworks (Aguas de Barcelona, or Aigües de Barcelona in Catalan), this influenced the tower's iridescent and colourful appearance. The immediate vicinity of the building was designed in such a way as to give onlookers the impression that the tower is standing in a body of water.

Consisting mainly of office space, a cafeteria and a multi-purpose hall, the building was inaugurated by the Spanish King on 16 October 2005.

For Vossloh-Schwabe, the "Torre Agbar" project began in September 2011. A need had been identified to improve the lighting situation in the foyer, the only solution to which was energy-efficient LED lighting in combination with DALI drivers and a LiCS Indoor light management system made by Vossloh-Schwabe. In cooperation with the customer, a project-specific luminaire was developed on the basis of the VS LED Shop module (3000 K).

Photos Torre Agbar: José Tío

LED System Overview by Application Fields

STREET

+ LICS OUTDOOR

LED modules
- M-Class: IP20, IP66, Allround, LightEngine
- S-Class: IP20, IP66, Allround, LightEngine
- AreaLED: IP20, IP66, Allround, LightEngine
- Streetlight FlatEmitter SMD

LED drivers
- Capacity range: 40–150 W
- Current supply: 350–1400 mA
- Dimming: DALI, PUSH, 1–10 V, power-reduction
- Variants: PrimeLine and ComfortLine

Accessories
Luminaire protection device, power switches, switch units

ARCHITECTURE

+ LICS OUTDOOR

LED modules
- High Power 24 V CA: White and RGB
- LEDLine Flex SMD Professional Indoor 24 V: White; Standard and High Brightness
- AluLED: IP20, IP64; White and RGB

LED Converters
- ComfortLine 24 V:
  Capacity range: 20, 70, 75, 100, 130, 150 W
  Degree of protection: IP20, IP67
- ComfortLine 12 V:
  Capacity range: 12, 15, 30, 50, 70 W
  Degree of protection: IP20, IP67

LED Colour control
- DigiLED: Manuell, DALI, DMX, IR, RF, Push, Mono, Slave

Accessories
Connecting technology: flatband cable, connector, PCB distributor

INDUSTRY

+ LICS INDOOR

LED modules
- SYM I: IP20, IP66, Allround, LightEngine
- SYM II: IP20, IP66, Allround, LightEngine
- LUGA Industrial
- Industrial FlatEmitter SMD
- LUGA C

LED Converters
- Capacity range: 20–230 W
- Current supply: 350–1400 mA
- Dimming: DALI, PUSH, 1–10 V
- Variants: ComfortLine and EasyLine

Accessories
Luminaire protection device, inrush current limiter, resistor network

OFFICE

+ LICS INDOOR

LED modules
- LUGA Line: Linear COB modules
- LED Line SMD: Kit, ECO, L14/28/56, Slim
- LED Line Fix: LUGA and SMD
- LED Line AluFix: LUGA and SMD
- LED Light Panel SMD
- AreaLED: IP20, IP66, Allround, LightEngine
- Streetlight FlatEmitter SMD

LED drivers
- Capacity range: 40–150 W
- Current supply: 350–1400 mA
- Dimming: DALI, PUSH, 1–10 V, power-reduction
- Variants: PrimeLine and ComfortLine

Accessories
Luminaire protection device, power switches, switch units

RETAIL

+ LICS INDOOR

LED modules
- LUGA Shop
- LUGA C

LED drivers
- Capacity range: 10–60 W
- Current supply: 250–1050 mA
- Dimming: DALI, PUSH, 1–10 V, 3C
- Variants: PrimeLine, ComfortLine and EasyLine

LED-Spots and Downlights
- ShopLine: Standard, NEXT, EVO
- Activeline: LUGA, COB 9.1, COB 7.1, COB 6.1, Quad
- Downlights Pro and Prime

LED Lamps
- AR111
- PAR30, PAR38
- GU10

Accessories
Luminaire protection device, inrush current limiter, resistor network

RESIDENTIAL

+ LICS INDOOR

LED modules
- PowerEmitter
- TriplePowerEmitter

LED modules for direct connection to mains
- LEDSpot ReadyLine IP and MR16
- ReadyLine: S, DL and C

LED drivers
- Capacity range: 5,2–36 W
- Current supply: 150–1050 mA
- Dimming: Phase-cut dimmable
- Variants: ComfortLine and EasyLine

LED Spots and Downlights
- Single LEDSpots
- ActiveLine Pro
- DecoLEDs

LED Lamps
- MR16
- GU10

Accessories
Reflectors, Optics

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

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

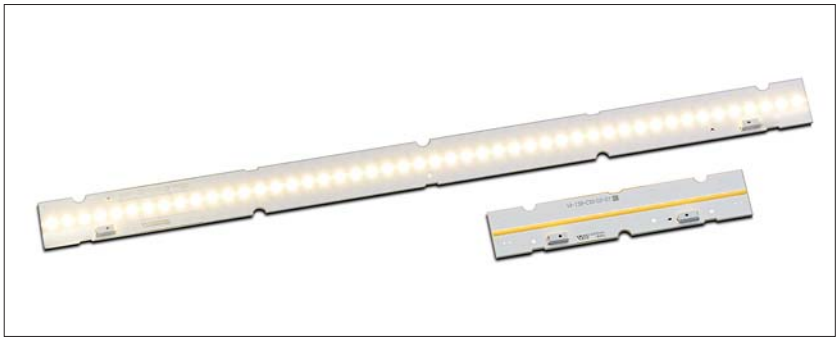
To ensure safe operation of LEDs that are connected in series, the operating current must be kept at a constant value by the ballast. It is recommended to operate all high-performance LED modules in combination with an external constant-current driver.

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 RX 2015

Built-in PCB lighting modules

The new LUGA Line RX 2015 is characterised by its particularly easy-to-use mounting and connection options (ZHAGA-compliant hole spacing).
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.

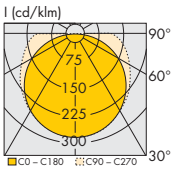


Technical notes

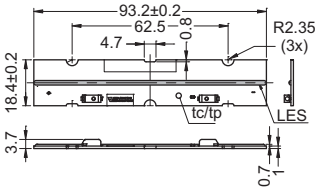
Dimensions: 280x18.4 mm und 93x18.4 mm
On-board push terminal system WAGO 2059
Allowed operating temperature at t_c point:
-40 to 85 °C
Use of external LED constant-current drivers required
Efficiency up to 148 lm/W
Colour rendering index R_a: > 80/> 90
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L80/B10:
50,000 hrs. (I_F 700 mA)
Unit: 60 pcs.

Typical applications

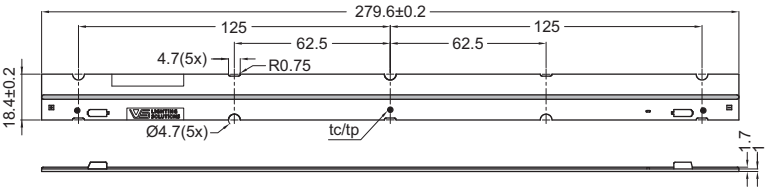
- Office lighting
- Retail lighting
- T5/T8 replacement as built-in module
- Furniture lighting



DML028



DML068

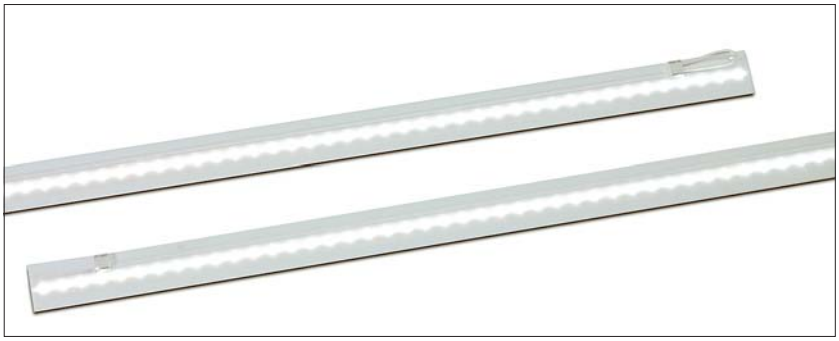


Products under development; preliminary technical datas

Type	Ref. No.	Colour	Correlated colour temperature* K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})** 350 mA lm	350 mA lm/W	500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	1050 mA lm	1050 mA lm/W	Beam angle °	CRI R_a typ.
DML068				P_{el} = 5.9 W $U_{typ.}$ = 16.9 V		P_{el} = 8.6 W $U_{typ.}$ = 17.2 V		P_{el} = 12.3 W $U_{typ.}$ = 17.6 V		P_{el} = 19 W $U_{typ.}$ = 18.1 V			
DML068C27FR	**557979**	warm white	2700	780	132	1070	124	1435	117	1980	104	120	82
DML068C30FR	**557980**	warm white	3000	810	137	1110	129	1490	121	2055	108	120	82
DML068C30FBR	**557981**	warm white	3000 (below BBL)	775	131	1065	124	1425	116	1965	103	120	82
DML068C35FR	**557982**	neutral white	3500	835	142	1150	134	1540	125	2125	111	120	82
DML068C40FR	**557983**	neutral white	4000	860	146	1185	138	1585	129	2185	114	120	84
DML068C40FBR	**557984**	neutral white	4000 (below BBL)	825	140	1135	132	1520	124	2095	110	120	84
DML068C50FR	**557985**	cool white	5000	875	148	1205	140	1615	131	2225	116	120	84
DML068C65FR	**557986**	cool white	6500	870	147	1200	140	1605	130	2215	116	120	84
DML068S31FR	**557987**	pearl white	3100	680	115	935	109	1260	102	1730	91	120	95
DML028				P_{el} = 2.0 W $U_{typ.}$ = 5.6 V		P_{el} = 2.9 W $U_{typ.}$ = 5.7 V		P_{el} = 4.1 W $U_{typ.}$ = 5.9 V		P_{el} = 6.4 W $U_{typ.}$ = 6.1 V			
DML028C27FR	**558100**	warm white	2700	245	125	340	119	455	111	625	98	120	82
DML028C30FR	**558101**	warm white	3000	255	130	355	125	470	114	650	102	120	82
DML028C30FBR	**558102**	warm white	3000 (below BBL)	245	125	340	119	450	110	625	98	120	82
DML028C35FR	**on request**	neutral white	3500	265	135	365	128	490	119	675	106	120	82
DML028C40FR	**558103**	neutral white	4000	270	138	375	132	505	123	695	109	120	84
DML028C40FBR	**558104**	neutral white	4000 (below BBL)	260	133	360	126	480	117	665	104	120	84
DML028C50FR	**558105**	cool white	5000	275	140	380	133	510	124	705	111	120	84
DML028C65FR	**on request**	cool white	6500	275	140	380	133	510	124	700	110	120	84
DML028S31FR	**558106**	pearl white	3100	215	110	295	104	400	97	550	86	120	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15 % | Min. CRI R_a: > 80 / > 90

LUGA Line 2015
45 Chips



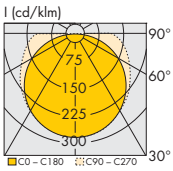
Built-in PCB lighting modules

The linear LED COB modules produce a very high lumen output.
The 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.

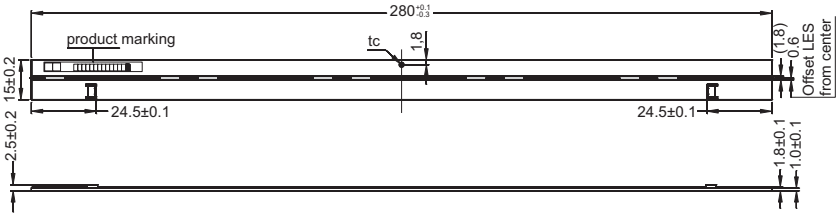
Typical applications

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

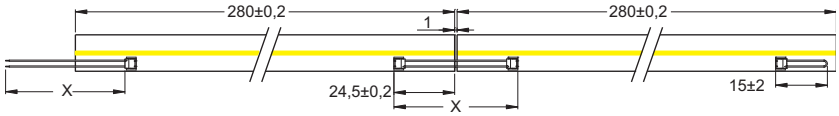


Technical notes

Dimensions: 280x15 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
Efficiency up to 160 lm/W
Colour rendering index R_a: > 80
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L90/B10:
55,000 hrs. (I_F 700 mA)
Unit: 60 pcs.



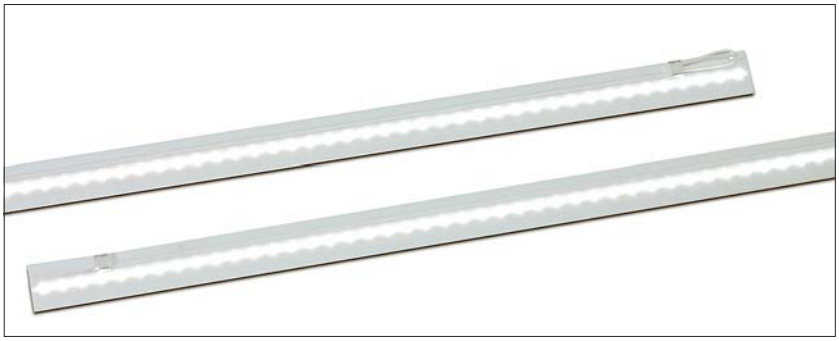
Connection example



Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature*	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})**								Beam angle	CRI R_a	
					350 mA		500 mA		700 mA		1050 mA				
		pcs.		K	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	°	min.	typ.
					P_{el} = 5.1 W		P_{el} = 7.7 W		P_{el} = 11.5 W		P_{el} = 19.1 W				
LUGA Line 2015 with 45 LEDs					$U_{typ.}$ = 14.7 V		$U_{typ.}$ = 15.4 V		$U_{typ.}$ = 16.4 V		$U_{typ.}$ = 18.2 V				
DML059C27EC	**556912**	45	warm white	2700	725	142	1030	134	1400	122	2000	105	120	80	82
DML059C30EC	**556926**	45	warm white	3000	755	148	1075	140	1460	127	2080	109	120	80	82
DML059C30EBC	**557228**	45	warm white	3000 (below BBL)	715	140	1015	132	1380	120	1965	103	120	80	82
DML059C35EC	**556927**	45	neutral white	3500	775	152	1110	144	1500	130	2140	112	120	80	82
DML059C40EC	**556928**	45	neutral white	4000	800	157	1145	149	1550	135	2210	116	120	80	84
DML059C40EBC	**557229**	45	neutral white	4000 (below BBL)	745	146	1060	138	1440	125	2050	107	120	80	84
DML059C50EC	**556929**	45	cool white	5000	815	160	1165	151	1580	137	2250	118	120	80	84
DML059C65EC	**556930**	45	cool white	6500	805	158	1150	149	1560	136	2220	116	120	80	84

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%
Min. CRI R_a: > 80

LUGA Line 2015 – FOOD



Built-in PCB lighting modules

The linear LED COB modules produce a very high lumen output.
The modules can also be seamlessly connected (no gaps).

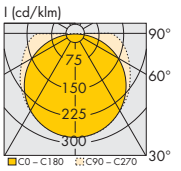
The ceramic PCB ensures optimum thermal management. Thanks to producing a homogeneous light field without any discernible individual light points, these LED modules are ideal for use in reflectors in luminaires constructed for T5 and T8 lamps.

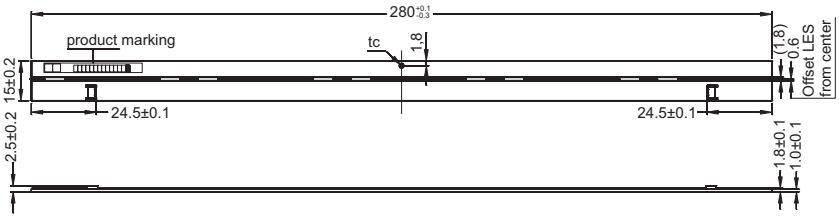
Technical notes

Dimensions: 280x15 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: > 80 or > 70
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L90/B10:
55,000 hrs. (I_F 700 mA)
Unit: 60 pcs.

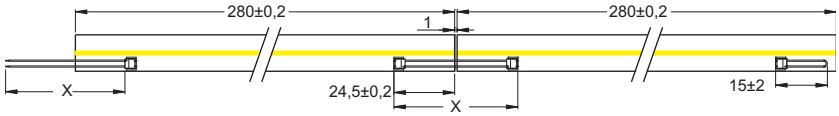
Typical applications

- Installation in luminaires for general lighting purposes
- T5/T8 replacement as built-in module
- Retail lighting
  especially for fresh food
  (bread, fruits, vegetables, meat)
- Refrigerator lighting





Connection example

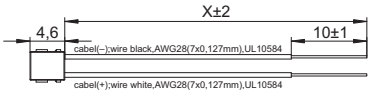


Type	Ref. No.	Colour	Correlated colour tempera-ture* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 700 mA lm	lm/W	1050 mA lm	lm/W	Typ. beam angle °	Typ. CRI R_a	Typical applications
				P_{el} = 11.5 W		P_{el} = 19.1 W				
LUGA Line 2015 – FOOD				$U_{typ.}$ = 16.4 V		$U_{typ.}$ = 18.2 V				
DML059G30EC	**566047**	warm white	3000	850	74	1210	63	120	85 (special spectrum: HiGa)	Bread, fruits, vegetables, cheese
DML059G40EC	**556933**	neutral white	4000	890	77	1265	66	120	85 (special spectrum: HiGa)	Fish, drugstore, drapery
DML059M19EC	**556934**	"white effect"	2000	675	59	965	51	120	82	Meat
DML059M40EC	**556935**	"pink effect"	4000	790	69	1125	59	120	70 (special spectrum: HiGa)	Meat

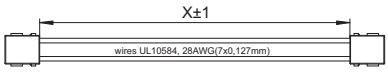
Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%

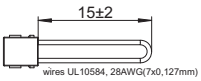
Accessories for LUGA Line Modules

Other lead lengths on request



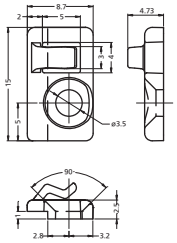
Feed-in connector
Feed in connector for power supply
Colour: – black
+ white
Max. permissible current: 1.5 A
Number of strands: 2
(Strand diameter: 0.09 mm²/AWG28)
Type: 893
Ref. No.: 551131 X = 310 mm
Ref. No.: 550952 X = 610 mm





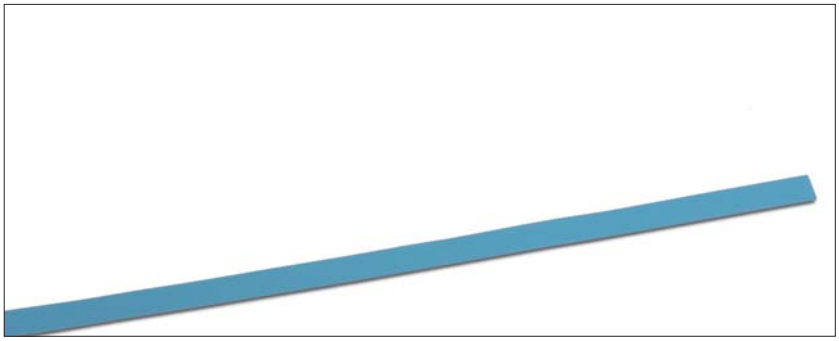
PCB–PCB connector
Max. permissible current: 1.5 A
Type: 893
Ref. No.: 551129 X = 43 mm
Ref. No.: 549993 X = 61 mm
Ref. No.: 549992 X = 220 mm

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

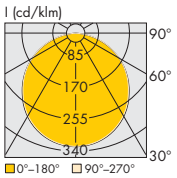


LED Line SMD Kit

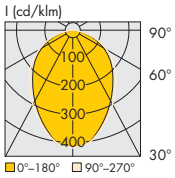
Built-in PCB lighting modules with optics

The LED Line SMD kit consists of SMD modules in two lengths (280 mm and 560 mm) as well as matching optics. LED modules and optics are an ideal LED solution to replace luminaires with T5/T8 lamps.
Both the optics and LED modules are easy to attach using standardised fixing holes (ZHAGA-compliant hole spacing) and screws.

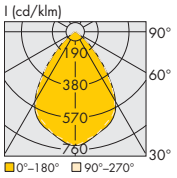
VS also provides optics that are perfect for office, industrial and shop (e.g. supermarket) lighting.



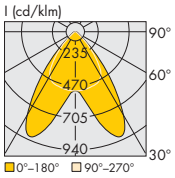
Without optics



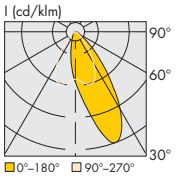
Diffuse



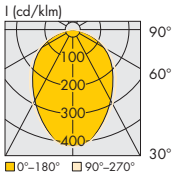
Standard



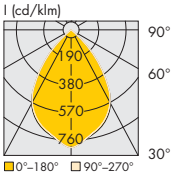
Retail SYM



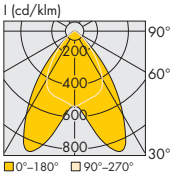
Retail ASYM



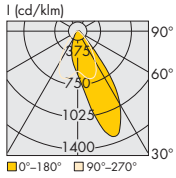
HB – Diffuse



HB – Standard



HB – Retail SYM



HB – Retail ASYM

Technical notes

Dimensions:
- WU-M-480/501: 279.6 x 39.6 mm
- WU-M-481/502: 560.6 x 39.6 mm

On-board push terminal system
Allowed operating temperature at t_c point:
- –20 to 75 °C

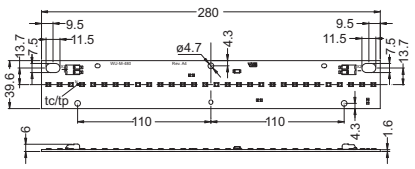
Use of external LED constant-current drivers required
Efficiency up to 170 lm/W
Colour rendering index R_a: > 80
Lumen maintenance L80/B10:
- 60,000 hrs. (I_F 350 mA; t_p 50 °C)

Typical applications

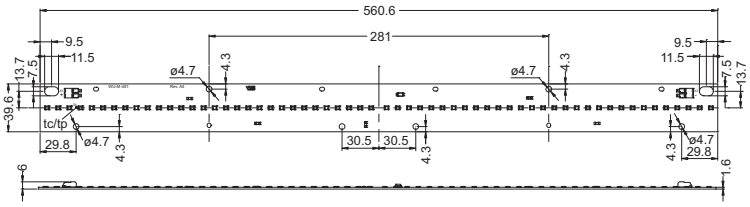
- Office lighting
- Retail lighting
- Industrial lighting
- T5/T8 replacement as built-in module

Dimensions of SMD board

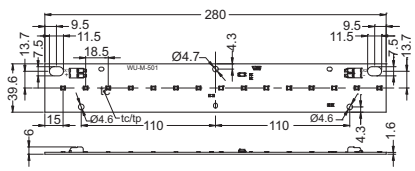
WU-M-480



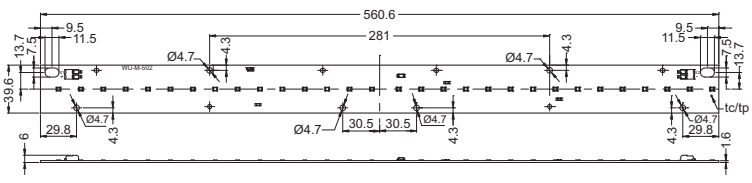
WU-M-481



WU-M-501



WU-M-502



LED Line SMD Kit

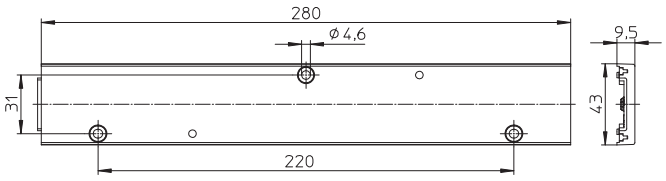
Built-in PCB lighting modules with optics

Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature	Luminous flux* (lm) and typical efficiency (lm/W), typical voltage ($U_{typ.}$) and power consumption (P_{el})									Beam angle	CRI R_a	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.			
		pcs.		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	min.	typ.
					P_{el} = 4.9 W			P_{el} = 7.3 W			P_{el} = 10.7 W					
LED Line SMD Kit – 280 mm – 30 LEDs					$U_{typ.}$ = 14.1 V			$U_{typ.}$ = 14.5 V			$U_{typ.}$ = 15.3 V					
WU-M-480-830	**555314**	30	warm white	3000	680	745	152	925	1015	139	1250	1375	129	120	80	85
WU-M-480-840	**555315**	30	neutral white	4000	680	815	166	925	1105	151	1250	1495	140	120	80	85
WU-M-480-850	**555316**	30	neutral white	5000	680	855	174	925	1160	159	1250	1570	147	120	80	85
WU-M-480-865	**555317**	30	cool white	6500	680	855	174	925	1160	159	1250	1570	147	120	80	85
					P_{el} = 9.9 W			P_{el} = 14.7 W			P_{el} = 21.2 W					
LED Line SMD Kit – 280 mm – 30 LEDs High Brightness					$U_{typ.}$ = 28.4 V			$U_{typ.}$ = 29.4 V			$U_{typ.}$ = 30.4 V					
WU-M-480-HB-830	**557723**	30	warm white	3000	1220	1350	136	1755	1940	132	2320	2570	121	120	80	85
WU-M-480-HB-840	**557724**	30	neutral white	4000	1220	1455	147	1755	2095	143	2320	2770	131	120	80	85
WU-M-480-HB-850	**559069**	30	neutral white	5000	1220	1530	155	1755	2200	150	2320	2910	137	120	80	85
WU-M-480-HB-865	**559070**	30	cool white	6500	1220	1530	155	1755	2200	150	2320	2910	137	120	80	85
					P_{el} = 9.9 W			P_{el} = 14.5 W			P_{el} = 21.4 W					
LED Line SMD Kit – 560 mm – 60 LEDs					$U_{typ.}$ = 28.2 V			$U_{typ.}$ = 29 V			$U_{typ.}$ = 30.5 V					
WU-M-481-830	**555318**	60	warm white	3000	1360	1495	151	1850	2030	140	2500	2745	128	120	80	85
WU-M-481-840	**555319**	60	neutral white	4000	1360	1630	165	1850	2210	152	2500	2990	140	120	80	85
WU-M-481-850	**555320**	60	neutral white	5000	1360	1710	173	1850	2320	160	2500	3140	147	120	80	85
WU-M-481-865	**555321**	60	cool white	6500	1360	1710	173	1850	2320	160	2500	3140	147	120	80	85
					P_{el} = 19.8 W			P_{el} = 29.4 W			P_{el} = 42.5 W					
LED Line SMD Kit – 560 mm – 60 LEDs High Brightness					$U_{typ.}$ = 56.7 V			$U_{typ.}$ = 58.7 V			$U_{typ.}$ = 60.7 V					
WU-M-481-HB-830	**557725**	60	warm white	3000	2435	2700	136	3505	3885	132	4635	5135	121	120	80	85
WU-M-481-HB-840	**557726**	60	neutral white	4000	2435	2915	147	3505	4195	143	4635	5545	130	120	80	85
WU-M-481-HB-850	**559071**	60	neutral white	5000	2435	3055	154	3505	4400	150	4635	5815	137	120	80	85
WU-M-481-HB-865	**559072**	60	cool white	6500	2435	3055	154	3505	4400	150	4635	5815	137	120	80	85
					P_{el} = 3 W			P_{el} = 4.5 W			P_{el} = 6.5 W					
LED Line SMD Kit – 280 mm – 15 LEDs					$U_{typ.}$ = 8.6 V			$U_{typ.}$ = 9 V			$U_{typ.}$ = 9.3 V					
WU-M-501-830	**557727**	15	warm white	3000	395	435	145	545	600	135	740	810	125	120	80	85
WU-M-501-840	**557728**	15	neutral white	4000	395	470	157	545	650	145	740	885	136	120	80	85
WU-M-501-850	**557729**	15	neutral white	5000	395	495	165	545	685	150	740	930	143	120	80	85
WU-M-501-865	**557730**	15	cool white	6500	395	495	165	545	685	150	740	930	143	120	80	85
					P_{el} = 6 W			P_{el} = 9 W			P_{el} = 13.1 W					
LED Line SMD Kit – 280 mm – 15 LEDs High Brightness					$U_{typ.}$ = 17.3 V			$U_{typ.}$ = 17.9 V			$U_{typ.}$ = 18.7 V					
WU-M-501-HB-830	**557731**	15	warm white	3000	745	825	138	1040	1150	128	1395	1545	118	120	80	85
WU-M-501-HB-840	**557732**	15	neutral white	4000	745	890	148	1040	1245	138	1395	1670	127	120	80	85
WU-M-501-HB-850	**559261**	15	neutral white	5000	745	930	155	1040	1305	145	1395	1750	134	120	80	85
WU-M-501-HB-865	**559262**	15	cool white	6500	745	930	155	1040	1305	145	1395	1750	134	120	80	85
					P_{el} = 6 W			P_{el} = 9 W			P_{el} = 13 W					
LED Line SMD Kit – 560 mm – 30 LEDs					$U_{typ.}$ = 17.2 V			$U_{typ.}$ = 18 V			$U_{typ.}$ = 18.6 V					
WU-M-502-830	**557733**	30	warm white	3000	790	865	144	1090	1195	135	1480	1625	125	120	80	85
WU-M-502-840	**557734**	30	neutral white	4000	790	945	158	1090	1305	145	1480	1770	136	120	80	85
WU-M-502-850	**557735**	30	neutral white	5000	790	990	165	1090	1365	150	1480	1855	143	120	80	85
WU-M-502-865	**557736**	30	cool white	6500	790	990	165	1090	1365	150	1480	1855	143	120	80	85
					P_{el} = 12.1 W			P_{el} = 17.9 W			P_{el} = 26.1 W					
LED Line SMD Kit – 560 mm – 30 LEDs High Brightness					$U_{typ.}$ = 34.5 V			$U_{typ.}$ = 35.9 V			$U_{typ.}$ = 37.3 V					
WU-M-502-HB-830	**557737**	30	warm white	3000	1485	1645	136	2080	2305	129	2795	3095	119	120	80	85
WU-M-502-HB-840	**557738**	30	neutral white	4000	1485	1775	147	2080	2490	139	2795	3340	128	120	80	85
WU-M-502-HB-850	**559263**	30	neutral white	5000	1485	1865	154	2080	2610	146	2795	3505	134	120	80	85
WU-M-502-HB-865	**559264**	30	cool white	6500	1485	1865	154	2080	2610	146	2795	3505	134	120	80	85

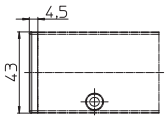
Emission data at t_p = 50 °C | * Measurement tolerance: ± 7 % | 2000 K and 2400 K on request

LED Line SMD Kit

Technical notes optics
Dimensions: 280×43 mm. SMD Kits can be stringed together, for modules 280 mm, 560 mm and module chains
Material: PMMA
Fixation with flat or cylinder head screws (M4)
Max. torque: 1.2 Nm (M4)



Optics type	**Ref. No.**	Efficiency %	Weight g	Unit pcs.
Standard	**555437**	95	50	192
Retail SYM	**555438**	95	50	192
Retail ASYM	**555439**	95	50	192
Diffuse	**559972**	88	50	192



End cap
Lateral tongue and groove for optics attachment
Weight: 0.9 g, unit: 500 pcs.
Type: 98810
Ref. No.: 555482

LED Line SMD L14/28/56 W2

Built-in PCB lighting modules

The SMD PCB LED Line SMD L14/28/56 W is optimally suited for use in classic T5/T8 luminaires. Available in three different lengths (140 mm, 280 mm and 560 mm), the LED modules are easy to fix.

Technical notes

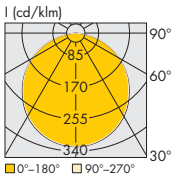
Dimensions:
- WU-M-507/508: 140×20 mm
- WU-M-509/510: 280×20 mm
- WU-M-511/512: 560×20 mm

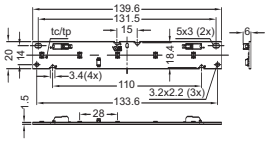
On-board push terminal system (WAGO 2060)
Allowed operating temperature at t_c point:
- –20 to 75 °C

Use of external LED constant-current drivers required
Aluminium PCB for optimum thermal management
Efficiency up to 165 lm/W
Colour rendering index R_a: > 80
Lumen maintenance L80/B10:
- up to 60,000 hrs. (I_F 700 mA, t_p = 50 °C)

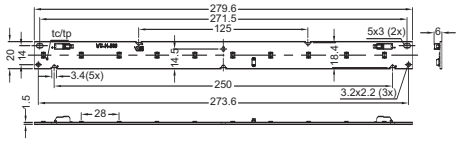
Typical applications

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

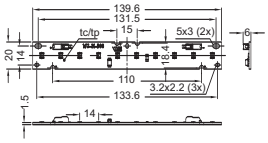




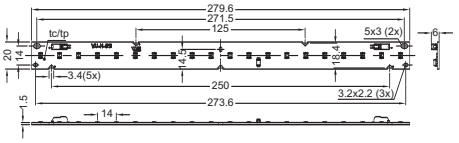
WU-M-507



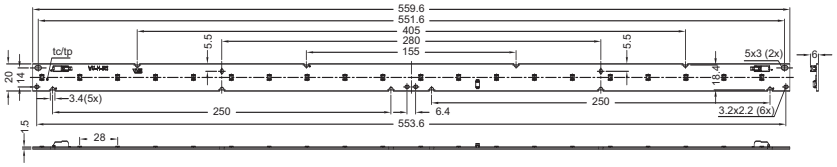
WU-M-509



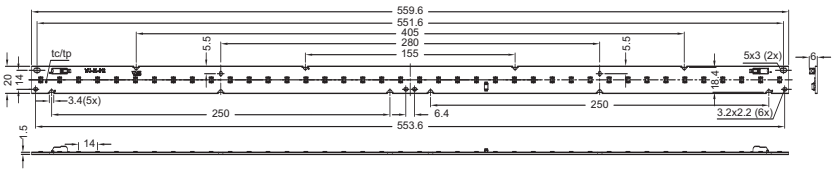
WU-M-508



WU-M-510

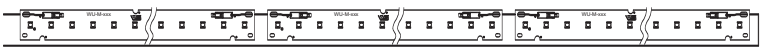


WU-M-511



WU-M-512

Connection example



LED Line SMD L14/28/56 W2

Built-in PCB lighting modules

Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature	Luminous flux* (lm) and typ. efficiency (lm/W), typical voltage ($U_{typ.}$) and power consumption (P_{el})									Beam angle	CRI R_a	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.			
		pcs.		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	min.	typ.
					P_{el} = 1 W			P_{el} = 1.5 W			P_{el} = 2.2 W					
LED Line SMD L14 W2 – 5 LEDs					$U_{typ.}$ = 2.9 V			$U_{typ.}$ = 3 V			$U_{typ.}$ = 3.1 V					
WU-M-507-830	**557992**	5	warm white	3000	130	145	145	180	200	133	245	270	123	120	80	85
WU-M-507-840	**557993**	5	neutral white	4000	130	155	155	180	215	143	245	295	134	120	80	85
WU-M-507-850	**559199**	5	neutral white	5000	130	165	165	180	230	153	245	310	141	120	80	85
WU-M-507-865	**559200**	5	cool white	6500	130	165	165	180	230	153	245	310	141	120	80	85
LED Line SMD L14 W2 – 5 LEDs					P_{el} = 2 W			P_{el} = 2.9 W			P_{el} = 4.3 W					
High Brightness					$U_{typ.}$ = 5.7 V			$U_{typ.}$ = 5.9 V			$U_{typ.}$ = 6.1 V					
WU-M-507-HB-830**	**559201**	5	warm white	3000	250	275	138	345	385	133	465	515	120	120	80	85
WU-M-507-HB-840**	**559202**	5	neutral white	4000	250	295	148	345	415	143	465	555	129	120	80	85
WU-M-507-HB-850**	**559203**	5	neutral white	5000	250	310	155	345	435	150	465	585	136	120	80	85
WU-M-507-HB-865**	**566051**	5	cool white	6500	250	310	155	345	435	150	465	585	136	120	80	85
					P_{el} = 2 W			P_{el} = 3 W			P_{el} = 4.3 W					
LED Line SMD L14 W2 – 10 LEDs					$U_{typ.}$ = 5.7 V			$U_{typ.}$ = 5.9 V			$U_{typ.}$ = 6.2 V					
WU-M-508-830	**557994**	10	warm white	3000	265	290	145	365	400	133	495	540	126	120	80	85
WU-M-508-840	**557995**	10	neutral white	4000	265	315	158	365	435	145	495	590	137	120	80	85
WU-M-508-850	**566052**	10	neutral white	5000	265	330	165	365	455	152	495	620	144	120	80	85
WU-M-508-865	**566053**	10	cool white	6500	265	330	165	365	455	152	495	620	144	120	80	85
LED Line SMD L14 W2 – 10 LEDs					P_{el} = 4 W			P_{el} = 5.9 W			P_{el} = 8.5 W					
High Brightness					$U_{typ.}$ = 11.4 V			$U_{typ.}$ = 11.8 V			$U_{typ.}$ = 12.2 V					
WU-M-508-HB-830**	**558825**	10	warm white	3000	495	550	138	695	770	131	930	1030	121	120	80	85
WU-M-508-HB-840**	**566054**	10	neutral white	4000	495	590	148	695	830	141	930	1110	131	120	80	85
WU-M-508-HB-850**	**566055**	10	neutral white	5000	495	620	155	695	870	147	930	1165	137	120	80	85
WU-M-508-HB-865**	**566056**	10	cool white	6500	495	620	155	695	870	147	930	1165	137	120	80	85
					P_{el} = 2 W			P_{el} = 3 W			P_{el} = 4.3 W					
LED Line SMD L28 W2 – 10 LEDs					$U_{typ.}$ = 11.4 V			$U_{typ.}$ = 5.9 V			$U_{typ.}$ = 6.2 V					
WU-M-509-830	**557996**	10	warm white	3000	265	290	145	365	400	133	495	540	126	120	80	85
WU-M-509-840	**557997**	10	neutral white	4000	265	315	158	365	435	145	495	590	137	120	80	85
WU-M-509-850	**566057**	10	neutral white	5000	265	330	165	365	455	152	495	620	144	120	80	85
WU-M-509-865	**566058**	10	cool white	6500	265	330	165	365	455	152	495	620	144	120	80	85
LED Line SMD L28 W2 – 10 LEDs					P_{el} = 4 W			P_{el} = 5.9 W			P_{el} = 8.5 W					
High Brightness					$U_{typ.}$ = 22.8 V			$U_{typ.}$ = 11.8 V			$U_{typ.}$ = 12.2 V					
WU-M-509-HB-830**	**566059**	10	warm white	3000	495	550	138	695	770	131	930	1030	121	120	80	85
WU-M-509-HB-840**	**566060**	10	neutral white	4000	495	590	148	695	830	141	930	1110	131	120	80	85
WU-M-509-HB-850**	**566061**	10	neutral white	5000	495	620	155	695	870	147	930	1165	137	120	80	85
WU-M-509-HB-865**	**566062**	10	cool white	6500	495	620	155	695	870	147	930	1165	137	120	80	85
					P_{el} = 4 W			P_{el} = 5.9 W			P_{el} = 8.7 W					
LED Line SMD L28 W2 – 20 LEDs					$U_{typ.}$ = 11.4 V			$U_{typ.}$ = 11.9 V			$U_{typ.}$ = 12.4 V					
WU-M-510-830	**557998**	20	warm white	3000	525	580	145	725	800	136	985	1080	124	120	80	85
WU-M-510-840	**557999**	20	neutral white	4000	525	630	158	725	870	147	985	1180	136	120	80	85
WU-M-510-850	**566063**	20	neutral white	5000	525	660	165	725	910	154	985	1235	142	120	80	85
WU-M-510-865	**566064**	20	cool white	6500	525	660	165	725	910	154	985	1235	142	120	80	85
LED Line SMD L28 W2 – 20 LEDs					P_{el} = 8 W			P_{el} = 11.8 W			P_{el} = 17.1 W					
High Brightness					$U_{typ.}$ = 22.8 V			$U_{typ.}$ = 23.6 V			$U_{typ.}$ = 24.4 V					
WU-M-510-HB-830**	**558826**	20	warm white	3000	990	1095	137	1385	1585	130	1860	2060	120	120	80	85
WU-M-510-HB-840**	**566065**	20	neutral white	4000	990	1185	148	1385	1385	141	1860	2225	130	120	80	85
WU-M-510-HB-850**	**566066**	20	neutral white	5000	990	1245	156	1385	1385	147	1860	2335	137	120	80	85
WU-M-510-HB-865**	**566067**	20	cool white	6500	990	1245	156	1385	1385	147	1860	2335	137	120	80	85

** Products under development; preliminary technical datas

Emission data at t_p = 50 °C | * Measuring tolerance of luminous flux: ± 7%

LED Line SMD L14/28/56 W2

Built-in PCB lighting modules

Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature	Luminous flux* (lm) and typ. efficiency (lm/W), typical voltage ($U_{typ.}$) and power consumption (P_{el})									Beam angle	CRI R_a	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.			
		pcs.		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	min.	typ.
					P_{el} = 4 W			P_{el} = 5.9 W			P_{el} = 8.7 W					
LED Line SMD L56 W2 – 20 LEDs					$U_{typ.}$ = 11.4 V			$U_{typ.}$ = 11.9 V			$U_{typ.}$ = 12.4 V					
WU-M-511-830	558000	20	warm white	3000	525	580	145	725	800	136	985	1080	124	120	80	85
WU-M-511-840	558001	20	neutral white	4000	525	630	158	725	870	147	985	1180	136	120	80	85
WU-M-511-850	559220	20	neutral white	5000	525	660	165	725	910	154	985	1235	142	120	80	85
WU-M-511-865	559221	20	cool white	6500	525	660	165	725	910	154	985	1235	142	120	80	85
LED Line SMD L56 W2 – 20 LEDs High Brightness					P_{el} = 8 W			P_{el} = 11.8 W			P_{el} = 17.1 W					
					$U_{typ.}$ = 22.8 V			$U_{typ.}$ = 23.6 V			$U_{typ.}$ = 24.4 V					
WU-M-511-HB-830**	559222	20	warm white	3000	990	1095	137	1385	1535	130	1860	2060	120	120	80	85
WU-M-511-HB-840**	559223	20	neutral white	4000	990	1185	148	1385	1660	141	1860	2225	130	120	80	85
WU-M-511-HB-850**	559224	20	neutral white	5000	990	1245	156	1385	1740	147	1860	2335	137	120	80	85
WU-M-511-HB-865**	559225	20	cool white	6500	990	1245	156	1385	1740	147	1860	2335	137	120	80	85
					P_{el} = 8 W			P_{el} = 11.9 W			P_{el} = 17.3 W					
LED Line SMD L56 W2 – 40 LEDs					$U_{typ.}$ = 22.9 V			$U_{typ.}$ = 23.8 V			$U_{typ.}$ = 24.8 V					
WU-M-512-830	558002	40	warm white	3000	1050	1155	144	1455	1595	134	1970	2165	125	120	80	85
WU-M-512-840	558003	40	neutral white	4000	1050	1260	158	1455	1740	146	1970	2355	136	120	80	85
WU-M-512-850	559226	40	neutral white	5000	1050	1320	165	1455	1825	153	1970	2475	143	120	80	85
WU-M-512-865	559227	40	cool white	6500	1050	1320	165	1455	1825	153	1970	2475	143	120	80	85
LED Line SMD L56 W2 – 40 LEDs High Brightness					P_{el} = 15.9 W			P_{el} = 23.6 W			P_{el} = 34.2 W					
					$U_{typ.}$ = 45.5 V			$U_{typ.}$ = 47.1 V			$U_{typ.}$ = 48.8 V					
WU-M-512-HB-830**	558827	40	warm white	3000	1980	2159	138	2775	3070	130	3720	4120	120	120	80	85
WU-M-512-HB-840**	559229	40	neutral white	4000	1980	2370	149	2775	3315	140	3720	4450	130	120	80	85
WU-M-512-HB-850**	559232	40	neutral white	5000	1980	2485	156	2775	3480	147	3720	4670	137	120	80	85
WU-M-512-HB-865**	559234	40	cool white	6500	1980	2485	156	2775	3480	147	3720	4670	137	120	80	85

** Products under development; preliminary technical datas
Emission data at t_p = 50 °C | * Measuring tolerance of luminous flux: ± 7%

LED Line SMD Slim

Equipped with SMD Line LED modules
Consisting of one energy-efficient LED Line SMD Slim, a thermo-conductive resin adhesive tape and a cover, this LED Line Slim 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 (Zhaga-compliant)
- screw fitting

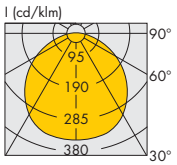
the unit constitutes an ideal solution for indoor linear lighting applications.

Lighting modules with cover
LED Line SMD Slim consists of an energy-efficient linear SMD module and a cover with several attachment options. The module was designed for integration into indoor luminaires providing direct or indirect light.

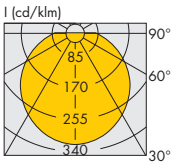
The fast, safe and flexible adhesive-based, click on (ZHAGA-compliant L56W2 hole spacing) or screw-based options for fixing the module within the luminaire constitute an ideal solution for linear lighting applications.

The light module is fitted with either a clear or diffuse cover that serves to protect it and, in the diffuse version, to reduce glare and distribute light in a similar manner to a fluorescent lamp.

Technical notes
On-board push terminals: 0.34 mm², for solid leads
Allowed operating temperature at t_c point:
–20 at 75 °C
Use of external LED constant-current drivers required
Efficiency up to 166 lm/W
Colour rendering index R_a: min. 80
Lumen maintenance L80/B10:
> 60,000 hrs. (I_F 700 mA, t_p = 50 °C)



With clear cover



With diffuse cover

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

Optical characteristics
at t_p = 50 °C
The specified values apply only to the version of the LED module without a cover.
The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

Type	Ref. No.	Number of LEDs	Colour	Correlated colour temperature	Luminous flux* and typ. efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})									Beam angle	CRI R_a	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.			
		pcs		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	min.	typ.
LED Line SMD Slim – PCB – 280 mm					P_{el} = 4.9 W $U_{typ.}$ = 14.1 V			P_{el} = 7.3 W $U_{typ.}$ = 14.5 V			P_{el} = 10.7 W $U_{typ.}$ = 15.3 V					
WU-M-499-830	**556538**	30	warm white	3000	680	745	152	925	1015	139	1250	1375	129	120	80	85
WU-M-499-840	**556539**	30	neutral white	4000	680	815	166	925	1105	151	1250	1495	140	120	80	85
LED Line SMD Slim – PCB – 560 mm					P_{el} = 9.9 W $U_{typ.}$ = 28.2 V			P_{el} = 14.5 W $U_{typ.}$ = 29 V			P_{el} = 21.4 W $U_{typ.}$ = 30.5 V					
WU-M-500-830	**556540**	60	warm white	3000	1360	1495	151	1850	2030	140	2500	2745	128	120	80	85
WU-M-500-840	**556541**	60	neutral white	4000	1360	1630	165	1850	2210	152	2500	2990	140	120	80	85

* Measurement tolerance of luminous flux: ± 7%

LED Line SMD Slim

Ref. No. LED Line SMD Slim – 280 mm

Fixing	**For tape fixing** - type: 89510		**For screw fixing** - type: 89511		**For clip fixing** - type: 89512	
Cover	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
SMD0283000	**557767**	**557769**	**558182**	**558184**	**558186**	**558188**
SMD0284000	**557768**	**557770**	**558183**	**558185**	**558187**	**558189**

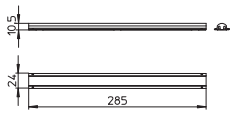
Ref. No. LED Line SMD Slim – 560 mm

Fixing	**For tape fixing** - type: 89560		**For screw fixing** - type: 89561		**For clip fixing** - type: 89562	
Cover	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
SMD0563000	**557440**	**557442**	**557445**	**557448**	**557452**	**557455**
SMD0564000	**557441**	**557443**	**557447**	**557449**	**557453**	**557456**

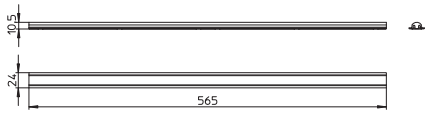
LED Line SMD Slim for tape fixing
With cover
Degree of protection: IP20
With base thermal tapes
Weight: 30.5/67 g, unit: 6 pcs.
Type: 89510/89560

Module length mm	Drawing	Dimensions (LxWxH) mm
280	A	285x24x10.5
560	B	565x24x10.5

A – For tape fixing - type 89510 - LED Line SMD Slim 280



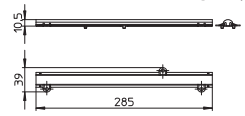
B – For tape fixing - type 89560 - LED Line SMD Slim 560



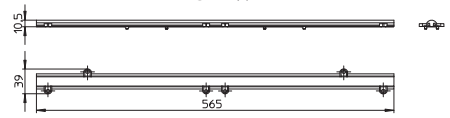
LED Line SMD Slim for screw fixing
With cover
Degree of protection: IP20
Fixing holes for screws M4
Tightening torque: 0.6-0.7 Nm
With base thermal tapes
Weight: 31/69 g, unit: 4 pcs.
Type: 89511/89561

Module length mm	Drawing	Dimensions (LxWxH) mm
280	C	285x39x10.5
560	D	565x39x10.5

C – For screw fixing - type 89511 - LED Line SMD Slim 280



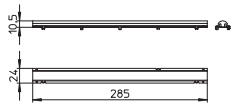
D – For screw fixing - type 89561 - LED Line SMD Slim 560



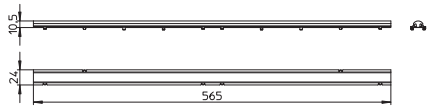
LED Line SMD Slim for clip fixing
With cover
Degree of protection: IP20
Base fixing clips for wall thickness 0.4-1 mm
With base thermal tapes
Weight: 30.5/68 g, unit: 6 pcs.
Type: 89512/89562

Module length mm	Drawing	Dimensions (LxWxH) mm
280	E	285x24x10.5
560	F	565x24x10.5

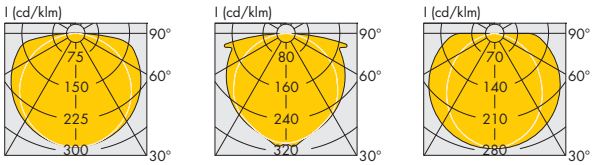
E – For clip fixing - type 89512 - LED Line SMD Slim 280



F – For clip fixing - type 89562 - LED Line SMD Slim 560



LED Line Fix LUGA 2015



Without cover | With clear cover | With diffuse cover

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

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

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

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

Technical notes LUGA Line module
On-board push terminal system: Electrical connection with lateral connection leads 28AWG
Allowed operating temperature at t_c point: –40 to 85 °C
Efficiency up to 160 lm/W
Colour rendering index R_a: > 80
Colour accuracy initially: 3 SDCM; after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L90/B10: 55,000 hrs. (I_F 700 mA)

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

LED Line Fix LUGA 2015

Optical characteristics

at t_p = 65 °C

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

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

Type	Number of LEDs	Colour	Correlated colour temperature	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})*								Beam angle	Typ. CRI
				350 mA		500 mA		700 mA		1050 mA			
	pcs.		K	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	°	R_a
				P_{el} = 5.1 W		P_{el} = 7.7 W		P_{el} = 11.5 W		P_{el} = 19.1 W			
For LED Line Fix LUGA 2015 – 280 mm				$U_{typ.}$ = 14.7 V		$U_{typ.}$ = 15.4 V		$U_{typ.}$ = 16.4 V		$U_{typ.}$ = 18.2 V			
DML059C27EC	45	warm white	2700	725	142	1030	142	1400	122	2000	105	120	82
DML059C30EC	45	warm white	3000	755	148	1075	148	1460	127	2080	109	120	82
DML059C40EC	45	neutral white	4000	800	157	1145	157	1550	135	2210	116	120	84
For LED Line Fix LUGA 2015 – 560 mm (2 wired LED modules per holder)				P_{el} = 10.2 W $U_{typ.}$ = 29.4 V		P_{el} = 15.4 W $U_{typ.}$ = 30.8 V		P_{el} = 23 W $U_{typ.}$ = 32.8 V		P_{el} = 38.2 W $U_{typ.}$ = 36.4 V			
DML059C27EC	2x45	warm white	2700	1450	142	2060	142	2800	122	4000	105	120	82
DML059C30EC	2x45	warm white	3000	1510	148	2150	148	2920	127	4160	109	120	82
DML059C40EC	2x45	neutral white	4000	1600	157	2290	157	3100	135	4420	116	120	84

* Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%

Ref. No. LED Line Fix LUGA 2015 – 280 mm

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
DML059C27EC	**558667**	**558670**	**558673**	**558676**	**558679**	**558682**	**558685**	**558688**
DML059C30EC	**558668**	**558671**	**558674**	**558677**	**558680**	**558683**	**558686**	**558689**
DML059C40EC	**558669**	**558672**	**558675**	**558678**	**558681**	**558684**	**558687**	**558690**

Ref. No. LED Line Fix LUGA 2015 – 560 mm (2 wired LED modules per holder)

Fixing	**For tape fixing** - type: 89350			**For screw fixing** - type: 89351			**For clip fixing** - type: 89352	
Cover	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
DML059C27EC	**558691**	**558694**	**558697**	**558700**	**558703**	**558706**	**558709**	**558712**
DML059C30EC	**558692**	**558695**	**558698**	**558701**	**558704**	**558707**	**558710**	**558713**
DML059C40EC	**558693**	**558696**	**558699**	**558702**	**558705**	**558708**	**558711**	**558714**

LED Line Fix LUGA 2015 – 280 mm

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

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

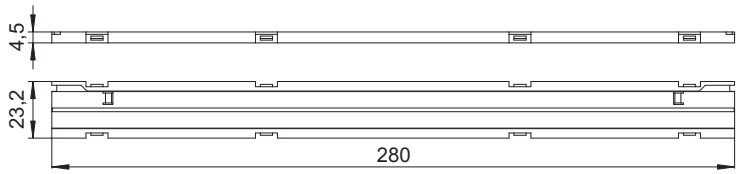
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 23.2 x16.1 mm
With base thermal tapes
Weight: 67 g, unit: 4 pcs.
Type: 89300, drawing B

LED Line Fix LUGA 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

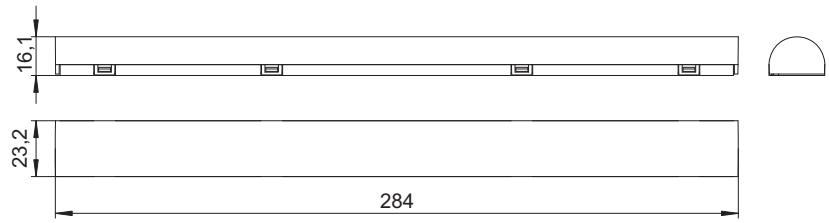
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 67 g, unit: 4 pcs.
Type: 89301, drawing D

LED Line Fix LUGA for clip fixing
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284x23.2x16.1 mm
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes
Weight: 67 g, unit: 4 pcs.
Type: 89302, drawing E

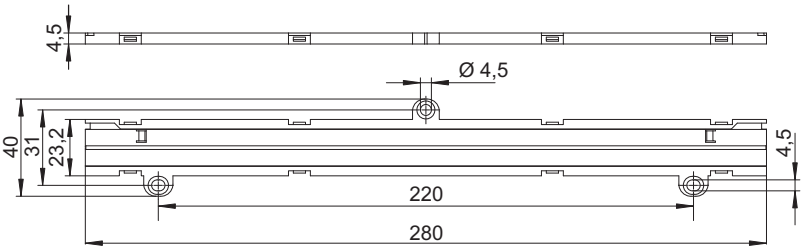
A – For tape fixing – type 89300 – LED Line Fix LUGA 2015 – 280



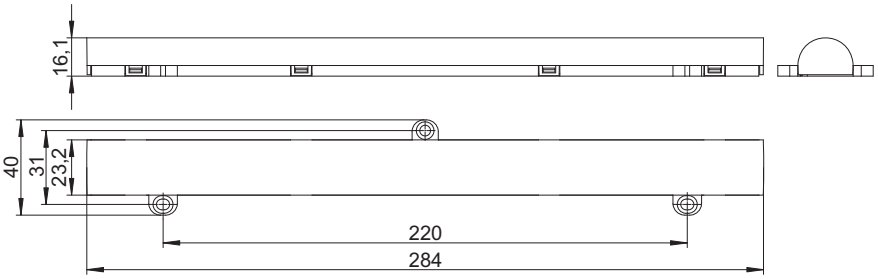
B – For tape fixing – type 89300 – LED Line Fix LUGA 2015 – 280



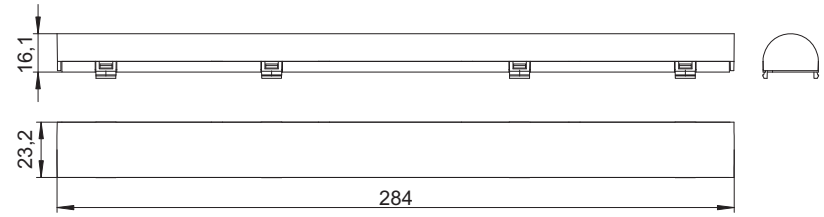
C – For screw fixing – type 89301 – LED Line Fix LUGA 2015 – 280



D – For screw fixing – type 89301 – LED Line Fix LUGA 2015 – 280



E – For clip fixing – type 89302 – LED Line Fix LUGA 2015 – 280



LED Line Fix LUGA 2015 – 560 mm

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

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

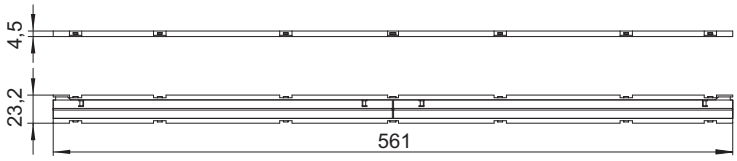
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 23.2 x16.1 mm
With base thermal tapes
Weight: 135 g, unit: 4 pcs.
Type: 89350, drawing G

LED Line Fix LUGA 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

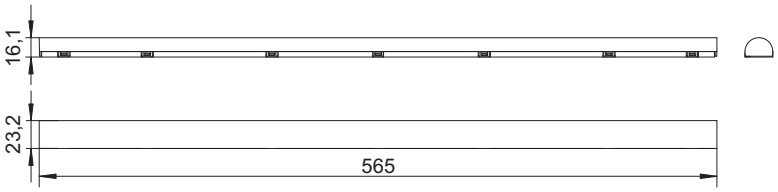
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 135 g, unit: 4 pcs.
Type: 89351, drawing J

LED Line Fix LUGA 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

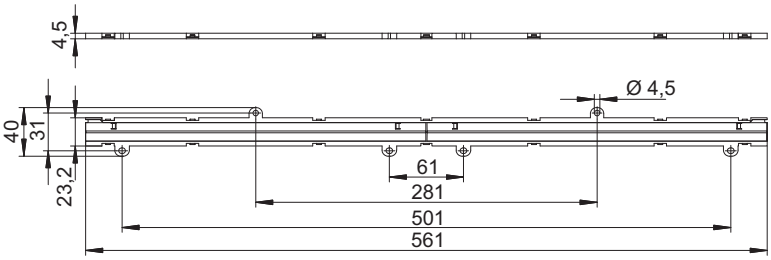
F – For tape fixing – type 89350 – LED Line Fix LUGA 2015 – 560



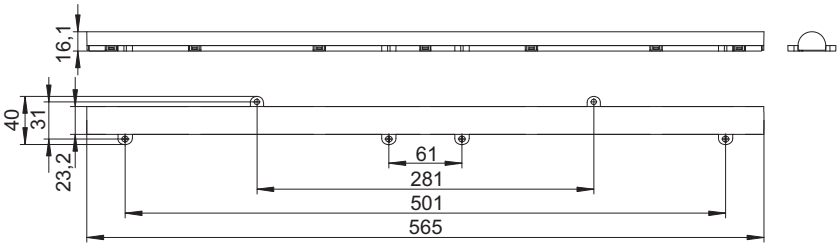
G – For tape fixing – type 89350 – LED Line Fix LUGA 2015 – 560



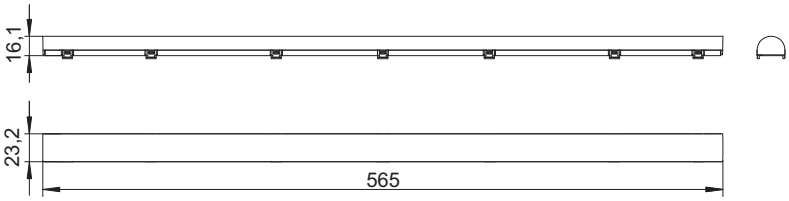
H – For screw fixing – type 89351 – LED Line Fix LUGA 2015 – 560



J – For screw fixing – type 89351 – LED Line Fix LUGA 2015 – 560



K – For clip fixing – type 89352 – LED Line Fix LUGA 2015 – 560



Covers

Technical notes LED Line Fix cover
Material: 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

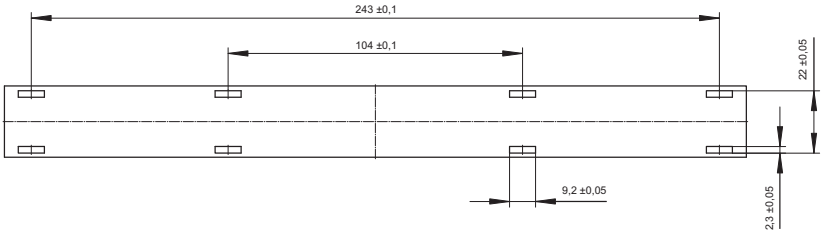
For type: 89350/89351, LED Line Fix 560 mm
Ref. No.: 550912 clear
Ref. No.: 550913 diffuse

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

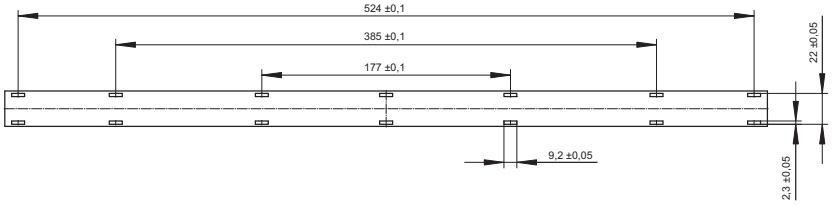
For type: 89352, LED Line Fix 560 mm
Ref. No.: 550914 clear
Ref. No.: 550915 diffuse

Luminaire cut-outs for clip fixing

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 on page 13.

LED Line Fix SMD

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

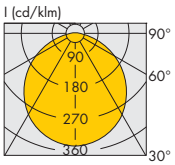
The fast, safe and flexible adhesive-based, click on (ZHAGA-compliant L28/L56W4) hole spacing) or screw-based options for fixing the module within the luminaire constitute an ideal solution for linear lighting applications.

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

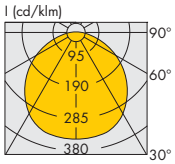
The diffuse cover reduces glare and distributes light in a similar manner to a fluorescent lamp.

Electrical characteristics
at t_p = 50 °C
The specified values apply only to the version of the LED module without a cover.
The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

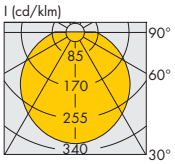
Technical notes SMD Line modules
On-board push-in terminals: 0.34 mm², for solid leads
Allowed operating temperature at tc point:
-20 to 75 °C
Use of external LED constant-current drivers required
Efficiency up to 166 lm/W
Colour rendering index R_a: min. 80
Colour accuracy: 3 SDCM
Lumen maintenance L80/B10:
> 60,000 hrs. (I_F 700 mA, t_p = 50°C)



Without cover



With clear cover



With diffuse cover

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

Type	Ref. No.	Number of LEDs pcs	Colour	Correlated colour temperature K	Luminous flux* and typ. efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el}) 350 mA min. lm	typ. lm	typ. lm/W	500 mA min. lm	typ. lm	typ. lm/W	700 mA min. lm	typ. lm	typ. lm/W	Beam angle °	CRI R_a min.	typ.
					P_{el} = 4.9 W			P_{el} = 7.3 W			P_{el} = 10.7 W					
LED Line SMD Slim – PCB – 280 mm					$U_{typ.}$ = 14.1 V			$U_{typ.}$ = 14.5 V			$U_{typ.}$ = 15.3 V					
WU-M-499-830	**556538**	30	warm white	3000	680	745	152	925	1015	139	1250	1375	129	120	80	85
WU-M-499-840	**556539**	30	neutral white	4000	680	815	166	925	1105	151	1250	1495	140	120	80	85
					P_{el} = 9.9 W			P_{el} = 14.5 W			P_{el} = 21.4 W					
LED Line SMD Slim – PCB – 560 mm					$U_{typ.}$ = 28.2 V			$U_{typ.}$ = 29 V			$U_{typ.}$ = 30.5 V					
WU-M-500-830	**556540**	60	warm white	3000	1360	1495	151	1850	2030	140	2500	2745	128	120	80	85
WU-M-500-840	**556541**	60	neutral white	4000	1360	1630	165	1850	2210	152	2500	2990	140	120	80	85

* Measurement tolerance of luminous flux: ± 7%

Ref. No. LED Line Fix SMD 280

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
SMD56/30/280	**557460**	**557462**	**557464**	**557466**	**557468**	**557470**	**557472**	**557474**
SMD56/40/280	**557461**	**557463**	**557465**	**557467**	**557469**	**557471**	**557473**	**557475**

Ref. No. LED Line Fix SMD 560

Fixing	**For tape fixing** - type: 89550			**For screw fixing** - type: 89551			**For clip fixing** - type: 89552	
Cover	Without	Clear	Diffuse	Without	Clear	Diffuse	Clear	Diffuse
SMD56/30/560	**557394**	**557396**	**557398**	**557400**	**557402**	**557404**	**557406**	**557408**
SMD56/40/560	**557395**	**557397**	**557399**	**557401**	**557403**	**557405**	**557407**	**557409**

LED Line Fix SMD

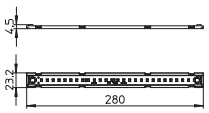
Technical notes LED Line Fix holder
Holder material: thermo-conductive resin
When joining linear modules in a row, a minimum clearance of 1 mm between the fixing units must be observed due to thermal expansion.

LED Line Fix SMD for tape fixing
With base thermal tapes
Weight: 95/142 g, unit: 4 pcs.
Type: 89500/89550

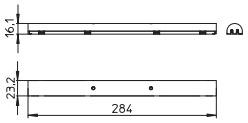
Module length mm	Drawing	Degree of protection	Dimensions (LxWxH) mm
Without cover			
280	A	–	280x23.2x4.5
560	C	–	561x23.2x4.5
With cover			
280	B	IP20	284x23.2x16.1
560	D	IP20	565x23.2x16.1

LED Line Fix SMD – For tape fixing

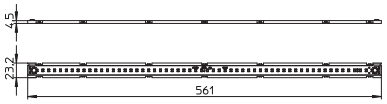
A – Type 89500 – 280 mm
Without cover



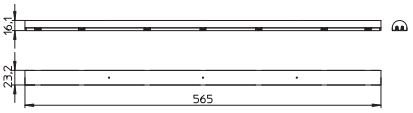
B – Type 89500 – 280 mm
With cover



C – Type 89550 – 560 mm
Without cover



D – Type 89550 – 560 mm
With cover

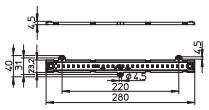


LED Line Fix SMD for screw fixing
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 96/143 g, unit: 4 pcs.
Type: 89501/89551

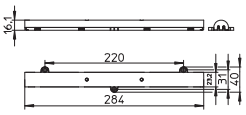
Module length mm	Drawing	Degree of protection	Dimensions (LxWxH) mm
Without cover			
280	E	–	280x40x4.5
560	G	–	561x40x4.5
With cover			
280	F	IP20	284x40x16.1
560	H	IP20	565x40x16.1

LED Line Fix SMD – For screw fixing

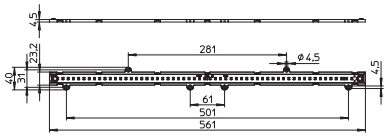
E – Type 89501 – 280 mm
Without cover



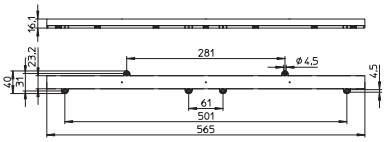
F – Type 89501 – 280 mm
With cover



G – Type 89551 – 560 mm
Without cover



H – Type 89551 – 560 mm
With cover

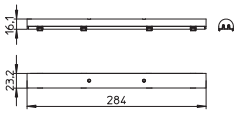


LED Line Fix SMD for clip fixing
With base thermal tapes
Base fixing clips for wall thickness 0.4–1 mm
Weight: 95/142 g, unit: 4 pcs.
Type: 89502/89552

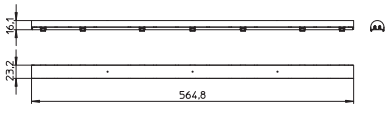
Module length mm	Drawing	Degree of protection	Dimensions (LxWxH) mm
With cover			
280	K	IP20	284x23.2x16,1
560	L	IP20	565x23.2x16,1

LED Line Fix SMD – For clip fixing

K – Type 89502 – 280 mm
With cover



L – Type 89552 – 560 mm
With cover



LED Line Fix SMD

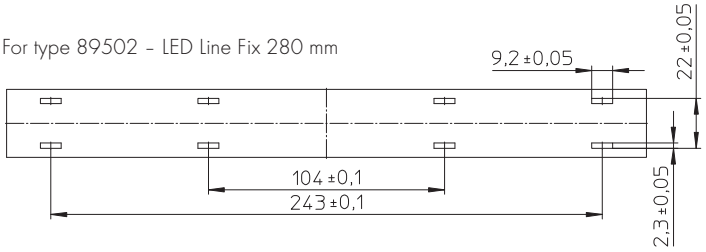
Technical notes LED Line Fix cover
Material: PC, clear or diffuse
Lead exit: lateral push-in holes
Efficency covers: clear 97%, diffuse 90%

Covers for LED Line Fix 280 mm for tape and screw fixing
For type: 89500/89501
Ref. No.: 554044 clear
Ref. No.: 554045 diffuse

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.: 554046 clear
Ref. No.: 554047 diffuse

Luminaire cut-outs for clip fixing

For type 89502 – LED Line Fix 280 mm

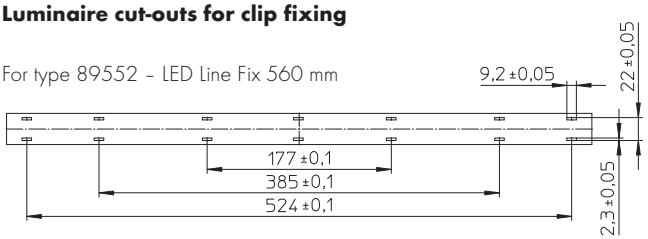


Covers for LED Line Fix for tape and screw fixing
For type: 89550/89551
Ref. No.: 551588 clear
Ref. No.: 551589 diffuse

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: 89552
Ref. No.: 551590 clear
Ref. No.: 551591 diffuse

Luminaire cut-outs for clip fixing

For type 89552 – LED Line Fix 560 mm



LED Line AluFix LUGA 2015

Lighting modules with holder and cover
LED Line AluFix LUGA consists of an energy-efficient linear COB module, an aluminium holder and a clear cover or, alternatively, optics. The module was designed for integration into indoor luminaires providing direct or indirect light.

The light module is available with up to five pre-wired LUGA modules in lengths of 305 to 1,429 mm.

The robust aluminium holder serves to optimise thermal management and is easy to attach using M3 screws. The clear or diffuse cover protects LED modules from environmental factors.
The diffuse cover reduces glare and distributes light in a similar manner to a fluorescent lamp.

Enabling the kind of light distribution typically required in offices or shops, the optics versions facilitate luminaire designs that can do without an additional light guidance system. The high-quality optics consist of only one unit, regardless of its length, and therefore provide optimal protection for LED modules and ensure homogeneously illuminated surfaces without optical interruptions.

Technical notes
For one to five LUGA Line modules
On-board push terminal system: Electrical connection with lateral connection leads 28AWG
Allowed operating temperature at t_c point: –40 to 85 °C
Use of external LED constant-current drivers required: for drivers with U_{OUT} < 150 V DC
Efficiency up to 157 lm/W
Colour rendering index R_a: > 80
Colour accuracy initially: 3 SDCM; after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L90/B10: 55,000 hrs. (I_F 700 mA)

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

Further shapes and optics on request.

LED Line AluFix
LUGA 2015

Optical characteristics of LUGA Line LED modules

at t_p = 65 °C | The following efficiency levels can be achieved when using a cover: see data sheets

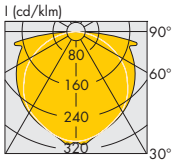
Type	Number of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})*							
				350 mA		500 mA		700 mA		1050 mA	
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W
				P_{el} = 5.1 W		P_{el} = 7.7 W		P_{el} = 11.5 W		P_{el} = 19.1 W	
For LED Line AluFix LUGA 2015 – 305 mm				$U_{typ.}$ = 14.7 V		$U_{typ.}$ = 15.4 V		$U_{typ.}$ = 16.4 V		$U_{typ.}$ = 18.2 V	
DML059C27EC	45	warm white	2700	725	142	1030	134	1400	122	2000	105
DML059C30EC	45	warm white	3000	755	148	1075	140	1460	127	2080	109
DML059C40EC	45	neutral white	4000	800	157	1145	149	1550	135	2210	116
For LED Line AluFix LUGA 2015 – 586 mm				P_{el} = 10.2 W		P_{el} = 15.4 W		P_{el} = 23 W		P_{el} = 38.2 W	
(2 wired LED modules per aluminium profile)				$U_{typ.}$ = 29.4 V		$U_{typ.}$ = 30.8 V		$U_{typ.}$ = 32.8 V		$U_{typ.}$ = 36.4 V	
DML059C27EC	2x45	warm white	2700	1450	142	2060	134	2800	122	4000	105
DML059C30EC	2x45	warm white	3000	1510	148	2150	140	2920	127	4160	109
DML059C40EC	2x45	neutral white	4000	1600	157	2290	149	3100	135	4420	116
For LED Line AluFix LUGA 2015 – 867 mm				P_{el} = 15,3 W		P_{el} = 23,1 W		P_{el} = 34,5 W		P_{el} = 57,3 W	
(3 wired LED modules per aluminium profile)				$U_{typ.}$ = 44,1 V		$U_{typ.}$ = 46,2 V		$U_{typ.}$ = 49,2 V		$U_{typ.}$ = 54,6 V	
DML059C27EC	3x45	warm white	2700	2175	142	3090	134	4200	122	6000	105
DML059C30EC	3x45	warm white	3000	2265	148	3225	140	4380	127	6240	109
DML059C40EC	3x45	neutral white	4000	2400	157	3435	149	4650	135	6630	116
For LED Line AluFix LUGA 2015 – 1148 mm				P_{el} = 20.4 W		P_{el} = 30.8 W		P_{el} = 46 W		P_{el} = 76.4 W	
(4 wired LED modules per aluminium profile)				$U_{typ.}$ = 58.8 V		$U_{typ.}$ = 61.6 V		$U_{typ.}$ = 65.6 V		$U_{typ.}$ = 72.8 V	
DML059C27EC	4x45	warm white	2700	2900	142	4120	134	5600	122	8000	105
DML059C30EC	4x45	warm white	3000	3020	148	4300	140	5840	127	8320	109
DML059C40EC	4x45	neutral white	4000	3200	157	4580	149	6200	135	8840	116
For LED Line AluFix LUGA 2015 – 1429 mm				P_{el} = 25.5 W		P_{el} = 38.5 W		P_{el} = 57.5 W		P_{el} = 95.5 W	
(5 wired LED modules per aluminium profile)				$U_{typ.}$ = 73.5 V		$U_{typ.}$ = 77 V		$U_{typ.}$ = 82 V		$U_{typ.}$ = 91 V	
DML059C27EC	5x45	warm white	2700	3625	142	5150	134	7000	122	10000	105
DML059C30EC	5x45	warm white	3000	3775	148	5375	140	7300	127	10400	109
DML059C40EC	5x45	neutral white	4000	4000	157	5725	149	7750	135	11050	116

* Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%

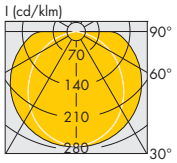
LED Line AluFix LUGA 2015

Technical notes

Material: Aluminium profile and PMMA cover
Rear connection leads, lead length: 70 mm
with 2-poles connector AMP Micro Mate-N-LOK 1445049-2
Degree of protection: IP40
Rear slots for screws M3
Tightening torque: 0.5 Nm



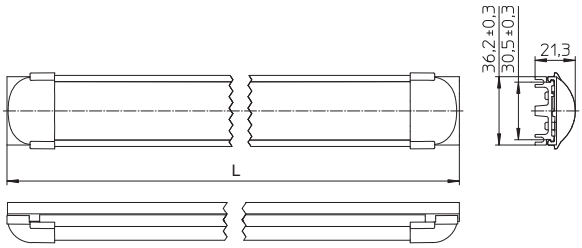
With clear cover



With diffuse cover

LED Line AluFix LUGA 2015 – Cover

Type	Dimensions (LxWxH) in mm			Unit	Weight
	L	W	H	pcs.	g
89001	305	40.2	22	15	171
89002	586	40.2	22	15	330
89003	867	40.2	22	15	495
89004	1148	40.2	22	15	650
89005	1429	40.2	22	15	815



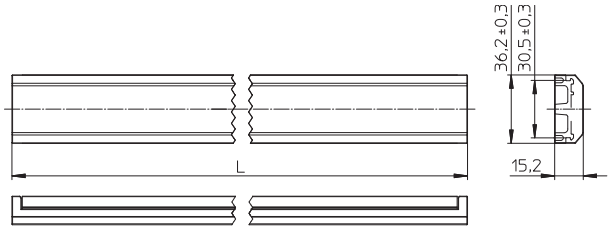
Ref. No. LED Line AluFix LUGA 2015 – Cover

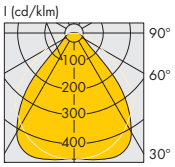
The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

Type / Total length	**89001** / 305 mm		**89002** / 586 mm		**89003** / 867 mm		**89004** / 1148 mm		**89005** / 1429 mm	
Cover	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
DML059C27EC	**558491**	**558494**	**558497**	**558500**	**558503**	**558506**	**558509**	**558512**	**558515**	**558518**
DML059C30EC	**558492**	**558495**	**558498**	**558501**	**558504**	**558507**	**558510**	**558513**	**558516**	**558519**
DML059C40EC	**558493**	**558496**	**558499**	**558502**	**558505**	**558508**	**558511**	**558514**	**558517**	**558520**

LED Line AluFix LUGA 2015 – Optics Office

Type	Dimensions (LxWxH) in mm			Unit	Weight
	L	W	H	pcs.	g
89011	305	36	15	15	165
89012	586	36	15	15	316
89013	867	36	15	15	466
89014	1148	36	15	15	617
89015	1429	36	15	15	767





Office

Ref. No. LED Line AluFix LUGA 2015 – Optics Office

Efficency optics: 94%

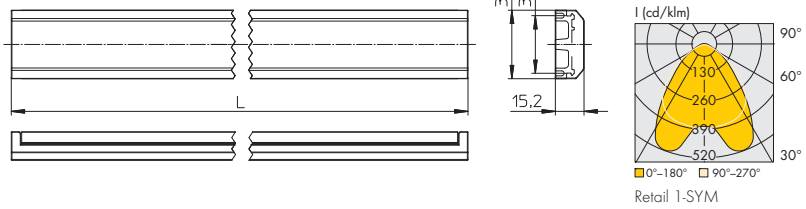
Type / Total length	**89011** / 305 mm	**89012** / 586 mm	**89013** / 867 mm	**89014** / 1148 mm	**89015** / 1429 mm
DML059C27EC	**558521**	**558524**	**558527**	**558530**	**558533**
DML059C30EC	**558522**	**558525**	**558528**	**558531**	**558534**
DML059C40EC	**558523**	**558526**	**558529**	**558532**	**558535**

LED Line AluFix LUGA 2015

Technical notes
Material: Aluminium profile and PMMA cover
Rear connection leads, lead length: 70 mm
with 2-poles connector AMP Micro Mate-N-LOK 1445049-2
Degree of protection: IP40
Rear slots for screws M3
Tightening torque: 0.5 Nm

LED Line AluFix LUGA 2015 – Optics Retail 1-SYM

Type	Dimensions (LxWxH) in mm			Unit	Weight
	L	W	H	pcs.	g
89021	305	36	15	15	165
89022	586	36	15	15	316
89023	867	36	15	15	466
89024	1148	36	15	15	617
89025	1429	36	15	15	767



Retail 1-SYM

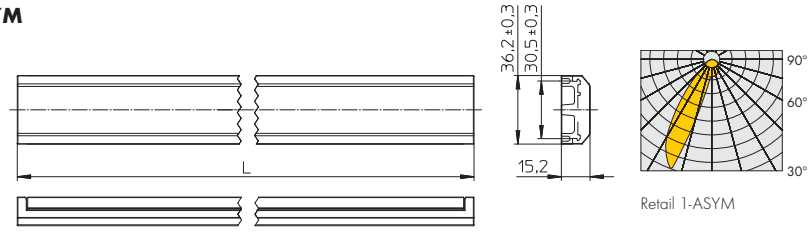
Ref. No. LED Line AluFix LUGA 2015 – Optics Retail 1-SYM

Efficency optics: 94%

Type / Total length	**89021** / 305 mm	**89022** / 586 mm	**89023** / 867 mm	**89024** / 1148 mm	**89025** / 1429 mm
DML059C27EC	**558628**	**558631**	**558634**	**558637**	**558640**
DML059C30EC	**558629**	**558632**	**558635**	**558638**	**558641**
DML059C40EC	**558630**	**558633**	**558636**	**558639**	**558642**

LED Line AluFix LUGA 2015 – Optics Retail 1-ASYM

Type	Dimensions (LxWxH) in mm			Unit	Weight
	L	W	H	pcs.	g
89031	305	36	15	15	165
89032	586	36	15	15	316
89033	867	36	15	15	466
89034	1148	36	15	15	617
89035	1429	36	15	15	767



Retail 1-ASYM

Ref. No. LED Line AluFix LUGA 2015 – Optics Retail 1-ASYM

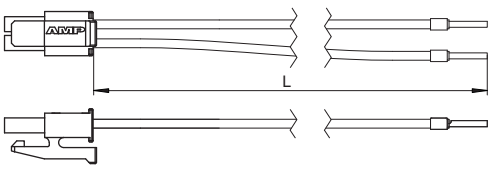
Efficency optics: 94%

Type / Total length	**89031** / 305 mm	**89032** / 586 mm	**89033** / 867 mm	**89034** / 1148 mm	**89035** / 1429 mm
DML059C27EC	**558644**	**558647**	**555650**	**555653**	**555656**
DML059C30EC	**558645**	**555648**	**555651**	**555654**	**555657**
DML059C40EC	**558646**	**555649**	**555652**	**555655**	**555658**

Connection leads

2-poles, ferrule on bare end of cores and AMP Micro Mate-N-LOK 1445022-2

	Lead length L					
	100 mm	200 mm	300 mm	400 mm	500 mm	600 mm
Ref. No.	**554285**	**554286**	**554287**	**554288**	**554289**	**554290**



LED Line AluFix SMD – Cover

Lighting modules with holder and cover
LED Line AluFix SMD consists of an energy-efficient linear SMD module, an aluminium holder and a clear or diffuse cover. The module was designed for integration into indoor luminaires providing direct or indirect light.

The light module is available with up to five pre-wired SMD modules in lengths of 305 to 1,429 mm and is thus an ideal component for LED lighting strips.

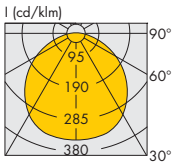
The robust aluminium holder serves to optimise thermal management and is easy to attach using M3 screws. The clear or diffuse cover protects LED modules from environmental factors.

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

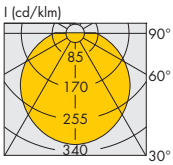
Typical applications
- Office and school lighting
- Retail lighting
- Industrial lighting
- For replacement of T5 and T8 lamps

Technical notes
Allowed operating temperature at t_c point:
–20 to 75 °C
Use of external LED constant-current drivers
required: for driver with U_{OUT} < 250 V DC
Efficiency up to 166 lm/W
Colour rendering index R_a: min. 80
Colour accuracy: 3 SDCM;
Lumen maintenance L80/B10
> 60,000 hrs. (I_F 700 mA, t_p = 50 °C)

Further shapes and optics on request.



With clear cover



With diffuse cover

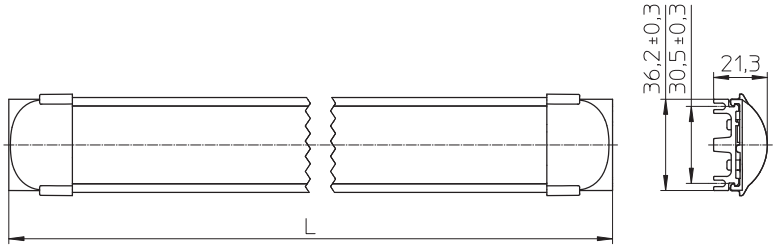
Optical characteristics
at t_p = 50 °C | The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

Type	Number of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux* and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el}) 350 mA lm	lm/W	500 mA lm	lm/W	700 mA lm	lm/W
For LED Line AluFix SMD Cover – 305 mm (1 SMD module 280 mm)				P_{el} = 4.9 W $U_{typ.}$ = 14.1 V		P_{el} = 7.3 W $U_{typ.}$ = 14.5 V		P_{el} = 10.7 W $U_{typ.}$ = 15.3 V	
AluFixSMD/305/30	1x30	warm white	3000	745	152	1015	139	1375	129
AluFixSMD/305/40	1x30	neutral white	4000	815	166	1105	151	1495	140
For LED Line AluFix SMD Cover – 586 mm (1 SMD module 560 mm)				P_{el} = 9.9 W $U_{typ.}$ = 28.2 V		P_{el} = 14.5 W $U_{typ.}$ = 29 V		P_{el} = 21.4 W $U_{typ.}$ = 30.5 V	
AluFixSMD/586/30	2x30	warm white	3000	1495	151	2030	140	2745	128
AluFixSMD/586/40	2x30	neutral white	4000	1630	165	2210	152	2990	140
For LED Line AluFix SMD Cover – 867 mm (2 wired SMD modules 1x560 mm + 1x280 mm per aluminium profile)				P_{el} = 14.8 W $U_{typ.}$ = 42.3 V		P_{el} = 21.8 W $U_{typ.}$ = 43.5 V		P_{el} = 32.1 W $U_{typ.}$ = 45.8 V	
AluFixSMD/867/30	3x30	warm white	3000	2240	151	3045	140	4120	128
AluFixSMD/867/40	3x30	neutral white	4000	2445	165	3315	152	4485	140
For LED Line AluFix SMD Cover – 1148 mm (2 wired SMD modules 560 mm per aluminium profile)				P_{el} = 19.8 W $U_{typ.}$ = 56.4 V		P_{el} = 29 W $U_{typ.}$ = 58 V		P_{el} = 42.8 W $U_{typ.}$ = 61 V	
AluFixSMD/1148/30	4x30	warm white	3000	2990	151	4060	140	5490	128
AluFixSMD/1148/40	4x30	neutral white	4000	3260	165	4420	152	5980	140
For LED Line AluFix SMD Cover – 1429 mm (3 wired SMD modules 2x560 mm + 1x280 mm per aluminium profile)				P_{el} = 24.7 W $U_{typ.}$ = 70.5 V		P_{el} = 36.3 W $U_{typ.}$ = 72.5 V		P_{el} = 53.5 W $U_{typ.}$ = 76.3 V	
AluFixSMD/1429/30	5x30	warm white	3000	3735	151	5075	140	6865	128
AluFixSMD/1429/40	5x30	neutral white	4000	4075	165	5525	152	7475	140

* Measurement tolerance of luminous flux: ± 7%

LED Line AluFix SMD – Cover

Technical notes LED Line AluFix cover
Material: Aluminium profile and PMMA cover
Rear connection leads: Cu tinned, single-core 0.32 mm² (AWG22), PVC-insulation, red and black, notched lead ends, lead length: L + 80 mm
Degree of protection: IP40
Rear slots for screws M3
Tightening torque: 0.5 Nm



Type	Dimensions (LxWxH) in mm			Unit	Weight
	L	W	H	pcs.	g
89001	305	40.2	22	15	171
89002	586	40.2	22	15	330
89003	867	40.2	22	15	495
89004	1148	40.2	22	15	650
89005	1429	40.2	22	15	815

Ref. No. LED Line AluFix SMD – Cover – with linear SMD module 280

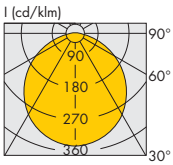
Type / Total length	**89001** / 305 mm		**89002** / 586 mm		**89003** / 867 mm		**89004** / 1148 mm		**89005** / 1429 mm	
Cover	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
SMD56/30/280	**557856**	**557820**	**557858**	**557822**	**557860**	**557824**	**557862**	**557826**	**557864**	**557828**
SMD56/40/280	**557857**	**557821**	**557859**	**557823**	**557861**	**557825**	**557863**	**557827**	**557865**	**557829**

LED Light Panel SMD

Built-in lighting modules

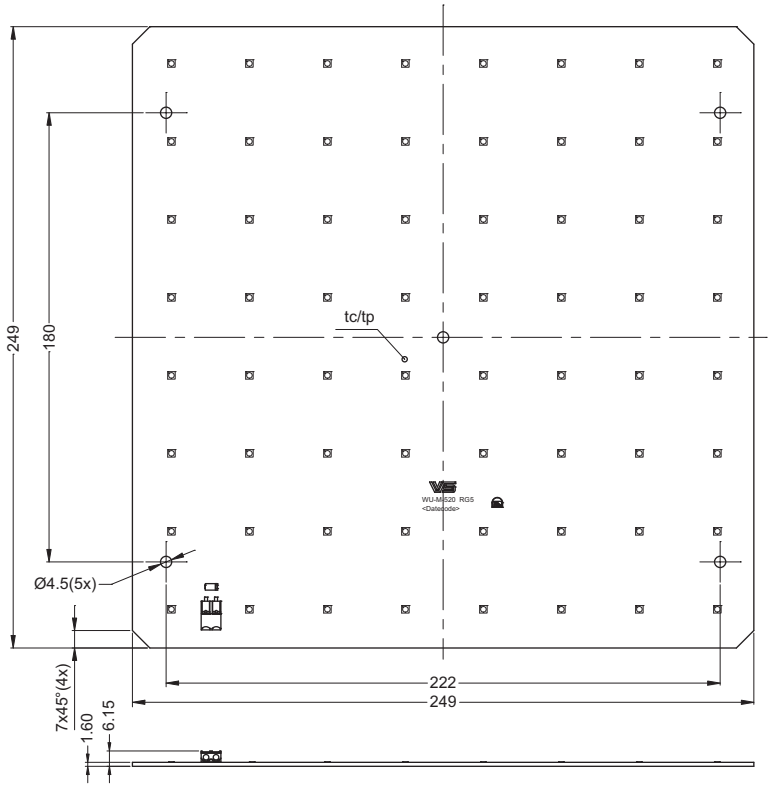
The new LED light panels are a highly effective SMD solution for producing very homogeneous, widely distributed light. They are particularly suitable for integration in louvered luminaires (600 x 600 mm).

These LED SMD modules are available in various shades of white and permit easy, cost-effective and solder-free connection using push-in connectors.



Technical notes

Dimensions: 249x249 mm
On-board push-in connector
Fixing holes: Ø 4.5 mm
Use of external LED constant-current drivers required
Efficiency up to 190 lm/W
Colour rendering index R_a: typ. 85
Lumen maintenance L80/B10:
up to 60,000 hrs. (I_F 350 mA, t_p = 70 °C)
Unit: 50 pcs.



Typical applications

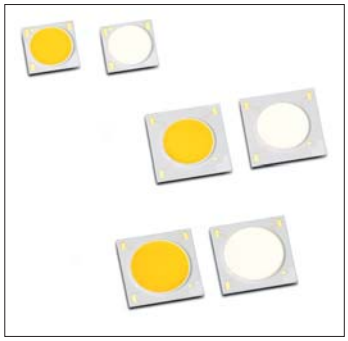
- Office lighting
- Retail lighting
- T5/T8 replacement as built-in module
- Furniture lighting
- Backlighting for advertising

Products under development; preliminary technical datas

Type	Ref. No.	Colour	Correlated colour temperature K	Luminous flux* and typ. efficiency*, voltage (U) and power consumption (P_{el})									Typ. beam angle °	CRI	
				350 mA			500 mA			700 mA					
				min.	typ.	lm/W (typ.)	min.	typ.	lm/W (typ.)	min.	typ.	lm/W (typ.)		R_a min.	R_a typ.
				P_{el} = 7.1-8.5 W U = 20.4-24.4 V			P_{el} = 1.5-12.5 W U = 21-25 V			P_{el} = 15.2-18 W U = 21.7-25.7 V					
WU-M-520-830	**559648**	warm white	3000 -80/+130	1160	1260	167	1630	1770	158	2235	2425	148	120	80	85
WU-M-520-840	**558905**	neutral white	4000 -160/+115	1210	1320	174	1700	1855	165	2330	2535	155	120	80	85
WU-M-520-850	**559649**	neutral white	5000 -125/+155	1260	1440	190	1770	2020	181	2425	2770	169	120	80	85
WU-M-520-865	**559650**	cool white	6500 -165/+220	1260	1385	183	1770	1945	174	2425	2665	163	120	80	85

Emission data at t_p = 50 °C | Products under development; preliminary technical datas | * Measurement tolerance of luminous flux: ± 7%

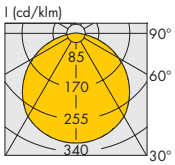
LUGA Shop 2015 PCB – 1000 lm to 8000 lm



Built-in lighting modules

This PCB version of the LUGA Shop 2015 series provides the option of simply replacing LED modules within their holder.

Simple and secure attachment is enabled with separate holders (see page 42).



Technical notes

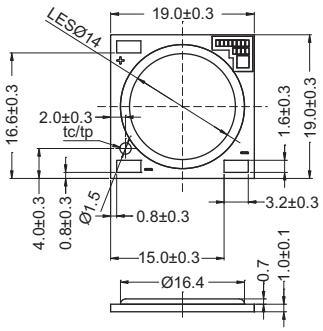
Dimensions: 19x19 mm, 28x28 mm
Light emitting surface (LES): Ø 14 mm, Ø 17 mm, Ø 20 mm
On-board push-in terminal
Beam angle: 120°
Allowed operating temperature at t_c point:
– 40 to 80 °C
Use of external LED constant current driver
Efficiency up to 172 lm/W
Colour rendering index R_a: typ. > 70 / > 80 / > 90
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L90/B10:
> 52,000 hrs. (I_F 700 mA, t_p = 65 °C)
Unit: 175 pcs. (DMS099),
100 pcs. (DMS120/DMS150)

Typical applications

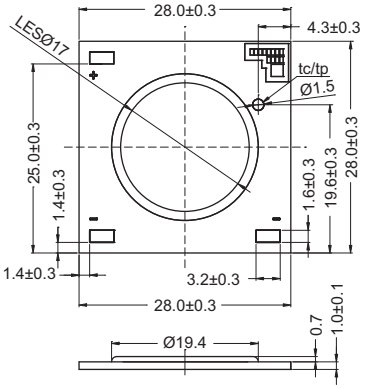
Integration in
- Reflector luminaires
- Flat surface-mounting luminaires
- Cladding illumination
- Suspended luminaire with external control gear

For use in
- Retail lighting
- Furniture lighting
- Stairway and corridor illumination

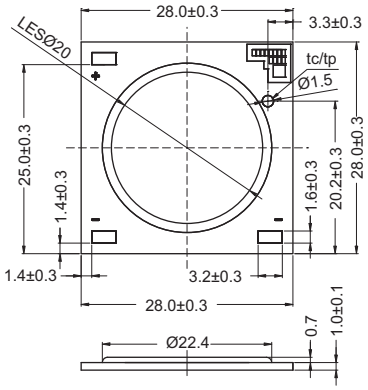
DMS099*F**



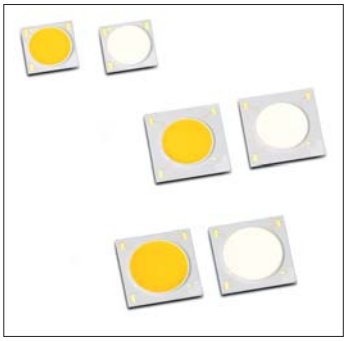
DMS120*F**



DMS150*F**



LUGA Shop 2015 PCB – 1000 lm to 8000 lm



Characteristics

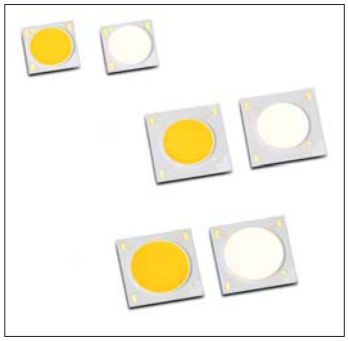
- Optimized for retail and furniture illumination
- Version CRI 70 for industrial and outdoor lighting
- Highly efficient: up to 164 lm/W

LUGA Shop 2015 PCB – CRI R_a > 80 (70)

Type	Ref. No.	Colour	Correlated colour temperature* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**										Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA		1400 mA		
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	
DMS099C				P_{el} = 8.7 W $U_{typ.}$ = 24.7 V		P_{el} = 12.6 W $U_{typ.}$ = 25.3 V		P_{el} = 18.1 W $U_{typ.}$ = 25.8 V		P_{el} = 28 W $U_{typ.}$ = 26.7 V		P_{el} = 38.1 W $U_{typ.}$ = 27.3 V		
DMS099C27F	**558922**	warm white	2700	1170	134	1655	131	2220	123	3110	111	3845	101	82
DMS099C30F	**558231**	warm white	3000	1260	145	1780	141	2390	132	3345	119	4140	109	85
DMS099C30FB	**558232**	warm white	3000 (below BBL)	1200	138	1685	134	2260	125	3170	113	3935	103	85
DMS099C35F	**558923**	neutral white	3500	1295	149	1815	144	2440	135	3425	122	4240	111	85
DMS099C35FB	**558924**	neutral white	3500 (below BBL)	1220	140	1715	136	2305	127	3220	115	3995	105	85
DMS099C40F	**558925**	neutral white	4000	1310	151	1850	147	2480	137	3475	124	4300	113	85
DMS099C40FB	**558926**	neutral white	4000 (below BBL)	1235	142	1740	138	2335	129	3275	117	4050	106	85
DMS099C50F	**558927**	cool white	5000	1320	152	1865	148	2505	138	3505	125	4350	114	85
DMS120C				P_{el} = 11.5 W $U_{typ.}$ = 32.9 V		P_{el} = 16.7 W $U_{typ.}$ = 33.4 V		P_{el} = 23.9 W $U_{typ.}$ = 34.1 V		P_{el} = 37 W $U_{typ.}$ = 35.3 V		P_{el} = 50.4 W $U_{typ.}$ = 36 V		
DMS120C27F	**558932**	warm white	2700	1635	142	2250	135	3030	127	4225	114	5215	103	82
DMS120C30F	**558234**	warm white	3000	1750	152	2425	145	3260	136	4550	123	5615	111	85
DMS120C30FB	**558235**	warm white	3000 (below BBL)	1660	144	2300	138	3090	129	4315	117	5330	106	85
DMS120C35F	**558933**	neutral white	3500	1795	156	2485	149	3345	140	4660	126	5755	114	85
DMS120C35FB	**558934**	neutral white	3500 (below BBL)	1690	147	2335	140	3145	132	4385	119	5410	107	85
DMS120C40F	**558935**	neutral white	4000	1825	159	2515	151	3385	142	4730	128	5840	116	85
DMS120C40FB	**558936**	neutral white	4000 (below BBL)	1715	149	2375	142	3195	134	4455	120	5500	109	85
DMS120C50F	**558937**	cool white	5000	1840	160	2540	152	3415	143	4770	129	5890	117	85
DMS120B50F	**on request**	cool white	5000	1945	169	2685	161	3615	151	5045	136	6235	124	70
DMS150C				P_{el} = 14.4 W $U_{typ.}$ = 41.1 V		P_{el} = 20.9 W $U_{typ.}$ = 41.8 V		P_{el} = 29.9 W $U_{typ.}$ = 42.7 V		P_{el} = 46.4 W $U_{typ.}$ = 44.2 V		P_{el} = 63 W $U_{typ.}$ = 45 V		
DMS150C27F	**558943**	warm white	2700	2070	144	2870	137	3870	129	5455	118	6750	107	82
DMS150C30F	**558237**	warm white	3000	2230	155	3090	148	4165	139	5865	126	7270	115	85
DMS150C30FB	**558238**	warm white	3000 (below BBL)	2110	147	2935	140	3955	132	5570	120	6900	110	85
DMS150C35F	**558944**	neutral white	3500	2285	159	3170	152	4270	143	6010	130	7450	118	85
DMS150C35FB	**558945**	neutral white	3500 (below BBL)	2145	149	2980	143	4020	134	5660	122	7010	111	85
DMS150C40F	**558946**	neutral white	4000	2315	161	3215	154	4335	145	6090	131	7560	120	85
DMS150C40FB	**558947**	neutral white	4000 (below BBL)	2175	151	3030	145	4085	137	5755	124	7120	113	85
DMS150C50F	**558948**	cool white	5000	2335	162	3240	155	4365	146	6165	133	7630	121	85
DMS150B50F	**on request**	cool white	5000	2475	172	3435	164	4630	155	6515	140	8070	128	70

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%
Min. CRI R_a: > 80 (70)

LUGA Shop 2015 PCB – 1000 lm to 8000 lm

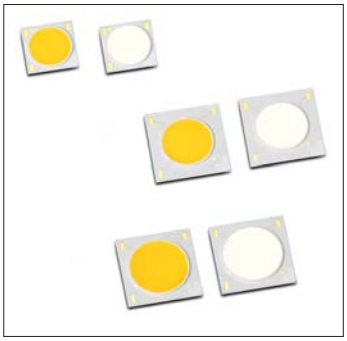


LUGA Shop 2015 PCB HiCRI – CRI R_a > 90

Type	Ref. No.	Colour	Correlated colour temperature* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**										Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA		1400 mA		
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	
				P_{el} = 8.7 W		P_{el} = 12.6 W		P_{el} = 18.1 W		P_{el} = 28 W		P_{el} = 38.1 W		
DMS099*F**				$U_{typ.}$ = 24.7 V		$U_{typ.}$ = 25.8 V		$U_{typ.}$ = 25.8 V		$U_{typ.}$ = 26.7 V		$U_{typ.}$ = 27.3 V		
DMS099S27F	**558928**	warm white	2700 (below BBL)	950	109	1340	106	1800	99	2520	90	3125	82	95
DMS099S30F	**558929**	warm white	3000 (below BBL)	1020	117	1435	114	1925	106	2700	96	3350	88	95
DMS099S35F	**558930**	neutral white	3500 (below BBL)	1085	125	1530	121	2055	114	2875	103	3560	93	95
DMS099S40F	**558931**	neutral white	4000 (below BBL)	1125	129	1585	126	2125	117	2975	106	3680	97	95
				P_{el} = 11.5 W		P_{el} = 16.7 W		P_{el} = 23.9 W		P_{el} = 37 W		P_{el} = 50.4 W		
DMS120*F**				$U_{typ.}$ = 32.9 V		$U_{typ.}$ = 34.1 V		$U_{typ.}$ = 34.1 V		$U_{typ.}$ = 35.3 V		$U_{typ.}$ = 36 V		
DMS120S27F	**558938**	warm white	2700 (below BBL)	1320	115	1825	109	2455	103	3430	93	4235	84	95
DMS120S30F	**558940**	warm white	3000 (below BBL)	1415	123	1955	117	2630	110	3685	100	4550	90	95
DMS120S35F	**558941**	neutral white	3500 (below BBL)	1505	131	2080	125	2800	117	3910	106	4820	96	95
DMS120S40F	**558942**	neutral white	4000 (below BBL)	1560	136	2150	129	2895	121	4040	109	5000	99	95
				P_{el} = 14.4 W		P_{el} = 20.9 W		P_{el} = 29.9 W		P_{el} = 46.4 W		P_{el} = 63 W		
DMS150*F**				$U_{typ.}$ = 41.1 V		$U_{typ.}$ = 42.7 V		$U_{typ.}$ = 42.7 V		$U_{typ.}$ = 44.2 V		$U_{typ.}$ = 45 V		
DMS150S27F	**558949**	warm white	2700 (below BBL)	1685	117	2325	111	3135	105	4430	95	5485	87	95
DMS150S30F	**558239**	warm white	3000 (below BBL)	1800	125	2495	119	3365	113	4755	102	5885	93	95
DMS150S35F	**558950**	neutral white	3500 (below BBL)	1920	133	2655	127	3575	120	5045	109	6255	99	95
DMS150S40F	**558951**	neutral white	4000 (below BBL)	1985	138	2745	131	3705	124	5220	113	6465	103	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%
Min. CRI R_a: > 90

LUGA Shop 2015 PCB – Pearl White



Characteristics

- Brilliant white light
- For retail lighting, especially fashion lighting
- Similar colour impression like C-HI lamps
- Highly efficient: up to 123 lm/W

LUGA Shop 2014 PCB – Pearl White – CRI R_a > 90

Type	Ref. No.	Colour	Correlated colour temperature* (K)	Typ. luminous flux and efficiency and typ. voltage ($U_{typ.}$) and power consumption (P_{el})**										Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA		1400 mA		
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	
DMS099S31FP				P_{el} = 8.7 W $U_{typ.}$ = 24.7 V		P_{el} = 12.6 W $U_{typ.}$ = 25.3 V		P_{el} = 18.1 W $U_{typ.}$ = 25.8 V		P_{el} = 28 W $U_{typ.}$ = 26.7 V		P_{el} = 38.1 W $U_{typ.}$ = 27.3 V		
DMS099S31FP	**558233**	pearl white	3100	1050	121	1475	117	1980	109	2775	99	3430	90	95
DMS120S31FP				P_{el} = 11.5 W $U_{typ.}$ = 32.9 V		P_{el} = 16.7 W $U_{typ.}$ = 33.4 V		P_{el} = 23.9 W $U_{typ.}$ = 34.1 V		P_{el} = 37 W $U_{typ.}$ = 35.3 V		P_{el} = 50.4 W $U_{typ.}$ = 36 V		
DMS120S31FP	**558236**	pearl white	3100	1455	127	2005	120	2695	113	3775	102	4655	92	95
DMS150S31FP				P_{el} = 14.4 W $U_{typ.}$ = 41.1 V		P_{el} = 20.9 W $U_{typ.}$ = 41.8 V		P_{el} = 29.9 W $U_{typ.}$ = 42.7 V		P_{el} = 46.4 W $U_{typ.}$ = 44.2 V		P_{el} = 63 W $U_{typ.}$ = 45 V		
DMS150S31FP	**558240**	pearl white	3100	1855	129	2575	123	3470	116	4890	105	6065	96	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%
Min. CRI R_a: > 90

LUGA Shop 2015 PCB – FOOD

Characteristics

- Optimized for use in all retail areas – especially for fresh food (bread, fruits, vegetables, meat)

Type	Ref. No.	Colour	Correl. colour temp.* K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})**						Typ. beam angle °	Typ. CRI R_a	Typical applications
				700 mA		1050 mA		1400 mA				
				lm	lm/W	lm	lm/W	lm	lm/W			
LUGA Shop FOOD				P_{el} = 29.9 W $U_{typ.}$ = 42.7 V		P_{el} = 46.4 W $U_{typ.}$ = 44.2 V		P_{el} = 63 W $U_{typ.}$ = 45 V				
DMS150G30F	**558952**	warm white	3000	2495	83	3515	76	4360	69	120	85 (special spectrum: HiGa)	Bread, fruits, vegetables, cheese
DMS150G40F	**558953**	neutral white	4000	2580	86	3635	78	4500	71	120	85 (special spectrum: HiGa)	Fish, drugstore, textiles
DMS150P40F	**558955**	"white effect"	4000	2325	78	3275	71	4070	65	120	70 (special spectrum: HiGa)	Meat
DMS150P19F	**558954**	"pink effect"	2000	2000	67	2815	61	3490	55	120	82	Meat

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%

PCB Holder for LUGA Shop 2015

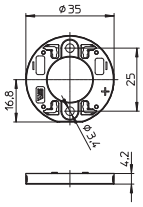
For DMS099*F / DMS120***F / DMS150***F**

The combination of PCB version and holder provides the option of simply replacing LED modules within their holder. Simple and secure attachment is enabled with a separate holder.

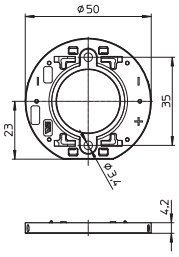
The PCB clicks into the opening on the reverse of the holder. In doing so, care must be taken to ensure correct polarity is maintained. The holder with the inserted PCB is then turned around and fixed with two screws. The holder also features lateral connection openings into which the electrical leads can be pushed.

Dependent on the used thermal conductive material and the power classes the expected service life times can differ from the values on the data sheet LUGA Shop 2015 PCB.

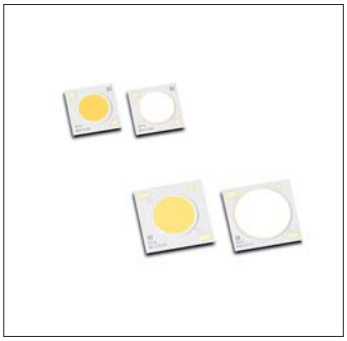
LUGA Shop 2015 holder
For LED LUGA Shop 2015 PCB DMS099
Dimensions (ØxH): 35 x 4.2 mm
Material: PBT, white
Fixing holes for screws M3
Hole distance: 25 mm
Unit: 500 pcs.
Type: 89721
Ref. No.: 559165 Ø 35 mm



LUGA Shop 2015 holder
For LED LUGA Shop 2015 PCB DMS120 and DMS150
Dimensions (ØxH): 50 x 4.2 mm
Material: PBT, white
Fixing holes for screws M3
Hole distance: 35 mm
Unit: 500 pcs.
Type: 89720
Ref. No.: 559164 Ø 50 mm



LUGA C 2015 – 500 lm to 4000 lm



Built-in lighting modules

Due to their tiny size, the LUGA C modules are particularly suitable as a replacement for mains and low-voltage halogen lamps.
As LUGA C modules are capable of producing lumen packages of up to 4000 lm, they can also be used for retail lighting and in downlights.

Technical notes

Dimensions
- DMC112: 13.5x13.5x1.7 mm
- DMC104/DMC115/
- DMC118: 19x19x1.7 mm

Light emitting surface (LES)
- DMC112: Ø 8 mm
- DMC104/DMC115: Ø 11.1 mm
- DMC118: Ø 13.8 mm

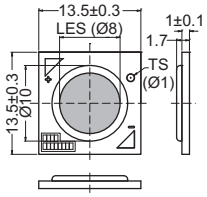
Allowed operating temperature at t_c point:
- -40 to 85 °C
- -40 to 80 °C (DMC104: > 500 mA)
- -40 to 75 °C (DMC118: > 700 mA)

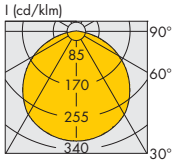
Use of external LED constant current driver
Efficiency up to 167 lm/W
Colour rendering index R_a: > 80
Colour accuracy initially: 3 SDCM;
- after 50,000 hrs. operating time: 4 SDCM

Lumen maintenance L90/B10
- DMC112: 53.000 hrs. (I_F 150 mA)
- DMC104: 48.000 hrs. (I_F 350 mA)
- DMC115/DMC118: 50.000 hrs. (I_F 350 mA)

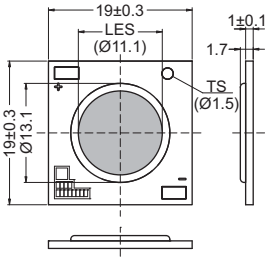
Unit:
- 225 pcs. (DMC112)
- 175 pcs. (DMC104/DMC115/DMC118)

DMC112CE**

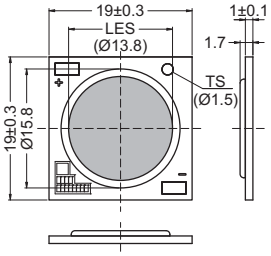




DMC104CE / DMC115C**E / DMC104D31EP / DMC115D31EP**



DMC118CE / DMC118D31EP**



Typical applications

Integration in
- Reflector luminaires for replacement of Halogen mains and low-voltage lamps
- Flat surface-mounting luminaires
- Downlights

For use in
- Residential lighting
- Furniture lighting
- Stairway and corridor illumination

LUGA C 2015 – 500 lm to 1000 lm

Characteristics

- Optimized for lumen packages ≤ 1000 lm
- Highly efficient: up to 134 lm/W

LUGA C 2015 – CRI R_a > 80

Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 150 mA lm	lm/W	200 mA lm	lm/W	250 mA lm	lm/W	Typ. beam angle (°)	Typ. CRI R_a
DMC112CE**				P_{el} = 4.7 W $U_{typ.}$ = 31.6 V		P_{el} = 6.5 W $U_{typ.}$ = 32.6 V		P_{el} = 8.4 W $U_{typ.}$ = 33.5 V			
DMC112C27E	**556875**	warm white	2700	545	116	685	105	805	96	120	82
DMC112C30E	**556863**	warm white	3000	590	126	740	114	870	104	120	85
DMC112C40E	**556876**	neutral white	3500	630	134	790	122	925	110	120	85

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 80 | Colour temperatures 3500 K and 5000 K on request

LUGA C 2015 – 500 lm to 800 lm

LUGA C 2015 – CRI R_a > 90

Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 150 mA lm	lm/W	200 mA lm	lm/W	250 mA lm	lm/W	Typ. beam angle (°)	Typ. CRI R_a
DMC112SE**				P_{el} = 4,7 W $U_{typ.}$ = 31,6 V		P_{el} = 6,5 W $U_{typ.}$ = 32,6 V		P_{el} = 8,4 W $U_{typ.}$ = 33,5 V			
DMC112S27E	**557803**	warm white	2700	465	99	580	89	685	82	120	95
DMC112S30E	**557804**	warm white	3000	505	107	630	97	740	88	120	95
DMC112S40E	**557805**	neutral white	3500	550	117	690	106	810	96	120	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 90 | Colour temperatures 3500 K on request

LUGA C 2015 – 500 lm to 800 lm – Pearl White

LUGA C 2015 – CRI R_a > 90

Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 150 mA lm	lm/W	200 mA lm	lm/W	250 mA lm	lm/W	Typ. beam angle (°)	Typ. CRI R_a
DMC112SEP**				P_{el} = 4.7 W $U_{typ.}$ = 31.6 V		P_{el} = 6.5 W $U_{typ.}$ = 32.6 V		P_{el} = 8.4 W $U_{typ.}$ = 33.5 V			
DMC112S31EP	**557806**	pearl white	3100	505	107	635	98	745	89	120	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 90

LUGA C 2015 – 1000 lm to 4000 lm

Characteristics

- Optimized for lumen packages from1000 lm to 4000 lm
- Highly efficient: up to 167 lm/W

LUGA C 2015 – CRI R_a > 80 / > 65

Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle (°)	Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
DMC104CE**				P_{el} = 10.2 W $U_{typ.}$ = 29.2 V		P_{el} = 15.3 W $U_{typ.}$ = 30.5 V							
DMC104C27E	**556877**	warm white	2700	1140	112	1465	96	–	–	–	–	120	82
DMC104C30E	**556864**	warm white	3000	1210	119	1555	102	–	–	–	–	120	85
DMC104C35E	**on request**	neutral white	3500	1265	124	1625	106	–	–	–	–	120	85
DMC104C40E	**556878**	neutral white	4000	1300	127	1665	109	–	–	–	–	120	85
DMC104C50E	**on request**	cool white	5000	1315	129	1690	110	–	–	–	–	120	85
DMC115CE**				P_{el} = 11 W $U_{typ.}$ = 31.4 V		P_{el} = 16.3 W $U_{typ.}$ = 32.6 V		P_{el} = 23.8 W $U_{typ.}$ = 34 V					
DMC115C27E	**556879**	warm white	2700	1325	120	1755	108	2205	93	–	–	120	82
DMC115C30E	**556865**	warm white	3000	1420	129	1875	115	2350	99	–	–	120	85
DMC115C30EB	**557233**	warm white	3000	1355	123	1785	110	2245	94	–	–	120	85
DMC115C35E	**557187**	neutral white	3500	1480	135	1950	120	2450	103	–	–	120	85
DMC115C40E	**556880**	neutral white	4000	1505	137	1995	122	2500	105	–	–	120	85
DMC115C50E	**557183**	cool white	5000	1535	140	2035	125	2555	107	–	–	120	85
DMC118CE**				P_{el} = 10.6 W $U_{typ.}$ = 30.2 V		P_{el} = 15.5 W $U_{typ.}$ = 31 V		P_{el} = 22.5 W $U_{typ.}$ = 32.1 V		P_{el} = 35.4 W $U_{typ.}$ = 33.7 V			
DMC118C27E	**556881**	warm white	2700	1375	130	1875	121	2460	109	3260	92	120	82
DMC118C30E	**556866**	warm white	3000	1455	137	1980	128	2595	115	3450	97	120	85
DMC118C30EB	**557234**	warm white	3000	1390	131	1905	123	2480	110	3310	94	120	85
DMC118C35E	**556882**	neutral white	3500	1525	144	2085	135	2735	122	3635	103	120	85
DMC118C40E	**556883**	neutral white	4000	1560	147	2125	137	2795	124	3710	105	120	85
DMC118C50E	**556867**	cool white	5000	1585	150	2160	139	2840	126	3770	106	120	85
DMC118B50E	**557182**	cool white	5000	1770	167	2415	156	3165	141	4295	121	120	70

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 80 / > 65

LUGA C 2015
– 1000 lm to 3000 lm

LUGA C 2015 – CRI R_a > 90

Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle (°)	Typ. CRI Ra
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
				P_{el} = 10.2 W		P_{el} = 15.3 W							
DMC104SE**				$U_{typ.}$ = 29.2 V		$U_{typ.}$ = 30.5 V							
DMC104S27E	**557807**	warm white	2700	970	95	1245	81	–	–	–	–	120	95
DMC104S30E	**557808**	warm white	3000	1025	100	1315	86	–	–	–	–	120	95
DMC104S35E	**on request**	neutral white	3500	1095	107	1405	92	–	–	–	–	120	95
DMC104S40E	**557809**	neutral white	4000	1145	112	1470	96	–	–	–	–	120	95
				P_{el} = 11 W		P_{el} = 16.3 W		P_{el} = 23.8 W					
DMC115SE**				$U_{typ.}$ = 31.4 V		$U_{typ.}$ = 32.6 V		$U_{typ.}$ = 34 V					
DMC115S27E	**557811**	warm white	2700	1115	101	1480	91	1860	78	–	–	120	95
DMC115S30E	**557799**	warm white	3000	1185	108	1565	96	1970	83	–	–	120	95
DMC115S35E	**557812**	neutral white	3500	1260	115	1665	102	2090	88	–	–	120	95
DMC115S40E	**557813**	neutral white	4000	1300	118	1715	105	2150	90	–	–	120	95
				P_{el} = 10.6 W		P_{el} = 15.5 W		P_{el} = 22.5 W		P_{el} = 35.4 W			
DMC118SE**				$U_{typ.}$ = 30.2 V		$U_{typ.}$ = 31 V		$U_{typ.}$ = 32.1 V		$U_{typ.}$ = 33.7 V			
DMC118S27E	**557814**	warm white	2700	1160	109	1580	102	2075	92	2755	78	120	95
DMC118S30E	**557801**	warm white	3000	1225	116	1665	107	2190	97	2910	82	120	95
DMC118S35E	**557815**	neutral white	3500	1310	124	1785	115	2340	104	3110	88	120	95
DMC118S40E	**557816**	neutral white	4000	1355	128	1845	119	2420	108	3220	91	120	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 90

LUGA C 2015 – 1000 lm to 3000 lm – Pearl White

Characteristics

- Optimized for lumen packages from1000 lm to 3000 lm
- Highly efficient: up to 114 lm/W

LUGA C 2015 Pearl White – CRI R_a > 80

Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle (°)	Typ. CRI Ra
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
DMC104D31EP				P_{el} = 10.2 W $U_{typ.}$ = 29.2 V		P_{el} = 15.3 W $U_{typ.}$ = 30.5 V							
DMC104C31EP	**557184**	pearl white	3100	1220	120	1565	102	–	–	–	–	120	85
DMC115D31EP				P_{el} = 11 W $U_{typ.}$ = 31.4 V		P_{el} = 16.3 W $U_{typ.}$ = 32.6 V		P_{el} = 23.8 W $U_{typ.}$ = 34 V					
DMC115C31EP	**on request**	pearl white	3100	1435	130	1895	116	2375	100	–	–	120	85
DMC118D31EP				P_{el} = 10.6 W $U_{typ.}$ = 30.2 V		P_{el} = 15.5 W $U_{typ.}$ = 31 V		P_{el} = 22.5 W $U_{typ.}$ = 32.1 V		P_{el} = 35.4 W $U_{typ.}$ = 33.7 V			
DMC118C31EP	**on request**	pearl white	3100	1485	140	2025	131	2650	118	3525	100	120	85

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 80

LUGA C 2015 Pearl White – CRI R_a > 90

Type	**Ref. No.**	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle (°)	Typ. CRI Ra
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
DMC104S31EP				P_{el} = 10.2 W $U_{typ.}$ = 29.2 V		P_{el} = 15.3 W $U_{typ.}$ = 30.5 V							
DMC104S31EP	**557810**	pearl white	3100	1035	101	1330	87	–	–	–	–	120	95
DMC115S31EP				P_{el} = 11 W $U_{typ.}$ = 31.4 V		P_{el} = 16.3 W $U_{typ.}$ = 32.6 V		P_{el} = 23.8 W $U_{typ.}$ = 34 V					
DMC115S31EP	**557800**	pearl white	3100	1195	109	1580	97	1990	84	–	–	120	95
DMC118S31EP				P_{el} = 10.6 W $U_{typ.}$ = 30.2 V		P_{el} = 15.5 W $U_{typ.}$ = 31 V		P_{el} = 22.5 W $U_{typ.}$ = 32.1 V		P_{el} = 35.4 W $U_{typ.}$ = 33.7 V			
DMC118S31EP	**557802**	pearl white	3100	1250	118	1705	110	2230	99	2970	84	120	95

Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10%
Min. CRI R_a: > 90

LED Industrial and Hall Lighting

These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities as well as for petrol stations (especially SYM II).

These modules were designed for built-in into luminaire casings. They enable a modular luminaire design.

The modules are available in four shapes (4, 16, 32 or 64 LEDs) and in three white colour tones.

Technical notes

LED built-in module for integration into luminaires
4, 16, 32 or 64 high-efficient High Power LEDs
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant current driver
Design for optimum thermal management
Efficiency up to 136 lm/W
Lumen maintenance L70/B10:
52,000 hrs. (I_F 1050 mA) at t_p 60 °C
ESD protection class 2
Surge protection: 4 kV

Typical applications

- Integration in outdoor luminaires
- Indoor lighting
- Industrial lighting for:
  - Production halls
  - Warehouses
- Petrol station lighting
- Lighting for sports facilities

LED Industrial and Hall Lighting

Optical characteristics

at t_p = 60 °C

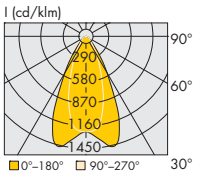
Type				Colour	Correlated colour temperature*	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})**								CRI***
IP20	IP66 (IP67) square	IP66 (IP67) linear			K	400 mA min.	400 mA typ.	700 mA min.	700 mA typ.	1050 mA min.	1050 mA typ.	1400 mA min.	1400 mA typ.	R_a
4 LEDs						P_{el} = 4.5 W $U_{typ.}$ = 11.3 V		P_{el} = 8.4 W $U_{typ.}$ = 12 V		P_{el} = 13.7 W $U_{typ.}$ = 13 V		P_{el} = 19.3 W $U_{typ.}$ = 13.8 V		
WU-M-444/B-..	–	–	WW	warm white	3000 -130/+220	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-444/B-..	–	–	NW	neutral white	4000 -290/+260	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-444/B-..	–	–	CW	cool white	5000 -255/+310	550	615	890	975	1225	1350	1550	1700	≥ 65
16 LEDs						P_{el} = 18 W $U_{typ.}$ = 45 V		P_{el} = 33.6 W $U_{typ.}$ = 48 V		P_{el} = 54.6 W $U_{typ.}$ = 52 V		P_{el} = 77 W $U_{typ.}$ = 55 V		
WU-M-475/16-..	WU-M-425/B-..	WU-M-438/B-..	WW	warm white	3000 -130/+220	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-475/16-..	WU-M-425/B-..	WU-M-438/B-..	NW	neutral white	4000 -290/+260	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-475/16-..	WU-M-425/B-..	WU-M-438/B-..	CW	cool white	5000 -255/+310	2200	2450	3550	3900	4900	5400	6200	6800	≥ 65
WU-M-488	–	–	WW	warm white	3000 -130/+220	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-488	–	–	NW	neutral white	4000 -290/+260	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-488	–	–	CW	cool white	5000 -255/+310	2200	2450	3550	3900	4900	5400	6200	6800	≥ 65
32 LEDs						P_{el} = 36 W $U_{typ.}$ = 90 V		P_{el} = 67.2 W $U_{typ.}$ = 96 V		P_{el} = 109.2 W $U_{typ.}$ = 104 V		– –		
–	–	WU-M-496-	WW	warm white	3000 -130/+220	4000	4500	6600	7200	9000	9900	–	–	≥ 70
–	–	WU-M-496-	NW	neutral white	4000 -290/+260	4000	4500	6600	7200	9000	9900	–	–	≥ 70
–	–	WU-M-496-	CW	cool white	5000 -255/+310	4400	4900	7100	7800	9800	10800	–	–	≥ 65
64 LEDs						P_{el} = 72 W $U_{typ.}$ = 180 V		P_{el} = 134.4 W $U_{typ.}$ = 192 V		P_{el} = 218.4 W $U_{typ.}$ = 208 V		P_{el} = 308 W $U_{typ.}$ = 220 V		
WU-M-475/64-..	–	–	WW	warm white	3000 -130/+220	8000	9000	13200	14400	18000	19800	22800	25200	≥ 70
WU-M-475/64-..	–	–	NW	neutral white	4000 -290/+260	8000	9000	13200	14400	18000	19800	22800	25200	≥ 70
WU-M-475/64-..	–	–	CW	cool white	5000 -255/+310	8800	9800	14200	15600	19600	21600	24800	27200	≥ 65

* 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.
** Production tolerance of voltage and power consumption: ± 10%; Measuring tolerance of luminous flux: ± 7%
*** CRI > 80 on request

LED Industrial Light SYM I – IP20

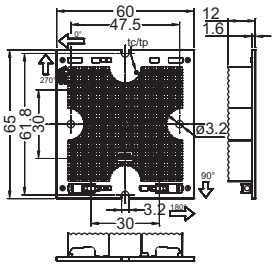
Technical notes

Dimensions (incl. optics) LxWxH
4 LEDs: 60 x 65 x12 mm
16 LEDs: 120 x120 x12 mm
64 LEDs: 240 x 240 x12 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:1 (height to distance) on the 0–180° layer (lengthwise) or 8:5 (height to distance) on the 90–270° layer (crosswise).

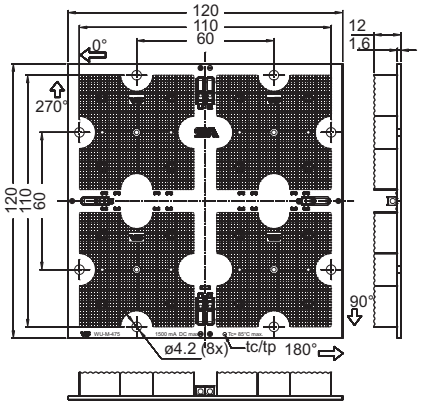


Type	Ref. No.	Number of LEDs
WU-M-444/B-WW	**556235**	4
WU-M-444/B-NW	**553933**	4
WU-M-444/B-CW	**553932**	4
WU-M-475/16-WW	**556236**	16
WU-M-475/16-NW	**553915**	16
WU-M-475/16-CW	**553914**	16
WU-M-475/64-WW	**556237**	64
WU-M-475/64-NW	**554806**	64
WU-M-475/64-CW	**554801**	64

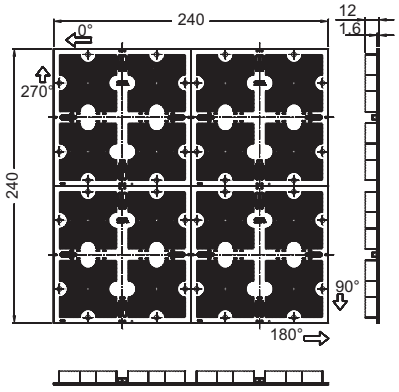
WU-M-444/B



WU-M-475/16



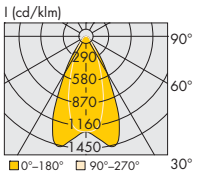
WU-M-475/64



LED Industrial Light Linear
SYM I – IP20

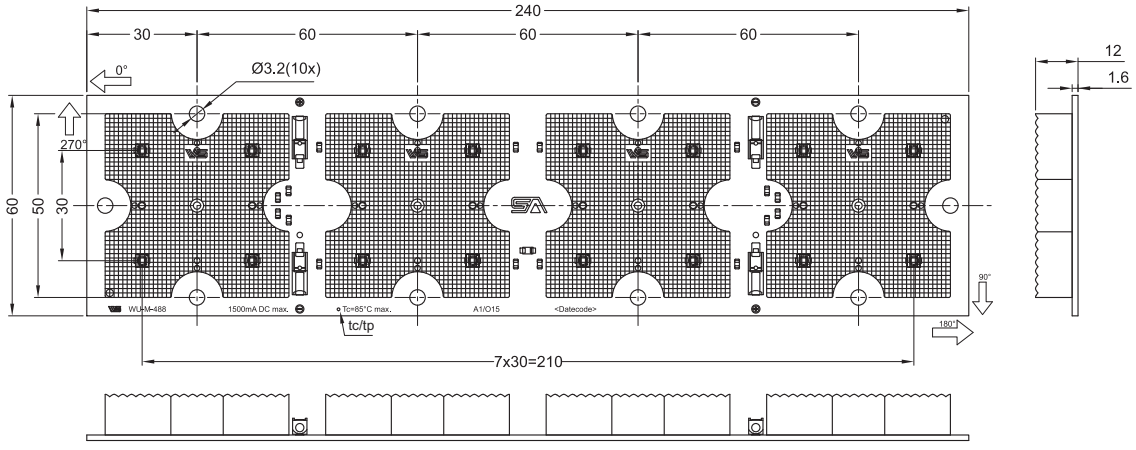
Technical notes

Dimensions (incl. optics) LxWxH
16 LEDs: 60 x 240 x12 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:1 (height to distance) on the 0–180° layer (lengthwise) or 8:5 (height to distance) on the 90–270° layer (crosswise).

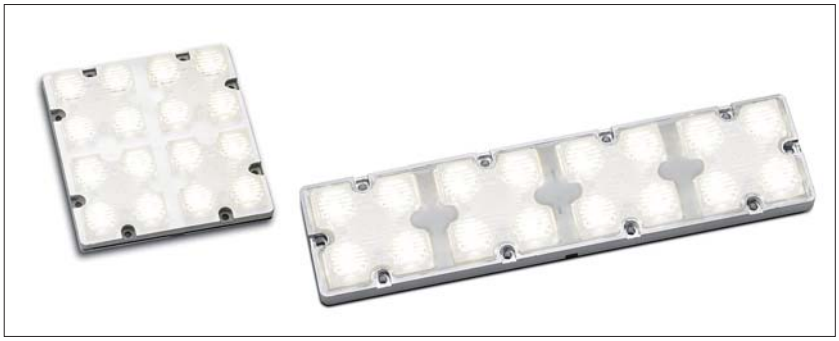


Type	Ref. No.	Number of LEDs
WU-M-488-WW	**on request**	16
WU-M-488-NW	**on request**	16
WU-M-488-CW	**556297**	16

WU-M-488 SYM I

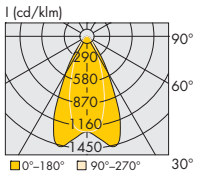


LED Industrial Light SYM I – Water Protected



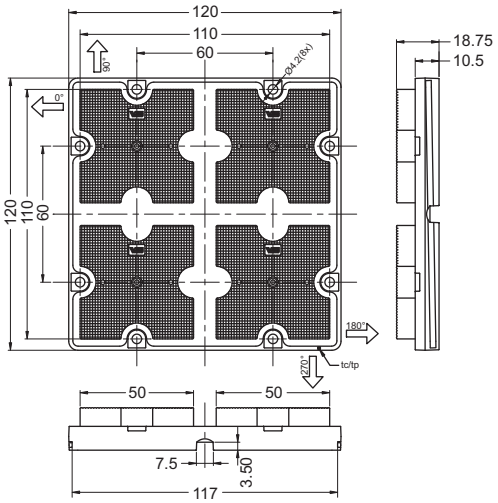
Technical notes

Dimensions (incl. optics) LxWxH
16 LEDs, square: 120 x120 x18.75 mm
16 LEDs, linear: 240 x 60 x18.75 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Version with 3 leads (incl. PE lead) on request
Optics for hall lighting
Optimum illumination – installation ratio:
1:1 (height to distance) on the 0–180° layer (lengthwise) or 8:5 (height to distance) on the 90–270° layer (crosswise).

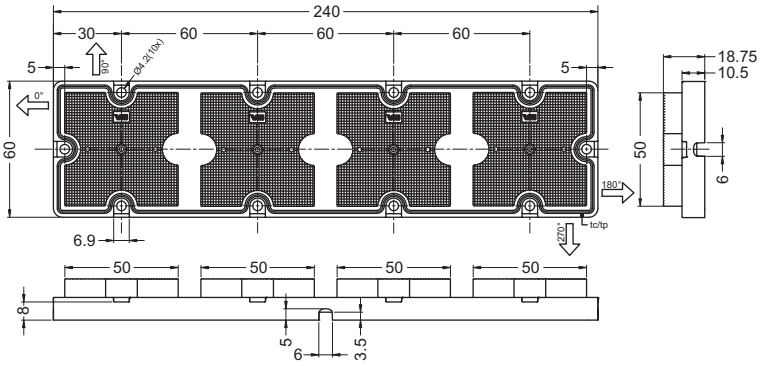


Type	Shape	**Ref. No.**	Number of LEDs
WU-M-425/B-WW	square	**554787**	16
WU-M-425/B-NW	square	**554782**	16
WU-M-425/B-CW	square	**553068**	16
WU-M-438/B-WW	linear	**556704**	16
WU-M-438/B-NW	linear	**556697**	16
WU-M-438/B-CW	linear	**554795**	16

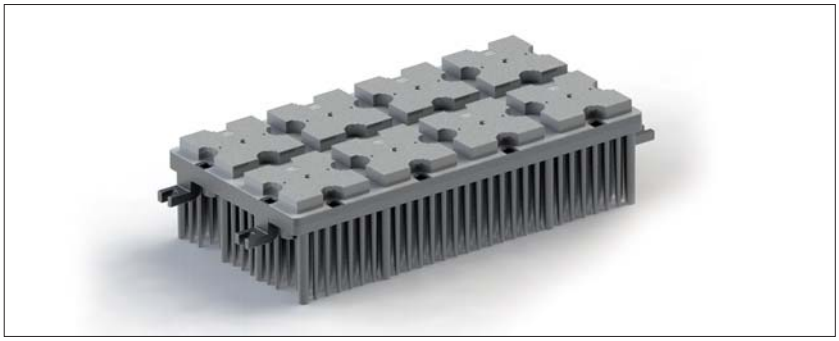
WU-M-425/B



WU-M-438/B

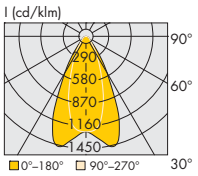


LED LightEngine SYM I – IP66



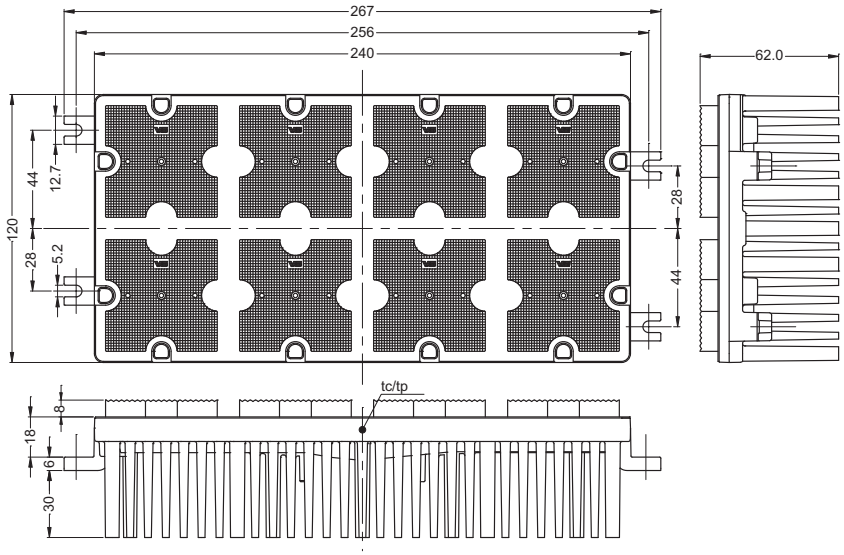
Technical notes

Dimensions (incl. optics) LxWxH
32 LEDs: 240 x 120 x 62 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for hall lighting
Optimum illumination – installation ratio:
1:1 (height to distance) on the 0–180° layer (lengthwise) or 8:5 (height to distance) on the 90–270° layer (crosswise).



Type	**Ref. No.**	Number of LEDs
WU-M-496-WW-R70	**558178**	32
WU-M-496-NW-R70	**558177**	32
WU-M-496-CW-RNN	**558176**	32

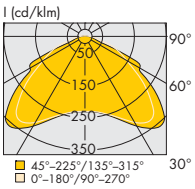
WU-M-496 SYM I



LED Industrial Light SYM II – IP20

Technical notes

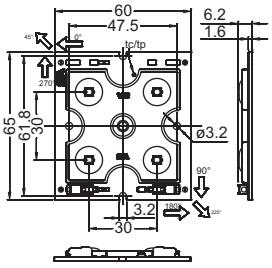
Dimensions (incl. optics) LxWxH
4 LEDs: 60 x 65 x 6.2 mm
16 LEDs: 120 x120 x 6.2 mm
64 LEDs: 240 x 240 x 6.2 mm
Degree of protection: IP20/IK05*
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:2 (height to distance)



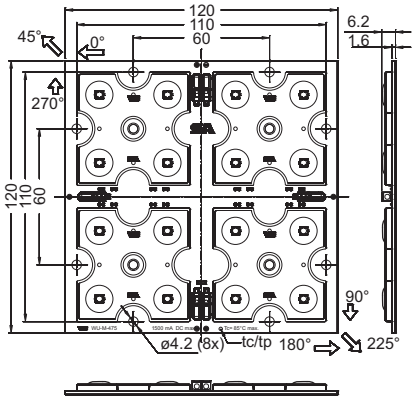
Type	Ref. No.	Number of LEDs
WU-M-444/B-WW	**556238**	4
WU-M-444/B-NW	**553936**	4
WU-M-444/B-CW	**553935**	4
WU-M-475/16-WW	**556239**	16
WU-M-475/16-NW	**553918**	16
WU-M-475/16-CW	**553917**	16
WU-M-475/64-WW	**556240**	64
WU-M-475/64-NW	**554807**	64
WU-M-475/64-CW	**554802**	64

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

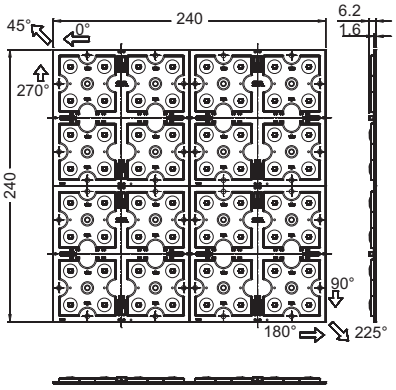
WU-M-444/B



WU-M-475/16



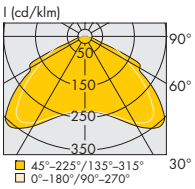
WU-M-475/64



LED Industrial Light Linear SYM II – IP20

Technical notes

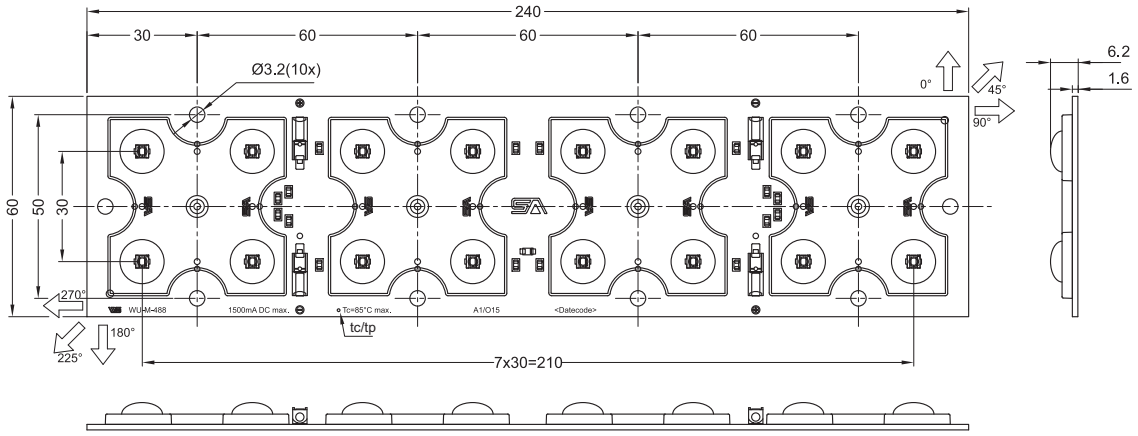
Dimensions (incl. optics) LxWxH
16 LEDs: 60 x 240 x 6,2 mm
Degree of protection: IP20/IK05*
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:2 (height to distance)



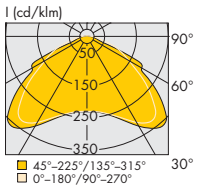
Type	**Ref. No.**	Number of LEDs
WU-M-488-WW	**on request**	16
WU-M-488-NW	**on request**	16
WU-M-488-CW	**556298**	16

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

WU-M-488 SYM II



LED Industrial Light SYM II – Water Protected



Technical notes

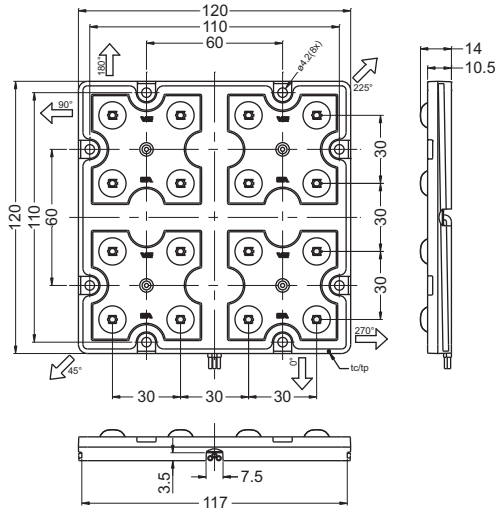
Dimensions (incl. optics) LxWxH
- 16 LEDs, square: 120 x 120 x 14 mm
- 16 LEDs, linear: 240 x 60 x 14 mm

Encapsulated for outdoor applications with degree of protection: IP66/IK05*
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Version with 3 leads (incl. PE lead) on request
Optics for hall lighting
Optimum illumination – installation ratio:
1:2 (height to distance)

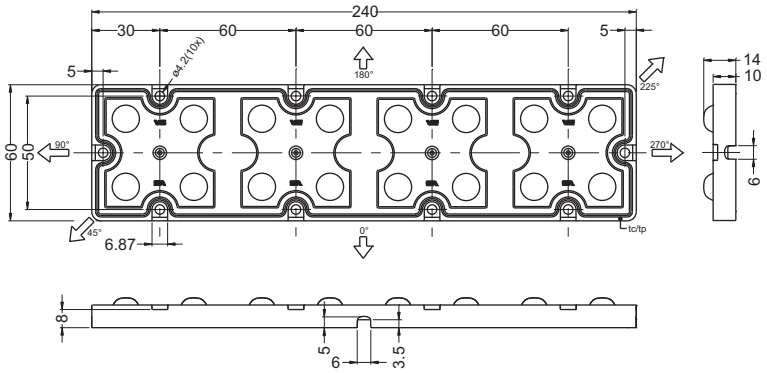
Type	Shape	**Ref. No.**	Number of LEDs
WU-M-425/B-WW	square	**554788**	16
WU-M-425/B-NW	square	**554783**	16
WU-M-425/B-CW	square	**553069**	16
WU-M-438/B-WW	linear	**556705**	16
WU-M-438/B-NW	linear	**556698**	16
WU-M-438/B-CW	linear	**553612**	16

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

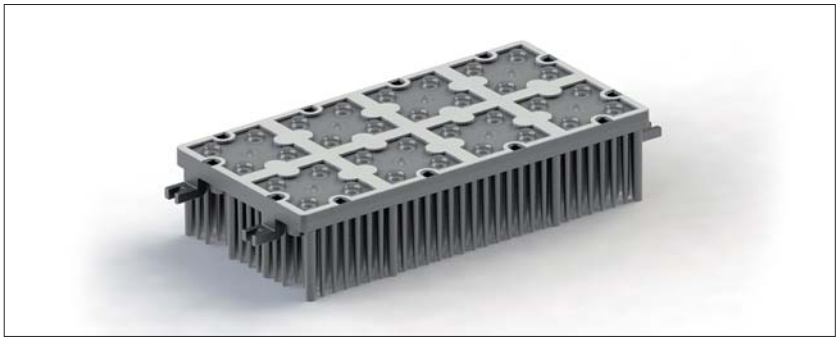
WU-M-425/B



WU-M-438/B

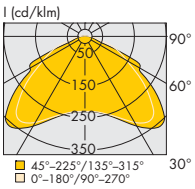


LED LightEngine SYM II – IP66



Technical notes

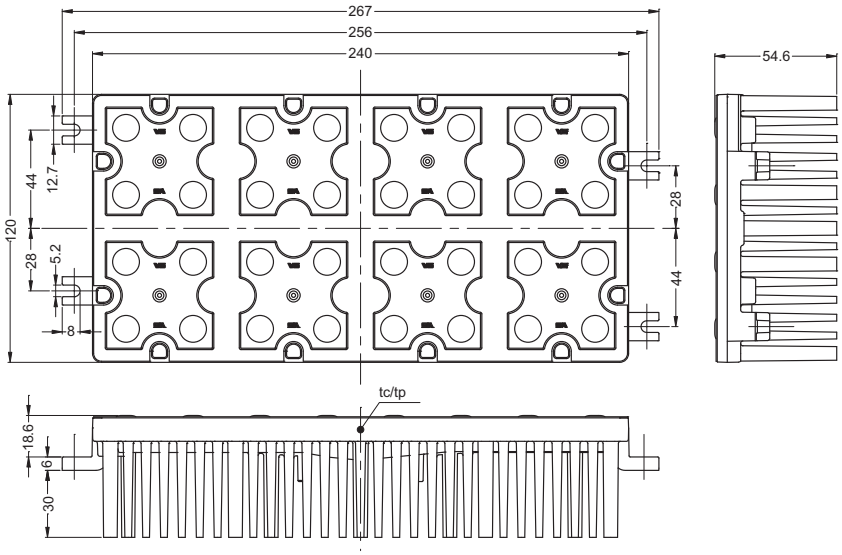
Dimensions (incl. optics) LxWxH
32 LEDs: 240 x 120 x 54,6 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05*
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for hall lighting
Optimum illumination – installation ratio:
1:2 (height to distance)



Type	**Ref. No.**	Number of LEDs
WU-M-496-WW-R70	**558181**	32
WU-M-496-NW-R70	**558180**	32
WU-M-496-CW-RNN	**558179**	32

* Degree of protection IP67/IK08 also possible by use of silicone optics; Ref. No. on request

WU-M-496 SYM II



LED Linear Allround Industrial and Hall Lighting

These LED modules are suitable for illuminating industrial, production, sports and warehouse facilities as well as for petrol stations (especially SYM II).

These Linear Allround modules were designed for built-in into luminaire casings. They enable an easy modular luminaire design with flexibility in system design.

The modules are available in three shapes (4, 8, or 16 LEDs) and in three white colour tones.

Typical applications

- Integration in outdoor luminaires
- Indoor lighting
- Industrial lighting for:
  - Production halls
  - Warehouses
- Petrol station lighting
- Lighting for sports facilities

Technical notes

LED built-in module for integration into luminaires
4, 8 or 16 high-efficient High Power LEDs
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant current driver
Design for optimum thermal management
Efficiency up to 136 lm/W
Lumen maintenance L70/B10:
52,000 hrs. (I_F 1050 mA) at t_p: 60 °C
ESD protection class 2
Surge protection: 4 kV

Optical characteristics

at t_p = 60 °C

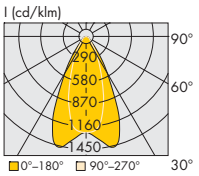
Type		Colour	Correlated colour temperature* K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})** 400 mA		700 mA		1050 mA		1400 mA		CRI***
				min.	typ.	min.	typ.	min.	typ.	min.	typ.	R_a
				P_{el} = 4.5 W		P_{el} = 8.4 W		P_{el} = 13.7 W		P_{el} = 19.3 W		
4 LEDs				$U_{typ.}$ = 11.3 V		$U_{typ.}$ = 12 V		$U_{typ.}$ = 13 V		$U_{typ.}$ = 13.8 V		
WU-M-479/4-...	WW	warm white	3000 -130/+220	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-479/4-...	NW	neutral white	4000 -290/+260	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-479/4-...	CW	cool white	5000 -255/+310	550	615	890	975	1225	1350	1550	1700	≥ 65
				P_{el} = 9 W		P_{el} = 16.8 W		P_{el} = 27.3 W		P_{el} = 38.6 W		
8 LEDs				$U_{typ.}$ = 22.6 V		$U_{typ.}$ = 24 V		$U_{typ.}$ = 26 V		$U_{typ.}$ = 27.6 V		
WU-M-479/8-...	WW	warm white	3000 -130/+220	1000	1130	1650	1840	2250	2480	2850	3150	≥ 70
WU-M-479/8-...	NW	neutral white	4000 -290/+260	1000	1130	1650	1840	2250	2480	2850	3150	≥ 70
WU-M-479/8-...	CW	cool white	5000 -255/+310	1100	1230	1780	1950	2450	2700	3100	3400	≥ 65
				P_{el} = 18.1 W		P_{el} = 33.6 W		P_{el} = 54.6 W		P_{el} = 77.3 W		
16 LEDs				$U_{typ.}$ = 45.2 V		$U_{typ.}$ = 48 V		$U_{typ.}$ = 52 V		$U_{typ.}$ = 55.2 V		
WU-M-479/16-...	WW	warm white	3000 -130/+220	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-479/16-...	NW	neutral white	4000 -290/+260	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-479/16-...	CW	cool white	5000 -255/+310	2200	2450	3550	3900	4900	5400	6200	6800	≥ 65

* 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.
** Production tolerance of voltage and power consumption: ± 10%; Measuring tolerance of luminous flux: ± 7%
*** CRI > 80 on request

SYM I Linear – Allround

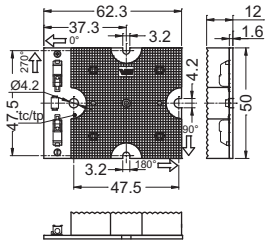
Technical notes

Dimensions (incl. optics) LxWxH
4 LEDs: 50x62,3x12 mm
8 LEDs: 50x113,2x12 mm
16 LEDs: 50x215x12 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:1 (height to distance) on the 0–180° layer (lengthwise) or 8:5 (height to distance) on the 90–270° layer (crosswise).

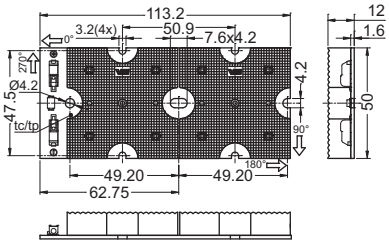


Type	Ref. No.	Number of LEDs
WU-M-479/4-WW	**on request**	4
WU-M-479/4-NW	**on request**	4
WU-M-479/4-CW	**on request**	4
WU-M-479/8-WW	**556267**	8
WU-M-479/8-NW	**556269**	8
WU-M-479/8-CW	**556270**	8
WU-M-479/16-WW	**556264**	16
WU-M-479/16-NW	**555399**	16
WU-M-479/16-CW	**556266**	16

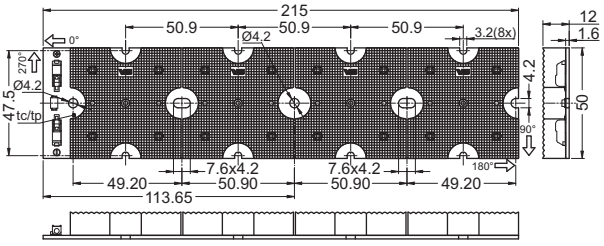
WU-M-479/4



WU-M-479/8



WU-M-479/16

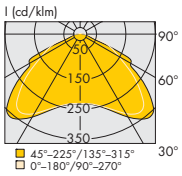


SYM II Linear – Allround

Technical notes

Dimensions (incl. optics) LxWxH
- 4 LEDs: 50x62,3x12 mm
- 8 LEDs: 50x113,2x12 mm
- 16 LEDs: 50x215x12 mm

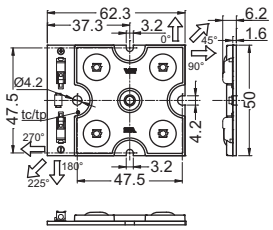
Degree of protection: IP20/IK05*
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:2 (height to distance)



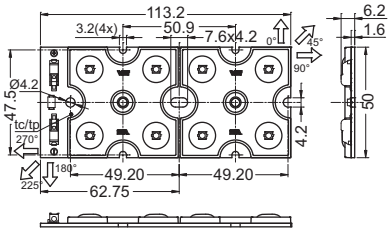
Type	Ref. No.	Number of LEDs
WU-M-479/4-WW	**on request**	4
WU-M-479/4-NW	**on request**	4
WU-M-479/4-CW	**on request**	4
WU-M-479/8-WW	**556274**	8
WU-M-479/8-NW	**556277**	8
WU-M-479/8-CW	**556278**	8
WU-M-479/16-WW	**556271**	16
WU-M-479/16-NW	**555479**	16
WU-M-479/16-CW	**556273**	16

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

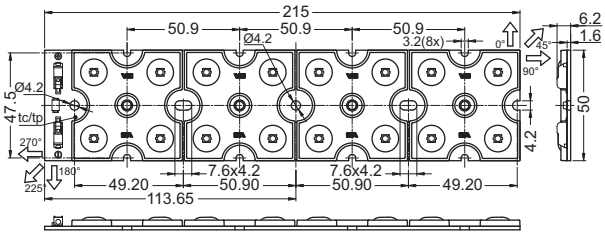
WU-M-479/4



WU-M-479/8



WU-M-479/16



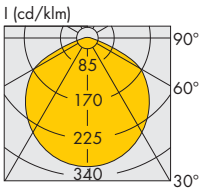
Industrial FlatEmitter SMD

Technical notes

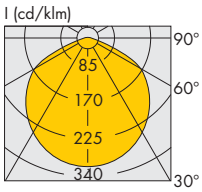
LED built-in module for integration into luminaires
Push-in terminals (WAGO series 2060)
LEDs on the module are serial connected
Reverse polarity protection
- up to 70 V at WU-M-452-12/B
- up to 100 V at WU-M-452-18/B
- up to 450 V at WU-M-433-xx/B

Dimensions (incl. optics) LxWxH
- 73.5 x 34 x 6 mm at WU-M-452-12/B
- 86 x 36.5 x 6 mm at WU-M-452-18/B
- 108 x 44 x 6 mm at WU-M-433-xx/B

ESD protection class 1
Surge protection: 3 kV
NTC-resistor (type: NCP18XH103J03RB) for external driver feedback of module temperature
- WU-M-452-xx/B: optional
- WU-M-433-xx/B: type NCP18xH103J03RB

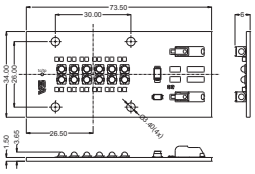


WU-M-452-xx/B

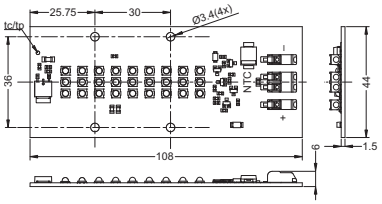


WU-M-433-xx/B

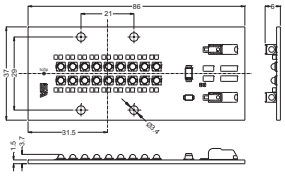
WU-M-452-12/B



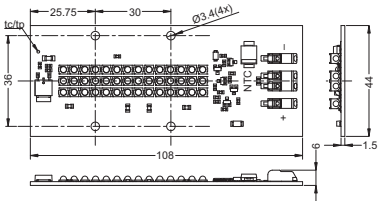
WU-M-433-27/B



WU-M-452-18/B



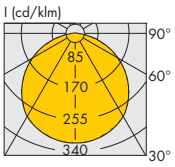
WU-M-433-42/B

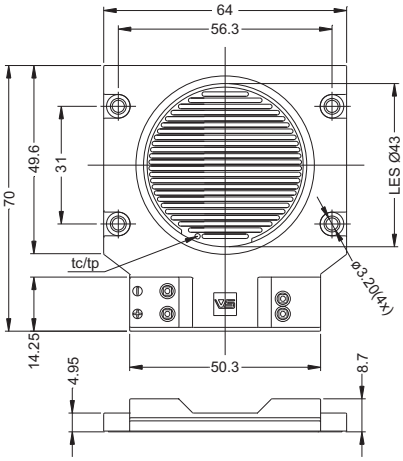


Type	Ref. No.	Number of LEDs pcs.	Colour	Correlated colour temperature (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 400 mA lm	400 mA lm/W	700 mA lm	700 mA lm/W	Typ. CRI R_a
LED modules with 12 LEDs					P_{el} = 13.8 W, $U_{typ.}$ = 34.4 V		P_{el} = 25.3 W, $U_{typ.}$ = 36.2 V		
WU-M-452-12/B-WW	**554820**	12	warm white	3000 -130/+220	1610	117	2565	101	> 80
WU-M-452-12/B-NW	**556214**	12	neutral white	4000 -300/+260	1740	126	2780	110	> 80
WU-M-452-12/B-CW	**556215**	12	cool white	5000 -255/+310	1780	129	2840	112	> 80
LED modules with 18 LEDs					P_{el} = 20.5 W, $U_{typ.}$ = 51.3 V		P_{el} = 37.8 W, $U_{typ.}$ = 54 V		
WU-M-452-18/B-WW	**554822**	18	warm white	3000 -130/+220	2410	118	3845	102	> 80
WU-M-452-18/B-NW	**556216**	18	neutral white	4000 -300/+260	2610	127	4165	110	> 80
WU-M-452-18/B-CW	**555786**	18	cool white	5000 -255/+310	2670	130	4260	113	> 80
LED modules with 27 LEDs					P_{el} = 30.9 W, $U_{typ.}$ = 77.2 V		P_{el} = 56.5 W, $U_{typ.}$ = 80.7 V		
WU-M-433-27/B-WW	**554816**	27	warm white	3000 -130/+220	3510	114	5595	99	> 80
WU-M-433-27/B-NW	**556217**	27	neutral white	4000 -300/+260	3800	123	6060	107	> 80
WU-M-433-27/B-CW	**556218**	27	cool white	5000 -255/+310	3885	126	6200	110	> 80
LED modules with 42 LEDs					P_{el} = 48 W, $U_{typ.}$ = 120 V		P_{el} = 87.7 W, $U_{typ.}$ = 125.3 V		
WU-M-433-42/B-WW	**554818**	42	warm white	3000 -130/+220	5455	114	8700	99	> 80
WU-M-433-42/B-NW	**556219**	42	neutral white	4000 -300/+260	5910	123	9430	107	> 80
WU-M-433-42/B-CW	**556220**	42	cool white	5000 -255/+310	6040	126	9640	110	> 80

Emission data at t_p = 65 °C | * Measuring tolerance of luminous flux: ± 7% | **Production tolerance of voltage and power consumption: +15/-19% at 400 mA and +12/-10% at 700 mA | Suitable thermal tapes for these LED modules see page 91.

LUGA Industrial 2014 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.

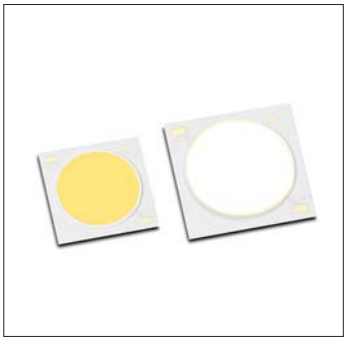
Technical notes
Dimensions (L x W x H): 64 x 70 x 8.7 mm
Push-in terminals (WAGO series 2060)
LED module is operated at high voltage (up to 140 V).
Safety must be considered acc. EN 60598
Allowed operating temperature at t_c point:
–40 to 85 °C
Efficiency up to 150 lm/W
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
NTC-resistor (type: NCP18XH103J03RB) for external driver feedback of module temperature
Lumen maintenance L90/B10:
45,000 hrs. (I_F 700 mA)
Unit: 12 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)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle (°)	Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
				P_{el} = 37.9 W $U_{typ.}$ = 108.4 V		P_{el} = 55.1 W $U_{typ.}$ = 110.3 V		P_{el} = 79.4 W $U_{typ.}$ = 113.4 V		P_{el} = 124.4 W $U_{typ.}$ = 118.5 V			
WU-M-467-830	**552167**	warm white	3000	5255	139	7000	127	9250	116	12800	103	120	85
WU-M-467-840	**552168**	neutral white	4000	5600	148	7450	135	9900	125	13600	109	120	85
WU-M-467-850	**552169**	cool white	5000	5675	150	7550	137	10050	127	13800	111	120	85

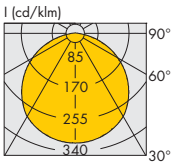
Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ± 10%
Min. CRI R_a: > 80 | Suitable thermal tapes for these LED modules see page 91.

LUGA C 2015 – 4000 lm to 15,000 lm

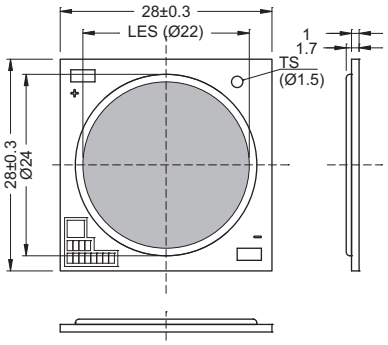


Built-in lighting modules
LUGA C modules with lumen values ranging from 4000 to 15,000 lm are especially designed as built-in module for industrial and outdoor lighting.

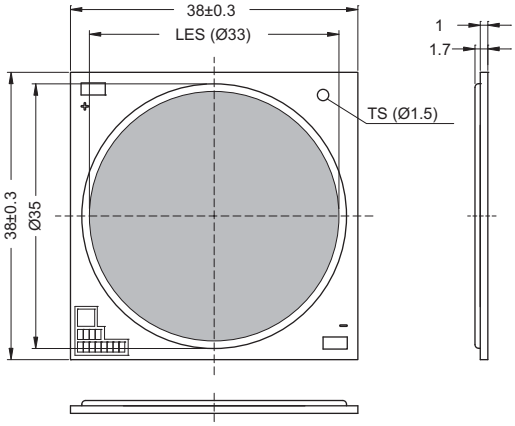
The wide range of variants (CRI 70/80) make them suitable for indoor as well as for street light applications.



DMC11C*E / DMC16C***E**



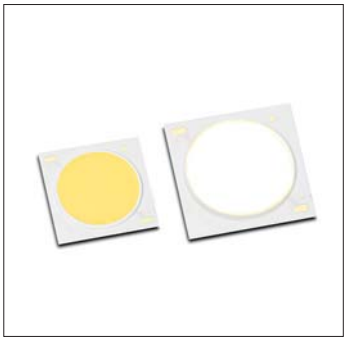
DMC17Q*E**



Technical notes
Dimensions
DMC11C***E / DMC16C***E: 28x28x1.7 mm
DMC17Q***E: 38x38x1.7 mm
Light emitting surface (LES)
DMC11C***E / DMC16C***E: Ø 22 mm
DMC17Q***E: Ø 33 mm
Allowed operating temperature at t_c point:
-40 to 85 °C
-40 to 80 °C (DMC11C: > 1400 mA and DMC17Q: >1700 mA)
-40 to 75 °C (DMC16C: > 1400 mA)
Use of external LED constant current driver
Efficiency up to 167 lm/W
Colour rendering index R_a: > 80 / > 65
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L90/B10
DMC11C: 45,000 hrs. (I_F 1050 mA)
DMC16C: 42,000 hrs. (I_F 1050 mA)
DMC17Q: 59,000 hrs. (I_F 1050 mA)
Unit:
100 pcs. (DMC11C/DMC16C)
75 pcs. (DMC17Q)

Typical applications
Integration in
- Reflector luminaires
- Flat surface-mounting luminaires
- Downlights
- Indoor and hall lighting
- Industrial lighting for:
  - Production halls
  - Warehouses
- Petrol station lighting
- Lighting for sports facilities

LUGA C 2015 – 4000 lm to 15,000 lm



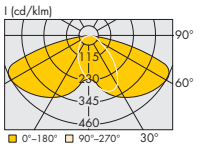
Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle	Typ. CRI R_a
				1050 mA		1400 mA		1700 mA		2100 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
				P_{el} = 33.7 W		P_{el} = 46.3 W		P_{el} = 57.8 W					
DMC11C*E**				$U_{typ.}$ = 32.1 V		$U_{typ.}$ = 33.1 V		$U_{typ.}$ = 34 V					
DMC11CC27E	**557642**	warm white	2700	3900	116	4815	104	5425	94	–	–	120	82
DMC11CC30E	**556884**	warm white	3000	4155	123	5125	111	5775	100	–	–	120	85
DMC11CC35E	**on request**	neutral white	3500	4350	129	5380	116	6060	105	–	–	120	85
DMC11CC40E	**556869**	neutral white	4000	4465	132	5515	119	6210	107	–	–	120	85
DMC11CB40E	**557239**	neutral white	4000	4755	141	5870	127	6625	115	–	–	120	70
DMC11CC50E	**556870**	cool white	5000	4515	134	5590	121	6290	109	–	–	120	85
DMC11CB50E	**557186**	cool white	5000	5065	150	6270	135	7045	122	–	–	120	70
				P_{el} = 48.6 W		P_{el} = 66.9 W		P_{el} = 83.1 W					
DMC16C*E**				$U_{typ.}$ = 46.3 V		$U_{typ.}$ = 47.8 V		$U_{typ.}$ = 48.9 V					
DMC16CC30E	**556885**	warm white	3000	5810	120	7135	107	8030	97	–	–	120	85
DMC16CC40E	**556871**	neutral white	4000	6215	128	7635	114	8590	103	–	–	120	85
DMC16CB40E	**557240**	neutral white	4000	6630	136	8160	122	9175	110	–	–	120	70
DMC16CC50E	**556872**	cool white	5000	6295	130	7750	116	8695	105	–	–	120	85
DMC16CB50E	**557081**	cool white	5000	7110	146	8735	131	9825	118	–	–	120	70
				P_{el} = 49.1 W		P_{el} = 66.8 W		P_{el} = 82.6 W		P_{el} = 104 W			
DMC17Q*E**				$U_{typ.}$ = 46.8 V		$U_{typ.}$ = 47.7 V		$U_{typ.}$ = 48.6 V		$U_{typ.}$ = 49.5 V			
DMC17QC30E	**556886**	warm white	3000	7035	143	8945	134	10420	126	12085	116	120	85
DMC17QC40E	**556873**	neutral white	4000	7255	148	9225	138	10740	130	12465	120	120	85
DMC17QB40E	**557241**	neutral white	4000	7695	157	9795	147	11405	138	13230	127	120	70
DMC17QC50E	**556874**	cool white	5000	7395	151	9405	141	10955	133	12690	122	120	85
DMC17QB50E	**557082**	cool white	5000	8190	167	10405	156	12120	147	14075	135	120	70

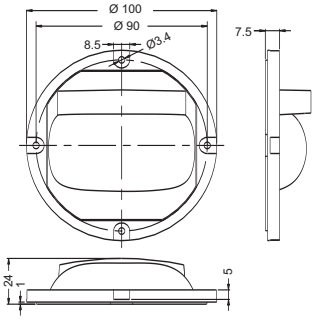
Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 15%; of voltage and power consumption: ± 10% | Min. CRI R_a: > 80 / > 65

Optics for Street Lighting

COB silicone optics M-Class (M1)

M-Class silicone optics especially designed and optimized for the use of COB modules with LES sizes up to 23 mm. (e.g. LUGA C, DMC11C***E and DMC16C***E)
Material: silicone
Optical efficiency: 93%
Self sealing ability (IP65)
Optimum illumination – installation ratio: 4:1 (pole distance to pole height)
Ref. No.: 559042 optics
Ref. No.: 558607 support





LED Street and Outdoor Lighting – M-Class, S-Class, Area

These LED modules are suitable for standard-compliant street lighting, paths and squares in accordance with EN 13201.

These modules were designed for built-in into luminaire casings. They enable a modular luminaire design.

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

The modules are available in four shapes (4, 16, 32 or 64 LEDs) and in three white colour tones.

Technical notes

LED built-in module for integration into luminaires
4, 16, 32 or 64 high-efficient High Power LEDs
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant current driver
Design for optimum thermal management
Efficiency up to 136 lm/W
Colour rendering index R_a: > 70 or > 80
Lumen maintenance L70/B10:
52,000 hrs. (I_F 1050 mA) at t_p 60 °C
Surge protection: 4 kV
ESD protection class 2

Typical Applications

- Integration in luminaires
- Streetlighting for ME- and S-classes (acc. to EN 13201)
- Illumination of public places

LED Street and Outdoor Lighting – M-Class, S-Class, Area

Optical Characteristics

at t_p = 60 °C

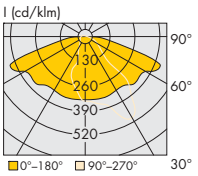
Type				Colour	Correlated colour temperature*	Luminous flux (lm) and typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								CRI***
IP20	IP66 (IP67) square	IP66 (IP67) linear			K	400 mA min.	400 mA typ.	700 mA min.	700 mA typ.	1050 mA min.	1050 mA typ.	1400 mA min.	1400 mA typ.	R_a
4 LEDs						P_{el} = 4.5 W $U_{typ.}$ = 11.3 V		P_{el} = 8.4 W $U_{typ.}$ = 12 V		P_{el} = 13.7 W $U_{typ.}$ = 13 V		P_{el} = 19.3 W $U_{typ.}$ = 13.8 V		
WU-M-444/B-..	–	–	WW	warm white	3000 -130/+220	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-444/B-..	–	–	NW	neutral white	4000 -290/+260	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-444/B-..	–	–	CW	cool white	5000 -255/+310	550	615	890	975	1225	1350	1550	1700	≥ 65
16 LEDs						P_{el} = 18 W $U_{typ.}$ = 45 V		P_{el} = 33.6 W $U_{typ.}$ = 48 V		P_{el} = 54.6 W $U_{typ.}$ = 52 V		P_{el} = 77 W $U_{typ.}$ = 55 V		
WU-M-475/16-..	WU-M-425/B-..	WU-M-438/B-..	WW	warm white	3000 -130/+220	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-475/16-..	WU-M-425/B-..	WU-M-438/B-..	NW	neutral white	4000 -290/+260	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-475/16-..	WU-M-425/B-..	WU-M-438/B-..	CW	cool white	5000 -255/+310	2200	2450	3550	3900	4900	5400	6200	6800	≥ 65
WU-M-488	–	–	WW	warm white	3000 -130/+220	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-488	–	–	NW	neutral white	4000 -290/+260	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-488	–	–	CW	cool white	5000 -255/+310	2200	2450	3550	3900	4900	5400	6200	6800	≥ 65
32 LEDs						P_{el} = 36 W $U_{typ.}$ = 90 V		P_{el} = 67.2 W $U_{typ.}$ = 96 V		P_{el} = 109.2 W $U_{typ.}$ = 104 V		– –		
–	–	WU-M-496-	WW	warm white	3000 -130/+220	4000	4500	6600	7200	9000	9900	–	–	≥ 70
–	–	WU-M-496-	NW	neutral white	4000 -290/+260	4000	4500	6600	7200	9000	9900	–	–	≥ 70
–	–	WU-M-496-	CW	cool white	5000 -255/+310	4400	4900	7100	7800	9800	10800	–	–	≥ 65
64 LEDs						P_{el} = 72 W $U_{typ.}$ = 180 V		P_{el} = 134.4 W $U_{typ.}$ = 192 V		P_{el} = 218.4 W $U_{typ.}$ = 208 V		P_{el} = 308 W $U_{typ.}$ = 220 V		
WU-M-475/64-..	–	–	WW	warm white	3000 -130/+220	8000	9000	13200	14400	18000	19800	22800	25200	≥ 70
WU-M-475/64-..	–	–	NW	neutral white	4000 -290/+260	8000	9000	13200	14400	18000	19800	22800	25200	≥ 70
WU-M-475/64-..	–	–	CW	cool white	5000 -255/+310	8800	9800	14200	15600	19600	21600	24800	27200	≥ 65

* 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.
** Production tolerance of voltage and power consumption: ± 10%; Measuring tolerance of luminous flux: ± 7%
*** CRI > 80 on request

LED Roadway Light M-Class – IP20

Technical notes

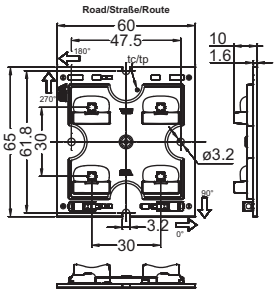
Dimensions (incl. optics) LxWxH
4 LEDs: 60 x 65 x10 mm
16 LEDs: 120 x120 x10 mm
64 LEDs: 240 x 240 x10 mm
Degree of protection: IP20/IK05*
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole)



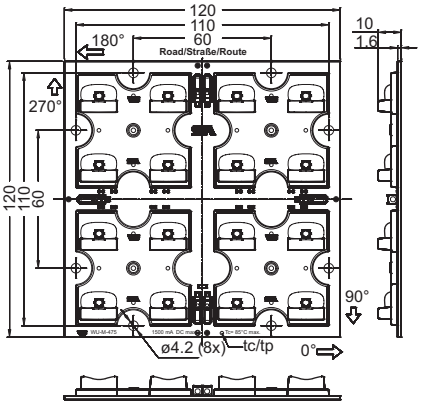
Type	Ref. No.	Number of LEDs
WU-M-444/B-WW-R70	**554901**	4
WU-M-444/B-NW	**553927**	4
WU-M-444/B-CW	**553926**	4
WU-M-475/16-WW-R70	**556227**	16
WU-M-475/16-NW	**553908**	16
WU-M-475/16-CW	**553907**	16
WU-M-475/64-WW-R70	**556228**	64
WU-M-475/64-NW	**554804**	64
WU-M-475/64-CW	**554022**	64

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

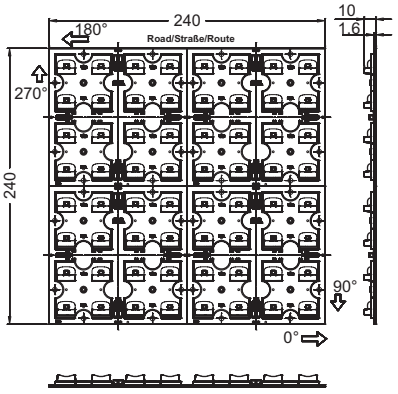
WU-M-444/B



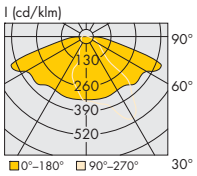
WU-M-475/16



WU-M-475/64



LED Roadway Light Linear M-Class – IP20



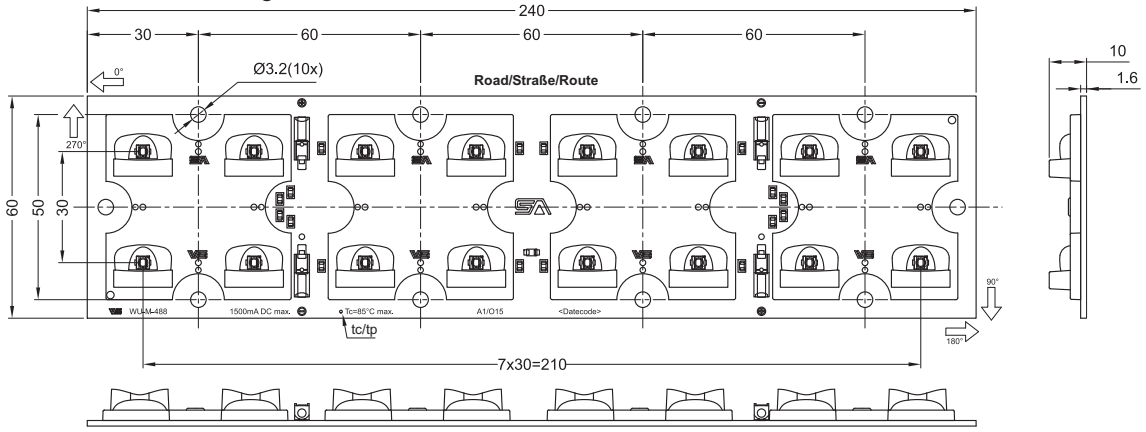
Technical notes

Dimensions (incl. optics) LxWxH
16 LEDs: 60x240x10 mm
Degree of protection: IP20/IK05*
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole)

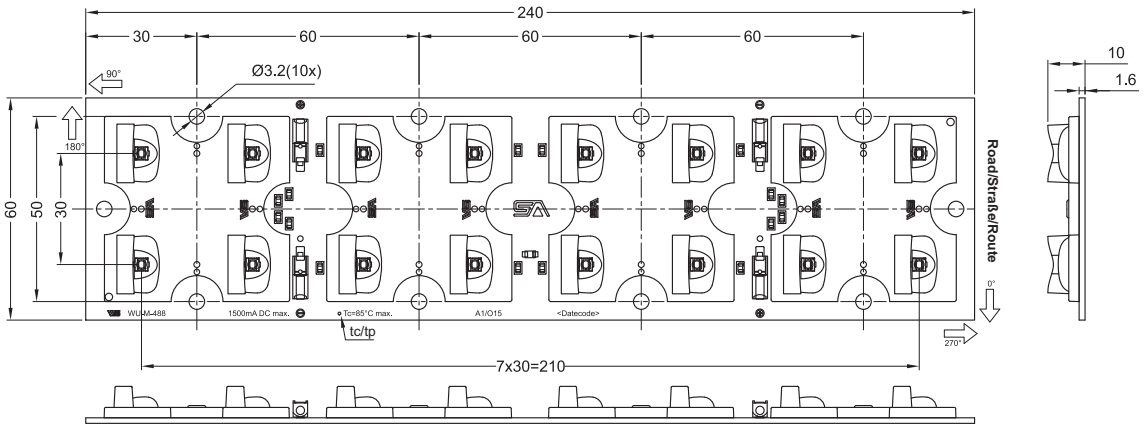
Type	Ref. No.	
	lengthwise	crosswise
WU-M-488-WW	**on request**	**on request**
WU-M-488-NW	**556571**	**556493**
WU-M-488-CW	**556293**	**556292**

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

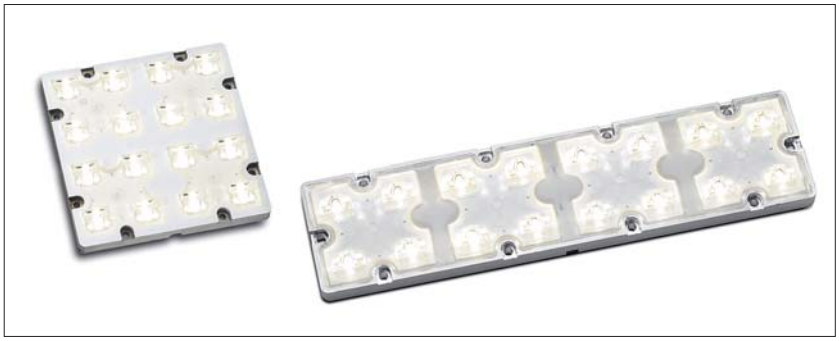
WU-M-488 M-Class – lengthwise

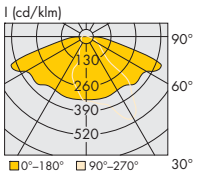


WU-M-488 M-Class – crosswise



LED Roadway Light M-Class – Water Protected





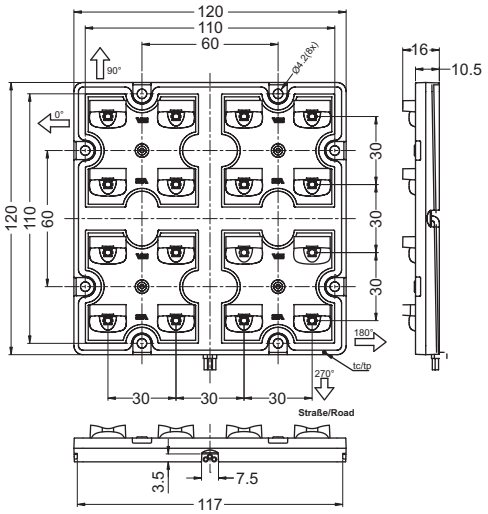
Technical notes

Dimensions (incl. optics) LxWxH
16 LEDs, square: 120 x 120 x 16 mm
16 LEDs, linear: 240 x 60 x 16 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05*
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Version with 3 leads (incl. PE lead) on request
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole)

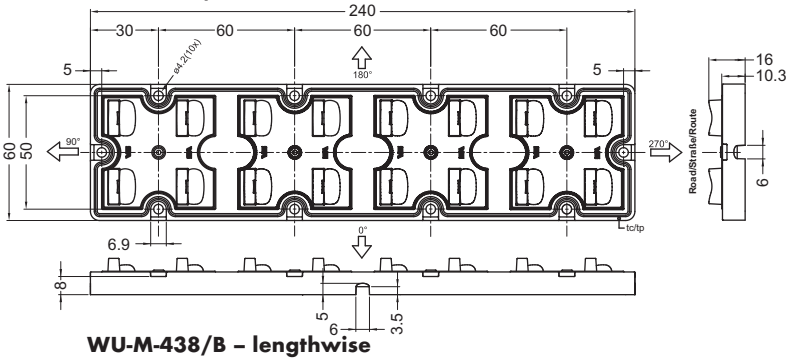
Type Optics direction	Shape	**Ref. No.** lengthwise	 crosswise
WU-M-425/B-WW	square	**554784**	**–**
WU-M-425/B-NW	square	**554409**	**–**
WU-M-425/B-CW	square	**553067**	**–**
WU-M-438/B-WW	linear	**556699**	**556700**
WU-M-438/B-NW	linear	**554797**	**554798**
WU-M-438/B-CW	linear	**554789**	**554790**

* Degree of protection IP67/IK08 also possible by use of silicone optics; Ref. No. on request

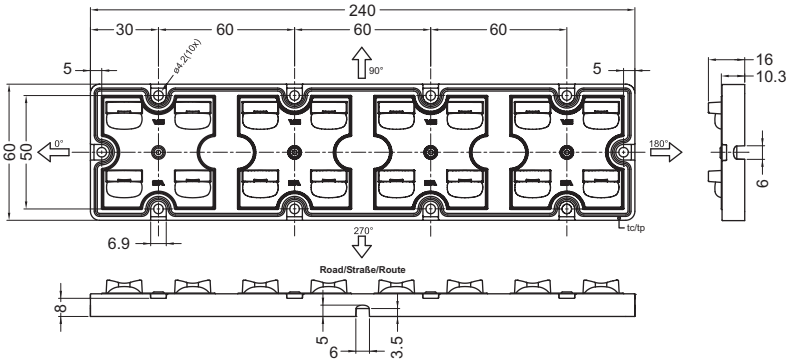
WU-M-425/B



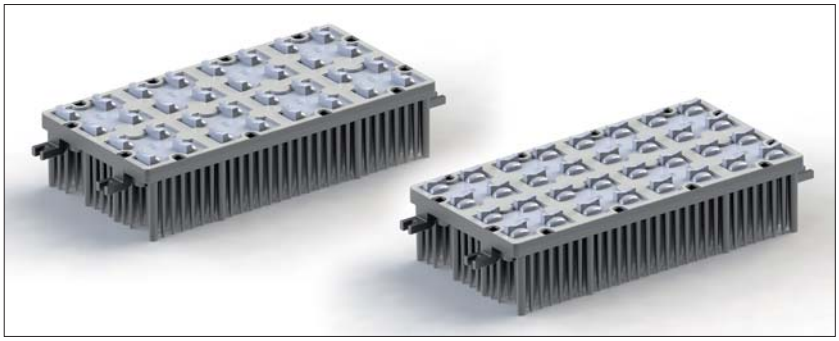
WU-M-438/B – crosswise



WU-M-438/B – lengthwise

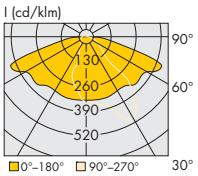


LED LightEngine M-Class – IP66



Technical notes

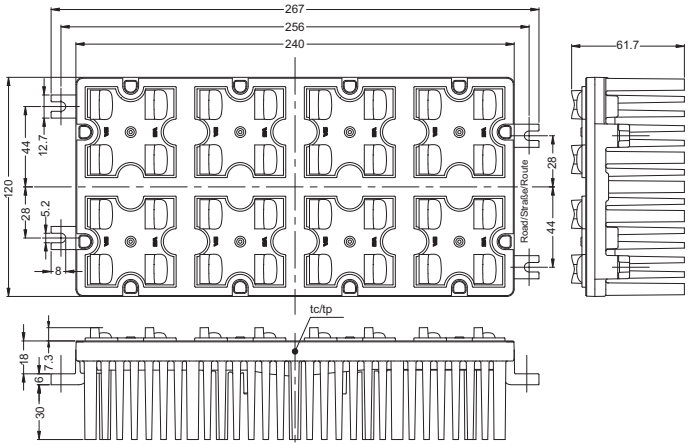
Dimensions (incl. optics) LxWxH
32 LED: 240x120x61.7 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05*
Pre-assembled leads:
2 leads: + (red); - (blue)
for luminaires of protection class II, length: 500 mm
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole)



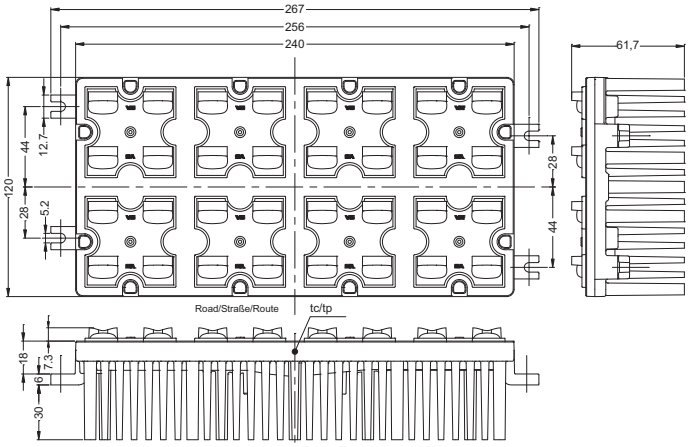
Type Optics direction	Ref. No. lengthwise	 crosswise
WU-M-496-WW-R70	**558166**	**557138**
WU-M-496-NW-R70	**557140**	**557137**
WU-M-496-CW-RNN	**557139**	**557136**

* Degree of protection IP67/IK08 also possible by use of silicone optics; Ref. No. on request

WU-M-496 M-Class – crosswise



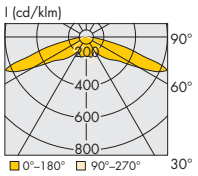
WU-M-496 M-Class – lengthwise



LED Roadway Light S-Class – IP20

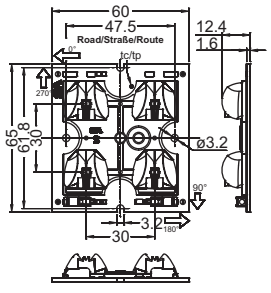
Technical notes

Dimensions (incl. optics) LxWxH
4 LEDs: 60 x 65 x12.4 mm
16 LEDs: 120 x120 x12.4 mm
64 LEDs: 240 x 240 x12.4 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 7.5:1 (distance between luminaire poles to the height of the luminaire pole)

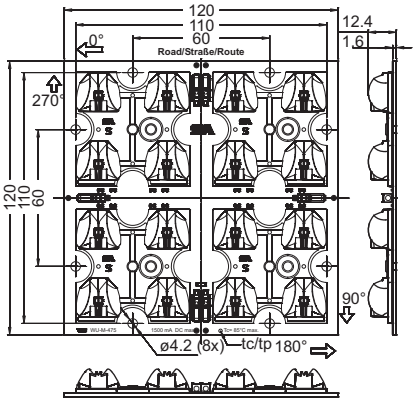


Type	**Ref. No.**	Number of LEDs
WU-M-444/B-WW	**556229**	4
WU-M-444/B-NW	**553930**	4
WU-M-444/B-CW	**553929**	4
WU-M-475/16-WW	**556230**	16
WU-M-475/16-NW	**553912**	16
WU-M-475/16-CW	**553911**	16
WU-M-475/64-WW	**556231**	64
WU-M-475/64-NW	**554805**	64
WU-M-475/64-CW	**556706**	64

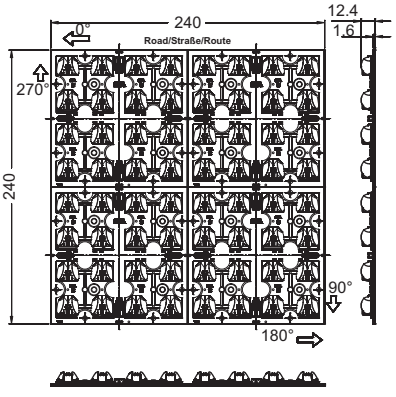
WU-M-444/B



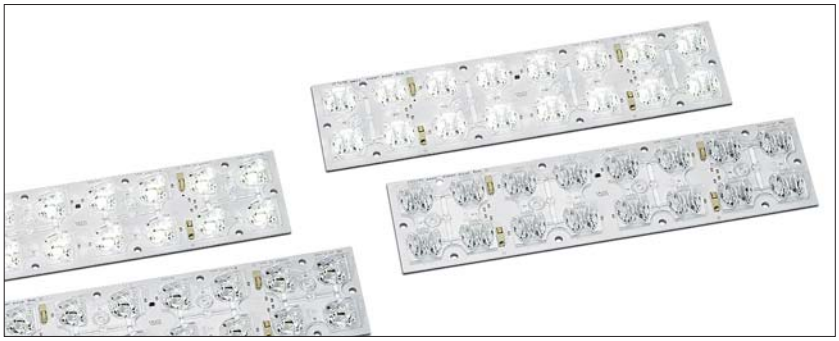
WU-M-475/16

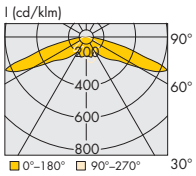


WU-M-475/64



LED Roadway Light Linear S-Class – IP20



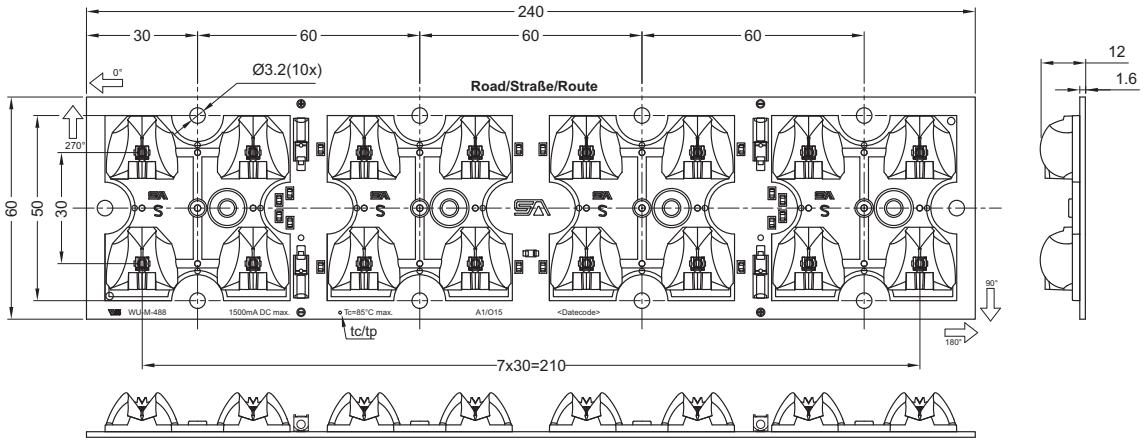


Technical notes

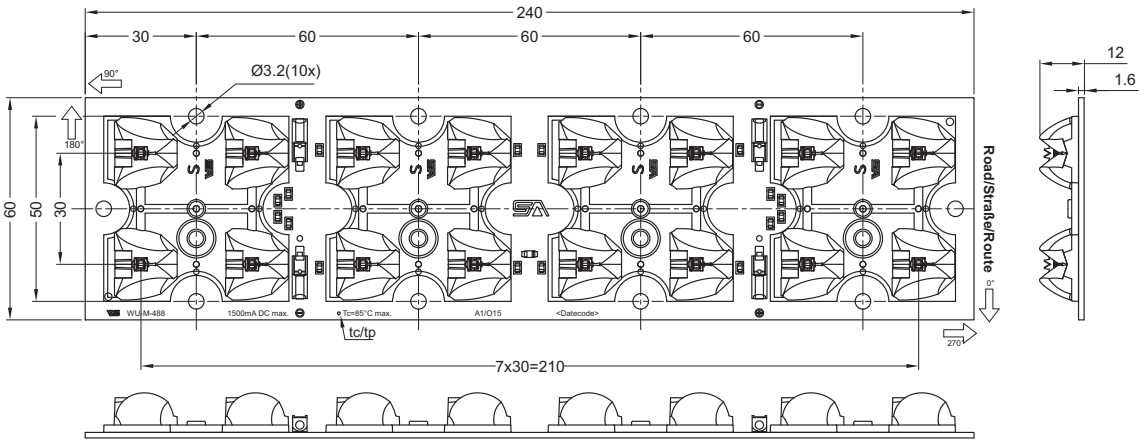
Dimensions (incl. optics) LxWxH
16 LEDs: 60 x 240x12,4 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 7.5:1 (distance between luminaire poles to the height of the luminaire pole)

Type	Ref. No.	
	lengthwise	crosswise
WU-M-488-WW	**on request**	**on request**
WU-M-488-NW	**on request**	**on request**
WU-M-488-CW	**556295**	**556294**

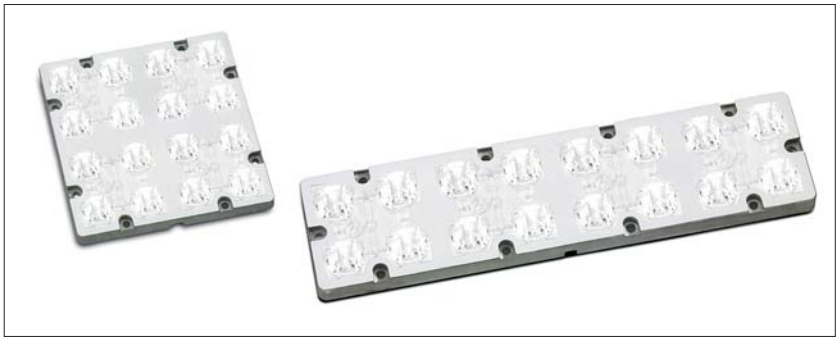
WU-M-488 S-Class – lengthwise

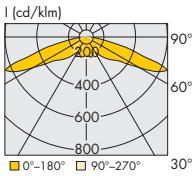


WU-M-488 S-Class – crosswise



LED Roadway Light S-Class – Water Protected



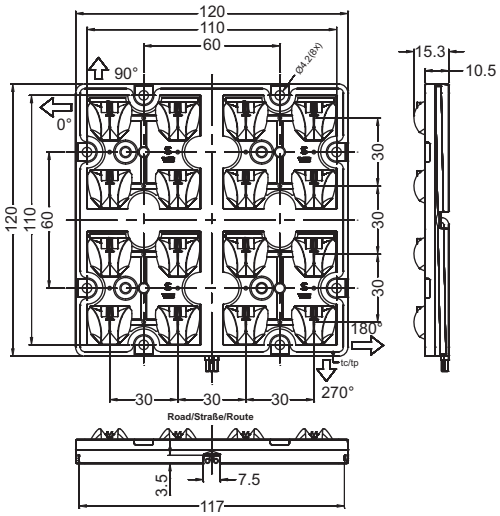


Technical notes

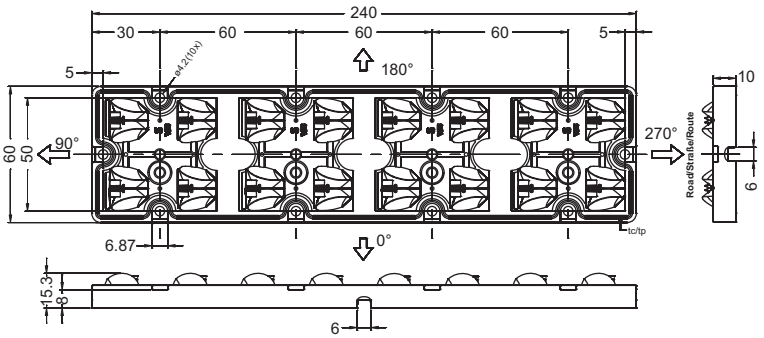
Dimensions (incl. optics) LxWxH
16 LEDs, square: 120 x 120 x 18.4 mm
16 LEDs, linear: 240 x 60 x 18.4 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Version with 3 leads (incl. PE lead) on request
Optics for illumination of streets with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 7.5:1 (distance between luminaire poles to the height of the luminaire pole)

Type Optics direction	Shape	**Ref. No.** lengthwise	 crosswise
WU-M-425/B-WW	square	**554785**	**—**
WU-M-425/B-NW	square	**554780**	**—**
WU-M-425/B-CW	square	**554300**	**—**
WU-M-438/B-WW	linear	**556701**	**556702**
WU-M-438/B-NW	linear	**554799**	**556695**
WU-M-438/B-CW	linear	**554792**	**554793**

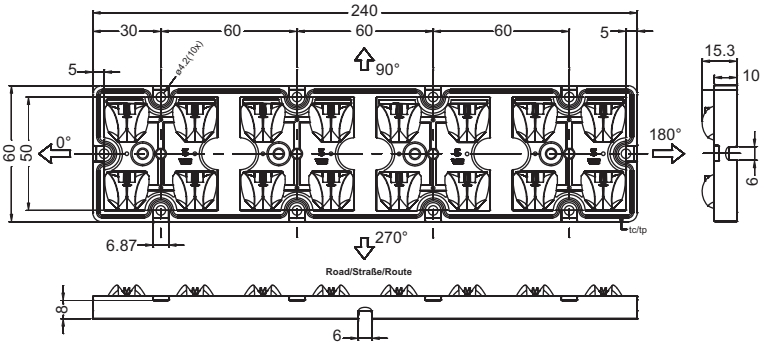
WU-M-425/B



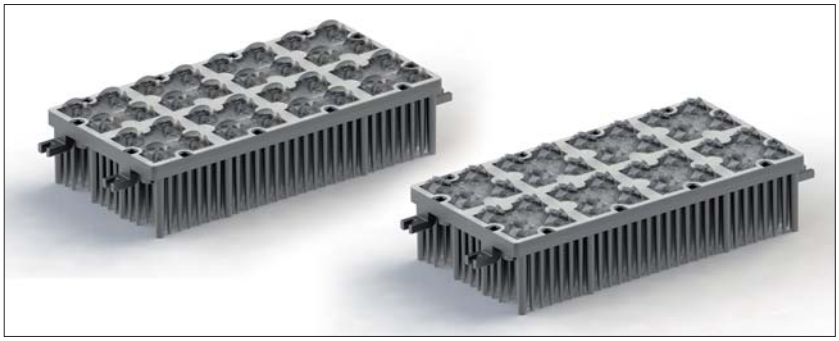
WU-M-438/B – crosswise



WU-M-438/B – lengthwise

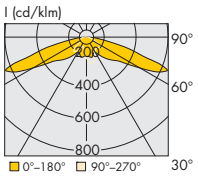


LED LightEngine S-Class – IP66



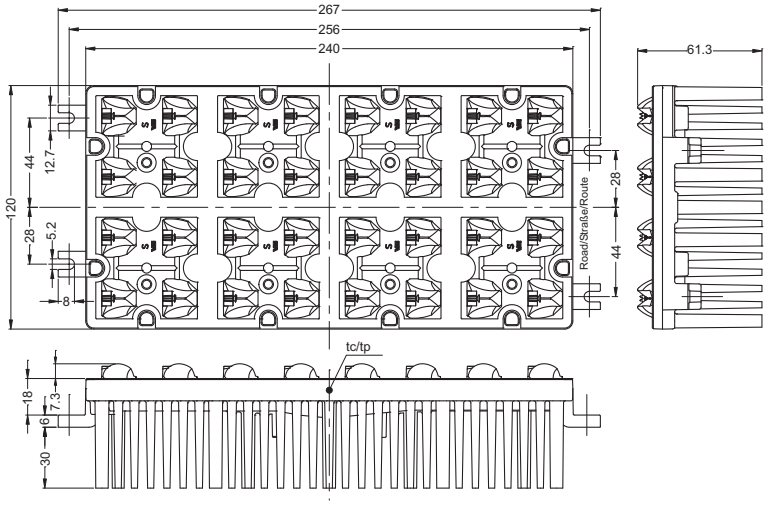
Technical notes

Dimensions (incl. optics) LxWxH
32 LEDs: 240x120x61,3 mm
Encapsulated for outdoor applications with degree of protection (in preparation): IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for illumination of streets with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 7.5:1 (distance between luminaire poles to the height of the luminaire pole)

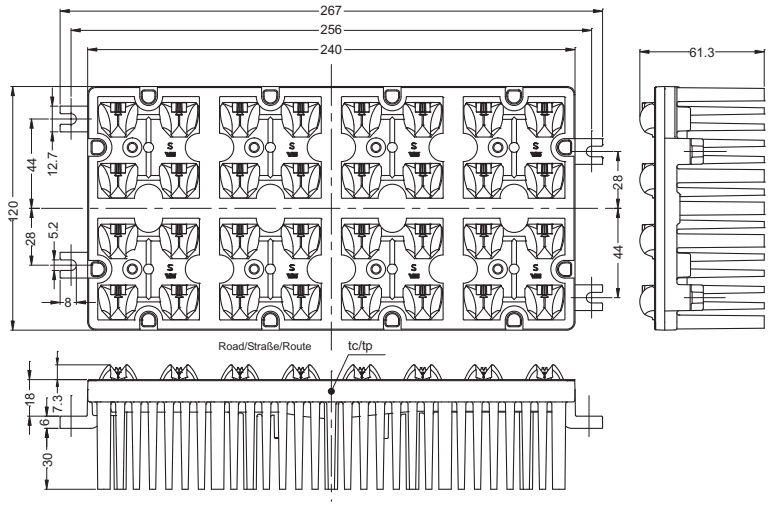


Type Optics direction	Ref. No. lengthwise	 crosswise
WU-M-496-WW-R70	**558172**	**558169**
WU-M-496-NW-R70	**558171**	**558168**
WU-M-496-CW-RNN	**558170**	**558167**

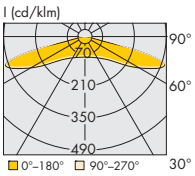
WU-M-496 S-Class – crosswise



WU-M-496 S-Class – lengthwise



LED Roadway Light Area – IP20

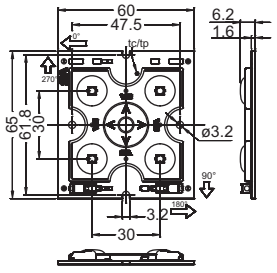


Technical notes

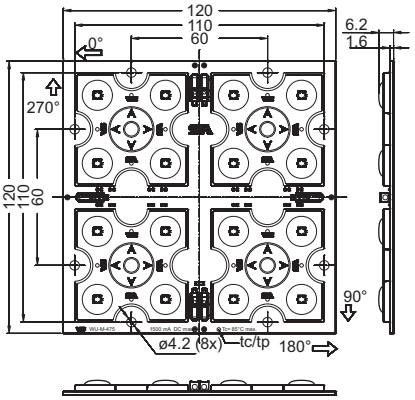
Dimensions (incl. optics) LxWxH
4 LEDs: 60 x 65 x 6.2 mm
16 LEDs: 120 x120 x 6.2 mm
64 LEDs: 240 x 240 x 6.2 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for illumination of public places
Optimum illumination – installation ratio: 5.5:1 (distance between luminaire poles to the height of the luminaire pole)

Type	**Ref. No.**	Number of LEDs
WU-M-444/B-WW	**556232**	4
WU-M-444/B-NW	**553939**	4
WU-M-444/B-CW	**553938**	4
WU-M-475/16-WW	**556233**	16
WU-M-475/16-NW	**553921**	16
WU-M-475/16-CW	**553920**	16
WU-M-475/64-WW	**556234**	64
WU-M-475/64-NW	**554808**	64
WU-M-475/64-CW	**554803**	64

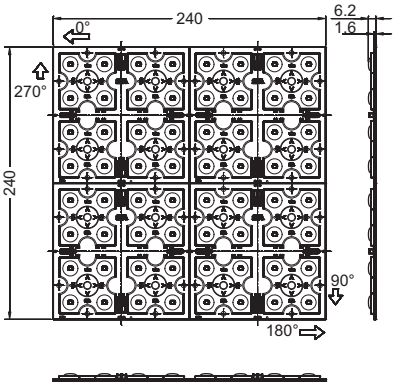
WU-M-444/B



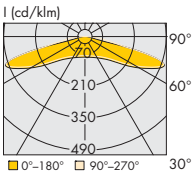
WU-M-475/16



WU-M-475/64



LED Roadway Light Linear Area – IP20

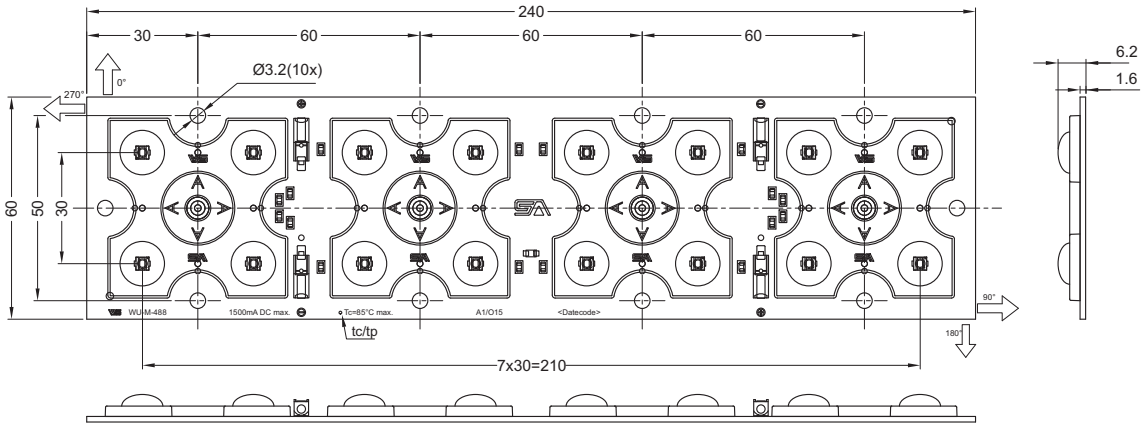


Technical notes

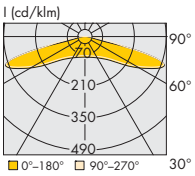
Dimensions (incl. optics) LxWxH
16 LEDs: 60 x 240x6.2 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for illumination of public places
Optimum illumination – installation ratio: 5.5:1 (distance between luminaire poles to the height of the luminaire pole)

Type	Ref. No.
WU-M-488-WW	**on request**
WU-M-488-NW	**on request**
WU-M-488-CW	**556296**

WU-M-488 Area



LED Roadway Light Area – Water Protected

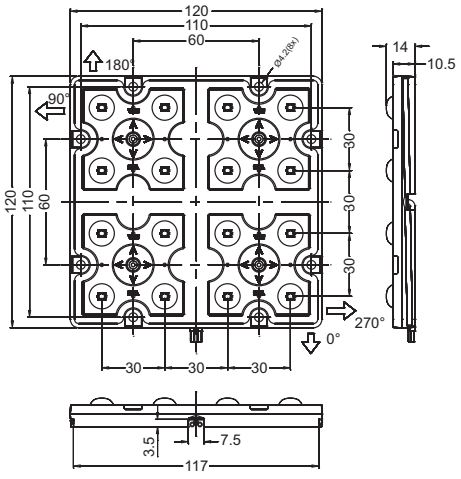


Technical notes

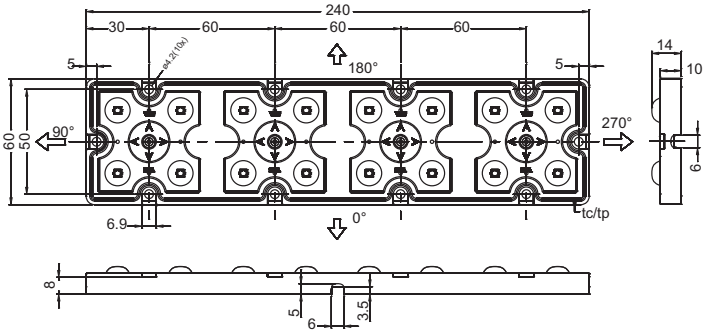
Dimensions (incl. optics) LxWxH
16 LEDs, square: 120 x 120 x 12.2 mm
16 LEDs, linear: 240 x 60 x 12.2 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Version with 3 leads (incl. PE lead) on request
Optics for illumination of public places
Optimum illumination – installation ratio:
5.5:1 (distance between luminaire poles to the height of the luminaire pole).

Type	Shape	**Ref. No.**
WU-M-425/B-WW	square	**554786**
WU-M-425/B-NW	square	**554781**
WU-M-425/B-CW	square	**554410**
WU-M-438/B-WW	linear	**556703**
WU-M-438/B-NW	linear	**556696**
WU-M-438/B-CW	linear	**554794**

WU-M-425/B



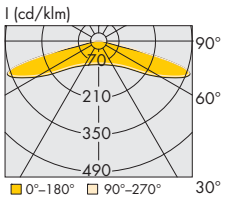
WU-M-438/B



LED LightEngine Area – IP66

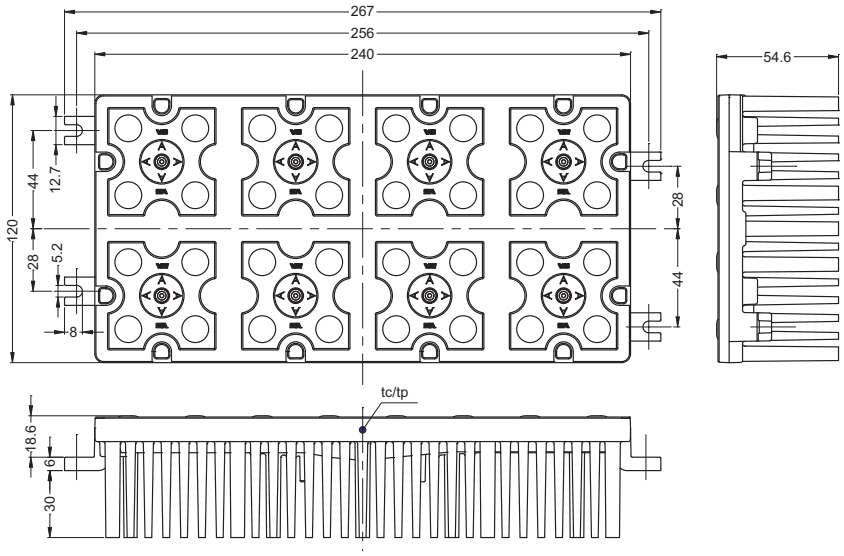
Technical notes

Dimensions (incl. optics) LxWxH
32 LEDs: 240 x 120 x 54.6 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for illumination of public places
Optimum illumination – installation ratio:
5.5:1 (distance between luminaire poles to the height of the luminaire pole).



Type	Ref. No.
WU-M-496-WW-R70	**558175**
WU-M-496-NW-R70	**558174**
WU-M-496-CW-RNN	**558173**

WU-M-496 Area



LED Linear Allround Street & Outdoor

These LED modules are suitable for standard-compliant street lighting, paths and squares in accordance with EN 13201.

These Linear Allround modules were designed for built-in into luminaire casings. They enable an easy modular luminaire design with flexibility in system design.

Technical notes

LED built-in module for integration into luminaires
4, 16, 32 or 64 high-efficient High Power LEDs
Allowed operating temperature at t_c point
at I_F = 700 mA: –20 to 85 °C
Use of external LED constant current driver
Design for optimum thermal management
efficiency up to 136 lm/W
Lumen maintenancen L70/B10:
52,000 hrs. (I_F 1050 mA) at t_p 60 °C
ESD protection class 2
Surge protection: 4 kV

Typical Applications

- Integration in luminaires
- Streetlighting for ME- and S-Classes
- (acc. to EN 13201)
- Illumination of public places

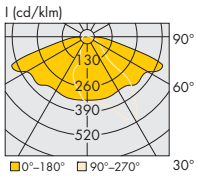
Optische Betriebsdaten

bei t_p = 60 °C

Type		Colour	Correlated colour temperatur* K	Luminous flux (lm) and typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 400 mA min.	typ.	700 mA min.	typ.	1050 mA min.	typ.	1400 mA min.	typ.	CRI*** R_a
4 LEDs				P_{el} = 4.5 W $U_{typ.}$ = 11.3 V		P_{el} = 8.4 W $U_{typ.}$ = 12 V		P_{el} = 13.7 W $U_{typ.}$ = 13 V		P_{el} = 19.3 W $U_{typ.}$ = 13.8 V		
WU-M-479/4-...	WW	warm white	3000 -130/+220	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-479/4-...	NW	neutral white	4000 -290/+260	500	565	825	920	1125	1240	1425	1575	≥ 70
WU-M-479/4-...	CW	cool white	5000 -255/+310	550	615	890	975	1225	1350	1550	1700	≥ 65
8 LEDs				P_{el} = 9 W $U_{typ.}$ = 22.6 V		P_{el} = 16.8 W $U_{typ.}$ = 24 V		P_{el} = 27.3 W $U_{typ.}$ = 26 V		P_{el} = 38.6 W $U_{typ.}$ = 27.6 V		
WU-M-479/8-...	WW	warm white	3000 -130/+220	1000	1130	1650	1840	2250	2480	2850	3150	≥ 70
WU-M-479/8-...	NW	neutral white	4000 -290/+260	1000	1130	1650	1840	2250	2480	2850	3150	≥ 70
WU-M-479/8-...	CW	cool white	5000 -255/+310	1100	1230	1780	1950	2450	2700	3100	3400	≥ 65
16 LEDs				P_{el} = 18.1 W $U_{typ.}$ = 45.2 V		P_{el} = 33.6 W $U_{typ.}$ = 48 V		P_{el} = 54.6 W $U_{typ.}$ = 52 V		P_{el} = 77.3 W $U_{typ.}$ = 55.2 V		
WU-M-479/16-...	WW	warm white	3000 -130/+220	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-479/16-...	NW	neutral white	4000 -290/+260	2000	2250	3300	3600	4500	4950	5700	6300	≥ 70
WU-M-479/16-...	CW	cool white	5000 -255/+310	2200	2450	3550	3900	4900	5400	6200	6800	≥ 65

* 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.
** Production tolerance of voltage and power consumption: ± 10% | Measuring tolerance of luminous flux: ± 7%
*** CRI > 80 on request

M-Class Linear – Allround



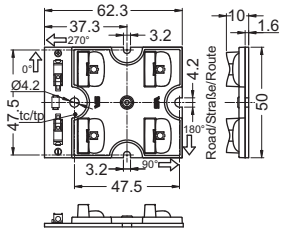
Technical notes

Dimensions (incl. optics) LxWxH
4 LEDs: 50x62.3x10 mm
8 LEDs: 50x113.2x10 mm
16 LEDs: 50x215x10 mm
Degree of protection: IP20/IK05*
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole).

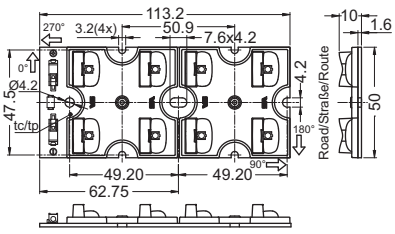
Type	Ref. No.		Number of LEDs
	lengthwise	crosswise	
WU-M-479/4-WW	**on request**	**on request**	4
WU-M-479/4-NW	**on request**	**on request**	4
WU-M-479/4-CW	**on request**	**on request**	4
WU-M-479/8-WW	**on request**	**556252**	8
WU-M-479/8-NW	**556962**	**554191**	8
WU-M-479/8-CW	**on request**	**554192**	8
WU-M-479/16-WW	**556567**	**556251**	16
WU-M-479/16-NW	**556526**	**554188**	16
WU-M-479/16-CW	**on request**	**554189**	16

* Degree of protection IK08 also possible by use of silicone optics; Ref. No. on request

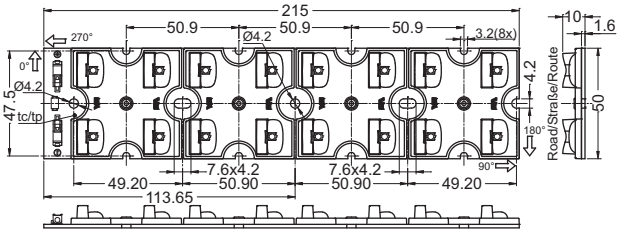
WU-M-479/4 – crosswise



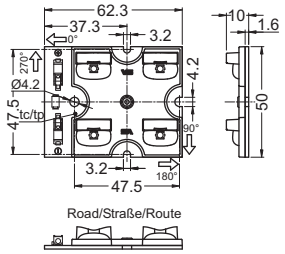
WU-M-479/8 – crosswise



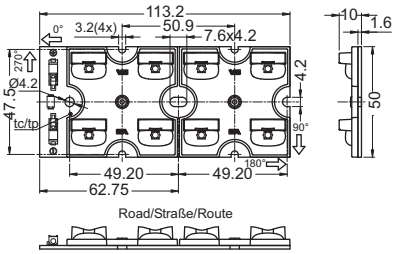
WU-M-479/16 – crosswise



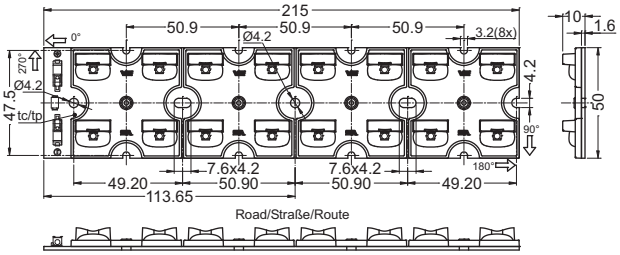
WU-M-479/4 – lengthwise



WU-M-479/8 – lengthwise



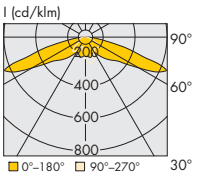
WU-M-479/16 – lengthwise



S-Class Linear – Allround

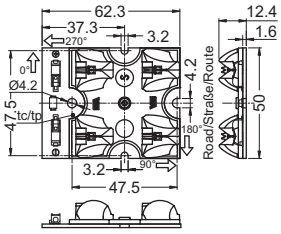
Technical notes

Dimensions (incl. optics) LxWxH
4 LEDs: 50x62.3x12.4 mm
8 LEDs: 50x113.2x12.4 mm
16 LEDs: 50x215x12.4 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for illumination of streets
with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio:
7:1 (lengthwise) or 7.5:1 (crosswise)
(distance between luminaire poles to the height of the luminaire pole)

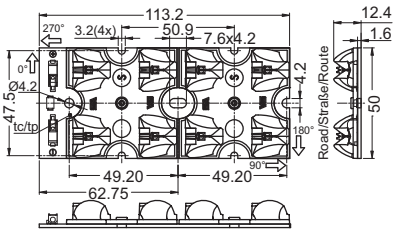


Type	Ref. No.		Number
	lengthwise	crosswise	of LEDs
WU-M-479/4-WW	**on request**	**on request**	4
WU-M-479/4-NW	**on request**	**on request**	4
WU-M-479/4-CW	**on request**	**on request**	4
WU-M-479/8-WW	**on request**	**556490**	8
WU-M-479/8-NW	**556963**	**556491**	8
WU-M-479/8-CW	**on request**	**556492**	8
WU-M-479/16-WW	**on request**	**556255**	16
WU-M-479/16-NW	**556961**	**556256**	16
WU-M-479/16-CW	**on request**	**556257**	16

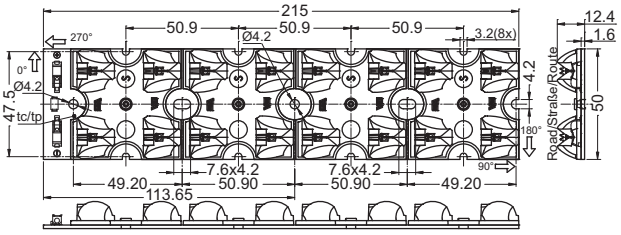
WU-M-479/4 – crosswise



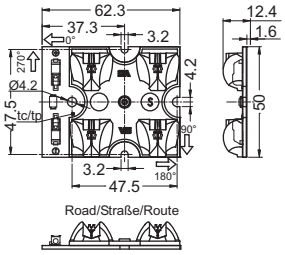
WU-M-479/8 – crosswise



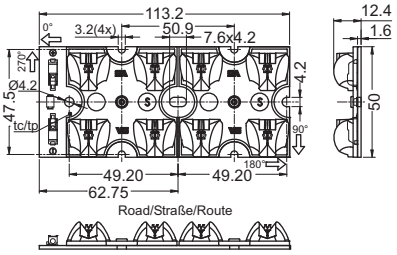
WU-M-479/16 – crosswise



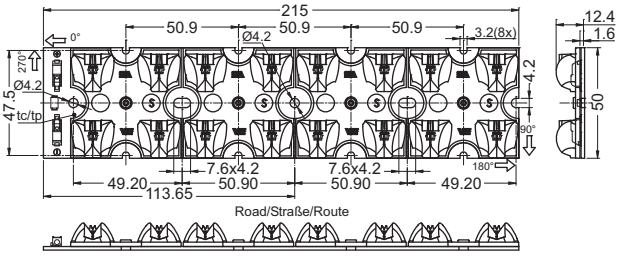
WU-M-479/4 – lengthwise



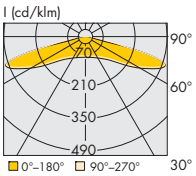
WU-M-479/8 – lengthwise



WU-M-479/16 – lengthwise



Area Linear – Allround

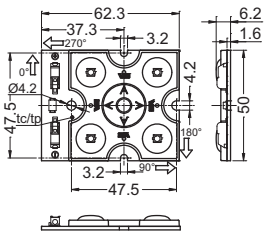


Technical notes

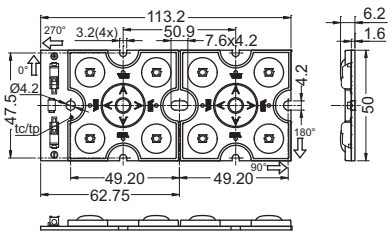
Dimensions (incl. optics) LxWxH
4 LEDs: 50x62,3x6.2 mm
8 LEDs: 50x113,2x6.2 mm
16 LEDs: 50x215x6.2 mm
Degree of protection: IP20/IK05
Push-in terminals (WAGO series 2060)
Optics for illumination of public places
Optimum illumination – installation ratio: 5.5:1 (distance between luminaire poles to the height of the luminaire pole).

Type	**Ref. No.**	Number of LEDs
WU-M-479/4-WW	**on request**	4
WU-M-479/4-NW	**on request**	4
WU-M-479/4-CW	**on request**	4
WU-M-479/8-WW	**556261**	8
WU-M-479/8-NW	**556262**	8
WU-M-479/8-CW	**556263**	8
WU-M-479/16-WW	**556258**	16
WU-M-479/16-NW	**556259**	16
WU-M-479/16-CW	**556260**	16

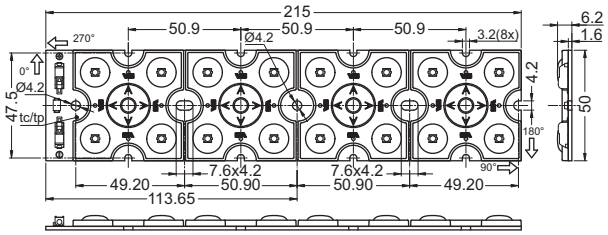
WU-M-479/4



WU-M-479/8



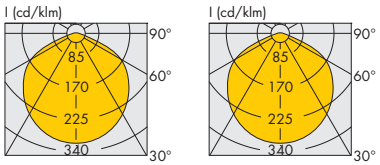
WU-M-479/16



Streetlight FlatEmitter SMD 3000–11,000 lm

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

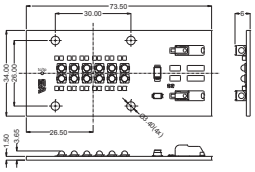
Technical notes
Dimensions (L x W x H)
with 12 LEDs: 73.5 x 34 x 6 mm
with 18 LEDs: 86 x 36.5 x 6 mm
with 27 or 42 LEDs: 108 x 44 x 6 mm
LEDs on the module are serial connected
Push-in terminals (WAGO series 2060)
LED module is operated at high voltage (up to 150 V).
Safety must be considered acc. EN 60598
Allowed operating temperature at t_c point:
–20 to 95 °C
Use of external LED constant current driver
Efficiency up to 142 lm/W
Lumen maintenance L70/B10:
> 60,000 hrs. (I_F 700 mA) at t_p 65 °C
Colour rendering index R_a: > 65
Surge protection: 3 kV
NTC resistor for external driver feedback
of module temperature
WU-M-452-xx/B: optional
WU-M-433-xx/B: Typ NCP18xH103J03RB



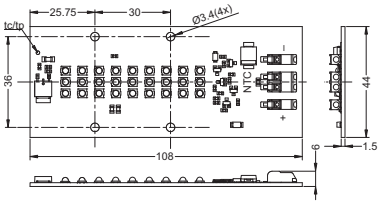
WU-M-452-xx/B

WU-M-433-xx/B

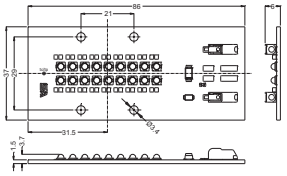
WU-M-452-12/B



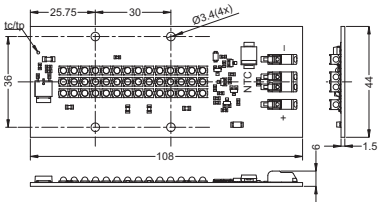
WU-M-433-27/B



WU-M-452-18/B



WU-M-433-42/B



Type	Ref. No.	Number of LEDs pcs.	Colour	Correlated colour temperature* K	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 400 mA lm	400 mA lm/W	700 mA lm	700 mA lm/W	Typ. CRI R_a
LED modules with 12 LEDs					P_{el} = 13.8 W, $U_{typ.}$ = 34.4 V		P_{el} = 25.3 W, $U_{typ.}$ = 36.2 V		
WU-M-452-12/B-WW	**556221**	12	warm white	3000 -130/+220	1845	134	2990	118	> 70
WU-M-452-12/B-NW	**554068**	12	neutral white	4000 -300/+260	1845	134	2990	118	> 70
WU-M-452-12/B-CW	**554821**	12	cool white	5000 -255/+310	2010	146	3260	128	> 65
LED modules with 18 LEDs					P_{el} = 20.5 W, $U_{typ.}$ = 51.3 V		P_{el} = 37.8 W, $U_{typ.}$ = 54 V		
WU-M-452-18/B-WW	**556222**	18	warm white	3000 -130/+220	2770	135	4485	119	> 70
WU-M-452-18/B-NW	**554067**	18	neutral white	4000 -300/+260	2770	135	4485	119	> 70
WU-M-452-18/B-CW	**554823**	18	cool white	5000 -255/+310	3015	147	4890	129	> 65
LED modules with 27 LEDs					P_{el} = 30.9 W, $U_{typ.}$ = 77.2 V		P_{el} = 56.5 W, $U_{typ.}$ = 80.7 V		
WU-M-433-27/B-WW	**556223**	27	warm white	3000 -130/+220	4025	130	6530	116	> 70
WU-M-433-27/B-NW	**554066**	27	neutral white	4000 -300/+260	4025	130	6530	116	> 70
WU-M-433-27/B-CW	**554817**	27	cool white	5000 -255/+310	4385	142	7110	126	> 65
LED modules with 42 LEDs					P_{el} = 48 W, $U_{typ.}$ = 120 V		P_{el} = 87.7 W, $U_{typ.}$ = 125.3 V		
WU-M-433-42/B-WW	**556224**	42	warm white	3000 -130/+220	6265	130	10150	116	> 70
WU-M-433-42/B-NW	**554065**	42	neutral white	4000 -300/+260	6265	130	10150	116	> 70
WU-M-433-42/B-CW	**554819**	42	cool white	5000 -255/+310	6820	142	11060	126	> 65

Emission data at t_p = 65 °C | * Measuring tolerance of luminous flux: ± 7% | **Production tolerance of voltage and power consumption: +15/–19% at 400 mA and +12/–10% at 700 mA | Suitable thermal tapes for these LED modules see page 91.

PowerEmitter XP and XML

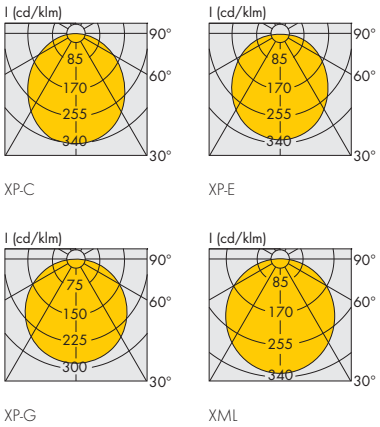
Built-in PCB lighting modules

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 87–89).

Typical applications

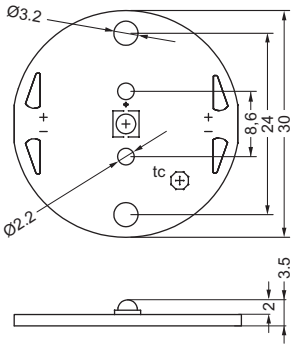
- Integration in luminaires
- Architectural lighting
- Marking paths, stairs, etc.
- Furniture lighting
- Light advertising
- Entertainment, retail lighting



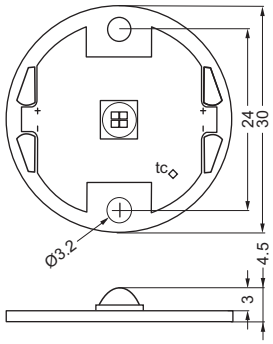
Technical notes

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 driver
FR4-PCB with thermal ducts (PowerEmitter XP)
or aluminium PCB (PowerEmitter XML)
for optimum thermal management
Efficiency up to 132 lm/W
Colour rendering index: white R_a = 75, warm white R_a = 80
ESD protection class 2
Minimum order quantity: 144 pcs.

PowerEmitter XP



PowerEmitter XML



PowerEmitter XP

Type	Ref. No.	Colour	Correlated colour temperature* K	Luminous flux* (lm), voltage (U) and power consumption (P_{el}) 350 mA min.	typ.	500 mA min.	typ.	700 mA min.	typ.	1050 mA min.	typ.	Beam angle °
PowerEmitter XP-C				P_{el} = 1.19–1.37 W U = 3.4–3.9 V		P_{el} = 1.75–2 W U = 3.5–4 V						
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} = 1.12–1.37 W U = 3.2–3.9 V		P_{el} = 1.65–2 W U = 3.3–4 V		P_{el} = 2.38–2.87 W U = 3.4–4.1 V				
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} = 1.05–1.31 W U = 3–3.75 V		P_{el} = 1.55–1.93 W U = 3.1–3.85 V		P_{el} = 2.24–2.77 W U = 3.2–3.95 V		P_{el} = 3.47–4.25 W U = 3.3–4.05 V		
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

Emission data at t_j = 25 °C | * Production tolerance of luminous flux: ± 7%
Suitable thermal tapes for these LED modules see page 90.

PowerEmitter XML

Type	Ref. No.	Colour	Correlated colour temperature* K	Luminous flux* (lm), voltage (U) and power consumption (P_{el})								Beam angle °
				350 mA		500 mA		700 mA		1050 mA		
				min.	typ.	min.	typ.	min.	typ.	min.	typ.	
PowerEmitter XML				P_{el} = 4-4.4 W U = 11.5-12.5 V		P_{el} = 6-6.5 W U = 12-13 V		P_{el} = 8.7-9.45 W U = 12.4-13.5 V		P_{el} = 12.7-14 W U = 12.7-14 V		
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

Emission data at t_j = 85 °C | * Production tolerance of luminous flux: ± 7%
Suitable thermal tapes for these LED modules see page 90.

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.

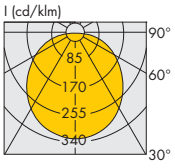
The modules can be safely operated with various constant-current drivers (350 mA, 500 mA or 700 mA). Sufficient cooling must be ensured.

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

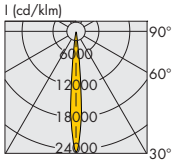
The modules are available without an optical attachment or with a fixed 10°, 20°, 30° or 40° optical attachment to enable the creation of different lighting scenes.

Technical notes
PCB diameter: 45 mm
Allowed operating temperature at t_c point:
-20 to 65 °C
Use of external LED constant current driver
Aluminium PCB for optimum thermal management
Efficiency up to 109 lm/W
Colour rendering index:
white R_a = 75, warm white R_a = 80
ESD protection class 2
Minimum order quantity: 120 pcs.

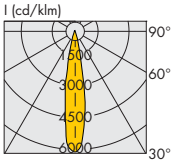
Typical applications
- Integration in luminaires
- Architectural lighting
- Marking paths, stairs, etc.
- Furniture lighting
- Light advertising
- Entertainment, retail lighting



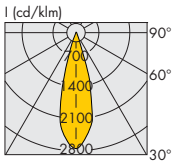
Without optics



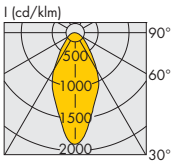
10°



20°



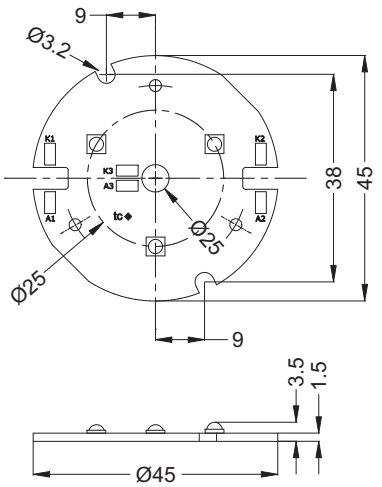
30°



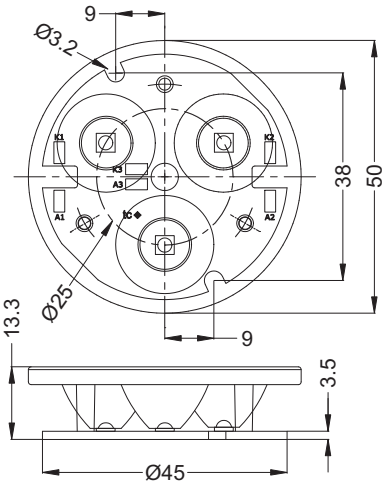
40°

TriplePowerEmitter XP

Module without optics



Module with optics



Type	Ref. No.	Colour	Correlated colour temperature	Luminous flux* (lm), voltage (U) and power consumption (P_{el})						Beam angle
				350 mA P_{el} = 3.36-4.1 W U = 9.6-11.7 V		500 mA P_{el} = 4.95-6 W U = 9.9-12 V		700 mA P_{el} = 7.14-8.61 W U = 10.2-12.3 V		
			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

Emission data at t_j = 25 °C | * Production tolerance of luminous flux: ± 7% | Suitable thermal tapes for these LED modules see page 90.

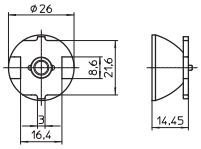
PowerOptics3 for XP/XT Modules

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%.

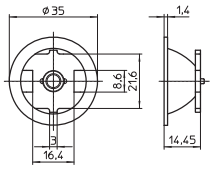
To guarantee easy mounting on PowerEmitter module, the PowerOptics3 are backed with self-adhesive tape. However, depending on the type of application and ambient conditions, the Power-Optics3 module may require additional fixing to ensure secure mounting.

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

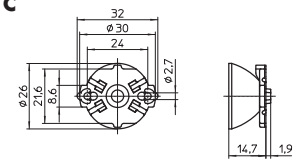
A



B



C



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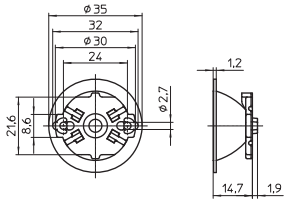
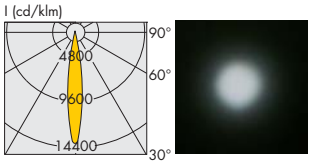


PowerOptics3 – Ø 26 mm

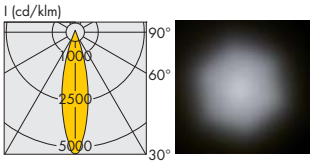
PowerOptics3 – Ø 35 mm

PowerOptics3 – Star

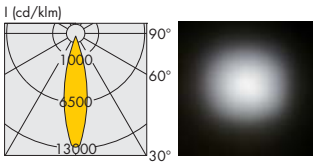
Light distribution curves PowerOptics3



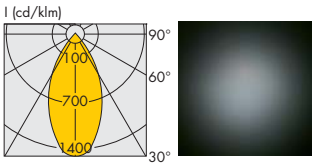
8°



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

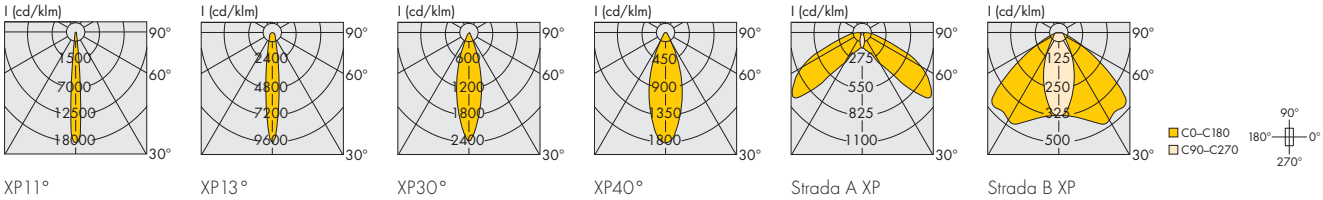
Various attachable optics are available for XP modules to enable different beam characteristics and illumination levels.

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

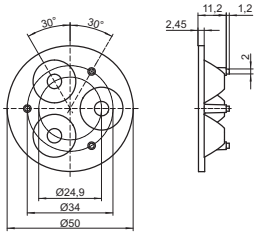
Type	Ref. No.	Beam angle* °	Dimensions* (mm) diameter x height / width x depth x height
Optics for LED modules of XP series			
PowerOptics XP 11°	**543422**	11	16.1 x 10.1
PowerOptics XP 13° diff	**543423**	12	16.1 x 10.1
PowerOptics XP 30°	**543424**	30	16.1 x 10.1
PowerOptics XP 40°	**543425**	40	16.1 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

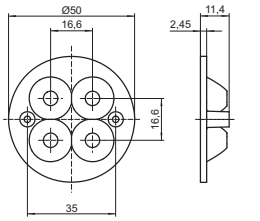
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

PowerOptics for XP Modules

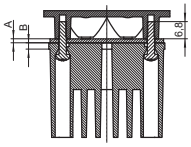
For TriplePowerEmitter and Spot modules
Various attachable optics are available for TriplePowerEmitter and the Spot modules of the XP series to enable different beam characteristics and illumination levels.

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)





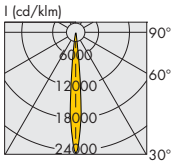
Fixing



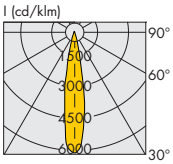
PowerOptics 3XP

PowerOptics 4XP

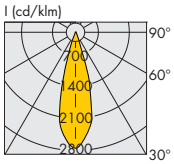
Light distribution curves PowerOptics 3XP



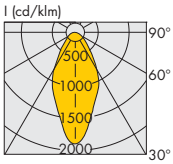
3XP 10°



3XP 20°

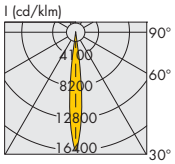


3XP 30°

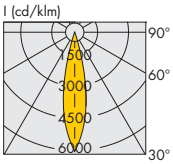


3XP 40°

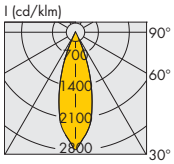
Light distribution curves PowerOptics 4XP



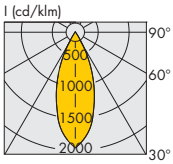
4XP 10°



4XP 20°



4XP 30°

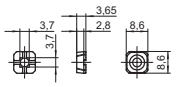


4XP 40°

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°

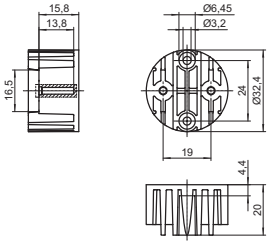


Heat Sinks for LED Modules XP and XML

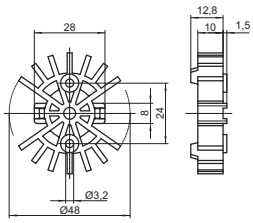
Under no circumstances may LEDSpots ever be covered by insulation material or similar.
Air ventilation must be ensured.

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

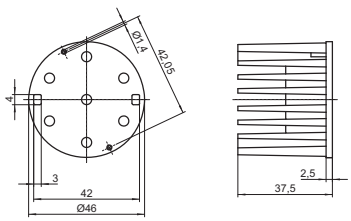
A



B

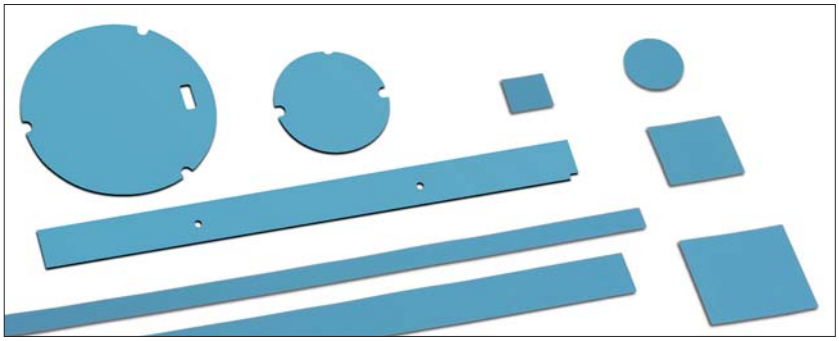


Heat sink for TriplePowerEmitter XP
For LED modules up to 700 mA
Material: thermoconductive resin
Dimensions (Ø x depth): 46x37.5 mm
Fixing: with screws
Weight: 51 g
Unit: 225 pcs.
Ref. No.: 544805



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.

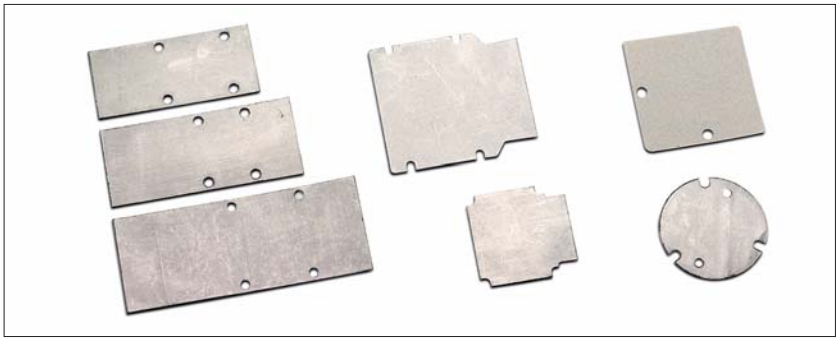
Depending on the type of application and/or the expected ambient conditions, the modules must be additionally secured to ensure optimum fixing.

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**	Ø 28	0.25	37.5 - 30	1.0	PowerEmitter	83 - 84
Adhesive pad Ø43	**536977**	Ø 43	0.20	76	0.5	TriplePowerEmitter Ø45mm, Ø50mm	84 - 85
Adhesive pad Ø63	**539625**	Ø 63	0.25	37.5 - 50	0.5	High Power 24V RGB Triple	194 - 195
Adhesive pad Ø107	**539624**	Ø 107	0.25	37.5 - 50	0.1	High Power 24V RGB Flood	194 - 195
For square LED modules							
Adhesive pad 49x49	**529157**	49x49	0.25	37.5 - 50	0.3	TriplePowerEmitter Ø50mm	84 - 85
For linear LED modules							
Adhesive pad 278x13	**548179**	278x13	0.25	35.5 - 50	0.3	LUGA Line	10 - 12
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	194 - 195

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 WU-M-425 (ME/S, SYM I, SYM II)					
Thermal conductive tape, adhesive on one side	**548252**	54x54	≤ 0.04	WU-M-425	51, 55, 68, 72, 76
For LED modules LUGA Industrial 10,000 lm					
Thermal conductive graphite tape	**552463**	67.25x61	≤ 0.04	WU-M-467	61
For LED modules Streetlight FlatEmitter SMD					
Thermal conductive graphite tape, adhesive on one side	**552788**	73x33.5	≤ 0.04	WU-M-452-12	60, 82
Thermal conductive graphite tape, adhesive on one side	**552787**	85.5x36.5	≤ 0.04	WU-M-452-18	60, 82
Thermal conductive graphite tape, adhesive on one side	**550224**	107.5x43.5	≤ 0.04	WU-M-433	60, 82

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

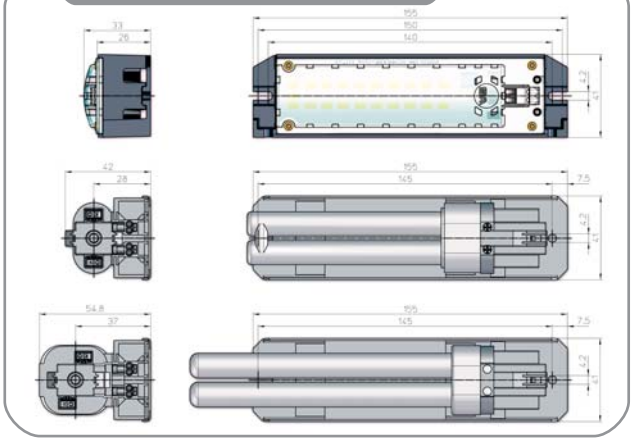
Luminaires of slim and flat design often provide little or no room for additional control gear. Examples of devices that pose a major design challenge are, in particular, small wall, corridor, hall and ceiling luminaires as well as special applications such as lighting of restaurant menus.

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

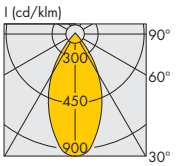


LEDSpot ReadyLine IP

Complete LEDSpot equipped with optics, heat sink, leads and metal frame

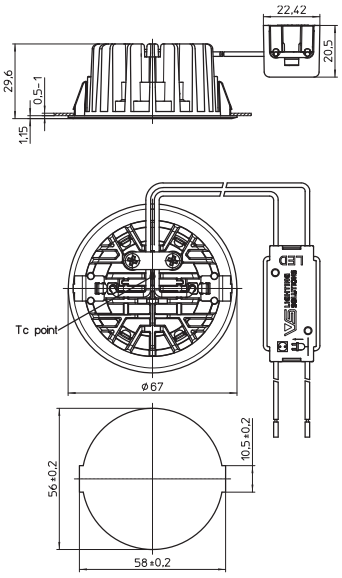
Technical notes

Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.95
Metal frame, round
Heat sink material: thermoconductive resin
For cut-out: Ø 56 mm
Lens with clear glass
Beam angle: 50°
With leads: Cu tinned, stranded conductors 0.5 mm², double FEP/FEP-insulation
MOV – metal-oxide varistor, enclosed
Protection class II
RFI suppressed
Degree of protection: IP54/IP20
Unit: 45 pcs.

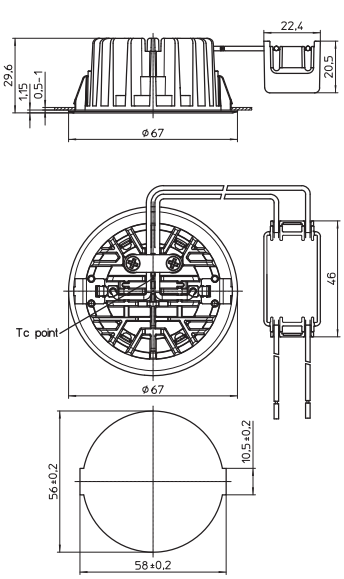


50°

IP20



IP54



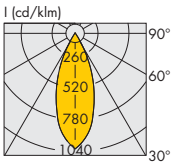
Max. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Luminous flux lm min.	typ.	CRI R_a	Light intensity Candela	Beam angle °	Frame colour	Energy efficiency
Degree of protection: IP54													
4.3	LCH024	**554956**	220–240	12	warm white	2900...3200	350	370	> 80	330	50	silver	A
	LCH024	**554957**										white	
	LCH024	**554958**	220–240	12	neutral white	3700...4200	380	400	> 80	350	50	silver	A
	LCH024	**554959**										white	
Degree of protection: IP20													
4.3	LCH025	**555016**	220–240	12	warm white	2900...3200	350	370	> 80	330	50	silver	A
	LCH025	**555017**										white	
	LCH025	**555019**	220–240	12	neutral white	3700...4200	380	400	> 80	350	50	silver	A
	LCH025	**555020**										white	

LEDSpot
ReadyLine MR16

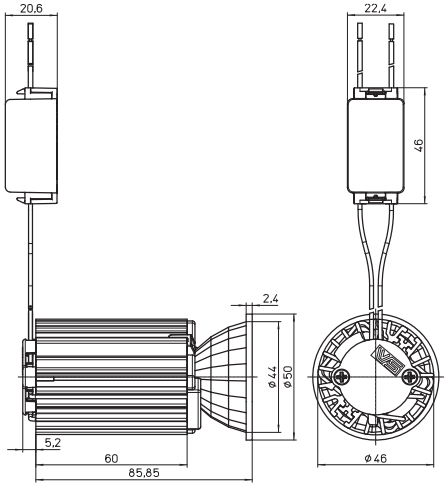
Complete LEDSpot equipped with optics, heat sink and leads

Technical notes

Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.95
Lens diameter: 50 mm
Beam angle: 42°
Heat sink material: aluminium
Leads: Cu tinned, stranded conductors 0.5 mm², double FEP/FEP-insulation, length: 300 mm
MOV – metal-oxide varistor, enclosed unassembled
Protection class II
RFI suppressed
Unit: 30 pcs.



42°



Max. output W	Type	**Ref. No.**	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Luminous flux lm min.	Luminous flux lm typ.	CRI R_a	Light intensity Candela	Beam angle °	Energy efficiency
8.7	LR8W	**554960**	220–240	8	warm white	2900...3200	515	600	> 80	636	42	A
	LR8W	**554961**			neutral white	3700...4200	580	670		680		

ReadyLine S

Built-in LED modules with integrated driver for mains voltage

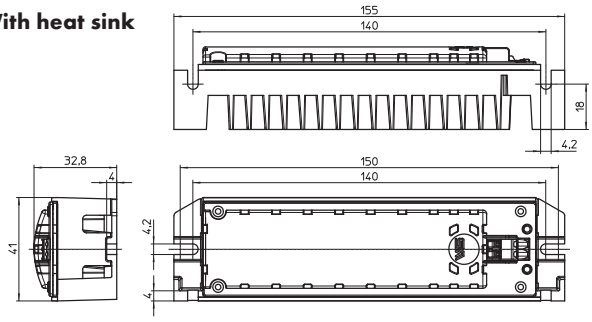
Technical notes

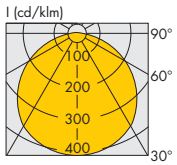
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.97
Dimensions:
with heat sink 155x41x32 mm
without heat sink 132x37.4x9.2 mm
Aluminium PCB for optimum thermal management
Heat sink made of thermoconductive resin
Protection cover: PC, UV-glued
or rivetted (module with heat sink)
Push-in terminals 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)
Unit: 80/40 pcs. (without/with heat sink)

Typical applications

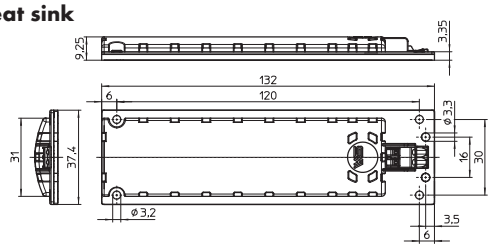
- Integration in luminaires
- Residential lighting
- Architectural lighting
- Retail lighting
- Furniture lighting

With heat sink





Without heat sink



Max. output W	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	Energy efficiency
8.7	LUT33	**559522**	**559526**	220–240	21	warm white	2600...2900	clear	590	650	> 80	A
	LUT33	**559523**	**559527**					diffuse	480	530	> 80	A
	LUT33	**550439**	**550441**	220–240	21	warm white	2900...3200	clear	720	780	> 80	A
	LUT33	**551983**	**551989**					diffuse	610	660	> 80	A
	LUT33	**551984**	**551990**	220–240	21	neutral white	3700...4200	clear	740	800	> 80	A
	LUT33	**551985**	**551991**					diffuse	630	680	> 80	A
13	LUT33	**559524**	**559030**	220–240	30	warm white	2600...2900	clear	910	940	> 80	A
	LUT33	**559525**	**559528**					diffuse	780	800	> 80	A
	LUT33	**550438**	**550440**	220–240	30	warm white	2900...3200	clear	1100	1190	> 80	A
	LUT33	**551986**	**551992**					diffuse	935	1010	> 80	A
	LUT33	**551987**	**551993**	220–240	30	neutral white	3700...4200	clear	1140	1210	> 80	A
	LUT33	**551988**	**551994**					diffuse	955	1030	> 80	A

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**552039**	Cord grip with 2 screws for LED modules with heat sink	–	–	–
–	–	**555009**	Thermally conductive adhesive transfer tape 132x38 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**553427**	Thermally conductive transfer tape, non-adhesive 136x36 mm	0.25 mm	2 W/mK	3 kV
–	–	**555008****	Thermally conductive transfer tape, adhesive on both sides 136x42 mm	0.19 mm	0.9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

LED Modules ReadyLine S IP54

Built-in LED modules with integrated driver for mains voltage

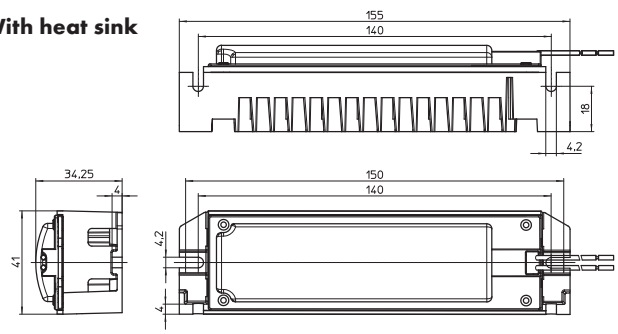
Technical notes

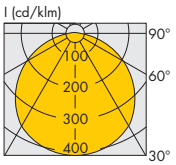
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.97
Dimensions:
with heat sink 155x41x32 mm
without heat sink 132x37.4x9.2 mm
Aluminium PCB for optimum thermal management
Heat sink made of thermoconductive resin
Protection cover: PC, UV-glued
or rivetted (module with heat sink)
Leads: Cu tinned, stranded conductors 0.5 mm², double FEP/FEP-insulation, length: 300 mm
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

Degree of protection: IP54

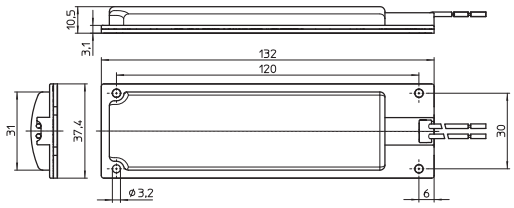
RFI suppressed
Weight: 35/140 g (without/with heat sink)
Unit: 80/40 pcs. (without/with heat sink)

With heat sink





Without heat sink



Typical applications

- Integration in luminaires
- Residential lighting
- Architectural lighting
- Retail lighting
- Furniture lighting

Max. output W	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	Energy efficiency
8.7	LUT33	**559529**	**559533**	220–240	21	warm white	2600...2900	clear	590	650	> 80	A
	LUT33	**559530**	**559534**					diffuse	480	530	> 80	A
	LUT33	**556749**	**556741**	220–240	21	warm white	2900...3200	clear	720	780	> 80	A
	LUT33	**556750**	**556742**					diffuse	610	660	> 80	A
	LUT33	**556751**	**556743**	220–240	21	neutral white	3700...4200	clear	740	800	> 80	A
	LUT33	**556752**	**556744**					diffuse	630	680	> 80	A
13	LUT33	**559531**	**559535**	220–240	30	warm white	2600...2900	clear	910	940	> 80	A
	LUT33	**559532**	**559536**					diffuse	780	800	> 80	A
	LUT33	**555875**	**556745**	220–240	30	warm white	2900...3200	clear	1100	1190	> 80	A
	LUT33	**556753**	**556746**					diffuse	935	1010	> 80	A
	LUT33	**556755**	**556747**	220–240	30	neutral white	3700...4200	clear	1140	1210	> 80	A
	LUT33	**556756**	**556748**					diffuse	955	1030	> 80	A

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**552039**	Cord grip with 2 screws for LED modules with heat sink	–	–	–
–	–	**555009**	Thermally conductive adhesive transfer tape 132x38 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**553427**	Thermally conductive transfer tape, non-adhesive 136x36 mm	0.25 mm	2 W/mK	3 kV
–	–	**555008****	Thermally conductive transfer tape, adhesive on both sides 136x42 mm	0.19 mm	0.9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

LED-Module ReadyLine DL

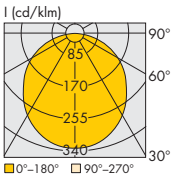
Built-in LED modules with integrated driver for mains voltage

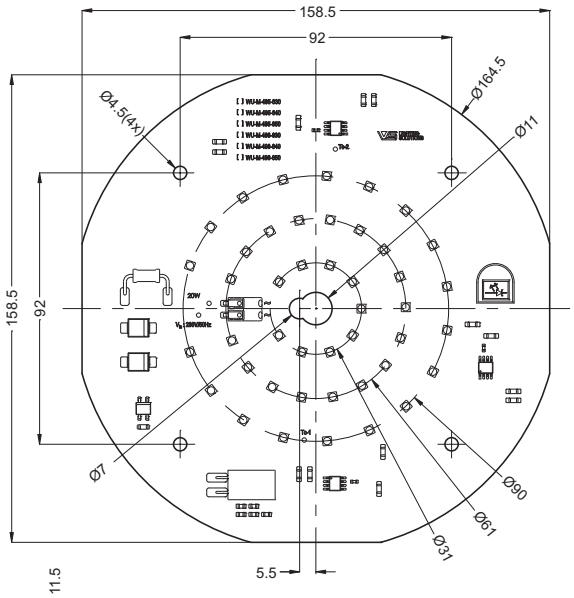
Technical notes

LED built-in module for luminaires
Mains voltage: 220–240 V, 50–60 Hz
Power factor: > 0.9
Dimensions: Ø 164 mm
Allowed operating temperature at t_c point:
–25 to 80 °C
Ambient temperature range t_a: –25 to 65 °C
Lumen maintenance L70/B50:
55,000 hrs. at t_p 80 °C
Unit: 36 pcs.

Typical applications

- Downlights
- Replacement for compact fluorescent lamps





Max. output W	Type	**Ref. No.**	Voltage AC 50–60 Hz V	Colour	Correlated colour temperature K	Typ. luminous flux* and efficiency* at 230 V lm	lm/W	Typ. beam angle °	Typ. CRI R_a	Energy efficiency
25	WU-M-498-830	**557252**	220–240	warm white	3000	2000	100	120	80	A+
	WU-M-498-840	**557253**	220–240	neutral white	4000	2200	110	120	80	A++
	WU-M-498-850	**on request**	220–240	cool white	5000	2500	125	120	80	A++

* Production tolerance of luminous flux and efficiency: ±15 %

LED Modules ReadyLine C

Built-in LED modules with integrated driver for mains voltage

Technical notes

Mains voltage: 220–240 V, 50/60 Hz
Aluminium PCB for optimum thermal management
Heat sink made of thermoconductive resin
or co-moulded heat sink made of thermoconductive resin and aluminium
Protection cover: PC, UV-glued
or rivetted (module with heat sink)
For luminaires of protection class II
RFI suppressed

ReadyLine	Heat sink	Weight (g)	Unit (pcs.)
C 10	with	40	36
	without	140	54
C 08	with	40	28
	without	140	36
C 07	with	40	28
	without	140	36
C 06	without	30	45
C 05	without	30	45

Typical applications

- Integration in luminaires
- Residential lighting
- Architectural lighting
- Retail lighting
- Furniture lighting

ReadyLine C 10

Technical notes

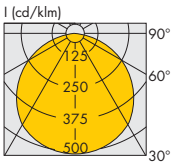
Power factor: > 0.97

Dimensions: Ø 100 mm,
Ø 120 mm with heat sink

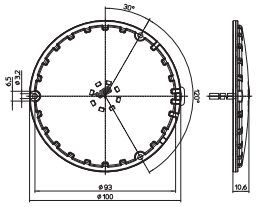
Screw terminals for LED module with heat sink:
2.5 mm²

Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit

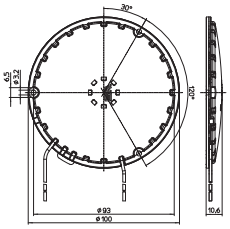
Fixing holes for screws M3 or self-tapping screws 2.9



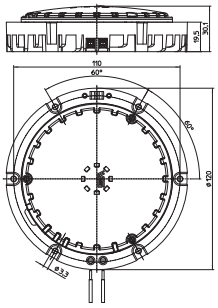
With central lead exit



With lateral lead exit



With heat sink, protection cover and 2-poles screw terminals



Max. output W	Type	Ref. No. Version A – 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.		CRI R_a	Lead exit	Energy efficiency
10	LR54	**559537**	**559539**	220–240	54	warm white	2600...2900	clear	1100	1200	> 80	central	A+
	LR54	**on request**	**559540**									lateral	A+
	LR54	**559538**	**559541**	220–240	54	warm white	2600...2900	diffuse	935	1020	> 80	central	A+
	LR54	**on request**	**559542**									lateral	A+
	LR54	**554951**	**554943**	220–240	54	warm white	2900...3200	clear	1100	1200	> 80	central	A+
	LR54	**on request**	**554944**									lateral	A+
	LR54	**554952**	**554945**	220–240	54	warm white	2900...3200	diffuse	935	1020	> 80	central	A+
	LR54	**on request**	**554946**									lateral	A+
	LR54	**554953**	**554947**	220–240	54	neutral white	3700...4200	clear	1150	1250	> 80	central	A+
	LR54	**on request**	**554948**									lateral	A+
	LR54	**554954**	**554949**	220–240	54	neutral white	3700...4200	diffuse	980	1060	> 80	central	A+
	LR54	**on request**	**554950**									lateral	A+
17.5	LR42	**559543**	**559545**	220–240	42	warm white	2600...2900	clear	1140	1300	> 80	central	A
	LR42	**on request**	**559546**									lateral	A
	LR42	**559544**	**559547**	220–240	42	warm white	2600...2900	diffuse	930	1070	> 80	central	A
	LR42	**on request**	**559548**									lateral	A
	LR42	**553828**	**553820**	220–240	42	warm white	2900...3200	clear	1440	1550	> 80	central	A
	LR42	**on request**	**553821**									lateral	A
	LR42	**553829**	**553822**	220–240	42	warm white	2900...3200	diffuse	1230	1320	> 80	central	A
	LR42	**on request**	**553823**									lateral	A
	LR42	**553830**	**553824**	220–240	42	neutral white	3700...4200	clear	1480	1590	> 80	central	A
	LR42	**on request**	**553825**									lateral	A
	LR42	**553831**	**553826**	220–240	42	neutral white	3700...4200	diffuse	1260	1350	> 80	central	A
	LR42	**on request**	**553827**									lateral	A

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**552039**	Cord grip with 2 screws for LED modules with heat sink	–	–	–
–	–	**555012**	Thermally conductive adhesive transfer tape Ø 100 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**553981**	Thermally conductive transfer tape, non-adhesive Ø 99 mm	0.25 mm	2 W/mK	3 kV
–	–	**553795****	Thermally conductive transfer tape, adhesive on both sides Ø 104 mm	0.19 mm	0.9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

ReadyLine C 08

Technical notes

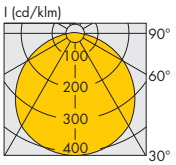
Power factor: > 0.97

Dimensions: Ø 81.5 mm,
Ø 120 mm with heat sink

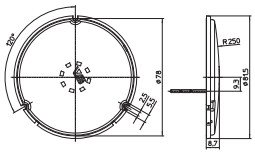
Screw terminals for LED module with heat sink:
2.5 mm²

Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit

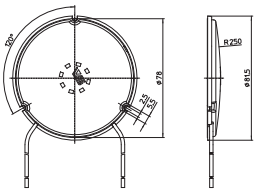
Fixing holes for screws M3 or self-tapping screws 2.9



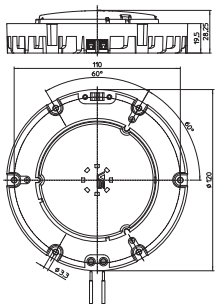
With central lead exit



With lateral lead exit



With heat sink, protection cover and 2-poles screw terminals



Max. output W	Type	Ref. No. Version A – 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.		CRI R_a	Lead exit	Energy efficiency
13	LR30W	**559550**	**559552**	220-240	30	warm white	2600...2900	clear	910	940	> 80	central	A
	LR30W	**on request**	**559553**									lateral	A
	LR30W	**559551**	**559554**					diffuse	780	800	> 80	central	A
	LR30W	**on request**	**559555**									lateral	A
	LR30W	**557843**	**557834**	220-240	30	warm white	2900...3200	clear	1100	1190	> 80	central	A
	LR30W	**on request**	**557835**									lateral	A
	LR30W	**557844**	**557836**					diffuse	935	1010	> 80	central	A
	LR30W	**on request**	**557837**									lateral	A
	LR30W	**557845**	**557838**	220-240	30	neutralweiß	3700...4200	clear	1140	1210	> 80	central	A
	LR30W	**on request**	**557839**									lateral	A
	LR30W	**557846**	**557840**					diffuse	955	1030	> 80	central	A
	LR30W	**on request**	**557841**									lateral	A

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**557692**	Wärmeleitendes Transferklebeband Ø 76 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**558229**	Thermally conductive adhesive transfer tape Ø 76 mm	0.25 mm	2 W/mK	3 kV
–	–	**557691****	Thermally conductive transfer tape, adhesive on both sides Ø 82 mm	0.19 mm	0.9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

ReadyLine C 07

Technical notes

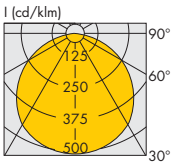
Power factor: > 0.95

Dimensions: Ø 73.3 mm;
Ø 120 mm with heat sink

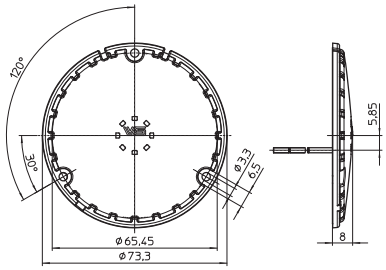
Screw terminals for LED module with heat sink:
2.5 mm²

Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit

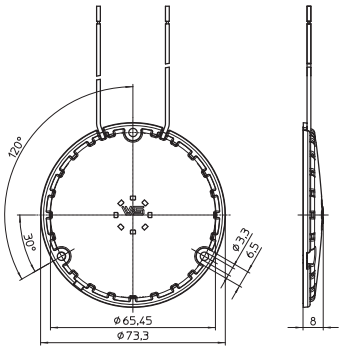
Fixing holes for screws M3 or self-tapping screws 2.9



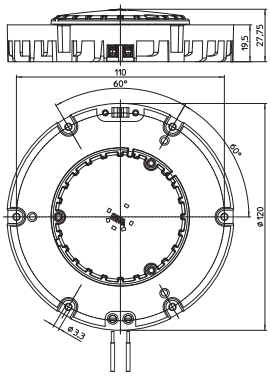
With central lead exit



With lateral lead exit



With heat sink



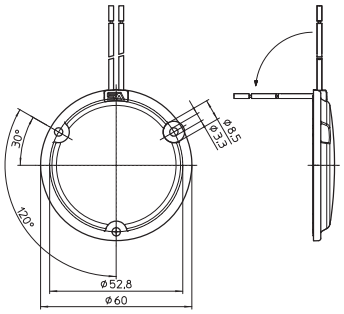
Max. output W	Type	**Ref. No.** with heat sink	**Ref. No.** without heat sink	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.		CRI R_a	Lead exit	Energy efficiency
17,5	LR42	**558025**	**556640**	220-240	42	warm white	2600...2900	clear	1140	1300	> 80	central	A
	LR42	**on request**	**559559**									lateral	A
	LR42	**559560**	**559563**	220-240	42	warm white	2600...2900	diffuse	930	1070	> 80	central	A
	LR42	**on request**	**559564**									lateral	A
	LR42	**552019**	**550382**	220-240	42	warm white	2900...3200	clear	1440	1550	> 80	central	A
	LR42	**on request**	**550958**									lateral	A
	LR42	**552020**	**552015**	220-240	42	warm white	2900...3200	diffuse	1230	1320	> 80	central	A
	LR42	**on request**	**552016**									lateral	A
	LR42	**552021**	**551448**	220-240	42	neutral white	3700...4200	clear	1480	1590	> 80	central	A
	LR42	**on request**	**550959**									lateral	A
	LR42	**552022**	**552018**	220-240	42	neutral white	3700...4200	diffuse	1260	1350	> 80	central	A
	LR42	**on request**	**552017**									lateral	A

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**552039**	Cord grip with 2 screws for LED modules with heat sink	–	–	–
–	–	**551265**	Thermally conductive adhesive transfer tape Ø 71 mm	0.25 mm	0,8 W/mK	5.5 kV
–	–	**553422**	Thermally conductive transfer tape, non-adhesive Ø 68 mm	0.25 mm	2 W/mK	3 kV
–	–	**555010****	Thermally conductive transfer tape, adhesive on both sides Ø 74 mm	0.19 mm	0,9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

ReadyLine C 06

Technical notes
Power factor: > 0.95
Dimensions: Ø 60 mm
Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit
Fixing holes for screws M2



Max. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.		CRI R_a	Lead exit	Energy efficiency
8,7	LR21W	**559565**	220–240	21	warm white	2600...2900	clear	590	650	> 80	central/lateral	A
	LR21W	**559566**					diffuse	480	530	> 80		A
	LR21W	**559567**	220–240	21	warm white	2900...3200	clear	720	780	> 80	central/lateral	A
	LR21W	**559568**					diffuse	610	660	> 80		A
	LR21W	**559569**	220–240	21	neutral white	3700...4200	clear	760	800	> 80	central/lateral	A
	LR21W	**559570**					diffuse	630	680	> 80		A

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**559968**	Thermally conductive adhesive transfer tape Ø 64 mm	0.25 mm	0,8 W/mK	5.5 kV
–	–	**559969**	Thermally conductive transfer tape, non-adhesive Ø 59 mm	0.25 mm	2 W/mK	3 kV
–	–	**559970****	Thermally conductive transfer tape, adhesive on both sides Ø 64 mm	0.19 mm	0,9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

ReadyLine C 05 / C 03

Technical notes

Power factor: > 0.95

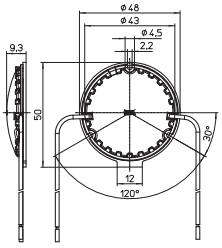
Dimensions: Ø 50 mm

Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit

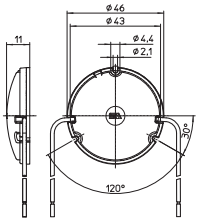
MOV – metal-oxide varistor, enclosed unassembled

Fixing holes for screws M2

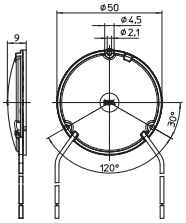
4.3 W – With lateral lead exit

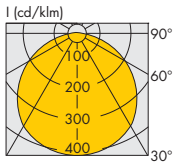


8.7 W – With lateral lead exit

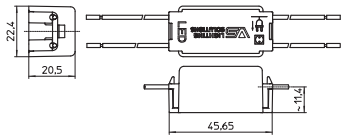


13 W – With lateral lead exit

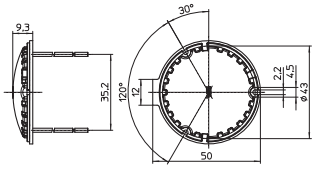




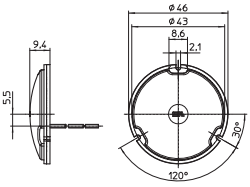
MOV



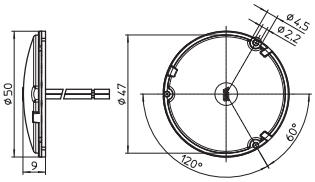
4.3 W – With central lead exit



8.7 W – With central lead exit



13 W – With central lead exit



Max. output W	Type	**Ref. No.**	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.		CRI R_a	Lead exit	Energy efficiency
4,3	LR12W	**559571**	220-240	12	warm white	2600...2900	clear	290	330	> 80	central	A+
	LR12W	**559572**									lateral	A+
	LR12W	**559573**					diffuse	255	290	> 80	central	A+
	LR12W	**559574**									lateral	A+
	LR12W	**556835**	220-240	12	warm white	2900...3200	clear	350	370	> 80	central	A+
	LR12W	**556836**									lateral	A+
	LR12W	**556576**					diffuse	312	330	> 80	central	A+
	LR12W	**556837**									lateral	A+
	LR12W	**556838**	220-240	12	neutral white	3700...4200	clear	380	400	> 80	central	A+
	LR12W	**556839**									lateral	A+
	LR12W	**556840**					diffuse	335	355	> 80	central	A+
	LR12W	**556841**									lateral	A+
8,7	LR21W	**559575**	220-240	21	warm white	2600...2900	clear	590	650	> 80	central	A
	LR21W	**559576**									lateral	A
	LR21W	**559577**					diffuse	480	530	> 80	central	A
	LR21W	**559578**									lateral	A
	LR21W	**559579**	220-240	21	warm white	2900...3200	clear	720	780	> 80	central	A
	LR21W	**554386**									lateral	A
	LR21W	**559580**					diffuse	610	660	> 80	central	A
	LR21W	**554387**									lateral	A
	LR21W	**559581**	220-240	21	neutralweiß	3700...4200	clear	760	800	> 80	central	A
	LR21W	**554388**									lateral	A
	LR21W	**559582**					diffuse	630	680	> 80	central	A
	LR21W	**554389**									lateral	A

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

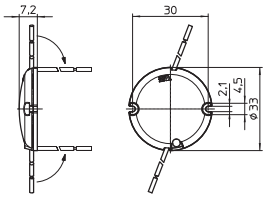
ReadyLine C 05

Max. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.		CRI R_a	Lead exit	Energy efficiency
13	LR30W	**559583**	220–240	30	warm white	2600...2900	clear	590	650	> 80	central	A
	LR30W	**559584**									lateral	A
	LR30W	**559585**					diffuse	480	530	> 80	central	A
	LR30W	**559586**									lateral	A
	LR30W	**554390**	220–240	30	warm white	2900...3200	clear	1100	1190	> 80	central	A
	LR30W	**554391**									lateral	A
	LR30W	**554392**					diffuse	935	1010	> 80	central	A
	LR30W	**554393**									lateral	A
	LR30W	**554394**	220–240	30	neutral white	3700...4200	clear	1140	1210	> 80	central	A
	LR30W	**554395**									lateral	A
	LR30W	**554396**					diffuse	955	1030	> 80	central	A
	LR30W	**554397**									lateral	A

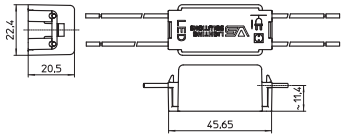
Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**555014**	Thermally conductive adhesive transfer tape Ø 54 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**554419**	Thermally conductive transfer tape, non-adhesive Ø 49 mm	0.25 mm	2 W/mK	3 kV
–	–	**555013****	Thermally conductive transfer tape, adhesive on both sides Ø 54 mm	0.19 mm	0.9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

ReadyLine C 03



MOV



Max. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.		CRI R_a	Lead exit	Energy efficiency
4.3	LR12W	**559690**	220–240	12	warm white	2600...2900	clear	290	330	> 80	lateral	A+
	LR12W	**559691**					diffuse	255	290	> 80	lateral	A+
	LR12W	**559693**	220–240	12	warm white	2900...3200	clear	350	370	> 80	lateral	A+
	LR12W	**559694**					diffuse	312	330	> 80	lateral	A+
	LR12W	**559695**	220–240	12	neutral white	3700...4200	clear	380	400	> 80	lateral	A+
	LR12W	**559696**					diffuse	335	355	> 80	lateral	A+

Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**559965**	Thermally conductive adhesive transfer tape Ø 37 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**559966**	Thermally conductive transfer tape, non-adhesive Ø 32 mm	0.25 mm	2 W/mK	3 kV
–	–	**559967****	Thermally conductive transfer tape, adhesive on both sides Ø 37 mm	0.19 mm	0.9 W/mK	10.3 kV

* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

DOWNLIGHTS

PRO SERIES / PRIME SERIES

ADVANTAGES OF VS LED DOWNLIGHTS

LED Recessed Mounted Downlight

The integration of solid state lighting technology to conventional down light provides optimal light distribution and extended lifetime, all at an affordable price. LED downlights are fully compatible with existing conventional downlight infrastructure, and are the perfect choice for both new and replacement markets.

PRO SERIES

- Slim design for easy installation in low false ceiling
- Integrated driver, direct connection to mains without additional connectors and/or junction box
- Dimmable with regular phase-cut dimmer (Pro Series)
- Tunable white-option to regulate white colour temperature by simple switch of the mains via wall switch (Pro Tune Series)

PRIME SERIES

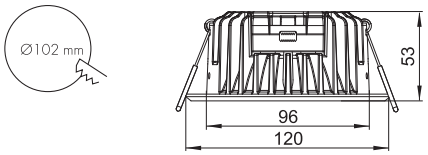
- Very high efficiency of up to 100 lm/W
- Slim design for easy installation in low false ceiling
- High CRI ≥ 90
- Dimmable with external dimmable drivers

Pro Series

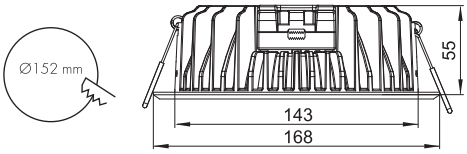
12 W / 18 W

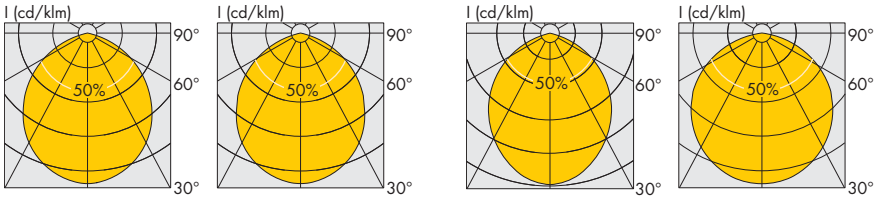
Advanced dimmable design (Pro Series)
or tunable white function (Pro Tune Series)
Voltage supply: 220–240 V AC
Integrated driver for direct connection to mains
Allowed operating temperature: –10 to 50 °C
Allowed storage temperature: –10 to 50 °C
Screw terminals: 2.5 mm²
Quantity of screw terminals: 1x2-poles primary
Protection class II
SELV
Degree of protection: IP20
Service life time: > 35,000 hours (L50)

Pro 12 W



Pro 18 W





Pro 12 W | Pro 18 W | Pro Tune 12 W | Pro Tune 18 W

Type	Ref. No.	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Beam angle °	Power factor	Dimming	Efficiency lm/W	System power W
Pro – 12 W										
DL-PRO-12-3000-110	**550880**	warm white	3000	≥ 80	850	110	> 0.9	Yes	71	12
DL-PRO-12-4000-110	**550882**	neutral white	4000	≥ 80	880	110	> 0.9	Yes	73	12
DL-PRO-12-6000-110	**550884**	cool white	6000	≥ 75	910	110	> 0.9	Yes	76	12
Pro – 18 W										
DL-PRO-18-3000-110	**550885**	warm white	3000	≥ 80	1350	110	> 0.9	Yes	75	18
DL-PRO-18-4000-110	**550886**	neutral white	4000	≥ 80	1450	110	> 0.9	Yes	80	18
DL-PRO-18-6000-110	**550887**	cool white	6000	≥ 75	1500	110	> 0.9	Yes	85	18
Pro Tune										
DL-PROTUNE-12-110	**550888**	warm/neutral/cool white	3000/4000/6000	≥ 80	730/870/860	110	> 0.9	No	61/73/72	12
DL-PROTUNE-18-110	**550889**	warm/neutral/cool white	3000/4000/6000	≥ 80	1200/1480/1420	110	> 0.9	No	67/82/79	18

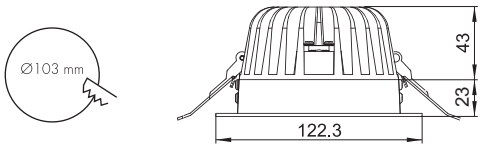
Test standards: IEC/EN 60598-1, IEC/EN 60598-2-2, IEC/EN 62493, IEC/EN 55015, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61547

Prime L Series

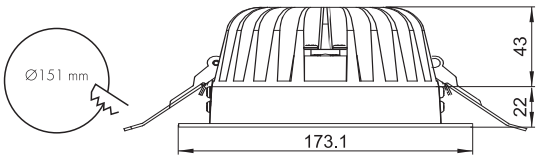
12 W / 26 W

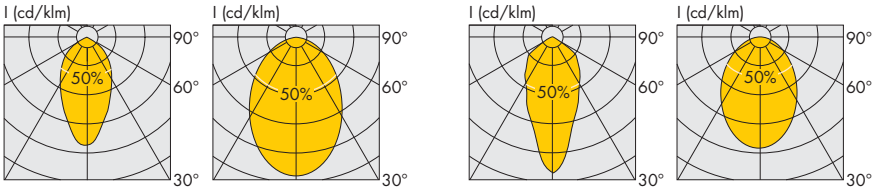
Current supply
for 12 W downlight: 350 mA DC
for 26 W downlight: 700 mA DC
Forward voltage: 37 V
Allowed operating temperature: -40 to 45 °C
Allowed storage temperature: -40 to 60 °C
Dimmable (dimmable LED drivers see from page 163 on)
Primary lead: PVC-insulation, length: 200 mm
Protection class III
Degree of protection: IP20
Service life time: > 50,000 hours (L70)

Prime L 12 W



Prime L 26 W





Prime L 12 W
99% clear

Prime L 12 W
87% diffuse

Prime L 26 W
99% clear

Prime L 26 W
87% diffuse

Type	Ref. No.	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Beam angle °	Power W	Efficiency lm/W	Front plate transparency	Unified glare rating index UGR	Energy efficiency
Prime L – 12 W											
DL-PRIME-L-12-3000-60-C	**550890**	warm white	3000	≥ 90	1240	45	12	105	99% clear	16.9	A
DL-PRIME-L-12-3000-80-D	**550891**	warm white	3000	≥ 90	1130	80	12	95	87% diffuse	20.8	A
DL-PRIME-L-12-4000-60-C	**550892**	neutral white	4000	≥ 90	1390	45	12	115	99% clear	16.1	A
DL-PRIME-L-12-4000-80-D	**550893**	neutral white	4000	≥ 90	1240	80	12	105	87% diffuse	21.7	A
Prime L – 26 W											
DL-PRIME-L-26-3000-50-C	**550894**	warm white	3000	≥ 90	2310	50	26	92	99% clear	19.8	A
DL-PRIME-L-26-3000-80-D	**550895**	warm white	3000	≥ 90	2200	80	26	88	87% diffuse	22.9	A
DL-PRIME-L-26-4000-50-C	**550896**	neutral white	4000	≥ 90	2400	50	26	92	99% clear	19.6	A
DL-PRIME-L-26-4000-80-D	**550897**	neutral white	4000	≥ 90	2250	80	26	88	87% diffuse	23.6	A

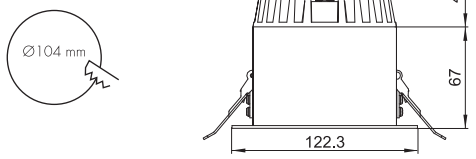
Test standards: IEC/EN 60598-1, IEC/EN 60598-2-2, IEC/EN 62031, IEC/EN 62471, IEC/EN 55015, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61547

Prime H Series

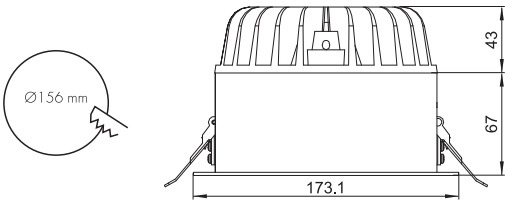
12 W / 26 W / 38 W and 40 W

Current supply
for 12 W downlight: 350 mA DC
for 26 W downlight: 700 mA DC
for 38 W/40 W downlight: 1050 mA DC
Forward voltage: 37 V
Allowed operating temperature: -40 to 45 °C
Allowed storage temperature: -40 to 60 °C
Dimmable (dimmable LED drivers see from page 163 on)
Primary lead: PVC-insulation, length:
200 mm (12 W and 26 W)
300 mm (38 W and 40 W)
Protection class III
Degree of protection: IP20
Service life time: > 50,000 hours (L70)

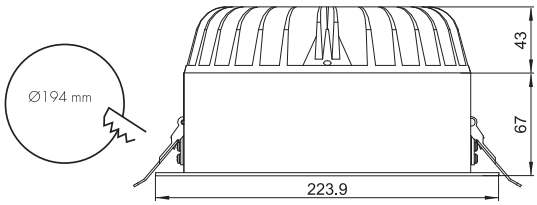
Prime H 12 W

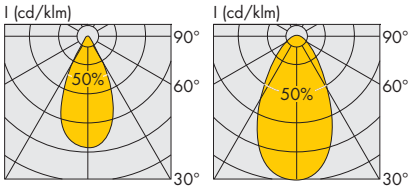


Prime H 26 W



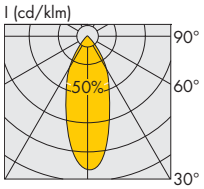
Prime H 38 W and 40 W



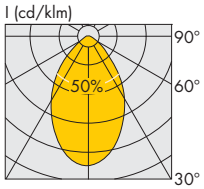


Prime H 12 W
99% clear

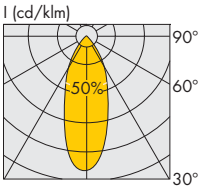
Prime H 12 W
87% diffuse



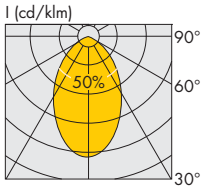
Prime H 26 W
99% clear



Prime H 26 W
87% diffuse



Prime H 38 W/40 W
99% clear



Prime H 38 W/40 W
87% diffuse

Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Beam angle °	Power W	Efficiency lm/W	Front plate transparency	Unified glare rating index UGR	Energy efficiency
Prime H – 12 W											
DL-PRIME-H-12-3000-50-C	**550898**	warm white	3000	≥ 90	895	50	12	75	99% clear	12.3	A
DL-PRIME-H12-3000-60-D	**550899**	warm white	3000	≥ 90	765	60	12	65	87% diffuse	15.2	A
DL-PRIME-H-12-4000-50-C	**550900**	neutral white	4000	≥ 90	1010	50	12	85	99% clear	14.2	A
DL-PRIME-H-12-4000-60-D	**550901**	neutral white	4000	≥ 90	840	60	12	70	87% diffuse	15.3	A
Prime H – 26 W											
DL-PRIME-H-26-3000-40-C	**550902**	warm white	3000	≥ 90	2140	40	26	85	99% clear	11.2	A
DL-PRIME-H-26-3000-70-D	**550903**	warm white	3000	≥ 90	1820	70	26	70	87% diffuse	19.3	A
DL-PRIME-H-26-4000-40-C	**550904**	neutral white	4000	≥ 90	2170	40	26	85	99% clear	12.0	A
DL-PRIME-H-26-4000-70-D	**550905**	neutral white	4000	≥ 90	1915	70	26	70	87% diffuse	18.6	A
Prime H – 38 W / 40 W											
DL-PRIME-H-383000-40-C	**550906**	warm white	3000	≥ 90	3240	40	38	85	99% clear	12.4	A
DL-PRIME-H-38-3000-75-D	**550907**	warm white	3000	≥ 90	3000	75	38	80	87% diffuse	20.2	A
DL-PRIME-H-40-4000-40-C	**550908**	neutral white	4000	≥ 90	3240	40	40	85	99% clear	13.8	A
DL-PRIME-H-40-4000-75-D	**550909**	neutral white	4000	≥ 90	2930	75	40	75	87% diffuse	20.3	A

Test standards: IEC/EN 60598-1, IEC/EN 60598-2-2, IEC/EN 62031, IEC/EN 62471, IEC/EN 55015, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61547

Typical Luminance

At 1, 2 and 3 meters

Pro

Light intensity (Lux)												
Colour temperature	**Pro-Serie 12 W**			**Pro-Serie 18 W**			**Pro Tune-Serie 12 W**			**Pro Tune-Serie 18 W**		
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
Warm white 3000 K	335	80	35	510	125	55	260	65	25	435	105	45
Neutral white 4000 K	380	90	40	620	150	65	310	75	30	525	130	55
Cool white 6000 K	425	105	45	680	170	75	320	80	35	545	135	60

Prime L

Light intensity (Lux)						
Colour temperature	**Prime L 12 W**			**Prime L 26 W**		
K	1 m	2 m	3 m	1 m	2 m	3 m
Warm white 3000 K – 99% clear	1270	320	140	1995	500	220
Warm white 3000 K – 87% diffuse	580	145	65	1065	265	120
Neutral white 4000 K – 99% clear	1395	350	155	2060	515	230
Neutral white 4000 K – 87% diffuse	625	155	70	1075	270	120

Prime H

Light intensity (Lux)									
Colour temperature	**Prime H 12 W**			**Prime H 26 W**			**Prime H 38 W / 40 W**		
K	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm white 3000 K – 99% clear	1120	280	125	3600	900	400	5200	1300	580
Warm white 3000 K – 87% diffuse	600	150	70	1210	300	135	1870	470	210
Neutral white 4000 K – 99% clear	1260	315	140	3600	900	400	5125	1280	570
Neutral white 4000 K – 87% diffuse	660	165	75	1290	325	145	1830	460	200

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.

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

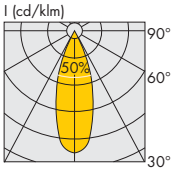
- Commercial lighting
- Showcase lighting
- Bathroom and kitchen lighting
- Residential lighting
- Entertainment lighting

VS DecoLED

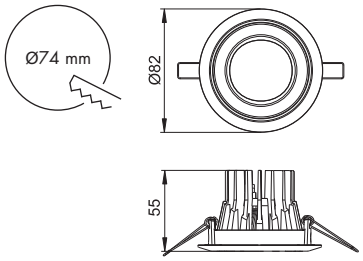
A slim and compact design with integrated thermal management and high-efficiency output, making it ideal for many lighting applications.

Allowed operating temperature: –20 to 40°C
Allowed storage temperature: –40 to 60°C
Dimmable (dimmable LED drivers see from page 163 on)
Protection class III
Degree of protection: IP20
Service life time: > 35,000 hrs (L50)

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



36°



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-7-2700-36	**552096**	warm white	2700	85	600	1150	36	74	7	A+

Typical Luminance

Of DecoLEDs at 1, 2 and 3 meters

Intensity (lux)			
Colour temperature K	**36°** 1 m	2 m	3 m
Warm White 2700 K	1200	300	133
Warm White 3000 K	–	–	–
Neutral White 4000 K	–	–	–
Cool White 6000 K	–	–	–

LED Constant Current Drivers

You will find LED drivers for the DecoLED modules on pages 138–182.

FOR RETAIL, 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 in a white, silver, Diffuse 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 drivers housed in a compact casing plus a set of cables with preassembled plugs for connecting up to two LED modules.

Typical applications for LEDSpots

- Replacement of more common lamps (AR111, MR16, MR11)
- Integration in luminaires (except PRO series)
- Retail lighting
- Marking paths, stairs, etc.
- Furniture lighting (IP54 version for humid rooms)
- Light advertising
- Entertainment

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.**

LEDSpots at a Glance

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

ShopLine Series
- Replacement for HID lamps 20–100 W
- Built-in spot with heat sink based on LUGA modules
- Reflector for homogeneous light distribution

ActiveLine Series
- Replacement for Halogen lamps 50 W and HID lamps 20–35 W (MR16)
- Built-in spot with heat sink based on LUGA or other COB modules
- Reflector or optics for homogeneous light distribution

Complete LEDSpots with Frame
- Replacement for Halogen lamps 20–35 W
- Flat LED spot with heat sink and frame based on COB or SMD modules
- For built-in into ceilings or metal sheets

ShopLine 111

Built-in LEDSpot equipped with a reflector, heat sink, leads and optional plug – Replacement for AR111

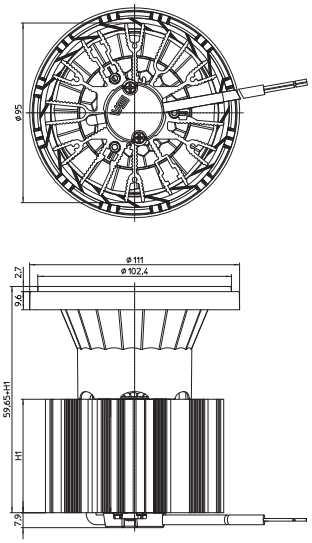
Technical notes

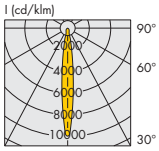
Reflector: Ø 111 mm
Heat sink material: aluminium
Allowed operating temperature at t_p point:
65 °C (L90/B10)
Max operating temperature t_c: 85 °C
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers required
The ceramic PCB ensures optimum thermal management
Fixation
reflector: front and back of rim
heat sink: lateral fixation with M5 screws and nuts or rear side fixation with tapping screws ST2.9
Plastic clear cover to protect reflector (opaque cover on request)
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 600 mm
With integrated cord grip
Unit: 6 pcs.

Dimensions H1	H	Weight g
40 mm	99.65 mm	310
60 mm	119.65 mm	430
80 mm	139.65 mm	550

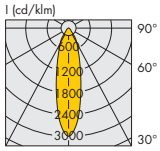

ShopLine 111


ShopLine 111 HL

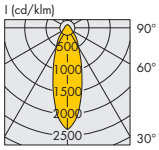




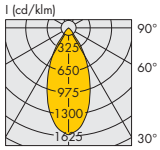
12° (088)



24° (088)



32° (088)



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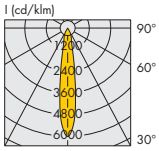
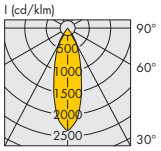
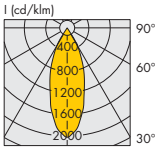


18° (128, 158)



24° (128, 158)



36° (128, 158)

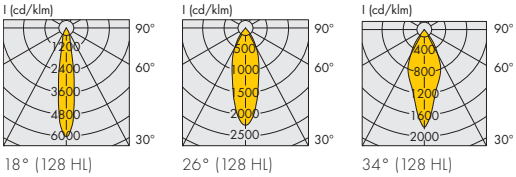
Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
				P_{el} = 7.8 W $U_{typ.}$ = 22.3 V	P_{el} = 11.4 W $U_{typ.}$ = 22.8 V	P_{el} = 16.6 W $U_{typ.}$ = 23.7 V				
H1 = 40 mm – ShopLine 111 088										
ShopLine 111 088	**553679**	warm white	3000	925	1240	1630	85	17500	12	A+
ShopLine 111 088	**553682**	neutral white	4000	980	1305	1725	85	18400	12	A+
ShopLine 111 088	**553680**	warm white	3000	905	1205	1590	85	5500	24	A+
ShopLine 111 088	**553683**	neutral white	4000	955	1275	1680	85	5700	24	A+
ShopLine 111 088	**553681**	warm white	3000	975	1300	1710	85	4300	32	A+
ShopLine 111 088	**553684**	neutral white	4000	1030	1370	1810	85	4600	32	A+
ShopLine 111 088	**558975**	warm white	3000	950	1270	1670	85	3000	40	A+
ShopLine 111 088	**558976**	neutral white	4000	1005	1340	1770	85	3100	40	A+
ShopLine 111 088	**558977**	pearl white	3100	905	1235	1615	85	17000	12	A+
ShopLine 111 088	**558978**	pearl white	3100	880	1205	1575	85	5100	24	A+
ShopLine 111 088	**558979**	pearl white	3100	950	1295	1700	85	4200	32	A+
ShopLine 111 088	**558980**	pearl white	3100	925	1265	1660	85	2900	40	A+

* Production tolerance of luminous flux, voltage and power consumption: ± 10%

ShopLine 111

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
H1 = 40 mm – ShopLine 111 128				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V					
ShopLine 111 128	**555333**	warm white	3000	1465	2000	–	85	12200	18	A++
ShopLine 111 128	**555336**	neutral white	4000	1560	2120	–	85	13000	18	A++
ShopLine 111 128	**555334**	warm white	3000	1480	2025	–	85	4900	24	A++
ShopLine 111 128	**555337**	neutral white	4000	1575	2145	–	85	5200	24	A++
ShopLine 111 128	**555335**	warm white	3000	1500	2050	–	85	4200	36	A++
ShopLine 111 128	**555338**	neutral white	4000	1600	2170	–	85	4400	36	A++
ShopLine 111 128	**558989**	pearl white	3100	1450	1980	–	85	12300	18	A+
ShopLine 111 128	**558990**	pearl white	3100	1470	2005	–	85	4100	24	A++
ShopLine 111 128	**558991**	pearl white	3100	1485	2025	–	85	4150	36	A++
H1 = 60 mm – ShopLine 111 128				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
ShopLine 111 128	**555339**	warm white	3000	1465	2000	2670	85	16200	18	A+
ShopLine 111 128	**555342**	neutral white	4000	1560	2120	2820	85	17100	18	A+
ShopLine 111 128	**555340**	warm white	3000	1480	2025	2700	85	6500	24	A+
ShopLine 111 128	**555343**	neutral white	4000	1575	2145	2855	85	6800	24	A+
ShopLine 111 128	**555341**	warm white	3000	1500	2050	2735	85	5600	36	A+
ShopLine 111 128	**555344**	neutral white	4000	1600	2170	2885	85	5800	36	A++
ShopLine 111 128	**558992**	pearl white	3100	1450	1980	2645	85	16200	18	A+
ShopLine 111 128	**558993**	pearl white	3100	1470	2005	2675	85	6500	24	A+
ShopLine 111 128	**557888**	pearl white	3100	1485	2025	2705	85	5100	36	A+
H1 = 80 mm – ShopLine 111 158				P_{el} = 14.6 W $U_{typ.}$ = 41.7 V	P_{el} = 21.4 W $U_{typ.}$ = 42.8 V	P_{el} = 31.1 W $U_{typ.}$ = 44.4 V				
ShopLine 111 158	**555345**	warm white	3000	1825	2490	3310	85	21000	18	A+
ShopLine 111 158	**555348**	neutral white	4000	1925	2630	3490	85	22000	18	A+
ShopLine 111 158	**555346**	warm white	3000	1845	2520	3350	85	8100	24	A+
ShopLine 111 158	**555349**	neutral white	4000	1950	2650	3525	85	8500	24	A+
ShopLine 111 158	**555347**	warm white	3000	1845	2520	3350	85	6800	36	A+
ShopLine 111 158	**555350**	neutral white	4000	1950	2650	3525	85	7200	36	A+
ShopLine 111 158	**559001**	pearl white	3100	1805	2455	3280	85	20000	18	A+
ShopLine 111 158	**559002**	pearl white	3100	1825	2490	3315	85	8000	24	A+
ShopLine 111 158	**557886**	pearl white	3100	1825	2490	3315	85	7000	36	A+
HL Versions – ShopLine 111 128				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
ShopLine 111 128 HL	**559494**	pearl white	3100	1450	1980	2650	85	15600	18	A+
ShopLine 111 128 HL	**559495**	pearl white	3100	1470	2005	2675	85	5800	26	A+
ShopLine 111 128 HL	**559496**	pearl white	3100	1470	2005	2675	85	4900	34	A+

* Production tolerance of luminous flux, voltage and power consumption: ± 10%



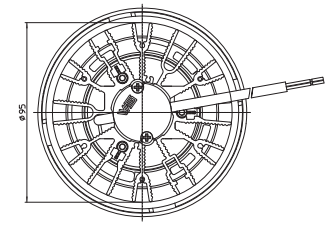
18° (128 HL) 26° (128 HL) 34° (128 HL)

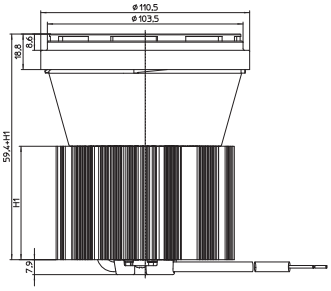
ShopLine NEXT 111

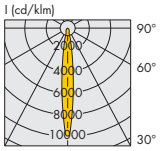
Built-in LEDSpot equipped with a interchangeable reflector, heat sink and leads
– Replacement for AR111

Technical notes

Reflector: Ø 111 mm
Heat sink material: aluminium
Allowed operating temperature at t_p point:
65 °C (L90/B10)
Max operating temperature t_c: 85 °C
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
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)
Fixation
reflector: front rim
heat sink: lateral fixation with M5 screws and nuts or rear side fixation with tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 300 mm
With integrated cord grip
Unit: 6 pcs.







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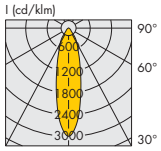

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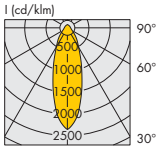

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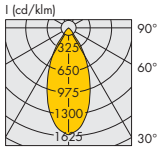

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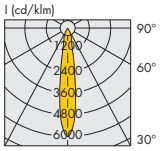
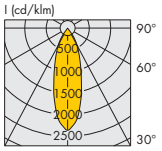


18° (128, 158)



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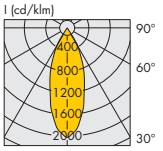


36° (128, 158)

Dimensions H1	H	Weight g
40 mm	99.65 mm	310
60 mm	119.65 mm	430
80 mm	139.65 mm	550

Type	**Ref. No.** For black LEDSpot	**Ref. No.** For white LEDSpot	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
H1 = 40 mm – ShopLine NEXT 111 088					P_{el} = 7.8 W $U_{typ.}$ = 22.3 V	P_{el} = 11.4 W $U_{typ.}$ = 22.8 V	P_{el} = 16.6 W $U_{typ.}$ = 23.7 V				
Next 111 088	**559208**	**559294**	warm white	3000	925	1240	1630	85	17500	12	A+
Next 111 088	**559216**	**559302**	neutral white	4000	980	1305	1725	85	18600	12	A+
Next 111 088	**559209**	**559295**	warm white	3000	905	1205	1590	85	5500	24	A+
Next 111 088	**559217**	**559303**	neutral white	4000	955	1275	1680	85	5700	24	A+
Next 111 088	**558137**	**559296**	warm white	3000	975	1300	1710	85	4300	32	A+
Next 111 088	**558140**	**559304**	neutral white	4000	1030	1370	1810	85	4600	32	A+
Next 111 088	**559210**	**559297**	warm white	3000	950	1270	1670	85	3000	40	A+
Next 111 088	**559218**	**559305**	neutral white	4000	1005	1340	1770	85	3100	40	A+
Next 111 088	**559211**	**559298**	pearl white	3100	905	1235	1615	85	17000	12	A+
Next 111 088	**559213**	**559299**	pearl white	3100	880	1205	1575	85	5100	24	A+
Next 111 088	**559214**	**559300**	pearl white	3100	950	1295	1700	85	4200	32	A+
Next 111 088	**559215**	**559301**	pearl white	3100	925	1265	1660	85	2900	40	A+

* Production tolerance of luminous flux, voltage and power consumption: ± 10%

ShopLine NEXT 111

Type	Ref. No. For black LEDSpots	Ref. No. For white LEDSpots	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
H1 = 60 mm – ShopLine NEXT 111 128					P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
Next 111 128	**558141**	**559306**	warm white	3000	1465	2000	2670	85	16200	18	A+
Next 111 128	**558144**	**559311**	neutral white	4000	1560	2120	2820	85	17100	18	A+
Next 111 128	**558142**	**559194**	warm white	3000	1480	2025	2700	85	6500	24	A+
Next 111 128	**558145**	**559312**	neutral white	4000	1575	2145	2855	85	6800	24	A+
Next 111 128	**558143**	**559307**	warm white	3000	1500	2050	2735	85	5600	36	A+
Next 111 128	**558146**	**559313**	neutral white	4000	1600	2170	2885	85	5800	36	A++
Next 111 128	**559237**	**559308**	pearl white	3100	1450	1980	2645	85	16200	18	A+
Next 111 128	**559238**	**559309**	pearl white	3100	1470	2005	2675	85	6500	24	A+
Next 111 128	**559239**	**559310**	pearl white	3100	1485	2025	2705	85	5200	36	A+
H1 = 80 mm – ShopLine NEXT 111 158					P_{el} = 14.6 W $U_{typ.}$ = 41.7 V	P_{el} = 21.4 W $U_{typ.}$ = 42.8 V	P_{el} = 31.1 W $U_{typ.}$ = 44.4 V				
Next 111 158	**558190**	**559326**	warm white	3000	1825	2490	3310	85	21000	18	A+
Next 111 158	**558193**	**559332**	neutral white	4000	1925	2630	3490	85	22000	18	A+
Next 111 158	**558191**	**559327**	warm white	3000	1845	2520	3350	85	8100	24	A+
Next 111 158	**558194**	**559333**	neutral white	4000	1950	2650	3525	85	8500	24	A+
Next 111 158	**558192**	**559328**	warm white	3000	1845	2520	3350	85	6800	36	A+
Next 111 158	**558195**	**559334**	neutral white	4000	1950	2650	3525	85	7200	36	A+
Next 111 158	**559287**	**559329**	pearl white	3100	1805	2455	3280	85	20000	18	A+
Next 111 158	**559288**	**559330**	pearl white	3100	1825	2490	3315	85	8000	24	A+
Next 111 158	**559289**	**559331**	pearl white	3100	1825	2490	3315	85	7000	36	A+
Food Version – ShopLine NEXT 111 158							P_{el} = 31.1 W $U_{typ.}$ = 44.4 V				
Next 111 158	**558728**	**559190**	"pink effect"	2000	–	–	1670	82	3430	36	A+
Next 111 158	**558729**	**559192**	warm white	3000	–	–	2140	85	4400	36	A+
Next 111 158	**558730**	**559191**	"white effect"	4000	–	–	1945	70	4000	36	A+
Next 111 158	**558731**	**559193**	neutral white	4000	–	–	2235	85	4600	36	A+

* Production tolerance of luminous flux, voltage and power consumption: ± 10%

With Zhaga Adaptor for Aluminium Reflectors

Reflektor size

top: Ø 94 mm

bottom: Ø 40 mm

height: 50 mm

Type	Ref. No. For black LEDSpots	Ref. No. For white LEDSpots	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	CRI R_a
H1 = 40 mm – ShopLine NEXT 111 088 Without reflector					P_{el} = 7.8 W $U_{typ.}$ = 22.3 V	P_{el} = 11.4 W $U_{typ.}$ = 22.8 V	P_{el} = 16.6 W $U_{typ.}$ = 23.7 V	
Next 111 088	**559941**	**on request**	pearl white	3100	1135	1555	2035	85
H1 = 60 mm – ShopLine NEXT 111 128 Without reflector					P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V	
Next 111 128	**559943**	**on request**	pearl white	3100	1720	2345	3135	85
H1 = 80 mm – ShopLine NEXT 111 158 Without reflector					P_{el} = 14.6 W $U_{typ.}$ = 41.7 V	P_{el} = 21.4 W $U_{typ.}$ = 42.8 V	P_{el} = 31.1 W $U_{typ.}$ = 44.4 V	
Next 111 158	**559944**	**on request**	pearl white	3100	2140	2915	3885	85

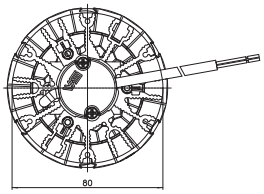
* Production tolerance of luminous flux, voltage and power consumption: ± 10%

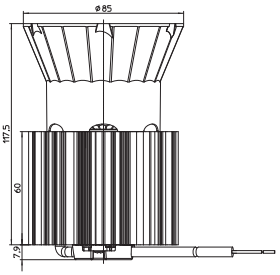
ShopLine 85

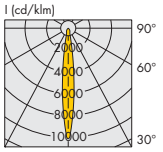
Built-in LEDSpot equipped with a reflector, heat sink, leads and optional plug

Technical notes

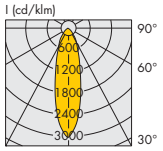
Reflector: Ø 85 mm
Heat sink material: aluminium
Allowed operating temperature at t_p point:
65 °C (L90/B10)
Max operating temperature t_c: 85 °C
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers required
The ceramic PCB ensures optimum thermal management
Fixation
heat sink: lateral fixation with M5 screws and nuts or rear side fixation with tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 300 mm, with or without plug
With integrated cord grip
Weight: 375 g
Unit: 6 pcs.



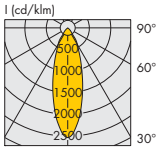




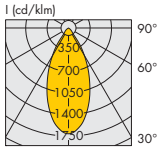
12° (088)



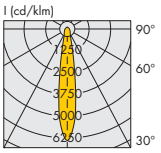
24° (088)



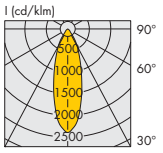
32° (088)



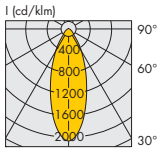
40° (088)



18° (128)



24° (128)



36° (128)

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
ShopLine 85 088				P_{el} = 7.8 W $U_{typ.}$ = 22.3 V	P_{el} = 11.4 W $U_{typ.}$ = 22.8 V	P_{el} = 16.6 W $U_{typ.}$ = 23.7 V				
Shopline 85 088	**554969**	warm white	3000	960	1285	1690	85	17675	12	A+
Shopline 85 088	**555351**	neutral white	4000	1020	1360	1790	85	18600	12	A+
Shopline 85 088	**554971**	warm white	3000	940	1255	1650	85	5555	24	A+
Shopline 85 088	**555353**	neutral white	4000	1000	1320	1750	85	5755	24	A+
Shopline 85 088	**554973**	warm white	3000	1000	1330	1755	85	4350	32	A+
Shopline 85 088	**555355**	neutral white	4000	1055	1405	1855	85	4645	32	A+
Shopline 85 088	**559098**	warm white	3000	975	1300	1710	85	3030	40	A+
Shopline 85 088	**559099**	neutral white	4000	1030	1370	1810	85	3130	40	A+
Shopline 85 088	**559100**	pearl white	3100	935	1280	1675	85	17170	12	A+
Shopline 85 088	**559101**	pearl white	3100	915	1250	1635	85	5150	24	A+
Shopline 85 088	**559102**	pearl white	3100	970	1326	1735	85	4220	32	A+
Shopline 85 088	**559103**	pearl white	3100	950	1295	1700	85	2930	40	A+
ShopLine 85 128				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
Shopline 85 128	**554981**	warm white	3000	1535	2095	2794	85	17600	18	A+
Shopline 85 128	**555357**	neutral white	4000	1630	2220	2952	85	18300	18	A++
Shopline 85 128	**554983**	warm white	3000	1550	2120	2826	85	7050	24	A+
Shopline 85 128	**555359**	neutral white	4000	1650	2245	2986	85	7500	24	A++
Shopline 85 128	**554985**	warm white	3000	1535	2095	2794	85	5850	36	A+
Shopline 85 128	**555361**	neutral white	4000	1630	2220	2952	85	6050	36	A++
Shopline 85 128	**559104**	pearl white	3100	1520	2075	2770	85	17500	18	A+
Shopline 85 128	**559105**	pearl white	3100	1535	2100	2800	85	7000	24	A+
Shopline 85 128	**559106**	pearl white	3100	1520	2080	2770	85	5800	36	A+

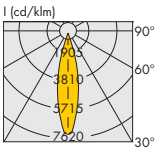
* Production tolerance of luminous flux, voltage and power consumption: ± 10%

ShopLine EVO90

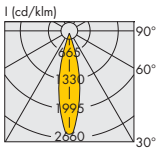
Built-in LEDSpot equipped with a reflector, heat sink and leads

Technical notes

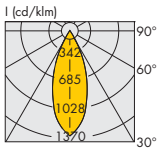
Reflector: Ø 90 mm, aluminium, bayonet fixing
Holder: PBT, inner ring: metallized
Heat sink material: aluminium
Allowed operating temperature at t_p point:
-25 to 85 °C
DMC125 (L90/B10; 40,000 hrs)
DMC128 (L90/B10; 50,000 hrs)
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers required
The ceramic PCB ensures optimum thermal management
Fixation
heat sink: lateral fixation with M5 screws and nuts or rear side fixation with tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 350 mm
With integrated cord grip
Weight: 360 g
Unit: 6 pcs.



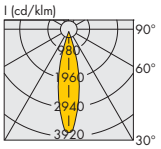
EVO90 125 - 12°



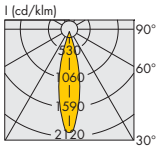
EVO90 125 - 22°



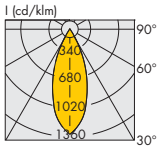
EVO90 125 - 32°



EVO90 128 - 18°

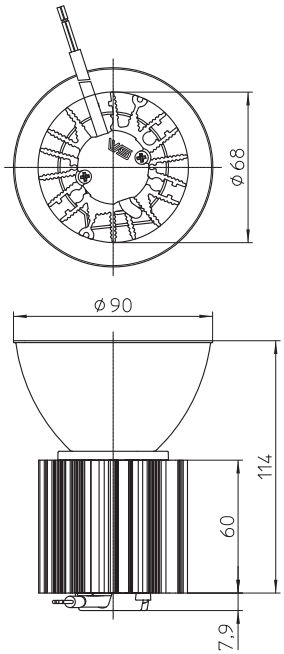


EVO90 128 - 26°

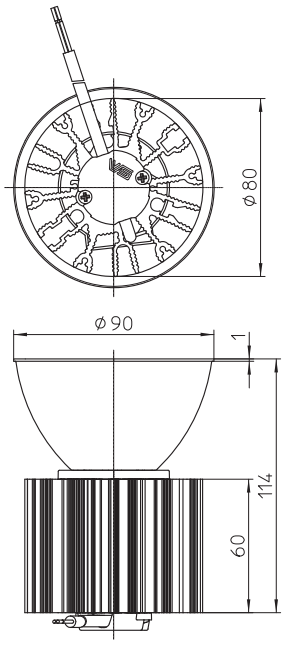


EVO90 128 - 36°

EVO90 125



EVO90 088/128



ShopLine EVO90

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el}) 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
Narrow beam angle: 12°				P_{el} = 12 W $U_{typ.}$ = 34.1 V	P_{el} = 17.7 W $U_{typ.}$ = 35.4 V					
EVO90 125	**558406**	warm white	2700	1250	1630	–	82	12350	12	A+
EVO90 125	**558409**	warm white	3000	1340	1750	–	85	13650	12	A+
EVO90 125	**558415**	neutral white	4000	1430	1870	–	85	14550	12	A+
Medium beam angle: 22°				P_{el} = 12 W $U_{typ.}$ = 34.1 V	P_{el} = 17.7 W $U_{typ.}$ = 35.4 V					
EVO90 125	**558407**	warm white	2700	1235	1615	–	82	4550	22	A+
EVO90 125	**558410**	warm white	3000	1325	1730	–	85	5150	22	A+
EVO90 125	**558413**	neutral white	4000	1415	1850	–	85	5350	22	A+
Wide beam angle: 32°				P_{el} = 12 W $U_{typ.}$ = 34.1 V	P_{el} = 17.7 W $U_{typ.}$ = 35.4 V					
EVO90 125	**558408**	warm white	2700	1235	1615	–	82	2500	32	A+
EVO90 125	**558411**	warm white	3000	1325	1730	–	85	2750	32	A+
EVO90 125	**558414**	neutral white	4000	1415	1850	–	85	2850	32	A+
Narrow beam angle: 18°				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
EVO90 128	**558085**	warm white	2700	1515	2070	2760	82	12500	18	A+
EVO90 128	**558089**	warm white	3000	1590	2170	2890	85	12550	18	A++
EVO90 128	**558094**	neutral white	4000	1685	2300	3055	85	13150	18	A++
Medium beam angle: 26°				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
EVO90 128	**558086**	warm white	2700	1515	2070	2760	82	6970	26	A+
EVO90 128	**557898**	warm white	3000	1590	2170	2890	85	7040	26	A++
EVO90 128	**558095**	neutral white	4000	1685	2300	3055	85	7450	26	A++
Wide beam angle: 36°				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
EVO90 128	**558088**	warm white	2700	1515	2070	2760	82	4230	36	A+
EVO90 128	**558090**	warm white	3000	1590	2170	2890	85	4280	36	A++
EVO90 128	**558096**	neutral white	4000	1685	2300	3055	85	4500	36	A++
Pearl White 2000 lm				P_{el} = 7.8 W $U_{typ.}$ = 22.3 V	P_{el} = 11.4 W $U_{typ.}$ = 22.8 V	P_{el} = 16.6 W $U_{typ.}$ = 23.7 V				
EVO90 088	**558412**	pearl white	3100	1030	1405	1840	85	10400	14	A+
EVO90 088	**558413**	pearl white	3100	1030	1405	1840	85	4800	24	A+
EVO90 088	**558414**	pearl white	3100	1030	1405	1840	85	2530	34	A+
Pearl White 3000 lm				P_{el} = 11.7 W $U_{typ.}$ = 33.4 V	P_{el} = 17.2 W $U_{typ.}$ = 34.4 V	P_{el} = 24.9 W $U_{typ.}$ = 35.6 V				
EVO90 128	**558091**	pearl white	3100	1570	2150	2865	85	12000	18	A+
EVO90 128	**558092**	pearl white	3100	1570	2150	2865	85	6920	26	A+
EVO90 128	**558093**	pearl white	3100	1570	2150	2865	85	420	36	A+

CRI > 90 on request

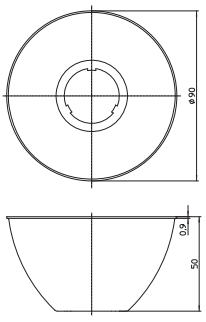
Reflectors for ShopLine EVO90

Reflectors made of aluminium with bayonet fixation
Surface: anodised, Weight: 27 g, Unit: 30 pcs.

Ref. No.	Beam characteristic	Beam angle		
Reflectors D90 H50		DMC125	DMS088	DMS128
557359	narrow	12°	14°	18°
557360	medium	22°	26°	26°
557361	wide	32°	36°	36°

Usage and maintenance

If necessary clean reflectors with mild soap, water and soft cloth.
Never use any commercial cleaning solvents on reflectors, like alcohol.
Please handle or install reflectors with wearing gloves, skin oils may damage reflector or its optical characteristic.

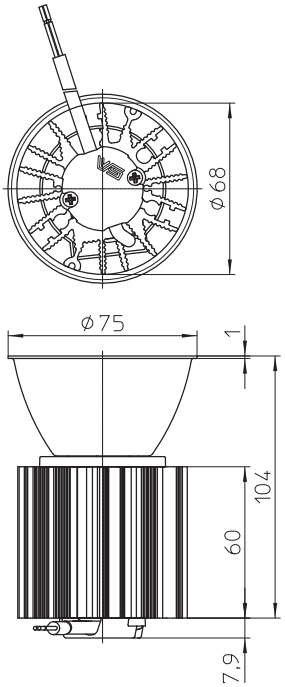


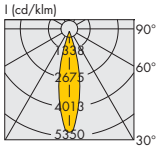
ShopLine EVO75

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

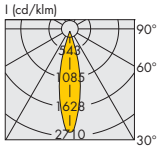
Technical notes

Reflector: Ø 75 mm, aluminium, bayonet fixing
Holder: PBT, inner ring: metallized
Heat sink material: aluminium
Allowed operating temperature at t_p point:
-25 to 85 °C
DMC125 (L90/B10; 40,000 hrs)
DMS088 (L90/B10; 50,000 hrs)
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers required
The ceramic PCB ensures optimum thermal management
Fixation
heat sink: lateral fixation with M5 screws and nuts or rear side fixation with tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 350 mm
With integrated cord grip
Weight: 295 g, Unit: 6 pcs.

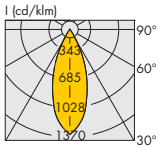




EVO75 125 - 15°



EVO75 125 - 25°



EVO75 125 - 32°

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el}) 350 mA lm	500 mA lm	700 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
Narrow beam angle: 15°				P_{el} = 12 W $U_{typ.}$ = 34.1 V	P_{el} = 17.7 W $U_{typ.}$ = 35.4 V					
EVO75 125	**557782**	warm white	2700	1260	1650	–	82	13480	15	A+
EVO75 125	**557785**	warm white	3000	1355	1765	–	85	14740	15	A+
EVO75 125	**557791**	neutral white	4000	1445	1890	–	85	15430	15	A+
Medium beam angle: 25°										
EVO75 125	**557783**	warm white	2700	1260	1650	–	82	6100	25	A+
EVO75 125	**557786**	warm white	3000	1355	1765	–	85	6700	25	A+
EVO75 125	**557792**	neutral white	4000	1445	1890	–	85	7040	25	A+
Wide beam angle: 32°										
EVO75 125	**557784**	warm white	2700	1260	1650	–	82	3155	32	A+
EVO75 125	**557787**	warm white	3000	1355	1765	–	85	3440	32	A+
EVO75 125	**557793**	neutral white	4000	1445	1890	–	85	3620	32	A+
Pearl White				P_{el} = 7.8 W $U_{typ.}$ = 22.3 V	P_{el} = 11.4 W $U_{typ.}$ = 22.8 V	P_{el} = 16.6 W $U_{typ.}$ = 23.7 V				
EVO75 088	**557788**	pearl white	3100	1030	1405	1840	85	12050	16	A+
EVO75 088	**557789**	pearl white	3100	1040	1420	1860	85	5950	28	A+
EVO75 088	**557790**	pearl white	3100	1030	1405	1840	85	3350	34	A+

CRI > 90 on request

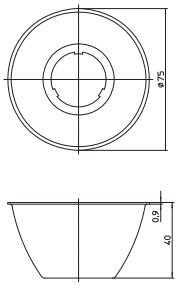
Reflectors for ShopLine EVO75

Reflectors made of aluminium with bayonet fixation
Surface: anodised, Weight: 17 g, Unit: 30 pcs.

Ref. No.	Beam characteristic	Beam angle	
Reflectors D75 H40		DMC125	DMS088
557152	narrow	15°	16°
557153	medium	25°	28°
557154	wide	32°	34°

Usage and maintenance

If necessary clean reflectors with mild soap, water and soft cloth.
Never use any commercial cleaning solvents on reflectors, like alcohol.
Please handle or install reflectors with wearing gloves, skin oils may damage reflector or its optical characteristic.



ActiveLine LUGA

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

Technical notes
Reflector: Ø 50 mm
Heat sink material: aluminium
Allowed operating temperature at t_c point:
–40 to 65 °C (**L90/B10**)
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
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)
Version with plug on request

ActiveLine 9.1 / 7.1 / 6.1 / Quad

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

Technical notes
Reflector: Ø 50 mm
Heat sink material: aluminium
(Quad: thermoconductive resin)
Allowed operating temperature at t_c point:
–40 to 85 °C (**L70/B30**)
–20 to 80 °C (Quad)
Colour accuracy: 3 SDCM
Use of external LED constant-current drivers required
Aluminium PCB for optimum thermal management
Plastic clear cover to protect reflector
(opaque cover on request)
Version with plug on request

ActiveLine PRO

Complete LEDSpots equipped with a reflector or optics, heat sink, leads and metal frame
Type and Ref. No. on request

ActiveLine LUGA C

Technical notes

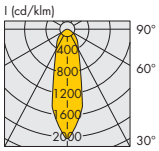
Reflector: Ø 50 mm

Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 200 mm

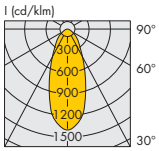
With integrated cord grip

Weight: 300 g

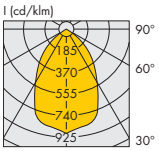
Unit: 35 pcs.



25°

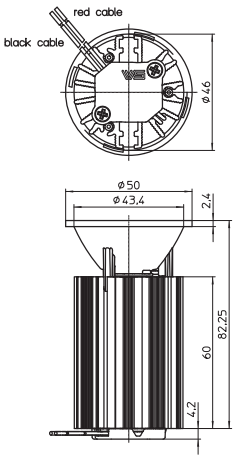


34°

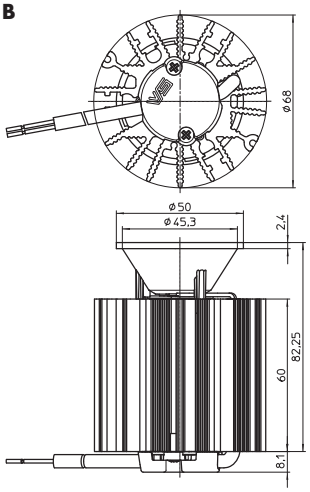


48°

A



B



ActiveLine (A) – max. 350 mA

ActiveLine (B) – max. 500 mA

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA min.	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current	Drawing
Narrow beam angle: 25°				P_{el} = 11 W, $U_{typ.}$ = 31.4 V	P_{el} = 16.3 W, $U_{typ.}$ = 32.6 V					
Luga C 115 27K	**559388**	warm white	2700	1190	–	82	2390	25	A+	A
Luga C 115 30K	**559391**	warm white	3000	1275	–	85	2560	25	A+	A
Luga C 115 40K	**559394**	neutral white	4000	1355	–	85	2720	25	A++	A
Luga C 115 30K	**559412**	warm white	3000	1065	–	95	3220	25	A+	A
Medium beam angle: 34°										
Luga C 115 27K	**559389**	warm white	2700	1170	–	82	1645	34	A+	A
Luga C 115 30K	**559392**	warm white	3000	1250	–	85	1755	34	A+	A
Luga C 115 40K	**559395**	neutral white	4000	1325	–	85	1860	34	A++	A
Luga C 115 30K	**559413**	warm white	3000	1045	–	95	1465	34	A+	A
Wide beam angle: 48°										
Luga C 115 27K	**559390**	warm white	2700	1210	–	82	1110	48	A+	A
Luga C 115 30K	**559393**	warm white	3000	1295	–	85	1185	48	A+	A
Luga C 115 40K	**559396**	neutral white	4000	1375	–	85	1260	48	A++	A
Luga C 115 30K	**559414**	warm white	3000	1080	–	95	990	48	A+	A
Narrow beam angle: 25°										
Luga C 115 27K	**559397**	warm white	2700	1190	1580	82	3165	25	A+	B
Luga C 115 30K	**559400**	warm white	3000	1275	1685	85	3370	25	A+	B
Luga C 115 40K	**559403**	neutral white	4000	1355	1795	85	3590	25	A+	B
Luga C 115 30K	**559418**	warm white	3000	1065	1405	95	2815	25	A+	B
Medium beam angle: 34°										
Luga C 115 27K	**559398**	warm white	2700	1170	1545	82	2160	34	A+	B
Luga C 115 30K	**559401**	warm white	3000	1250	1650	85	2310	34	A+	B
Luga C 115 40K	**559404**	neutral white	4000	1325	1760	85	2460	34	A+	B
Luga C 115 30K	**559419**	warm white	3000	1045	1380	95	1930	34	A+	B
Wide beam angle: 48°										
Luga C 115 27K	**559399**	warm white	2700	1210	1600	82	1460	48	A+	B
Luga C 115 30K	**559402**	warm white	3000	1295	1710	85	1560	48	A+	B
Luga C 115 40K	**559405**	neutral white	4000	1375	1820	85	1660	48	A+	B
Luga C 115 30K	**559420**	warm white	3000	1080	1430	95	1310	48	A+	B

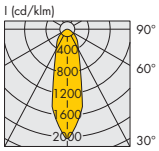
* Production tolerance of luminous flux, voltage and power consumption: ± 15%

ActiveLine LUGA C

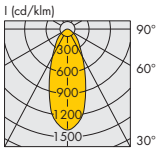
Technical notes

Reflector: Ø 50 mm
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm
With integrated cord grip
Weight: 145 g
Unit: 45 pcs.

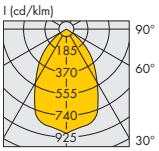

ActiveLine LUGA C 104



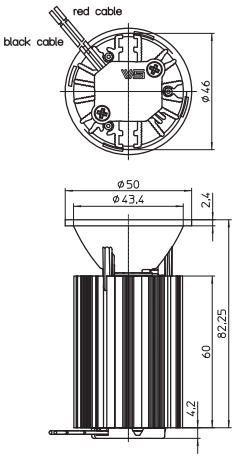
25°



34°



48°



Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
Narrow beam angle: 25° – LUGA C 104				P_{el} = 10.2 W, $U_{typ.}$ = 29.2 V				
Luga C 104 27K	**559379**	warm white	2700	1020	82	2050	25	A+
Luga C 104 30K	**559382**	warm white	3000	1080	85	2170	25	A+
Luga C 104 40K	**559385**	neutral white	4000	1160	85	2330	25	A++
Luga C 104 30K	**559406**	warm white	3000	914	95	1850	25	A+
Medium beam angle: 34° – LUGA C 104				P_{el} = 10.2 W, $U_{typ.}$ = 29.2 V				
Luga C 104 27K	**559380**	warm white	2700	1005	82	1410	34	A+
Luga C 104 30K	**559383**	warm white	3000	1065	85	1495	34	A+
Luga C 104 40K	**559386**	neutral white	4000	1145	85	1610	34	A++
Luga C 104 30K	**559407**	warm white	3000	905	95	1270	34	A+
Wide beam angle: 48° – LUGA C 104				P_{el} = 10.2 W, $U_{typ.}$ = 29.2 V				
Luga C 104 27K	**559381**	warm white	2700	1045	82	955	48	A+
Luga C 104 30K	**559384**	warm white	3000	1105	85	1010	48	A+
Luga C 104 40K	**559387**	neutral white	4000	1190	85	1090	48	A++
Luga C 104 30K	**559408**	warm white	3000	940	95	860	48	A+

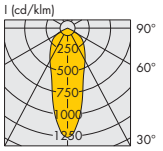
* Production tolerance of luminous flux, voltage and power consumption: ± 15%

ActiveLine 9.1 & 7.1

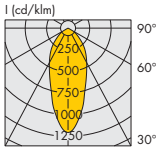
Technical notes
Reflector: Ø 50 mm
Heat sink material: aluminium
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm
With integrated cord grip
Weight: 145 g
Unit: 45 pcs.


ActiveLine 9.1

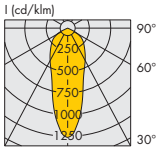

ActiveLine 7.1



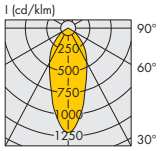
25° – ActiveLine 9.1



36° – ActiveLine 9.1

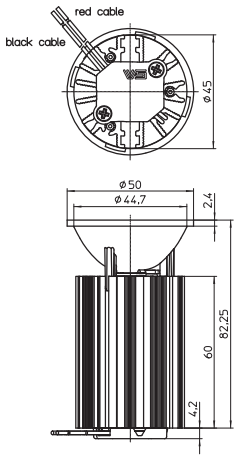


25° – ActiveLine 7.1

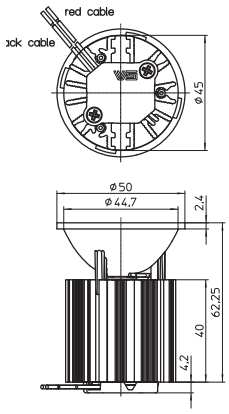


36° – ActiveLine 7.1

ActiveLine 9.1



ActiveLine 7.1

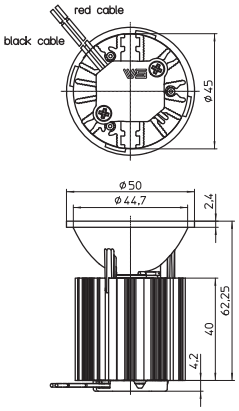


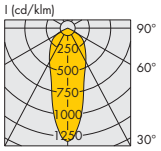
Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el}) 350 mA lm	500 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
				P_{el} = 6.2 W $U_{typ.}$ = 17.8 V	P_{el} = 9.3 W $U_{typ.}$ = 18.5 V				
Narrow beam angle: 25° – ActiveLine 9.1									
ActiveLine 9.1 27K	**559442**	warm white	2700	580	780	80	1400	25	A+
ActiveLine 9.1 30K	**559444**	warm white	3000	615	825	80	1430	25	A+
ActiveLine 9.1 40K	**559446**	neutral white	4000	645	865	80	1540	25	A++
Medium beam angle: 36° – ActiveLine 9.1									
ActiveLine 9.1 27K	**559443**	warm white	2700	580	780	80	1150	36	A+
ActiveLine 9.1 30K	**559445**	warm white	3000	615	825	80	1220	36	A+
ActiveLine 9.1 40K	**559447**	neutral white	4000	645	865	80	1350	36	A++
Narrow beam angle: 25° – ActiveLine 7.1									
ActiveLine 7.1 27K	**559436**	warm white	2700	580	–	80	1000	25	A+
ActiveLine 7.1 30K	**559438**	warm white	3000	615	–	80	1075	25	A+
ActiveLine 7.1 40K	**559440**	neutral white	4000	645	–	80	1150	25	A++
Medium beam angle: 36° – ActiveLine 7.1									
ActiveLine 7.1 27K	**559437**	warm white	2700	580	–	80	865	36	A+
ActiveLine 7.1 30K	**559439**	warm white	3000	615	–	80	925	36	A+
ActiveLine 7.1 40K	**559441**	neutral white	4000	645	–	80	1010	36	A++

ActiveLine 6.1

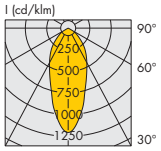
Technical notes
Reflector: Ø 50 mm
Heat sink material: aluminium
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm
With integrated cord grip
Weight: 145 g
Unit: 45 pcs.


ActiveLine 6.1





24° - ActiveLine 6.1

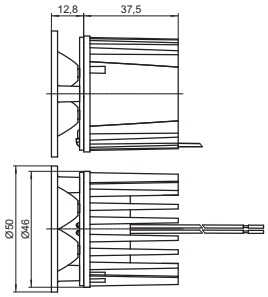


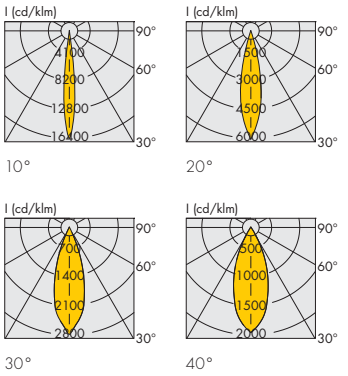
36° - ActiveLine 6.1

Type	**Ref. No.**	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el}) 350 mA lm	CRI R_a	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
Narrow beam angle: 24° – ActiveLine 6.1				P_{el} = 6.8 W, $U_{typ.}$ = 19.4 V				
ActiveLine 6.1 27K	**559430**	warm white	2700	520	80	950	24	A+
ActiveLine 6.1 30K	**559432**	warm white	3000	550	80	1010	24	A+
ActiveLine 6.1 40K	**559434**	neutral white	4000	575	80	1050	24	A+
Medium beam angle: 36° – ActiveLine 6.1								
ActiveLine 6.1 27K	**559431**	warm white	2700	520	80	800	36	A+
ActiveLine 6.1 30K	**559433**	warm white	3000	550	80	870	36	A+
ActiveLine 6.1 40K	**559435**	neutral white	4000	575	80	950	36	A+

ActiveLine Quad

Technical notes
Optics: Ø 50 mm
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 300 mm
ESD protection class 2
Weight: 90 g
Unit: 45 pcs.





Type	Description	Ref. No. with plug	Ref. No. without plug	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA min.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	Light intensity at max. current Candela	Beam angle °	Energy efficiency at max. current
						P_{el} = 3.99 W		P_{el} = 5.8 W		P_{el} = 8.5 W				
LEDSpot ActiveLine Quad 10°						$U_{typ.}$ = 11.4 V		$U_{typ.}$ = 11.6 V		$U_{typ.}$ = 12.1 V				
LR4W	XTE 3000K bin Q3	**547794**	**547790**	warm white	2870...3200	338	373	450	496	601	663	10000	10	A
LR4W	XTE 4000K bin Q4	**549917**	**548864**	neutral white	3700...4260	360	398	479	529	640	707	10600	10	A+
LR4W	XPE 6300K bin Q4	**547802**	**547798**	cool white	5650...6950	360	398	468	517	612	676	10200	10	A+
LEDSpot ActiveLine Quad 20°														
LR4W	XTE 3000K bin Q3	**547793**	**547789**	warm white	2870...3200	338	373	450	496	601	663	3100	20	A
LR4W	XTE 4000K bin Q4	**549916**	**547940**	neutral white	3700...4260	360	398	479	529	640	707	3300	20	A+
LR4W	XPE 6300K bin Q4	**547801**	**547797**	cool white	5650...6950	360	398	468	517	612	676	3150	20	A+
LEDSpot ActiveLine Quad 30°														
LR4W	XTE 3000K bin Q3	**547792**	**547788**	warm white	2870...3200	338	373	450	496	601	663	1600	30	A
LR4W	XTE 4000K bin Q4	**549915**	**548863**	neutral white	3700...4260	360	398	479	529	640	707	1700	30	A+
LR4W	XPE 6300K bin Q4	**547800**	**547796**	cool white	5650...6950	360	398	468	517	612	676	1630	30	A+
LEDSpot ActiveLine Quad 40°														
LR4W	XTE 3000K bin Q3	**547791**	**547726**	warm white	2870...3200	338	373	450	496	601	663	1100	40	A
LR4W	XTE 4000K bin Q4	**549914**	**547837**	neutral white	3700...4260	360	398	479	529	640	707	1180	40	A+
LR4W	XPE 6300K bin Q4	**547799**	**547795**	cool white	5650...6950	360	398	468	517	612	676	1130	40	A+

Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

LEDSpots

Complete LEDSpot equipped with optics, heat sink, leads and frame

LEDSpot IPLine
Metal frame, round
For cut-out: Ø 56 mm
Degree of protection: IP54

LEDSpot SmartLine COB / XT
Metal frame, round or square
For cut-out: Ø 56 mm
Degree of protection: IP40

LEDSpot StartLine
Resin or steel frame, round
For cut-out: Ø 56 mm
Degree of protection: IP20

Surface Kit with Mounted LEDSpot
Plastic frame to use IPLine, SmartLine or StartLine as surface mounting spots
Dimensions (ØxH): Ø 67 x 30 mm
Degree of protection: IP20

LEDSpot DiscLine
Metal frame, round
For cut-out: Ø 56 mm
Degree of protection: IP40

LEDSpot EffectLine
Metal frame, round or square
For cut-out: Ø 37 mm
Degree of protection: IP20

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.

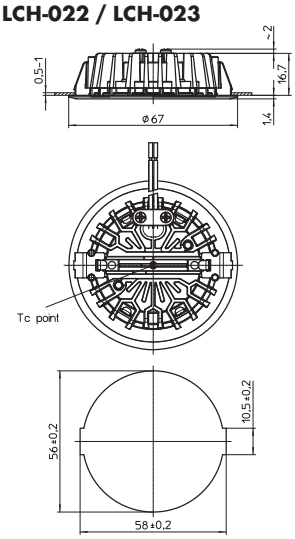
Lead sets for LEDSpots
Lead sets with connector for easy and fast connection.

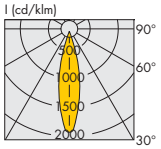
LEDSpot IPLine

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

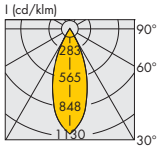
Technical notes
Metal frame, round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Reflector with clear glass (opaque glass on request)
Beam angle: 30° or 50° (XTE), 40° (COB)
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP54
Unit: 45 pcs.

LCH-022 / LCH-023

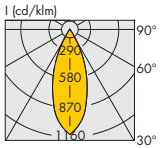




30°



50°



40°

Type	Description	LEDSpot version	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA min.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	Light intensity at max. current Candela 30°	Light intensity at max. current Candela 50°	Beam angle °	Energy efficiency at max. current
					P_{el} = 0.98 W		P_{el} = 1.48 W		P_{el} = 2.17 W		30°	50°		
LEDSpot IPLine (LCH-022)					$U_{typ.}$ = 3.5 V		$U_{typ.}$ = 3 V		$U_{typ.}$ = 3.1 V					
LCH-022	XTE 3000K bin min Q3	**A**	warm white	2870...3200	79.8	88	103.7	114.4	135.7	149.6	290	170	50	A+
LCH-022	XTE 4500K bin min Q5	**B**	neutral white	4250...4750	91	100.3	121	133.4	161.7	178.3	360	190	50	A++
LCH-022	XTE 6000K bin min R3	**C**	cool white	5000...6950	103.7	114.3	139.7	152.1	184.4	203.3	370	210	50	A++
					P_{el} = 3.5 W						350 mA / 40°			
LEDSpot IPLine COB (LCH-023)					$U_{typ.}$ = 10 V									
LCH-023	COB 3000K bin min Q3	**D**	warm white	2920...3070	250	285	–	–	–	–	330	–	40	A+
LCH-023	COB 4200K bin min Q5	**E**	neutral white	3850...4650	263	300	–	–	–	–	380	–	40	A+

Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

	LEDSpot IPLine						LEDSpot IPLine COB	
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)
	30°	50°	30°	50°	30°	50°	40°	40°
silver	**555403**	**552083**	**555405**	**552085**	**555407**	**552087**	**552089**	**552091**
white	**555402**	**552082**	**555404**	**552084**	**555406**	**552086**	**552088**	**552090**

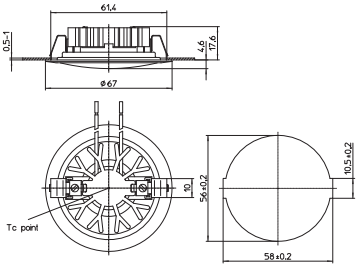
LEDSpot SmartLine COB

Complete LEDSpot equipped with optics, heat sink, leads and metal frame

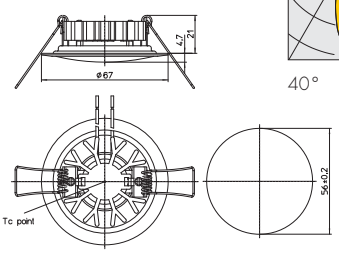
Technical notes

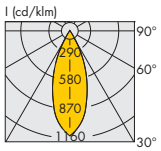
Metal frame, round or square
For cut-out: Ø 56 mm
LEDSpot with one LED and with an aluminium heat sink
Beam angle: 40°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
for luminaire sheets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

LCH-017



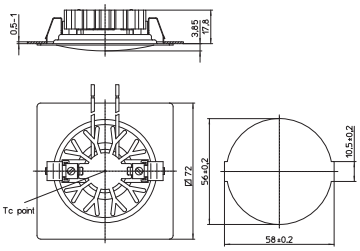
LCH-019



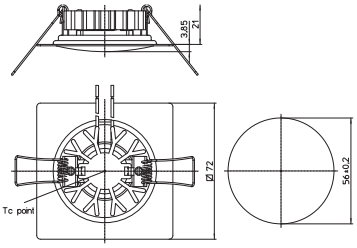


40°

LCH-020



LCH-021



Type	Description	**LEDSpot version** for luminaire sheets	**LEDSpot version** for ceiling	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* at 350 mA		Light intensity at max. current Candela	Frame shape		Energy efficiency at max. current
						min.	typ.		round	square	
						P_{el} = 3.5 W $U_{typ.}$ = 10 V					
All types	COB 3000K 40°	**A**	**C**	warm white	2920...3070	250	285	330	round	square	A+
All types	COB 4200K 40°	**B**	**D**	neutral white	3850...4650	263	300	380	round	square	A+

Emission data at t_c = 25 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

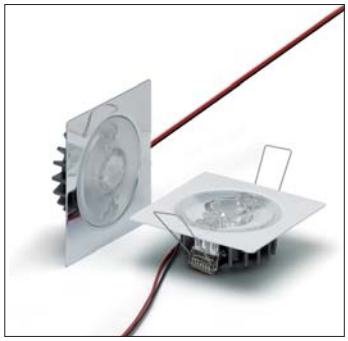
	For luminaire sheets (LCH-017 and LCH-020)				**For ceilings** (LCH-019 and LCH-021)			
Frame colour	**Ref. No.** **A** (warm white)		**Ref. No.** **B** (neutral white)		**Ref. No.** **C** (warm white)		**Ref. No.** **D** (neutral white)	
	round	square	round	square	round	square	round	square
silver	**548912**	**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

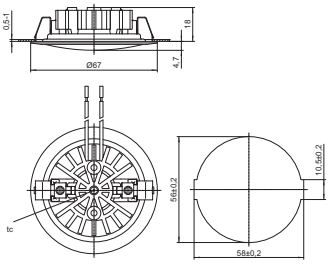
Complete LEDSpot equipped with optics, heat sink, leads and metal frame

Technical notes

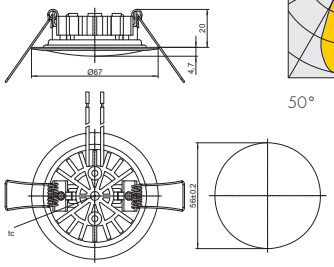
Metal frame, round or square
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 50°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
for luminaire sheets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

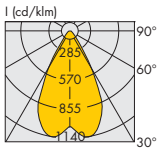


LCH-002



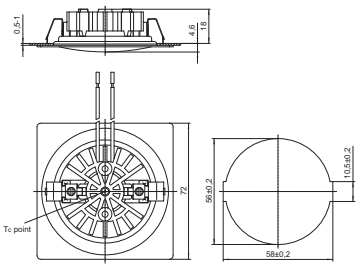
LCH-004



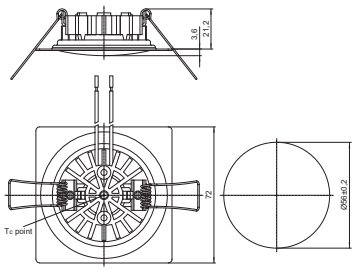


50°

LCH-008



LCH-009

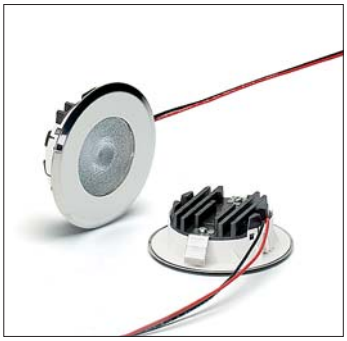


Type	Description	LEDSpot version for luminaire sheets	LEDSpot version for ceiling	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA min.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	Light intensity at max. current Candela	Frame shape round	Frame shape square	Energy efficiency at max. current
						P_{el} = 0.98 W $U_{typ.}$ = 2.8 V		P_{el} = 1.48 W $U_{typ.}$ = 3 V		P_{el} = 2.17 W $U_{typ.}$ = 3.1 V					
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	A+
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	A+
All types	XTE 6000K bin R3	**C**	**F**	cool white	5000...6950	103.7	114.3	139.7	152.1	184.4	203.3	270	round	square	A++

Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

Frame colour	**For luminaire sheets** (LCH-002 and LCH-008) **Ref. No. A** (warm white) round	**A** square	**Ref. No. B** (neutral white) round	**B** square	**Ref. No. C** (cool white) round	**C** square	**For ceilings** (LCH-004 and LCH-009) **Ref. No. D** (warm white) round	**D** square	**Ref. No. E** (neutral white) round	**E** square	**Ref. No. F** (cool white) round	**F** 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 StartLine

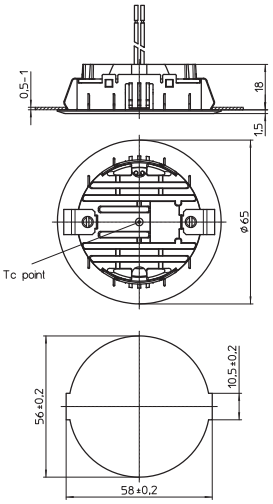


Complete LEDSpot equipped with optics, heat sink, leads and frame

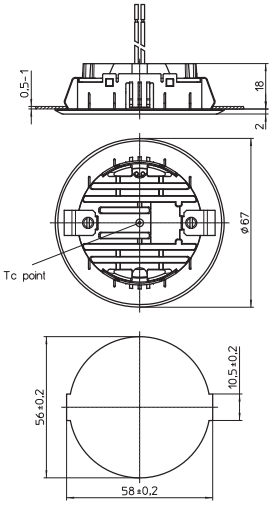
Technical notes

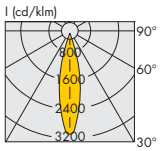
Frame, round: resin (LCH-015) or steel (LCH-016)
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 20° or 40°
Leads: Cu tinned, stranded conductors 0.5 mm², PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP20
Unit: 90 pcs.

LCH-015

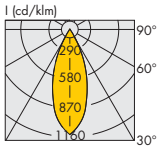


LCH-016





20°



40°

Type	Description	**LEDSpot version**	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA min.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	Light intensity at max. current Candela 20°	Light intensity at max. current Candela 40°	Energy efficiency at max. current
					P_{el} = 1.02 W $U_{typ.}$ = 2.9 V		P_{el} = 1.49 W $U_{typ.}$ = 3 V		P_{el} = 2.17 W $U_{typ.}$ = 3.1 V				
All types	XBD Min Q2	**A**	warm white	2870...3200	74.3	82.5	96.6	107.2	127.8	141.8	430	160	A+
All types	XBD Min Q4	**B**	neutral white	3850...4250	85	93.9	110.5	122.1	146.2	161.6	520	220	A+
All types	XBD Min Q5	**C**	cool white	5250...6250	91	100.3	118.2	130.2	156.4	172.5	600	230	A+

Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

With resin frame (LCH-015)							**With steel frame** (LCH-016)						
Frame colour	**Ref. No.** **A** (warm white) 20°	**Ref. No.** **A** (warm white) 40°	**Ref. No.** **B** (neutral white) 20°	**Ref. No.** **B** (neutral white) 40°	**Ref. No.** **C** (cool white) 20°	**Ref. No.** **C** (cool white) 40°	Frame colour	**Ref. No.** **A** (warm white) 20°	**Ref. No.** **A** (warm white) 40°	**Ref. No.** **B** (neutral white) 20°	**Ref. No.** **B** (neutral white) 40°	**Ref. No.** **C** (cool white) 20°	**Ref. No.** **C** (cool white) 40°
silver mat	**553424**	**553426**	**553429**	**553431**	**553433**	**553435**	silver	**553442**	**551758**	**553444**	**551748**	**553446**	**551750**
white	**553423**	**553425**	**553428**	**553430**	**553432**	**553434**	white	**553441**	**551757**	**553443**	**551747**	**553445**	**551749**

Surface Kit with Mounted LEDSpot

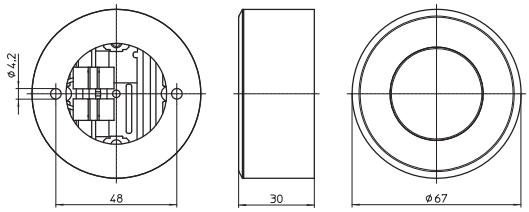
Metal frame to use IPLine, SmartLine or StartLine as surface mounting spots
Two single pole terminals for electrical connection inside the kit (frame + spot)
Fixation by self tapping screws
Unit: 90 pcs.

Ref. No.: 554845 Frame colour: white
Ref. No.: 554843 Frame colour: silver

Frame

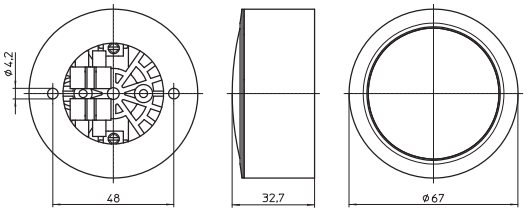
Surface Kit with LEDSpot StartLine
Colour temperature: 3000 K
Beam angle: 40°
Unit: 1 pcs.
Type: StartLine SFK LCH016

Ref. No.: 557621 Frame colour: white
Ref. No.: 557157 Frame colour: silver



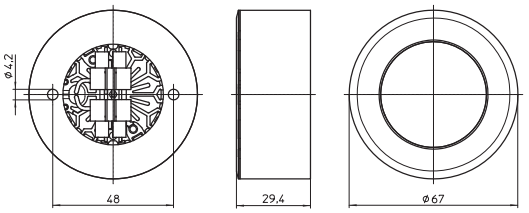
Surface Kit with LEDSpot SmartLine
Colour temperature: 3000 K
Beam angle: 50°
Unit: 1 pcs.
Type: SmartLine SFK LCH002

Ref. No.: 557158 Frame colour: white
Ref. No.: 557622 Frame colour: silver



Surface Kit with LEDSpot IPLine
Colour temperature: 4500 K
Beam angle: 30°
Unit: 1 pcs.
Type: IPLine SFK LCH022

Ref. No.: 559624 Frame colour: white
Ref. No.: 559623 Frame colour: silver



Type	Description	Ref. No.	Colour	Correlated colour temp. (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 at max. current (Cd)	Beam angle °	Energy efficiency 700 mA
					P_{el} = 1.02 W		P_{el} = 1.49 W		P_{el} = 2.17 W				
Surface Kit with LEDSpot StartLine					$U_{typ.}$ = 2.9 V		$U_{typ.}$ = 3 V		$U_{typ.}$ = 3.1 V				
StartLine SFK LCH016	XBD Min Q2	**557157/559621**	warm white	2870...3200	74.3	82.5	96.6	107.2	127.8	141.8	160	40	A+
					P_{el} = 0.98 W		P_{el} = 1.48 W		P_{el} = 2.17 W				
Surface Kit with LEDSpot SmartLine					$U_{typ.}$ = 2.8 V		$U_{typ.}$ = 3 V		$U_{typ.}$ = 3.1 V				
SmartLine SFK LCH002	XTE 3000K bin Q3	**557158/559622**	warm white	2870...3200	79.8	88	103.7	114.4	135.7	149.6	210	50	A+
					P_{el} = 0.98 W		P_{el} = 1.48 W		P_{el} = 2.17 W				
Surface Kit with LEDSpot IPLine					$U_{typ.}$ = 3.5 V		$U_{typ.}$ = 3 V		$U_{typ.}$ = 3.1 V				
IPLine SFK LCH022	XTE 4500K bin Q5	**559623/559624**	neutral white	4250...4750	91	100.3	121	133.4	161.7	178.7	190	30	A++

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

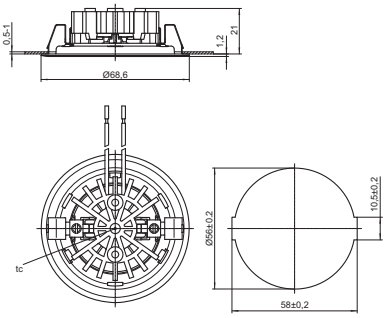
LEDSpot DiscLine

Complete LEDSpot equipped with optics, heat sink, leads and metal frame

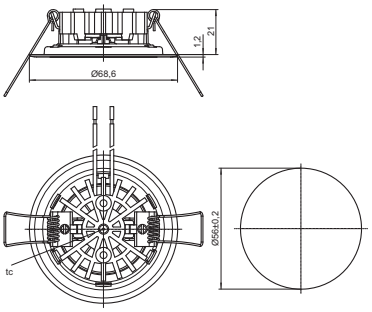
Technical notes

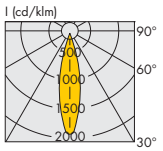
Metal frame, round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Reflector with clear glass (opaque glass on request)
Beam angle: 30° or 50°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
for luminaires sheets (type LCH-006)
for ceilings (type LCH-007)
Degree of protection: IP40
Unit:
90 pcs. (type LCH-006), 40 pcs. (type LCH-007)

LCH-006

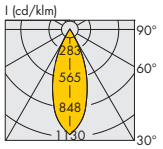


LCH-007





30°



50°

Type	Description	**LEDSpot version** for luminaire sheet	**LEDSpot version** for ceiling	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})*						Light intensity at max. current Candela		Energy efficiency at max. current
						350 mA		500 mA		700 mA		30°	50°	
						min.	typ.	min.	typ.	min.	typ.			
						P_{el} = 0.98 W $U_{typ.}$ = 2.8 V		P_{el} = 1.48 W $U_{typ.}$ = 3 V		P_{el} = 2.17 W $U_{typ.}$ = 3.1 V				
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	A+
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	A++
All types	XTE 6000K min R3	**C**	**F**	cool white	5000...6950	103.7	114.3	139.7	152.1	184.4	203.3	370	210	A++

Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

	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)	
	30°	50°	30°	50°	30°	50°	30°	50°	30°	50°	30°	50°
silver	**548769**	**548782**	**548944**	**548948**	**548775**	**548788**	**548794**	**548806**	**548952**	**548956**	**548800**	**548812**
silver brushed	**548771**	**548784**	**554907**	**554908**	**548777**	**548790**	**548796**	**548808**	**554910**	**554911**	**548802**	**548814**
white	**548772**	**548785**	**548947**	**548951**	**548778**	**548791**	**548797**	**548809**	**548955**	**548959**	**548803**	**548815**

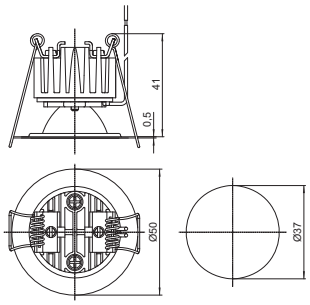
LEDSpot EffectLine XTE

Complete LEDSpot equipped with optics, heat sink, leads and metal frame

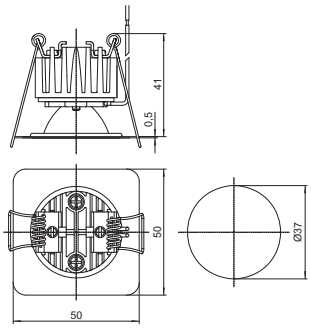
Technical notes

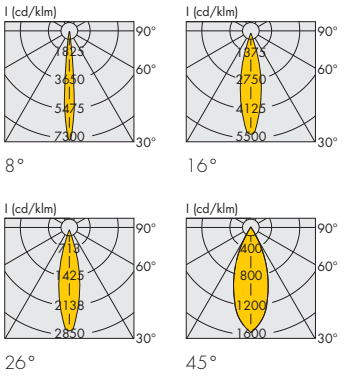
Metal frame, round or square
For cut-out: Ø 37 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 8°, 16°, 26° or 45°
Leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 250 mm
Use of external LED constant-current drivers required
Snap-in clips for easy installation
Degree of protection: IP20
Unit: 45 pcs.

LCH-010



LCH-011





Type	Description	LEDSpot version	Colour	Correlated colour temperature	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})*						Light intensityat max. current				Energy efficiency at max. current
					350 mA		500 mA		700 mA		Candela				
				K	min.	typ.	min.	typ.	min.	typ.	8°	16°	26°	45°	
					P_{el} = 0.98 W $U_{typ.}$ = 2.8 V		P_{el} = 1.48 W $U_{typ.}$ = 3 V		P_{el} = 2.17 W $U_{typ.}$ = 3.1 V						
All types	XTE 3000K bin Q3	**A**	warm white	2870...3200	84.5	93.2	109.9	121.1	163.7	158.4	1160	880	460	260	A+
All types	XTE 4500K bin Q4	**B**	neutral white	4250...4750	90.0	99.4	117.0	129.3	153.0	169.0	1200	900	490	280	A++

Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ± 7%

Frame colour	**Ref. No. A** (warm white)								**Ref. No. B** (neutral white)							
	round				square				round				square			
	8°	16°	26°	45°	8°	16°	26°	45°	8°	16°	26°	45°	8°	16°	26°	45°
silver	**554912**	**554914**	**548964**	**548960**	**554921**	**554923**	**548966**	**548962**	**554916**	**554918**	**548965**	**548961**	**554925**	**554927**	**548967**	**548963**
white	**554913**	**554915**	**552398**	**552399**	**554922**	**554924**	**552406**	**552407**	**554917**	**554919**	**552400**	**552401**	**554926**	**554928**	**552408**	**552409**

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.: 554529 / 554530

LEDSpot set 2 – Ref. No.: 554532 / 554533

LEDSpot set 3 – Ref. No.: 554534

LEDSpot set 4 – Ref. No.: 554535

Set No.	**Ref. No.**	Sets includes LEDSpot	Beam angle	Frame		Driver	Lead set
1	**554529**	1 piece LEDSpot ActiveLine LUGA Pro 3000 K	40°	round	silver	186350	inclusive
	554530	2 pieces ActiveLine LUGA Pro 3000 K				186353	
2	**554532**	1 piece ActiveLine 600 Pro 3000 K				186342	
	554533	2 pieces ActiveLine 600 Pro 3000 K				186294	
3	**554534**	2 pieces SmartLine COB 3000 K				186341	
4	**554535**	2 pieces StartLine 3000 K				186348	

Lead sets

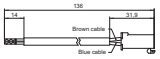
For LEDSpots with connectors

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

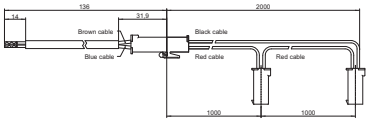
Lead sets
Lead sets with connector and lead ends
Leads: H03VVH2-F
Weight: 18/36/58/90 g, unit: 10 pcs.

Ref. No.: 545029 with 1 connector
Ref. No.: 546388 with 2 connectors
Ref. No.: 545315 with 3 connectors
Ref. No.: 554929 with 4 connectors
Ref. No.: 545316 with 5 connectors

545029



546388



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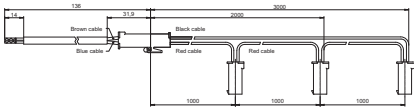

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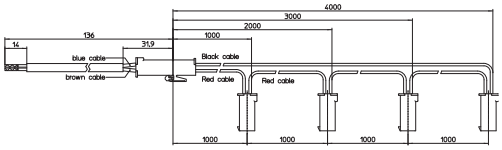

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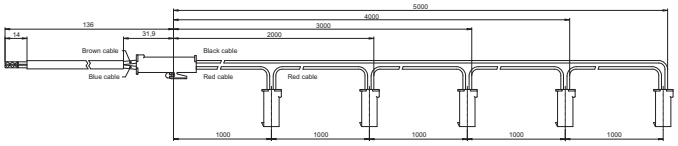


545029

546388

LEDLINE ECX

ELECTRONIC CONSTANT CURRENT DRIVERS

LED CONSTANT CURRENT DRIVERS

Electronic converters for LED modules operated with constant current LED 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 LED driver.

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**

Product Classification and Overview of LED Drivers

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

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

PrimeLine
Intelligent
Digital networking and control
Up to 100,000 hrs. expected service life time
Maximum flexibility

ComfortLine
Comfortable
Many dimming options
Up to 100,000 hrs. expected service life time

EasyLine
Cost-efficient
Approved VS quality
Up to 100,000 hrs. expected service life time

Product overview by main application fields

Main application field	Capacity range W	Output current DC mA	Ref. No.	Version	Current setting	Dimming	Max. service lifetime hrs.	Page
Office	4x9	4x60	186384	ComfortLine	–	DALI, PUSH	100,000	143
			186305	ComfortLine	–	–	100,000	147
	15	350	186229	ComfortLine	–	–	100,000	149
	2x20	2x350	186407	ComfortLine	–	1-10 V	100,000	144
			186406	ComfortLine	–	–	100,000	147
	27.5/33/38.5	125/150/175	186486	ComfortLine	Push-in terminal	–	100,000	145
	2x28.5/2x40	2x500/2x700	186410	ComfortLine	Dip switch	1-10 V	100,000	144
			186409	ComfortLine	Dip switch	–	100,000	147
	40	350/500/700	186444	ComfortLine	Push-in terminal	–	100,000	146
	42	350-700	186446	PrimeLine	Programmable	DALI, PUSH	100,000	141
		350	186414	EasyLine	–	–	50,000	150
	44/47	200/225/250	186487	ComfortLine	Push-in terminal	–	100,000	145
	47	275/300/325	186488	ComfortLine	Push-in terminal	–	100,000	145
	60	700	186429	EasyLine	–	–	50,000	150
	2x70	2x700	186356	ComfortLine	–	DALI, PUSH	100,000	142
			186355	ComfortLine	–	1-10 V	100,000	144
			186354	ComfortLine	–	–	100,000	147
	77/84	350-700	186445	PrimeLine	Programmable	DALI, PUSH	100,000	141
	79/85	350/500/700	186443	ComfortLine	Push-in terminal	–	100,000	146
	85	375/400/425	186491	ComfortLine	Push-in terminal	–	100,000	145
		550/600/650	186492	ComfortLine	Push-in terminal	–	100,000	145
	107	500	186460	ComfortLine	–	DALI, PUSH	100,000	143
			186315	ComfortLine	–	–	100,000	148
Retail	10/14/20	250/350/500	186463	EasyLine	Push-in terminal	–	50,000	158
	15/18/21	500/600/700	186464	EasyLine	Push-in terminal	–	50,000	158
	24	350-700	186465	PrimeLine	Programmable	DALI, PUSH	100,000	151
	24	700	186280	ComfortLine	–	DALI, PUSH	100,000	152
			186279	ComfortLine	–	1-10 V	100,000	154
			186278	ComfortLine	–	–	100,000	155
	25	500	186363	EasyLine	–	–	50,000	159
	34	700	186177, 186195	ComfortLine	–	DALI, PUSH	100,000	153
	35	700	186364	EasyLine	–	–	50,000	159
		1050	186365	EasyLine	–	–	50,000	159
	37	350-700	186503	PrimeLine	Programmable	DALI, PUSH	100,000	151
		700	186308	ComfortLine	–	DALI, PUSH	100,000	152
			186306	ComfortLine	–	–	100,000	155
	40	700	186221, 186222	ComfortLine	–	DALI, PUSH	100,000	153
			186266, 186267	ComfortLine	–	–	100,000	156
			186330, 186331	ComfortLine	–	–	100,000	157
	51.3	900	186386, 186387	ComfortLine	–	–	100,000	157
	60	1050	186196, 186197	ComfortLine	–	DALI, PUSH	100,000	153
			186268, 186269	ComfortLine	–	–	100,000	156
			186328, 186329	ComfortLine	–	–	100,000	157

Product overview by main application fields								
Main application field	Capacity range W	Output current DC mA	Ref. No.	Version	Current setting	Dimming	Max. service lifetime hrs.	Page
Residential	5.2	700	186458	EasyLine	–	–	50,000	164
	5.6	700	186348	EasyLine	–	–	50,000	165
	6	150	186447	EasyLine	–	L,C	50,000	163
	7	350	186342	EasyLine	–	–	50,000	165
	8	350	186180	ComfortLine	–	–	100,000	161
	10	500	186448	EasyLine	–	L,C	50,000	163
	11	350	186424	ComfortLine	–	–	100,000	161
	12	250	186449	EasyLine	–	L,C	50,000	163
	12.6	350	186341	EasyLine	–	–	50,000	166
	15	500	186349	EasyLine	–	–	50,000	166
	16	500	186425	ComfortLine	–	–	100,000	161
	17	700	186426	ComfortLine	–	–	100,000	161
	18	350	186415	EasyLine	–	L,C	50,000	163
		700	186450	EasyLine	–	L,C	50,000	163
	20	1050	186427	ComfortLine	–	–	100,000	161
		350	186431	EasyLine	–	–	50,000	166
	20.3	700	186350	EasyLine	–	–	50,000	166
	25	700	186416	EasyLine	–	L,C	50,000	163
	25.2	700	186353	EasyLine	–	–	50,000	166
	30	700	186393	ComfortLine	–	L,C	100,000	160
		350	186430	EasyLine	–	–	50,000	167
	31.5	1050	186351	EasyLine	–	–	50,000	167
	32	1050	186479	ComfortLine	–	–	100,000	162
	36	1050	186394, 186395	ComfortLine	–	L,C	100,000	160
		700	186451	EasyLine	–	L,C	50,000	163
Street	40	700	186490	ComfortLine	–	1-10 V	100,000	171
			186489	ComfortLine	–	–	100,000	174
	42	350	186175	ComfortLine	–	–	100,000	176
	60	1050	186316	ComfortLine	–	1-10 V	100,000	170
	75	700	186400	ComfortLine	–	1-10 V	100,000	169
		700 / 400	186397	ComfortLine	–	Power reduction	100,000	173
	82/90/90	700/1000/1400	186367	PrimeLine	Dip switch/DALI	DALI, PUSH, MidNight	100,000	168
	100	700	186401	ComfortLine	–	1-10 V	100,000	169
		700 / 400	186398	ComfortLine	–	Power reduction	100,000	173
	150	700	186402	ComfortLine	–	1-10 V	100,000	169
		700 / 400	186202, 186203	ComfortLine	–	Power reduction	100,000	172
			186509	ComfortLine	–	Power reduction	100,000	173
		700	186399	ComfortLine	–	–	100,000	175
Industry	19.95/28.5/ 34.2/39.9	350/500/ 600/700	186326, 186327	ComfortLine	Rotary switch	1-10 V	100,000	179
	38.7/45.1/ 51.6/60.2	900/1050/ 1200/1400	186208	ComfortLine	Rotary switch	1-10 V	100,000	178
	50	700	186452	EasyLine	–	–	50,000	181
	75	1050	186453	EasyLine	–	–	50,000	181
	100	1400	186454	EasyLine	–	–	50,000	181
	112	700	186299, 186300	ComfortLine	–	DALI, PUSH	100,000	177
			186297, 186298	ComfortLine	–	–	100,000	180
	125	1700	186455	EasyLine	–	–	50,000	181
	126	1050	186303, 186304	ComfortLine	–	DALI, PUSH	100,000	177
			186301, 186302	ComfortLine	–	–	100,000	180
	150	2100	186456	EasyLine	–	–	50,000	181
	175	2400	186510	EasyLine	–	–	50,000	181
	200	2800	186477	EasyLine	–	–	50,000	181
	230	3200	186478	EasyLine	–	–	50,000	181
Accessories								
iProgrammer	Ref. No. 186428	The iProgrammer is designed to let you configure LED drivers using the 3C function.						182

PrimeLine LED Drivers – with Selectable Current

350–700 mA,
max. 42 W and max. 84 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.97
Stand-by losses: < 0.5 W

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 3 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Programmability
The output current can be freely adjusted in 1 mA steps between 350 mA and 700 mA (factory setting: 350 mA).
An iProgrammer (Ref. No. 186428) and a PC running the respective VS software are required for programming purposes.

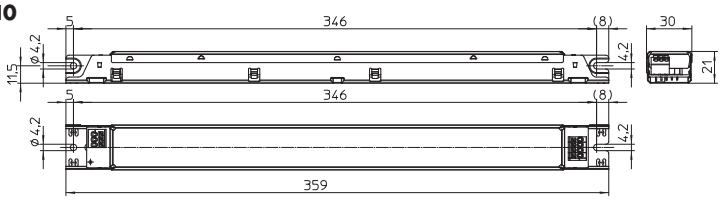
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186446		186445	
all	60 °C	50 °C	70 °C	60 °C
hrs.	50,000	100,000	50,000	100,000

M10



Products under development; preliminary technical datas

Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC programmable mA	Voltage output* DC V	Max. voltage without load DC V	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
42	ECXe 700.150	**186446**	220–240	420–390	350–700 ± 5%	28–114	< 250	> 88	-25 to 50	60	227
77	ECXe 700.149	**186445**	220–240	200–110	350–700 ± 5%	60–220	< 250	> 88	-25 to 50	70	250
84											

* Depends on the adjusted current output

ComfortLine LED Drivers – Dimmable

2x700 mA / max. 2x70 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.95
Stand-by losses: < 0.5 W

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 3 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

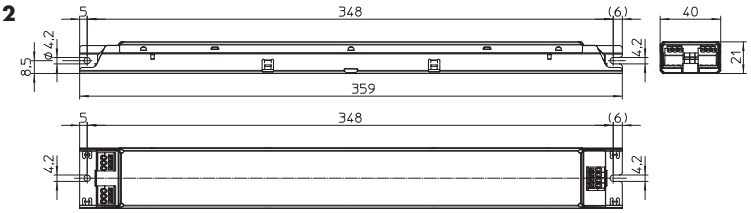
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186356	
2x700 mA	80 °C	70 °C
hrs.	50,000	100,000

M12



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M12 – Dimensions: 359x40x21 mm											
2x70	ECXd 2700.089	**186356**	198–264	834–625	2x700 ± 5%	42–100	< 120	> 90	-20 to 50	80	400
			220–240	750–688							

ComfortLine LED Drivers – Dimmable

4x60 mA / max. 4x9 W
350 mA / max. 75 W
500 mA / max. 107 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.95
Stand-by losses: < 0.5 W

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 3 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I

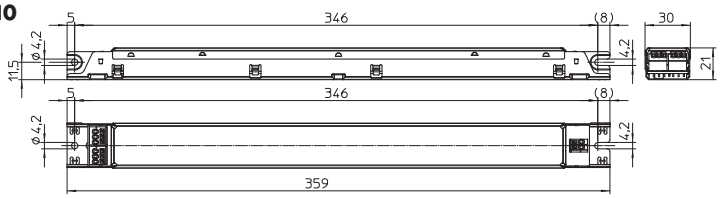
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	70 °C	60 °C
hrs.	50,000	100,000

DALI

PUSH

M10



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
4x9	ECXd 460.110	**186384**	198–264	190–140	4x60 ± 5%	55–150	< 450	> 91	-25 to 65	70	230
			220–240	170–150							
107	ECXd 500.163	**186460**	198–264	557–412	500 + 5/-10%	90–215	< 450	> 90	-20 to 50	70	220
			220–240	502–460							

ComfortLine LED Drivers – Dimmable

2x350 mA / max. 2x20 W
2x500 mA / max. 2x28.5 W
2x700 mA / max. 2x40 W
and max. 2x70 W

The linear LED constant-current drivers are designed for use in office and retail lighting.

1–10V

Electrical characteristics

Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.95

Dimming

The dimming function is achieved by applying a PWM signal to the nominal current (M12) or with an analogue dimming signal (M10/M11).
Dimming range: 3 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details

Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Push-in terminals: 0.2–1.5 mm²

Safety features

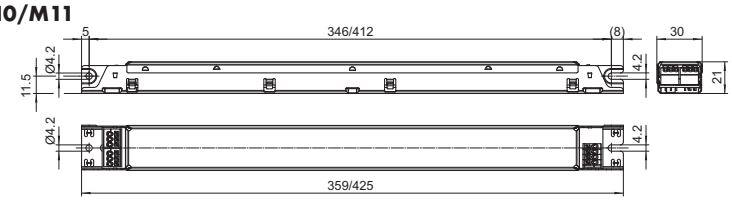
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV

Expected service life time

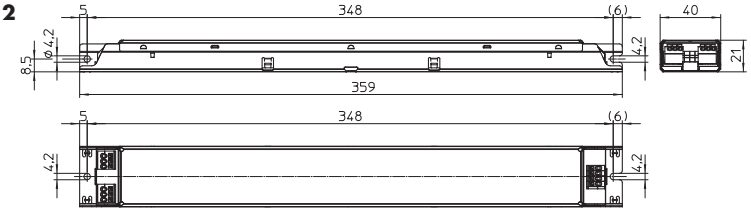
at operation temperatures at t_c point

Operation current	Ref. No. 186407		186410		186355	
2x350 mA	75 °C	65°C	–	–	–	–
2x500 mA	–	–	75 °C	65 °C	–	–
2x700 mA	–	–	75 °C	65 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000

M10/M11



M12



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
2x20	ECXd 2350.124	**186407**	198–264	500–340	2x350 ± 5%	17–57	42	> 85	-20 to 50	75	270
			220–240	400–370							
M11 – Dimensions: 425x30x21 mm											
2x28,5/ 2x40	ECXd 2700.127	**186410**	198–264	260–175	2x500 ± 5%/ 2x700 ± 5%	17–57	60	> 88	-20 to 50	75	310
			220–240	200–190							
M12 – Dimensions: 359x40x21 mm											
2x70	ECXd 2700.088	**186355**	198–264	834–625	2x700 ± 5%	42–100	120	> 90	-20 to 50	80	400
			220–240	750–688							

ComfortLine LED Drivers – with Selectable Current

125 to 650 mA / 27.5 W to 85.1 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.97

Selectable current output
The required current output can be chosen by selecting the respective pin at the output terminal.

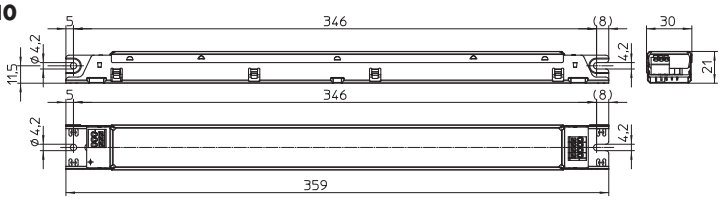
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186486		186487		186488		186491		186492	
350 mA	55 °C	45 °C	60 °C	50 °C	60 °C	50 °C	65 °C	55 °C	65 °C	55 °C
500 mA	55 °C	45 °C	60 °C	50 °C	60 °C	50 °C	65 °C	55 °C	70 °C	60 °C
700 mA	55 °C	45 °C	60 °C	50 °C	60 °C	50 °C	65 °C	55 °C	70 °C	60 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000	50,000	100,000	50,000	100,000

M10



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
27.5	ECXe 175.173	**186486**	220–240	150–140	125	155–220	< 250	> 90	-25 to 50	55	220
33				175–165	150	130–220		> 91			
38.5				200–190	175	110–220		> 92			
44	ECXe 250.174	**186487**	220–240	220–205	200	112–220	< 250	> 93	-25 to 50	60	220
47				230–220	225	104–208		> 92			
47				235–220	250	94–188		> 92			
46.8	ECXe 325.175	**186488**	220–240	235–220	275	85–170	< 250	> 91	-25 to 50	60	220
				235–220	300	78–156		> 91			
				235–220	325	72–144		> 91			
82.5	ECXe 425.178	**186491**	220–240	410–375	375	113–220	< 250	> 93	-25 to 50	60	243
84.8				420–385	400	105–212		> 94			
85				420–390	425	100–200		> 94			
84.7	ECXe 650.179	**186492**	220–240	420–390	550	77–154	< 250	> 93	-25 to 50	65	244
84.6				420–390	600	71–141		> 93		70	
85.1				420–390	650	65–131		> 93		70	

ComfortLine LED Drivers – with Selectable Current

350/500/700 mA,
max. 40 W and max. 85 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.97

Selectable current output
The required current output can be chosen by selecting the respective pin at the output terminal.

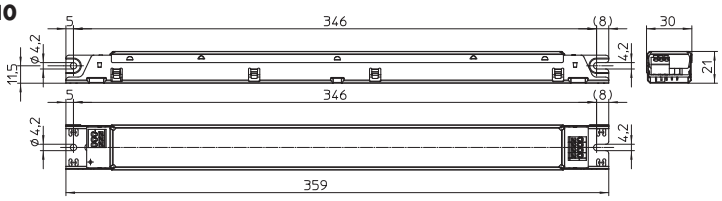
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186444		186443	
350 mA	60 °C	50 °C	70 °C	60 °C
500 mA	65 °C	55 °C	75 °C	65 °C
700 mA	70 °C	60 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000

M10



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
40	ECXe 700.148	**186444**	220–240	400–370	350 ± 5%	57–114	< 250	> 90	-25 to 50	60	227
				420–390	500 ± 5%	40–80		> 89		65	
				420–390	700 ± 5%	28–57		> 88		70	
79	ECXe 700.147	**186443**	220–240	200–190	350 ± 5%	120–225	< 250	> 94	-25 to 50	70	250
85				205–190	500 ± 5%	80–170		> 93		75	
				210–195	700 ± 5%	60–120		> 92		80	

ComfortLine LED Drivers

2x350 mA / max. 2x20 W
2x500 mA / max. 2x28.5 W
2x700 mA / max. 2x40 W
and max. 2x70 W

The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics

Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.95

Connection details

Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Push-in terminals: 0.2–1.5 mm²

Safety features

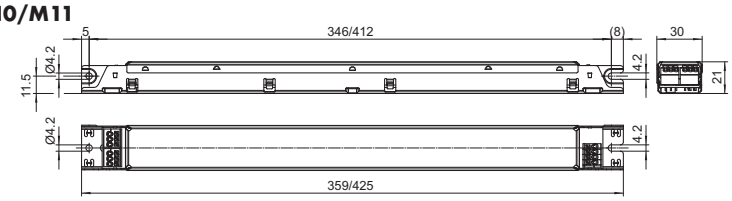
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV

Expected service life time

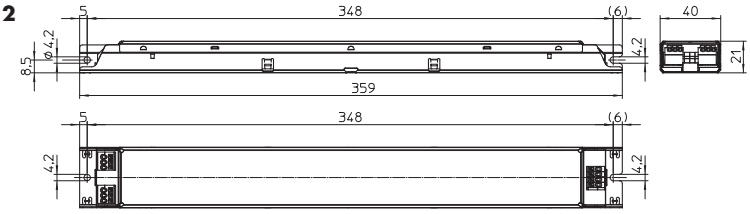
at operation temperatures at t_c point

Operation current	Ref. No. 186406		186409		186354	
2x350 mA	75 °C	65°C	–	–	–	–
2x500 mA	–	–	75 °C	65 °C	–	–
2x700 mA	–	–	75 °C	65 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000

M10/M11



M12



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
2x20	ECXe 2350.123	**186406**	198–264	500–340	2x350 ±5%	17–57	< 60	> 85	-20 to 50	75	270
			220–240	400–370							
M11 – Dimensions: 425x30x21 mm											
2x28.5/ 2x40	ECXe 2700.126	**186409**	198–264	260–175	2x500 ±5%/ 2x700 ±5%	17–57	< 60	> 88	-20 to 50	75	310
			220–240	200–190							
M12 – Dimensions: 359x40x21 mm											
2x70	ECXe 2700.087	**186354**	198–264	834–625	2x700 ±5%	42–100	< 120	> 90	-20 to 50	80	400
			220–240	750–688							

ComfortLine LED Drivers

4x60 mA / max. 4x9 W
350 mA / max. 75 W
500 mA / max. 107 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.95

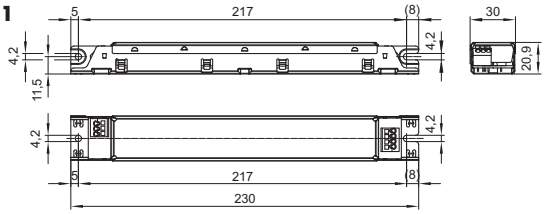
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176/198–264 V DC, 0 Hz (except 186305)
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I

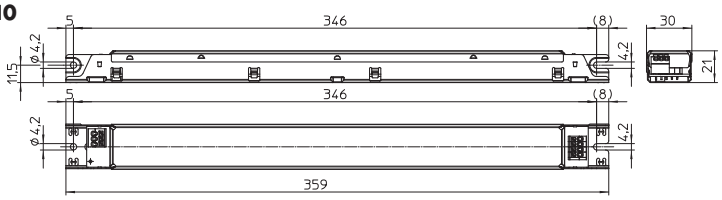
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	70 °C	60 °C
hrs.	50,000	100,000

M6.1



M10



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M6.1 – Dimensions: 230x30x20.9 mm											
4x9	ECXe 460.061	**186305**	–	–	4x60 ± 5%	110–150	450	> 88	-20 to 60	70	156
			220–240	180–165							
M10 – Dimensions: 359x30x21 mm											
107	ECXe 500.068	**186315**	198–264	650–410	500 ± 5%	90–215	450	> 94	-25 to 50	70	273
			220–240	520–440							

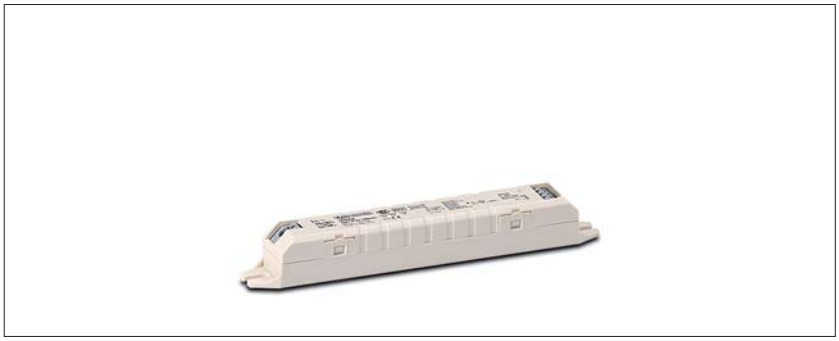
ComfortLine LED Drivers

350 mA / max. 15 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.6

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²

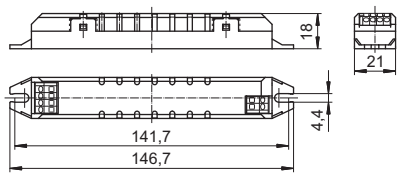
Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV



Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186229	
350 mA	80 °C	70 °C
hrs.	50,000	100,000

K21



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K21 – Dimensions: 146.7x21x18 mm											
15	ECXe 350.031	**186229**	176-264	140-90	350 +5/-10%	2-40	42	> 81	-20 to 50	80	49
			220-240	81-75							

EasyLine LED Drivers

350 mA / max. 42 W
700 mA / max. 60 W
The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

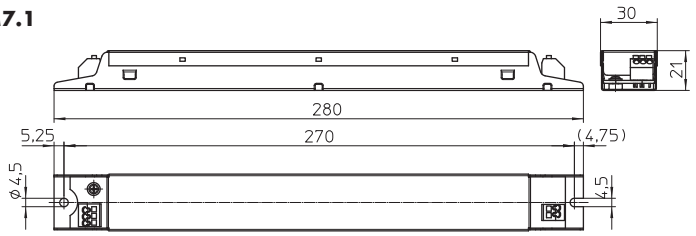
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV (186429)

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186414		186429	
350 mA	70 °C	60 °C	–	–
700 mA	–	–	75 °C	65 °C
hrs.	30,000	50,000	30,000	50,000

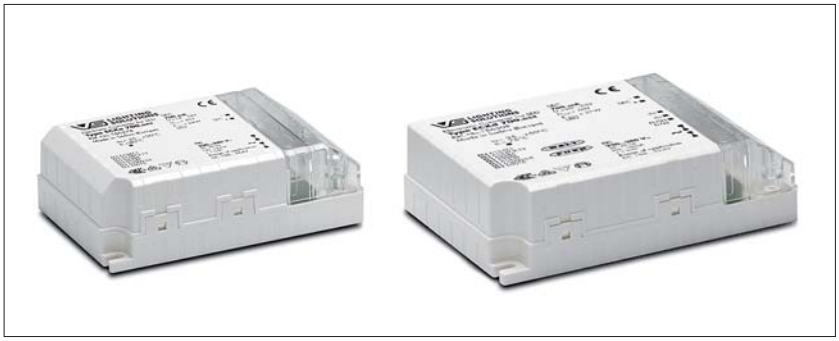
M7.1



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M7.1 – Dimensions: 280x30x21 mm											
42	ECXe 350.129	**186414**	220–240	220–200	350 ± 5%	80–120	< 130	> 88	-15 to 45	70	200
60	ECXe 700.140	**186429**	220–240	305–275	700 ± 5%	46–86	< 95	> 89	-15 to 45	75	200

PrimeLine LED Drivers – with Selectable Current

350–700 mA / max. 24 W and max. 37 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.



Electrical characteristics
Secondary side switching of LED modules is allowed (hot wiring).
Power factor at full load: > 0.9
Stand-by losses: < 0.5 W

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 1 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Programmability
The output current can be freely adjusted in 1 mA steps between 350 mA and 700 mA (factory setting: 350 mA).
An iProgrammer (Ref. No. 186428) and a PC running the respective VS software are required for programming purposes.

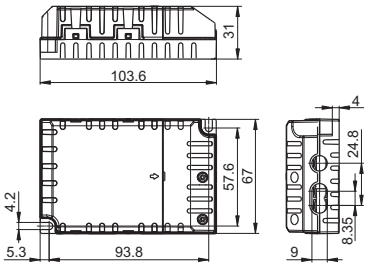
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
With integrated through-wiring
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

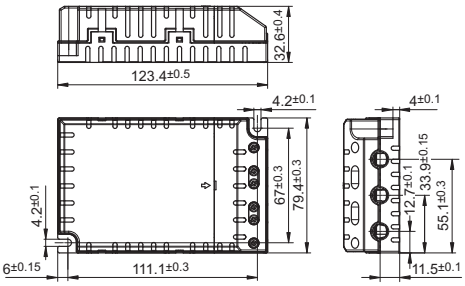
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	75 °C	65 °C
hrs.	50.000	100.000

K2.1



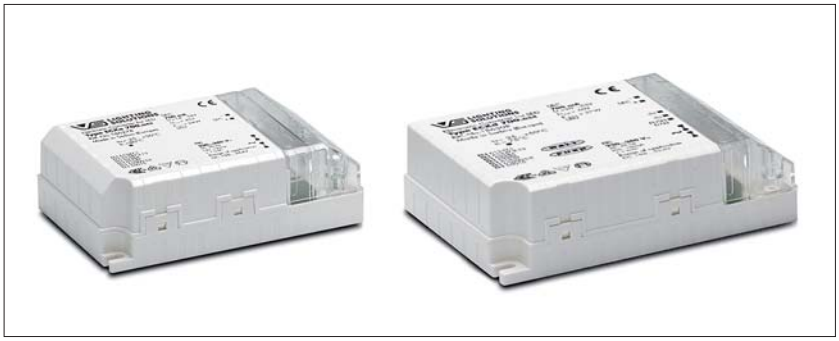
K3.2



Max. output W	Type	Ref. No.	Mains voltage 0 Hz, 50–60 Hz V	Mains current mA	Current output DC programmable mA	Voltage output DC V	Max. voltage without load DC V	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2.1 – Dimensions: 103.6 x 67 x 31 mm											
24	ECXd 700.166	**186465**	198–264	160–100	350–700 ± 5%	14–34	< 45	> 84	-25 to 50	75	145
			220–240	130–120							
K3.2 – Dimensions: 123.4 x 79.4 x 32.6 mm											
37	ECXd 700.184	**186503**	198–264	235–155	350–700 ± 5%	30–53	< 60	> 87	-25 to 50	75	190
			220–240	200–180							

ComfortLine LED Drivers – Dimmable

700 mA / max. 24 W and max. 37 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.



Electrical characteristics
Secondary side switching of LED modules is allowed (hot wiring).
Power factor at full load: > 0.9
Stand-by losses: < 0.5 W

Dimming
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.
Dimming range: 1 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
With integrated through-wiring
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

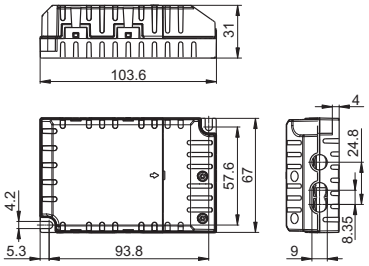
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	75 °C	65 °C
hrs.	50,000	100,000

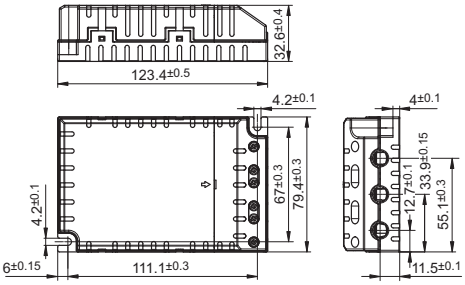
DALI

PUSH

K2.1



K3.2



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2.1 – Dimensions: 103.6 x 67 x 31 mm											
24	ECXd 700.044	**186280**	198–264	160–100	700 ± 5%	14–34	< 45	> 84	-25 to 50	75	145
			220–240	130–120							
K3.2 – Dimensions: 123.4 x 79.4 x 32.6 mm											
37	ECXd 700.064	**186308**	198–264	235–155	700 ± 5%	30–53	< 60	> 87	-25 to 50	75	190
			220–240	200–180							

ComfortLine LED Drivers – Dimmable

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

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.97
Stand-by losses: < 0.5 W

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 0.5 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV equivalent

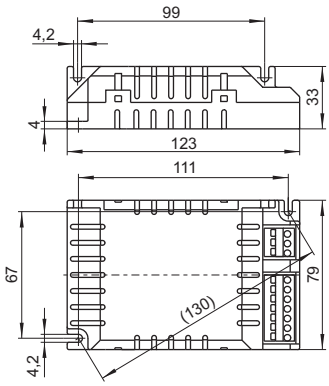
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
700	75 °C	65 °C
1050	80 °C	70 °C
hrs.	50,000	100,000

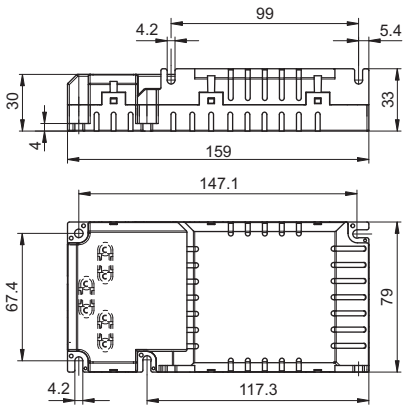
DALI

PUSH

K3



K3 with cord grip



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	Efficiency at full load % (230 V)	12 V interface max. 2 W	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3 – Dimensions: 123 x 79 x 33 mm												
34	ECXd 700.017	**186177**	176-264	230-160	700 ± 5%	9-48	52	> 85	no	-20 to 50	75	180
			220-240	190-170								
40	ECXd 700.026	**186221**	176-264	280-185	700 ± 5%	20-57	60	> 85	yes	-20 to 50	75	186
			220-240	230-200								
60	ECXd 1050.020	**186196**	176-264	380-252	1050 ± 5%	20-57	60	> 85	yes	-20 to 50	80	220
			220-240	305-275								
K3 with cord grip – Dimensions: 159 x 79 x 33 mm												
34	ECXd 700.017	**186195**	176-264	230-160	700 ± 5%	9-48	52	> 85	no	-20 to 50	75	215
			220-240	190-170								
40	ECXd 700.026	**186222**	176-264	280-185	700 ± 5%	20-57	60	> 85	yes	-20 to 50	75	223
			220-240	230-200								
60	ECXd 1050.020	**186197**	176-264	380-252	1050 ± 5%	20-57	60	> 85	yes	-20 to 50	80	250
			220-240	305-275								

ComfortLine LED Drivers – Dimmable

700 mA / max. 24 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.

Electrical characteristics
Secondary side switching of LED modules is allowed (hot wiring).
Power factor at full load: > 0.9

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 1 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
With integrated through-wiring
Push-in terminals: 0.2–1.5 mm²

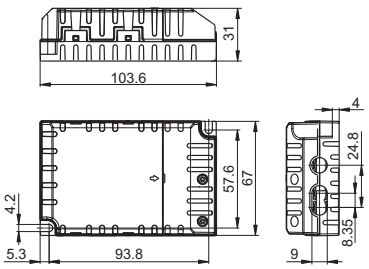
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186279	
700	75 °C	65 °C
hrs.	50,000	100,000

1–10V

K2.1



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2.1 – Dimensions: 103.6×67×31 mm											
24	ECXd 700.043	**186279**	198-264	160-100	700 ± 5%	14-34	< 45	> 84	-25 to 50	75	145
			220-240	130-120							

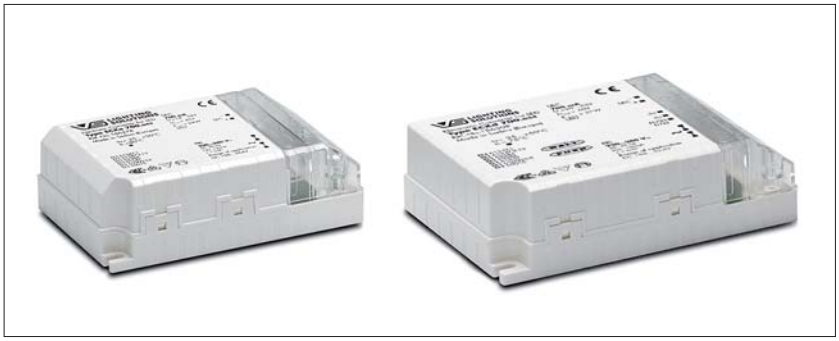
ComfortLine LED Drivers

700 mA / max. 24 W and max. 37 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.

Electrical characteristics
Secondary side switching of LED modules is allowed (hot wiring).
Power factor at full load: > 0.9

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
With integrated through-wiring
Push-in terminals: 0.2–1.5 mm²

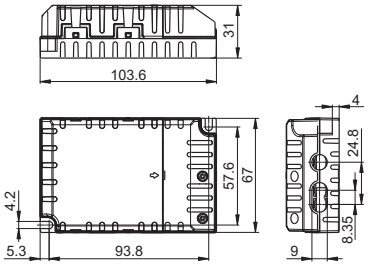
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV



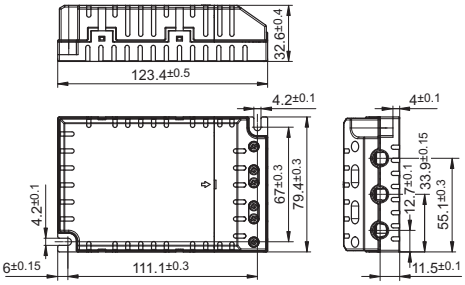
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
700	75 °C	65 °C
hrs.	50,000	100,000

K2.1



K3.2



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2.1 – Dimensions: 103.6 x 67 x 31 mm											
24	ECXe 700.042	**186278**	198-264	160-100	700 ± 5%	14-34	< 45	> 84	-25 to 50	75	135
			220-240	130-120							
K3.2 – Dimensions: 123.4 x 79.4 x 32.6 mm											
37	ECXe 700.062	**186306**	198-264	235-155	700 ± 5%	30-53	< 60	> 87	-25 to 50	75	170
			220-240	200-180							

ComfortLine LED Drivers

700 mA / max. 40 W
1050 mA / max. 60 W
With 12 V interface

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.98

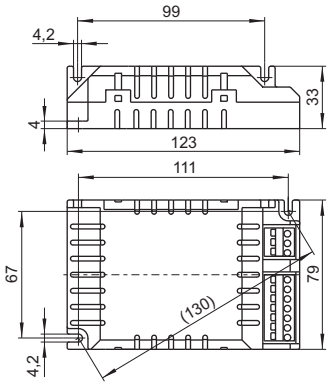
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV equivalent

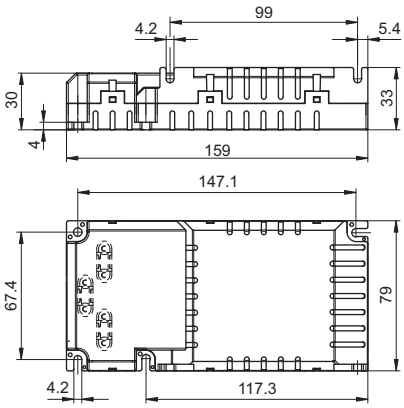
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
700	75 °C	65 °C
1050	80 °C	70 °C
hrs.	50,000	100,000

K3



K3 with cord grip



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	Efficiency at full load % (230 V)	12 V interface max. 2 W	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3 – Dimensions: 123 x 79 x 33 mm												
40	ECXe 700.034	**186266**	176–264	280–185	700 ± 5%	20–57	60	> 85	yes	–20 to 50	75	182
			220–240	230–200								
60	ECXe 1050.035	**186268**	176–264	380–252	1050 ± 5%	20–57	60	> 85	yes	–20 to 50	80	213
			220–240	305–275								
K3 with cord grip – Dimensions: 159 x 79 x 33 mm												
40	ECXe 700.034	**186267**	176–264	280–185	700 ± 5%	20–57	60	> 85	yes	–20 to 50	75	220
			220–240	230–200								
60	ECXe 1050.035	**186269**	176–264	380–252	1050 ± 5%	20–57	60	> 85	yes	–20 to 50	80	248
			220–240	305–275								

ComfortLine LED Drivers

700 mA / max. 40 W
900 mA / max. 51.3 W
1050 mA / max. 60 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.98

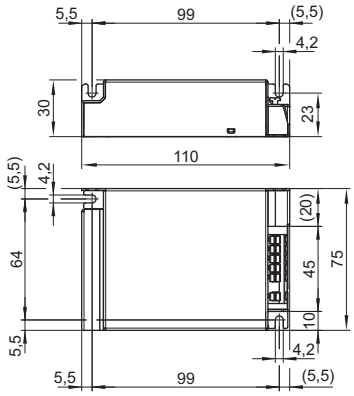
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
With integrated through-wiring
Push-in terminals: 0.2–1.5 mm²

Safety features
Temporary electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV equivalent

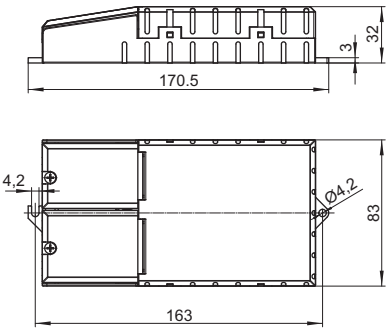
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
700	75 °C	65 °C
900	80 °C	70 °C
1050	80 °C	70 °C
hrs.	50,000	100,000

M3



K34 with cord grip



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M3 – Dimensions: 110 x 75 x 30 mm											
40	ECXe 700.022	**186330**	176–264	250–160	700 ± 5%	20–57	60	> 90	-20 to 60	75	210
			220–240	200–180							
51.3	ECXe 900.111	**186386**	176–264	325–210	900 ± 5%	20–57	60	> 90	-20 to 60	80	210
			220–240	255–235							
60	ECXe 1050.021	**186328**	176–264	391–261	1050 ± 5%	20–57	60	> 90	-20 to 60	80	226
			220–240	308–286							
K34 with cord grip – Dimensions: 170.5 x 83 x 32 mm											
40	ECXe 700.022	**186331**	176–264	250–160	700 ± 5%	20–57	60	> 90	-20 to 60	75	257
			220–240	200–180							
51.3	ECXe 900.111	**186387**	176–264	325–210	900 ± 5%	20–57	60	> 90	-20 to 60	80	257
			220–240	255–235							
60	ECXe 1050.021	**186329**	176–264	391–261	1050 ± 5%	20–57	60	> 90	-20 to 50	80	273
			220–240	308–286							

EasyLine LED Drivers

250/350/500 mA / max. 20 W
500/600/700 mA / max. 21 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

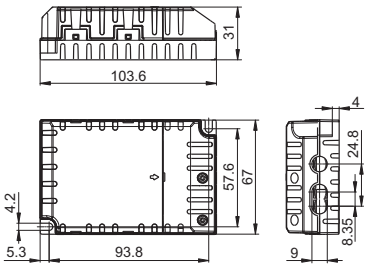
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²
The output current can be selected with the connection of the different connection terminals with 250/350/500 mA or 500/600/700 mA.

Safety features
Temporary electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	80 °C	70 °C
hrs.	30,000	50,000

K2.1



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2.1 – Dimensions: 103,6×67×31 mm											
10	ECXe 500.164	**186463**	220–240	53–48	250 ± 7.5%	17–40	< 60	> 85	-20 to 50	80	145
14				73–67	350 ± 7.5%						
20				104–95	500 ± 7.5%						
15	ECXe 700.165	**186464**	220–240	80–71	500 ± 7.5%	17–30	< 60	> 85	-20 to 40	80	145
18				94–86	600 ± 7.5%						
21				110–100	700 ± 7.5%						

EasyLine LED Drivers

500 mA / max. 25 W
700 mA / max. 35 W
1050 mA / max. 35 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

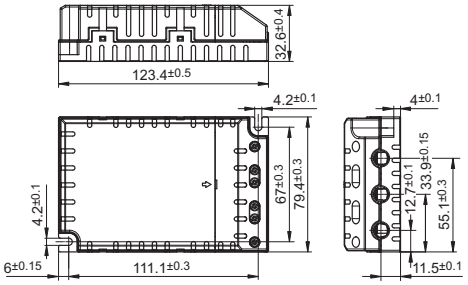
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Temporary electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	70 °C	60 °C
hrs.	30,000	50,000

K3.2



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3.2 – Dimensions: 123.4 x 79.4 x 32.6 mm											
25	ECXe 500.093	**186363**	220–240	135–125	500 ± 7.5%	25–50	< 60	> 89	–20 to 50	70	170
35	ECXe 700.094	**186364**	220–240	185–170	700 ± 7.5%	25–50	< 60	> 89	–20 to 50	70	170
35	ECXe 1050.095	**186365**	220–240	185–170	1050 ± 7.5%	16–34	< 60	> 90	–20 to 50	70	180

ComfortLine LED Drivers – Dimmable

700 mA / max. 30 W
1050 mA / max. 36 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

Dimming (Type ECXd)
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.

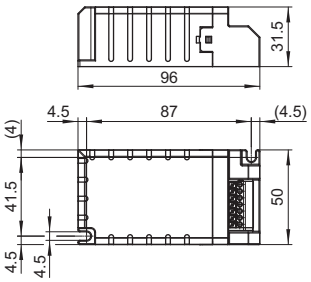
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

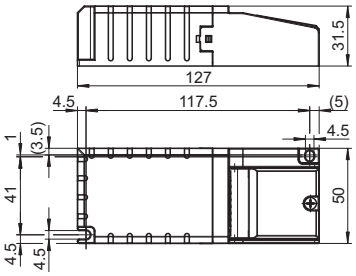
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186393		186394		186395	
700 mA	75 °C	65°C	–	–	–	–
1050 mA	–	–	75 °C	65 °C	75 °C	65 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000

K35



K35 with cord grip



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K35 – Dimensions: 96x50x31.5 mm											
30	ECXe 700.112	**186393**	220–240	155–140	700 ± 5%	17–42	< 60	> 88	-25 to 50	75	130
K35 – Dimmable – Dimensions: 96x50x31.5 mm											
36	ECXd 1050.113	**186394**	220–240	200–180	1050 ± 10%	18–36	< 60	> 85	-10 to 40	75	140
K35 with cord grip – Dimmable – Dimensions: 127x50x31.5 mm											
36	ECXd 1050.113	**186395**	220–240	200–180	1050 ± 10%	18–36	< 60	> 85	-10 to 40	75	155

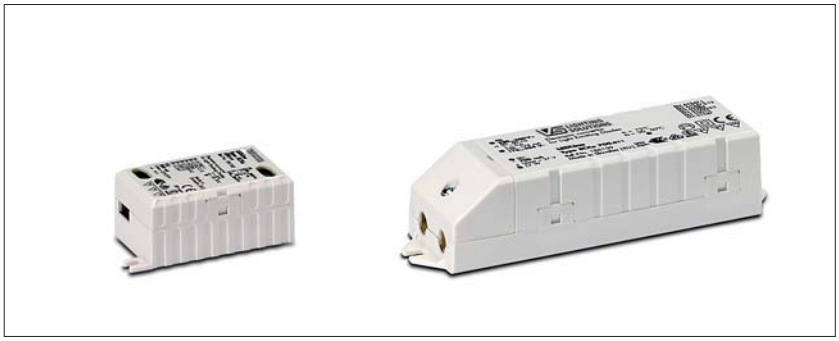
ComfortLine LED Drivers

350 mA / max. 8 W
to 1050 mA / max. 20 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.55 (186180 > 0.60)

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Screw terminals: 2.5 mm²
With integrated cord grip (except 186180)

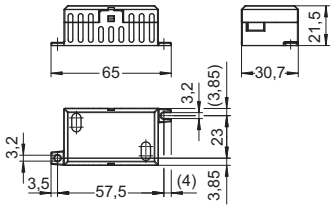
Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV equivalent



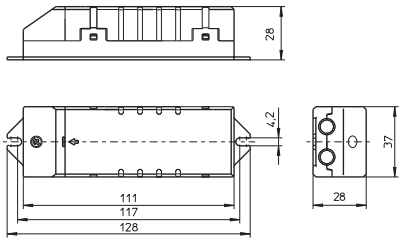
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186180		186424		186425		186426		186427	
350 mA	80 °C	70 °C	70 °C	60 °C	–	–	–	–	–	–
500 mA	–	–	–	–	75 °C	65 °C	–	–	–	–
700 mA	–	–	–	–	–	–	75 °C	65 °C	–	–
1050 mA	–	–	–	–	–	–	–	–	75 °C	65 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000	50,000	100,000	50,000	100,000

K29



K39



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K29 – Dimensions: 65 x 30.7 x 21.5 mm											
8	ECXe 350.018	**186180**	176–264	60–40	350 ± 5%	2–24	25	> 78	-20 to 50	80	33
			220–240	91–88							
K39 – Dimensions: 128 x 37 x 28 mm											
11	ECXe 350.009	**186424**	176–264	75–51	350 ± 5%	2–32	34	> 87	-20 to 50	70	71
			220–240	122–117							
16	ECXe 500.010	**186425**	176–264	106–72	500 ± 5%	2–32	34	> 88	-20 to 50	75	71
			220–240	160–155							
17	ECXe 700.011	**186426**	176–264	117–79	700 ± 5%	2–25	27	> 87	-20 to 50	75	71
			220–240	188–178							
20	ECXe 1050.012	**186427**	176–264	137–92	1050 ± 5%	2–19	21	> 87	-20 to 45	75	71
			220–240	210–202							

ComfortLine LED Drivers

1050 mA / max. 32 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

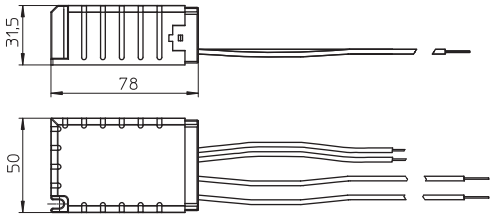
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary: 2x0.5 mm², length: 385 mm
secondary: 2x0.5 mm², length: 185 mm

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186479	
1050 mA	75 °C	65 °C
hrs.	50,000	100,000

K35 with leads



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K35 with leads – Dimensions: 78x50x31.5 mm											
32	ECXe 1050.117	**186479**	220–240	165–140	1050 ± 10%	20–31	< 60	> 85	-25 to 50	75	170

EasyLine LED Drivers – Dimmable

150–700 mA / max. 6–36 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.85

Dimming
Dimmable with phase-cutting trailing-edge dimmer.
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.

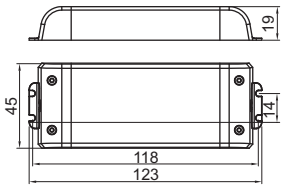
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

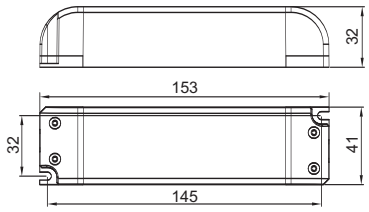
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186415, 186416, 186451		186447, 186448, 186449, 186450	
all	80 °C	70 °C	70 °C	60 °C
hrs.	30,000	50,000	30,000	50,000

K52



K53



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K52 – Dimensions: 123x45x19 mm											
6	ECXd 150.151	**186447**	220-240	40-35	150 ± 8%	27-41	60	> 78	-15 to 45	70	70
10	ECXd 500.152	**186448**	220-240	60-50	500 ± 8%	13-20	30	> 80	-15 to 45	70	70
12	ECXd 250.153	**186449**	220-240	70-60	250 ± 8%	27-48	60	> 80	-15 to 45	70	70
K53 – Dimensions: 153x41x32 mm											
18	ECXd 350.130	**186415**	220-240	100-90	350 ± 8%	32-52	60	> 85	-15 to 45	80	70
18	ECXd 700.134	**186450**	220-240	95-85	700 ± 8%	16-26	35	> 85	-15 to 45	70	140
25	ECXd 700.131	**186416**	220-240	140-120	700 ± 8%	22-36	60	> 85	-15 to 45	80	140
36	ECXd 700.155	**186451**	220-240	190-170	700 ± 8%	32-52	60	> 83	-15 to 45	80	170

EasyLine LED Drivers

700 mA / max. 5.2 W
For applications according to EN 60335

Electrical characteristics
Secondary side switching of LED modules
is not allowed.
Power factor at full load: > 0.5

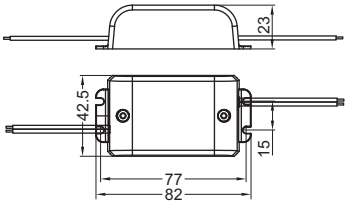
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary: 2x0.75 mm², length: 180 mm
secondary: 2x0.5–0.75 mm², length: 180 mm

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186458	
700 mA	70 °C	60 °C
hrs.	30,000	50,000

K51



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K51 – Dimensions: 82x42.5x23 mm											
5.2	ECXe 700.161	**186458**	220–240	50–30	700 ± 8%	2.8–7.4	< 60	> 70	-15 to 45	70	45

EasyLine LED Drivers

350 mA / max. 7 W
700 mA / max. 5.6 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.5

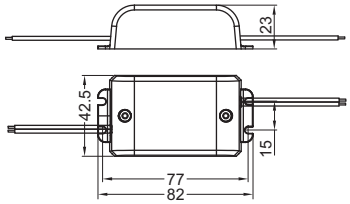
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary: 2x0.75 mm², length: 180 mm
secondary: 2x0.5–0.75 mm², length: 180 mm

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	75 °C	65 °C
hrs.	30,000	50,000

K51



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K51 – Dimensions: 82x42.5x23 mm											
5.6	ECXe 700.081	**186348**	220-240	45-30	700 ± 5%	2.8-8	< 60	> 70	-15 to 45	75	45
7	ECXe 350.079	**186342**	220-240	50-36	350 ± 5%	8.4-20	< 60	> 70	-15 to 45	75	45

EasyLine LED Drivers

350 mA / max. 12.6 W and max. 20 W
500 mA / max. 15 W
700 mA / max. 20.3 W and max. 25.2 W
The LED constant-current drivers are designed for use in residential lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.5 or > 0.95 (186353)

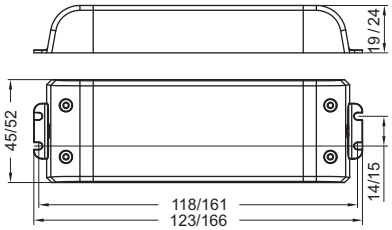
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186341		186349		186431		186350		186353	
350 mA	75 °C	65 °C	–	–	70 °C	60 °C	–	–	–	–
500 mA	–	–	75 °C	65 °C	–	–	–	–	–	–
700 mA	–	–	–	–	–	–	75 °C	65 °C	70 °C	60 °C
hrs.	30,000	50,000	30,000	50,000	30,000	50,000	30,000	50,000	30,000	50,000

K52/K54



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K52 – Dimensions: 123x45x19 mm											
12.6	ECXe 350.078	**186341**	220–240	100–70	350 ± 5%	8.4–36	< 60	> 83	-15 to 45	75	65
15	ECXe 500.082	**186349**	220–240	90–70	500 ± 5%	8–30	< 60	> 83	-15 to 45	75	70
20	ECXe 350.142	**186431**	220–240	110–95	350 ± 5%	16–57	< 60	> 85	-15 to 45	70	140
20.3	ECXe 700.083	**186350**	220–240	115–100	700 ± 5%	8–29	< 60	> 83	-15 to 45	75	70
K54 – Dimensions: 166x52x24 mm											
25.2	ECXe 700.086	**186353**	220–240	130–115	700 ± 8%	22–36	< 60	> 88	-15 to 45	70	140

EasyLine LED Drivers

350 mA / max. 30 W
1050 mA / max. 31.5 W
The LED constant-current drivers are designed for use in residential lighting.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.98

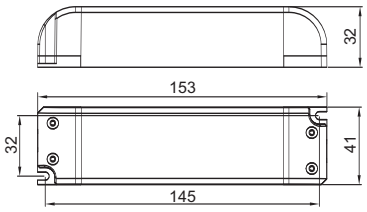
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186430		186351	
350 mA	70 °C	60 °C	–	–
1050 mA	–	–	75 °C	65 °C
hrs.	30,000	50,000	30,000	50,000

K53



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K53 – Dimensions: 153x41x32 mm											
30	ECXe 350.141	**186430**	220–240	160–140	350 ± 6%	57–86	< 90	> 89	-15 to 45	70	200
31.5	ECXe 1050.084	**186351**	220–240	150–145	1050 ± 6%	20–30	< 60	> 88	-15 to 45	75	140

PrimeLine LED Drivers – Dimmable

700, 1000, 1400 mA / max. 90 W
The nominal current can be set to 700 mA, 1000 mA, 1400 mA with a dip switch or it can be adjusted with a DALI signal.

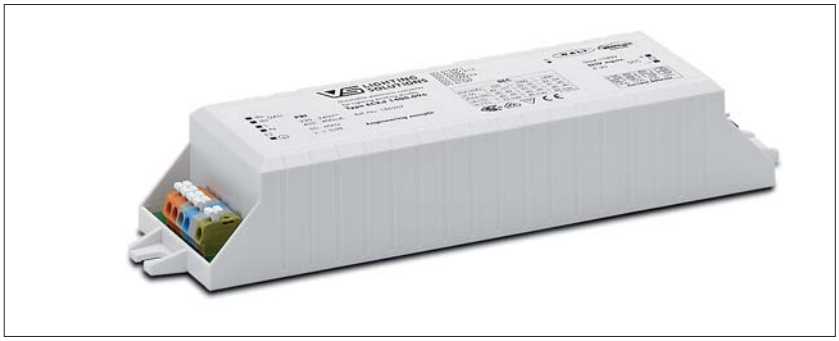
Electrical characteristics
Secondary side switching of LED modules is allowed (hot wiring).
Power factor at full load: > 0.98

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 10 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

MidNight – Multi-Step dimming
The MidNight concept is based on dimmable ballasts for integration in lampposts; these ballasts can be programmed to create different light scenes with different dimm settings.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.75–2.5 mm²

Safety features
Protection against transient main peaks up to 2 kV (between L and N) and up to 4 kV (between L, N and PE)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP65
Protection class I



Expected service life time
at operation temperatures at t_c point

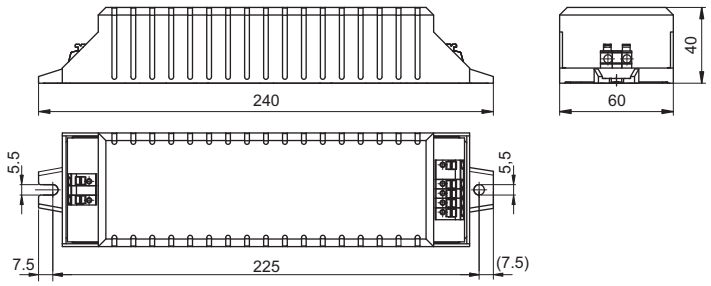
Operation current	Ref. No. 186367	
700	70 °C	60 °C
1000	80 °C	70 °C
1400	85 °C	75 °C
hrs.	50,000	100,000

DALI

PUSH

MidNight™ Multi-Step Dimming

K37



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K37 – Dimensions: 240 x 60 x 40 mm											
82	ECXd 1400.096	**186367**	220–240	450–150	700 ± 5%	43–117	< 120	> 90	-40 to 50	70	445
90					1000 ± 5%	33–91			-40 to 45	80	
					1400 ± 5%	22–64			-40 to 40	85	

ComfortLine LED Drivers – Dimmable

700 mA / max. 75, 100 and 150 W
These electronic LED constant current drivers are especially designed for use in street lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

Dimming
The dimming function is achieved by applying an analogue dimming signal to the nominal current.
Dimming range: 10 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 120–277 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads:
primary: 2x0.75 mm², length: 450 mm
secondary: 4x0.75 mm², length: 180 mm

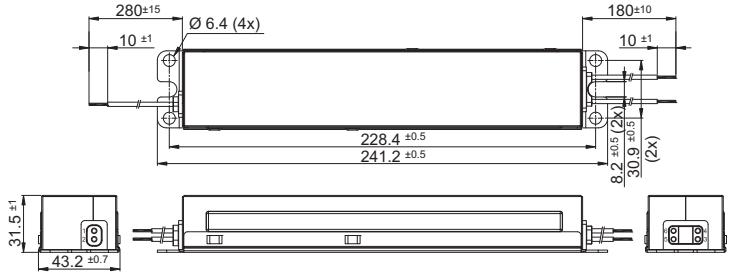
Safety features
Protection against transient main peaks up to 6 kV (between L and N)
Electronic short-circuit protection
Overload protection
Overtemperature protection (186402)
Protection against "no load" operation
Degree of protection: IP65
Protection class II

Expected service life time
at operation temperatures at t_c point

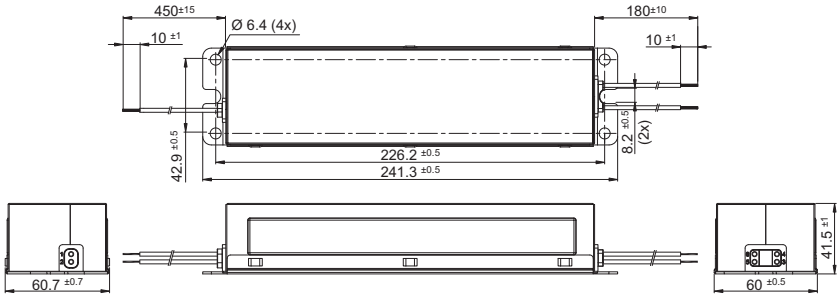
Operation current	Ref. No. 186400, 186402		186401	
700 mA	85 °C	75 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000

1–10V

M59.1



M59.2



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 DC (V)	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M59.1 – Dimensions: 241.2x43.2x31.5 mm											
75	ECXd 700G.117	**186400**	120–277	700–304	700 ± 5%	54–107	< 250	> 88	-40 to 55	85	625
M59.2 – Dimensions: 241.3x60.7x41.5 mm											
100	ECXd 700G.118	**186401**	120–277	917–398	700 ± 5%	70–143	< 250	> 88	-40 to 55	80	1070
150	ECXd 700G.119	**186402**	120–277	1363–591	700 ± 5%	107–210	< 250	> 88	-40 to 55	85	1070

ComfortLine LED Drivers – Dimmable

1050 mA / max. 60 W
These electronic LED constant current drivers are especially designed for use in street lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.96

Dimming
The dimming function is achieved by applying an analogue dimming signal to the nominal current.
Dimming range: 10 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads:
primary: 2x0.75 mm², length: 300 mm
secondary: 6x0.75 mm², length: 300 mm

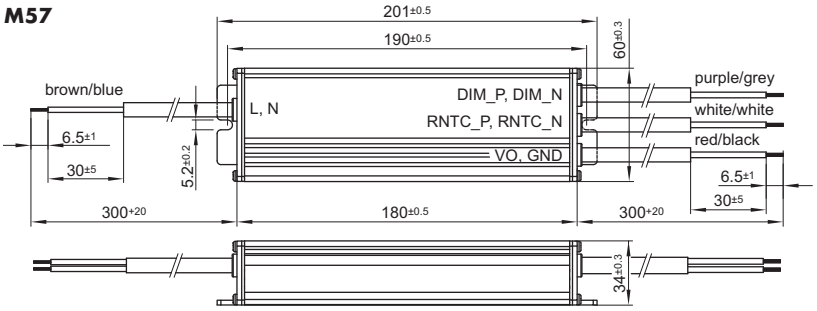
Safety features
Protection against transient main peaks up to 4 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP67
Protection class II
SELV

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186316	
all	80 °C	70 °C
hrs.	50,000	100,000

1–10V

M57



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M57 – Dimensions: 201x60x34 mm											
60	ECXd 1050.069	**186316**	220–240	310–280	1050 ± 5%	28–57	< 60	> 88	-40 to 50	80	730

ComfortLine LED Drivers – Dimmable

700 mA / max. 40 W
These electronic LED constant current drivers are especially designed for use in street lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.96

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current.
Dimming range: 3 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 120–277 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.75–2.5 mm²

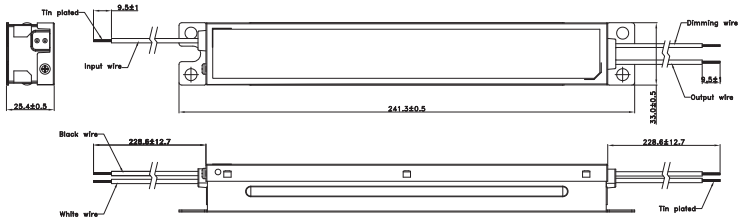
Safety features
Protection against transient main peaks up to 6 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP65
Protection class II

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186490	
700 mA	80 °C	70 °C
hrs.	50,000	100,000

1–10V

M59



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M59 – Dimensions: 241x32x20 mm											
40	ECXd 700G.177	**186490**	120–277	440–200	700 ± 5%	32–55	60	> 85	-30 to 55	80	398

ComfortLine LED Drivers – for Power Reduction

700/400 mA / max. 150 W

These electronic LED constant current drivers 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 700 mA and 400 mA.

Electrical characteristics

Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.95

Power reduction

The nominal current output will be reduced by connecting the control phase (L_{ST}) to 57%.
Connecting L (black) and L_{ST} (orange) to the mains voltage reduces output by lowering the output current. If this function is not used, an additional terminal should be provided in the luminaire to fix the L_{ST} wire.

Connection details

Mains voltage: 220–277 V ± 10%
Mains frequency: 50–60 Hz
K37: Push-in terminals: 0.75–2.5 mm²
K37 with cord grip:
- 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.

Safety features

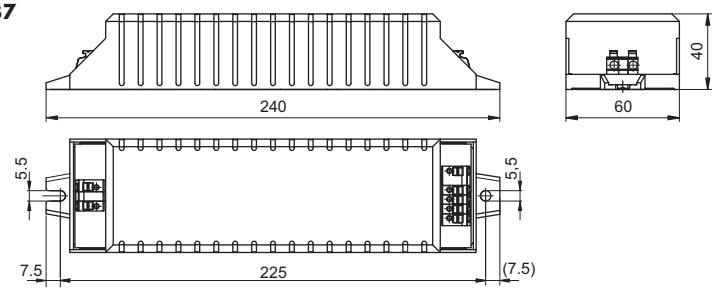
Protection against transient main peaks up to 3 kV (between L and N) and up to 4 kV (between L, N and PE)
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20 or IP66 (K37 with cord grip)
Protection class I

Expected service life time

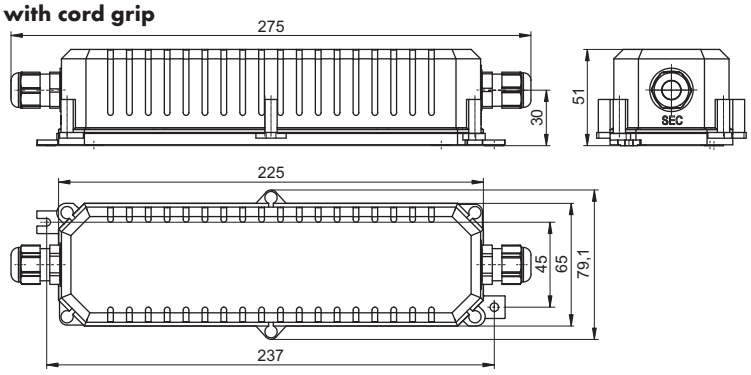
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	75 °C	65 °C
hrs.	50,000	100,000

K37



K37 with cord grip



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K37 – Dimensions: 240x60x40 mm											
150	ECXd 700.023	**186202**	220–277	735–585	700 +5/-10%	48–215	445	> 93	-40 to 60	75	440
					400 +5/-10%	48–375					
K37 with cord grip – Dimensions: 275x79.1x51 mm											
150	ECXd 700.023	**186203**	220–277	735–585	700 +5/-10%	48–215	445	> 93	-40 to 60	75	560
					400 +5/-10%	48–375					

Power reduction can be effected with VS Power Switches PR12 K LC and PR12 K D.
These power switches are used to switch the 230-V power reduction input on the LED driver of a luminaire.

ComfortLine LED Drivers – for Power Reduction

700/400 mA / max. 75, 100 and 150 W
These electronic LED constant current drivers 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 700 mA and 400 mA.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

Connection details
Mains voltage: 120–277 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads:
primary: 2x0.75 mm²,
length: 450 mm / 280 mm (M59.1)
secondary: 2x0.75 mm², length: 180 mm

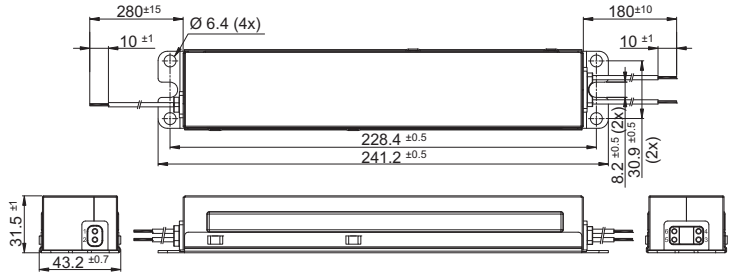
Power reduction
The nominal current output will be reduced by connecting the control phase (L_{ST}) to 57%.
Connecting L (black) and L_{ST} (orange) to the mains voltage reduces output by lowering the output current. If this function is not used, an additional terminal should be provided in the luminaire to fix the L_{ST} wire.

Safety features
Protection against transient main peaks up to 6 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP65
Protection class II

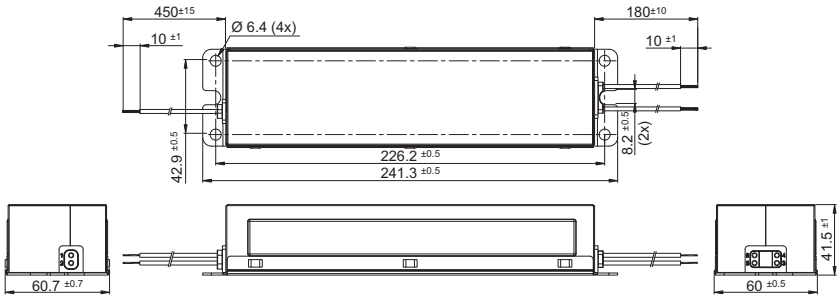
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186397, 186399		186398	
700 mA	85 °C	75 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000

M59.1



M59.2



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 DC (V)	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M59.1 – Dimensions: 241.2x43.2x31.5 mm											
75	ECXe 700G.114	**186397**	120–277	700–304	700 ± 5%	54–107	< 250	> 88	-40 to 55	85	625
					400 ± 5 %						
M59.2 – Dimensions: 241.3x60.7x41.5 mm											
100	ECXe 700G.115	**186398**	120–277	917–398	700 ± 5%	70–143	< 250	> 88	-40 to 55	80	1070
					400 ± 5 %						
150	ECXe 700G.190	**186509**	120–277	1363–591	700 ± 5%	107–210	< 250	> 88	-40 to 55	85	1070
					400 ± 5 %						

ComfortLine LED Drivers

700 mA / max. 40 W
These electronic LED constant current drivers are especially designed for use in street lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

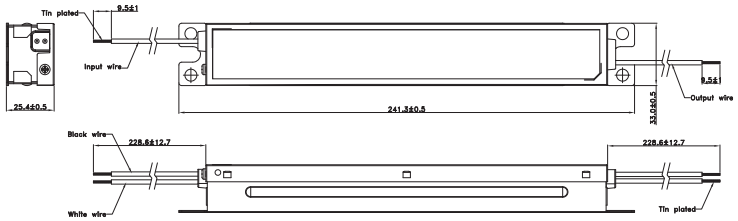
Connection details
Mains voltage: 120–277 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.75–2.5 mm²

Safety features
Protection against transient main peaks up to 6 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP65
Protection class II

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186489	
700 mA	80 °C	70 °C
hrs.	50,000	100,000

M59



Products under development; preliminary technical datas

Max. output	Type	**Ref. No.**	Mains voltage 50–60 Hz	Mains current	Current output DC	Voltage output DC	Max. voltage without load DC	Efficiency at full load	Ambient temperature t_a	Casing temperature t_c	Weight
W			V	mA	mA	V	DC (V)	% (230 V)	°C	°C	g
M59 – Dimensions: 241x32x20 mm											
40	ECXe 700G.176	**186489**	120–277	440–200	700 ± 5%	32–55	60	> 85	-30 to 55	80	393

ComfortLine LED Drivers

700 mA / max. 150 W
These electronic LED constant current drivers are especially designed for use in street lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

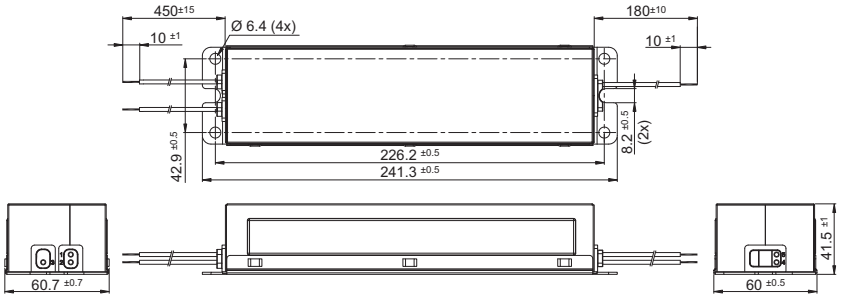
Connection details
Mains voltage: 120–277 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads:
primary: 2x0.75 mm², length: 450 mm
secondary: 2x0.75 mm², length: 180 mm

Safety features
Protection against transient main peaks up to 6 kV (between L and N)
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP65
Protection class II

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186399	
700 mA	80 °C	70 °C
hrs.	50,000	100,000

M59.2



Products under development; preliminary technical datas

Max. output	Type	Ref. No.	Mains voltage 50–60 Hz	Mains current	Current output DC	Voltage output DC	Max. voltage without load DC	Efficiency at full load	Ambient temperature t_a	Casing temperature t_c	Weight
W			V	mA	mA	V	DC (V)	% (230 V)	°C	°C	g
M59.2 – Dimensions: 241.3 x 60.7 x 41.5 mm											
150	ECXe 700G.116	**186399**	120–277	1363–591	700 ± 5%	107–210	< 250	> 88	-40 to 55	85	1070

ComfortLine LED Drivers

350 mA / max. 42 W

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.97

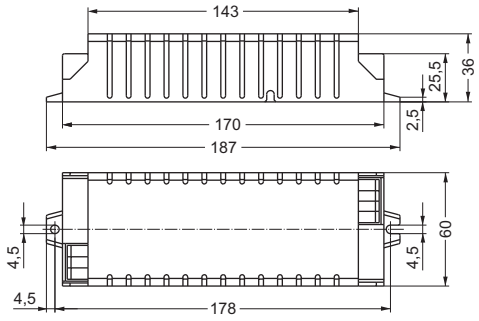
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.75–2.5 mm²

Safety features
Protection against transient main peaks up to 3 kV (between L and N) and up to 4 kV (between L, N and PE)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV equivalent

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186175	
350	70 °C	60 °C
hrs.	50,000	100,000

K30



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K30 – Dimensions: 187 x 60 x 36 mm											
42	ECXe 350.015	**186175**	220–240	210–190	350 ± 5%	40–115	120	> 90	-30 to 60	70	270

ComfortLine LED Drivers – Dimmable

700 mA / max. 112 W
1050 mA / max. 126 W
These electronic LED constant current drivers are designed for use in industrial hall lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.95
Stand-by losses: < 0.5 W

Dimming
The dimming function is achieved by applying a PWM signal to the nominal current. Dimming range: 3 to 100%. If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220 – 240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached.

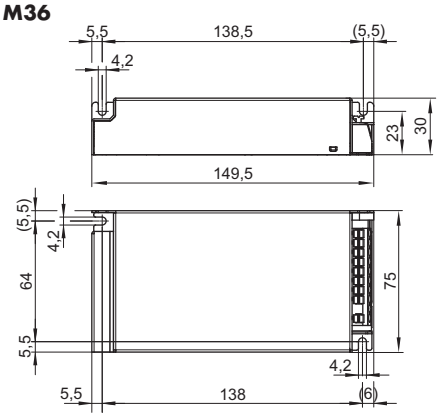
NTC at LED module 10 kΩ (Type Nurata NCP18XH103J03RB)	
R (kΩ)	Nominal current (%)
10	100
< 1.49	60
< 1.13	0 (off)

DALI
PUSH

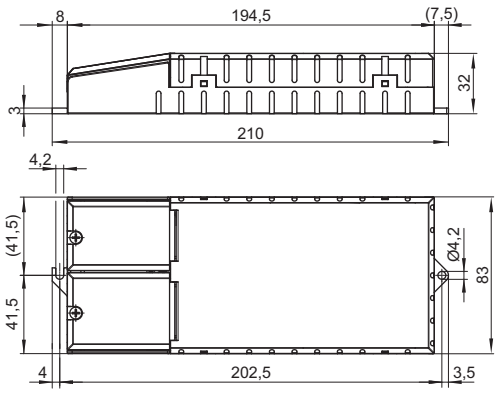
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186299		186303		186300		186304	
700 mA	70 °C	60 °C	–	–	80 °C	70 °C	–	–
1050 mA	–	–	75 °C	65 °C	–	–	90 °C	80 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000	50,000	100,000

M36



K38



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	Efficiency at full load % (230 V)	12 V interface max. 2 W	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M36 – Dimensions: 149.5 x 75 x 30 mm												
112	ECXd 700.058	**186299**	198–264	550–510	700 ± 5%	85–160	< 450	> 91	yes	-25 to 50	70	288
			220–240									
126	ECXd 1050.060	**186303**	198–264	630–590	1050 ± 5%	85–120	< 450	> 91	yes	-25 to 50	75	288
			220–240									
K38 – Dimensions: 210 x 83 x 32 mm												
112	ECXd 700.058	**186300**	198–264	550–510	700 ± 5%	85–160	< 450	> 91	yes	-25 to 50	80	335
			220–240									
126	ECXd 1050.060	**186304**	198–264	630–590	1050 ± 5%	85–120	< 450	> 91	yes	-25 to 50	90	335
			220–240									

ComfortLine LED Drivers – Dimmable and Adjustable

900/1050/1200/1400 mA / max. 60.2 W
The dial can be used to set the current output to 900 mA (1), 1050 mA (2), 1200 mA (3) or 1400 mA (4).

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.95

Dimming
The dimming function is achieved by applying a PWM signal.
Dimming range: 3 to 100%.
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²
(NTC interface: 0.2–0.5 mm²)

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I

SELV
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached.

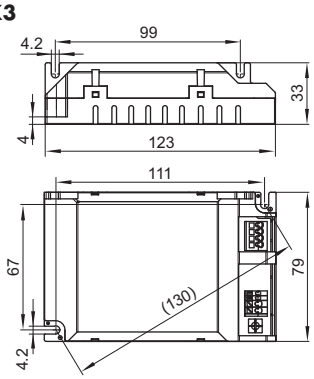
NTC at LED module 220 kΩ	
R (kΩ)	Nominal current (%)
34	100
27	60
16	0 (off)

1–10V

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186208	
all	85 °C	75 °C
hrs.	50,000	100,000

K3



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3 – Dimensions: 123x79x33 mm											
38,7/ 45,1/ 51,6/ 60,2	ECXd 1400.025	**186208**	198–264 220–240	315–290 350–265	900 +5/-10%/ 1050 +5/-10%/ 1200 +5/-10%/ 1400 +5/-10%	20–43	< 52	> 85	-20 to 50	85	230

ComfortLine LED Drivers – Dimmable and Adjustable

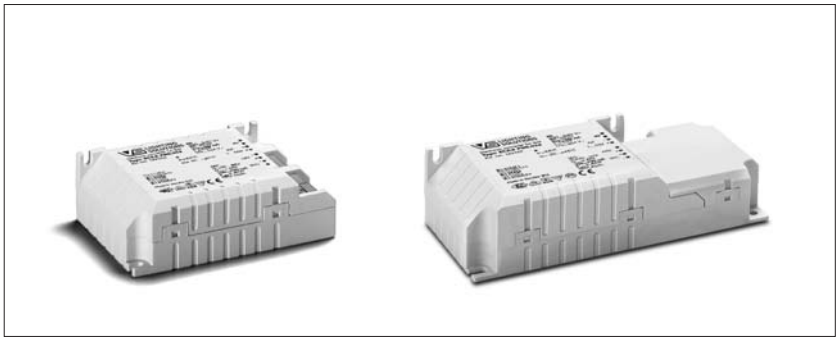
350/500/600/700 mA / max. 39.9 W
The dial can be used to set the current output to 350 mA (1), 500 mA (2), 600 mA (3) or 700 mA (4).

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: 0.95

Dimming
The dimming function is achieved by applying a PWM signal.
Dimming range: 3 to 100%
If no dimming interface is connected, brightness will stay at 100%.

Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²
(NTC interface: 0.2–0.5 mm²)

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached.



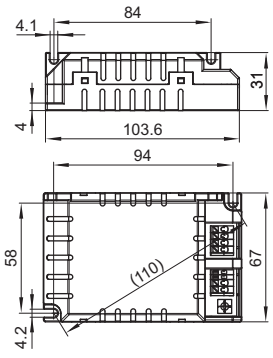
NTC at LED module 220 kΩ	
R (kΩ)	Nominal current (%)
34	100
27	60
16	0 (off)

1–10V

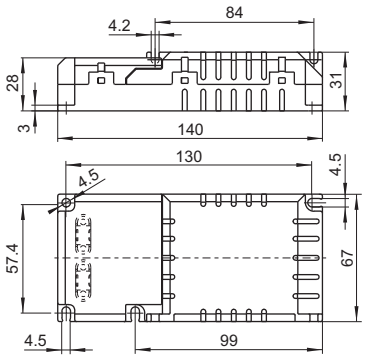
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	75 °C	65 °C
hrs.	50,000	100,000

K2



K2 mit Zugentlastung



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K2 – Dimensions: 103.6x67x31 mm											
19.95/ 28.5/ 34.2/ 39.9	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	> 85	-20 to 50	75	190
K2 with cord grip – Dimensions: 140x67x31 mm											
19.95/ 28.5/ 34.2/ 39.9	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	> 85	-20 to 50	75	220

ComfortLine LED Drivers

700 mA / max. 112 W
1050 mA / max. 126 W
These electronic LED constant current drivers are designed for use in industrial hall lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.95

Connection details
Mains voltage: 220 – 240 V ± 10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Push-in terminals: 0.2–1.5 mm²

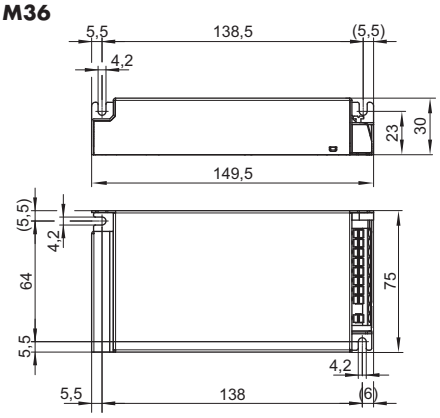
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached.

NTC at LED module 10 kΩ (Type Nurata NCP18XH103J03RB)	
R (kΩ)	Nominal current (%)
10	100
< 1.49	60
< 1.13	0 (off)

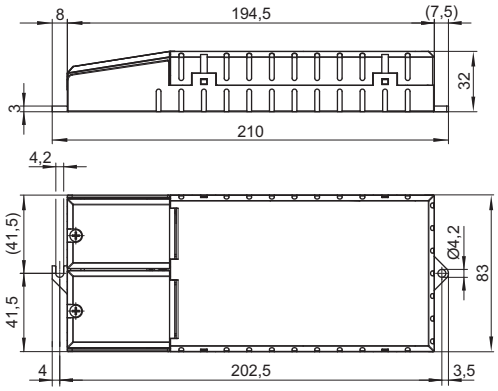
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186297		186301		186298		186302	
700 mA	70 °C	60 °C	–	–	80 °C	70 °C	–	–
1050 mA	–	–	75 °C	65 °C	–	–	90 °C	80 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000	50,000	100,000

M36



K38 with cord grip



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	Efficiency at full load % (230 V)	12 V interface max. 2 W	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M36 – Dimensions: 149.5 x 75 x 30 mm												
112	ECXe 700.057	**186297**	198–264	550–510	700 ± 5%	85–160	< 450	> 91	yes	–25 to 50	70	288
			220–240									
126	ECXe 1050.059	**186301**	198–264	630–590	1050 ± 5%	85–120	< 450	> 91	yes	–25 to 50	75	288
			220–240									
K38 with cord grip – Dimensions: 210 x 83 x 32 mm												
112	ECXe 700.057	**186298**	198–264	550–510	700 ± 5%	85–160	< 450	> 91	yes	–25 to 50	80	335
			220–240									
126	ECXe 1050.059	**186302**	198–264	630–590	1050 ± 5%	85–120	< 450	> 91	yes	–25 to 50	90	335
			220–240									

EasyLine LED Drivers

700–3200 mA / max. 50–230 W
These electronic LED constant current drivers are especially designed for use in street lighting systems.

Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.9

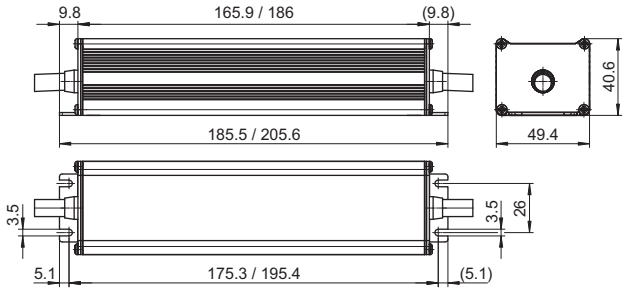
Connection details
Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads:
primary: 3x2.08 mm², length: 320 mm
secondary: 2x2.08 mm², length: 320 mm

Safety features
Protection against transient main peaks up to 1.5 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP67
Protection class I

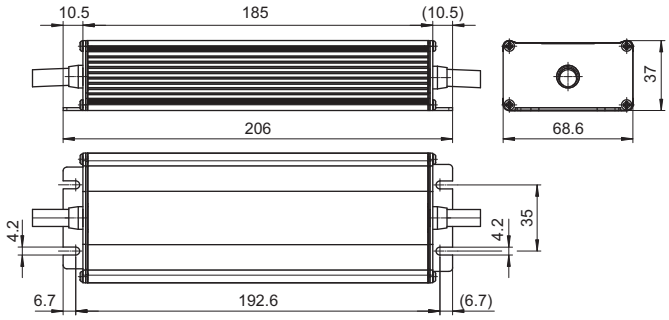
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
all	75 °C	65 °C
hrs.	30,000	50,000

M56/M58



M58.1



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	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M56 – Dimensions: 185.5x49.4x40.6 mm											
50	ECXe 700.156	**186452**	220-240	255-235	700 ± 5%	35-72	75	> 88	-30 to 50	75	520
75	ECXe 1050.157	**186453**	220-240	380-350	1050 ± 5%	35-72	75	> 88	-30 to 50	75	520
M58 – Dimensions: 205.6x49.4x40.6 mm											
100	ECXe 1400.158	**186454**	220-240	510-470	1400 ± 5%	30-72	75	> 90	-30 to 50	75	600
125	ECXe 1700.159	**186455**	220-240	625-580	1700 ± 5%	30-72	75	> 90	-30 to 50	75	600
M58.1 – Dimensions: 206x68.6x37 mm											
150	ECXe 2100.160	**186456**	220-240	750-690	2100 ± 5%	45-72	85	> 90	-30 to 50	75	840
175	ECXe 2400.167	**186510**	220-240	910-850	2400 ± 5%	45-72	85	> 85	-30 to 50	75	840
200	ECXe 2800.168	**186477**	220-240	1040-960	2800 ± 5%	45-72	85	> 85	-30 to 50	75	840
230	ECXe 3200.169	**186478**	220-240	1200-1100	3200 ± 5%	45-72	85	> 85	-30 to 50	75	840

iProgrammer

For programming LED drivers
The iProgrammer is designed to let you configure LED drivers using the 3C function.

Using DALI commands, the iProgrammer enables various functions to be configured on all VS LED drivers that feature the "3C" symbol.
As an example, not only can the current be set to a precise level, but programming functions for the street lighting zone can also be transferred.
Please refer to the manual at www.vossloh-schwabe.com/en/home/products/led-light-engines-and-modules/led-control-gears/constant-current.html for detailed configuration procedures.

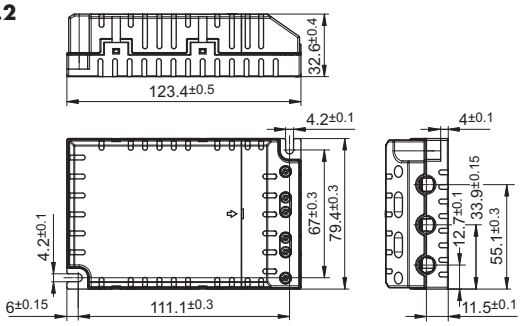
Technical notes
Configuration interface: DALI
Ambient temperature t_a: 5 to 50 °C
Push-in terminals: 0.2–1.5 mm²
Degree of protection: IP20

Connections
- Mains connection: 220–240 V AC/50–60 Hz
- Max. power consumption: 5 W
- USB 2.0

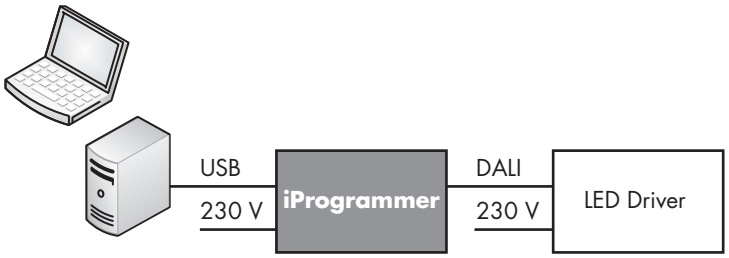
Software download
Under www.vossloh-schwabe.com/en/home/products/led-light-engines-and-modules/led-control-gears/constant-current.html

Functions
Configuring "3C" LED drivers

K3.2



Connection



Type	**Ref. No.**	Connection to PC/Laptop	Functions	Dimensions mm (LxWxH)	Weight g
iProgrammer	**186428**	USB 2.0	Configuring "3C" LED drivers	123.4x79.4x33	135

OPTIMISED LUMINAIRE PROTECTION

LUMINAIRE PROTECTION AND POWER ADJUSTMENT

This chapter presents inrush current limiters, electronic components to protect luminaires against mains surges, power reduction products and components with which the output current of LED drivers can be adjusted.

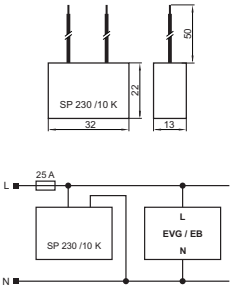
Luminaire Protection Device

For electronic devices
When electronic components form part of lighting systems, it is often necessary to protect such components against power-supply interruptions and electric overloads (power surges).

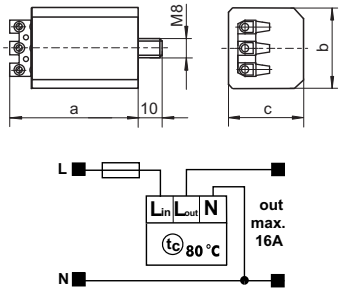
These can be caused by switching inductive loads or by atmospheric discharges such as lightning striking the mains or the ground. A further cause can be induced voltages from neighbouring cables when working with leading-edge phase-cutting controls.

The protection unit reduces overvoltages at the connection terminals of electronic components. The remaining residual voltage is then reduced to a respective protective level, based on the discharge current (see diagram below).

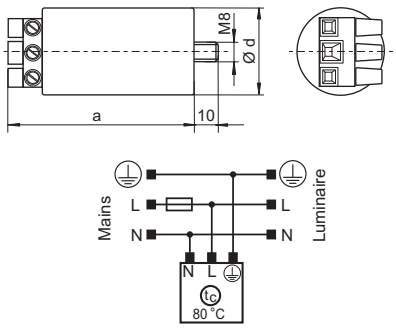
SP 230/10 K
Suitable for luminaires of protection class I and II
Dimensions: 32x22x13 mm
Weight: 20 g
Connecting: solid wire, length: 50 mm
Ref. No.: 147230



SPC 230/10 K
If the protective luminaire component overloads, the connected lighting circuit will be interrupted. This cut-out function makes it easier to detect the end of life of the protective component, facilitates quick replacement by maintenance staff and provides reliable protection for lighting components.
Suitable for luminaires of protection class I
Type 3 product
Dimensions: 53x28x27 mm
Weight: 50 g
Screw terminals: 0.5–1.5 mm²
Ref. No.: 142736



SP 3/230/10 K
Suitable for luminaires of protection class I
Type 3 product
Dimensions: Ø 36x75 mm
Weight: 60 g
Screw terminals: 0.75–4 mm²
Ref. No.: 147233

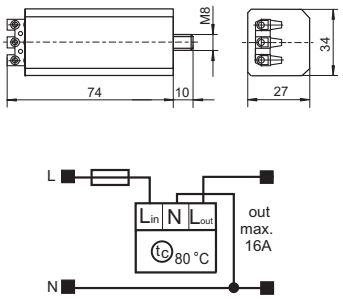


Type	Ref. No.	Voltage 50/60 Hz V ± 10 %	Max. load current A	Max. impulse voltage U_{OC} (V)	Discharge current (8/20 µs) I_N (A)	$I_{max.}$ (A)	Protection level at discharge current of 1000 A	Safety max. A	Max. permitted casing temperature °C	Min. permitted ambient temperature °C	Fixation
SP 230/10 K	**147230**	220–240	–	10,000	5000	10,000	≤ 850 V	25	80	-30	–
SPC 230/10 K	**142736**	220–240	16	10,000	5000	10,000	≤ 850 V	16	80	-30	M8x10
SP 3/230/10 K	**147233**	100–277	–	10,000	5000	10,000	≤ 1000 V	25	80	-30	M8x10

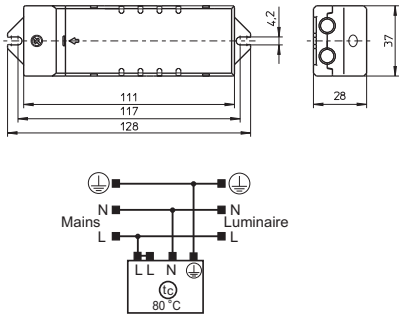
Luminaire Protection Device

For electronic devices
These protective components are fitted with an LED indicator. Once the end of the component's life has been reached, the LED goes out and the protective component has to be replaced.

SPC 230/10 K/i
Suitable for luminaires of protection class II
Type 3 product
Dimensions: 74x24x27 mm
Weight: 100 g
Screw terminals: 0.5–2.5 mm²
Ref. No.: 142737



SP 3/230/10 K/i
Suitable for luminaires of protection class I
Type 3 product
Dimensions: 128x37x28 mm
Weight: 61 g
Screw terminals: 0.5–2.5 mm²
Ref. No.: 147234



Type	Ref. No.	Voltage 50/60 Hz V ± 10 %	Max. load current A	Max. impulse voltage U_{OC} (V)	Discharge current (8/20 µs) I_N (A)	$I_{max.}$ (A)	Protection level at discharge current of 1000 A	Safety max. A	Max. permitted casing temperature °C	Min. permitted ambient temperature °C	Fixation
SPC 230/10 K/i	**142737**	220–240	16	10,000	5000	10,000	≤ 1000 V	16	80	–30	M8x10
SP 3/230/10 K/i	**147234**	100–277	–	10,000	5000	10,000	≤ 1000 V	25	80	–30	–

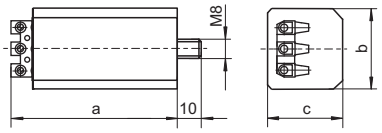
Inrush Current Limiter ESB-6K

Limits capacitive inrush currents of electronic ballasts and converters for LED modules

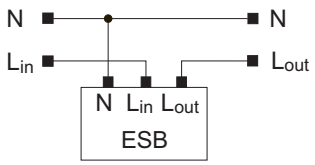
Due to their capacitive nature, these products generate high inrush currents. By temporarily activating a limiting resistor, the inrush current is reduced to an uncritical value (see graph below).

Several LED drivers or electronic ballasts can be connected downstream under consideration of the maximum permissible continuous current of the inrush current limiter.

The device thus prevents any automatic circuit breakers from being triggered or any damage from being caused to upstream relay contacts.



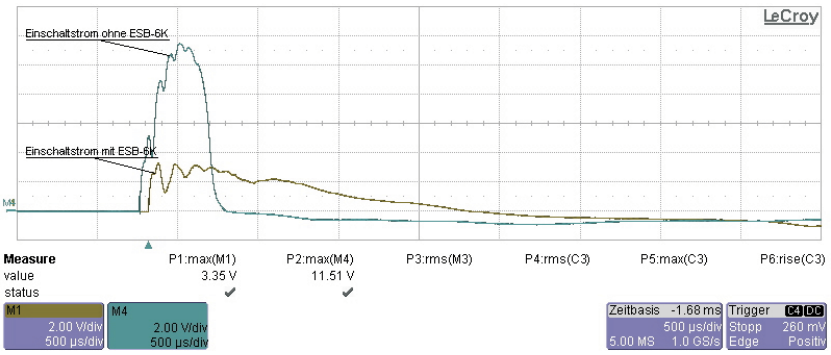
Wiring



ESB-6K
Casing: PC
Dimensions (axbxc): 55x28x27 mm
Weight: 61 g
Screw terminals: 0.5–1.5 mm²
Ref. No.: 149820

Type	**Ref. No.**	Nominal voltage 50–60 Hz V ± 10 %	Power consumption W	Max. direct current A	Limiting resistor Ω	Period of limitation ms	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
ESB-6K	**149820**	220–240	0.25	6	20	approx. 18	80	-30	M8x10

Example using a 150 W LED driver
Brown: with ICL (ESB)
Blue: without ICL (ESB)
1 V = 1 A



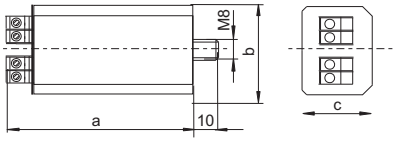
Power Switch PS 16 K

For electronic LED drivers
Given centralised control of an LED driver's 230 V power switch terminals, the existing cable capacities of the control line can lead to switching errors. This can be prevented by installing a PS 16 K power switch, which features a potential-free and galvanically isolated switching contact.

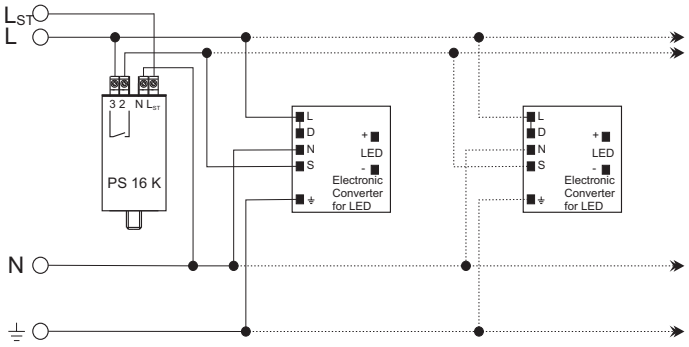
The PS 16 K power switch complies with EN 61347 and is also suitable for use in luminaires of protection class I and II.

The power switch complies with the specification of DIN EN 61347.

PS 16 K
Casing: PC
Dimensions (axbxc): 74 x 34 x 27 mm
Weight: 100 g
Screw terminals: 0.75 – 2.5 mm²
Ref. No.: 142185



Wiring



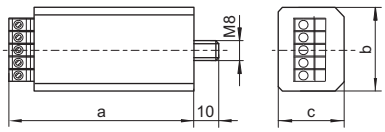
Type	**Ref. No.**	Control voltage 50/60 Hz V ± 10 %	Max. switching capacity (VA)	Max. switching voltage (V)	Max. contact current A λ = 1	λ = 0.6	Inherent heating K	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
PS 16 K	**142185**	230 / 220	4000	400	16	10	< 25	80	-30	M8x10

Automatical Power Switch for LED Drivers – PR 12 K LC

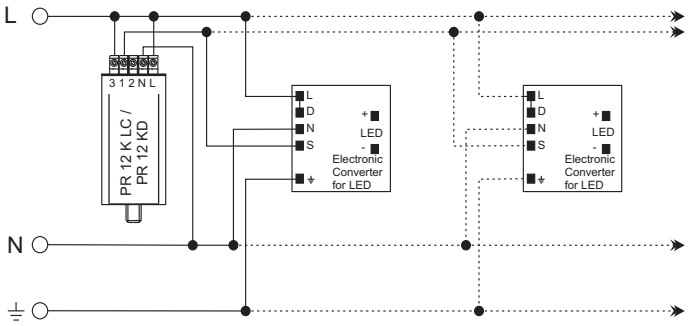
The PR 12 K LC can be used for power switching of LED drivers with respective interface.
A control phase is not needed.
Once it's connected to the mains supply voltage the power switch will switch automatically.

The power switch complies with the specification of DIN EN 61347 and is suitable for the application in luminaires of protection class I and II.

PR 12 K LC
Casing: PC
Dimensions (axbxc): 76x34x30 mm
Weight : 100 g
Screw terminals: 0.75–2.5 mm²
Ref. No.: 142170



Wiring diagram
For example with VS LED drivers ECXd 700.023 (Ref. No. 186202 or 186203)



Type	**Ref. No.**	Nominal voltage/ frequency V ± 10 %	Max. switching capacity (VA)	Max. contact current (A) λ = 0.5	λ = 1	Internal loss W	Inherent heating K	Switching-time selectable	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
PR 12 K LC	**142170**	220–230 / 50 220 / 60	3000	8	12	< 1	< 12	see table	80	–30	M8x10

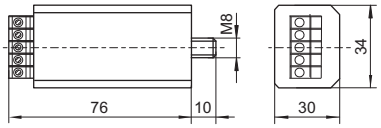
Programmable Power Switch for LED Drivers – PR 12 KD

For power reduction purposes, the PR 12 KD power switch can be used, which addresses the LED driver's 230 V power reduction input.
A control phase is not needed.
The constant switching-time is selectable.

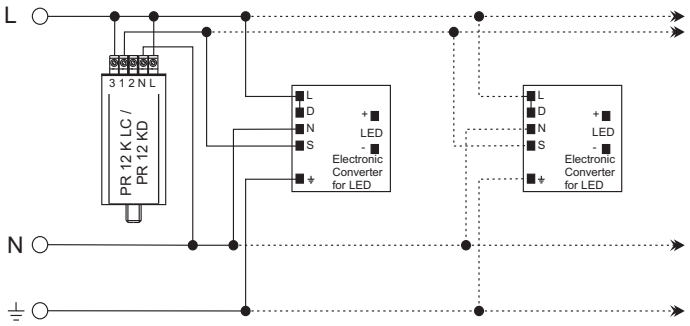
The left side of the rotary switch is used for reset to full power after eleven hours; the right side is for continuous power reduction after programmed time has been reached.

The power switch complies with the specification of DIN EN 61347 and is suitable for the application in luminaires of protection class I and II.

PR 12 KD
Casing: PC
Dimensions (axbxc): 76x34x30 mm
Weight : 100 g
Screw terminals: 0.75–2.5 mm²
Ref. No.: 142150



Wiring diagram
For example with VS LED drivers ECXd 700.023 (Ref. No. 186202 or 186203)



Type	**Ref. No.**	Nominal voltage/ frequency V ± 10 %	Max. switching capacity (VA)	Max. contact current (A) λ = 0.5	λ = 1	Internal loss W	Inherent heating K	Switching-time*	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
PR 12 KD	**142150**	220–230 / 50 220 / 60	3000	8	12	< 1	< 12	selectable	80	–30	M8x10

* Switching-time selectable: 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 hrs. at 50 Hz

Switch Units for Electronic Operating Devices with 1–10 V Interface

Vossloh-Schwabe's switch units are designed to enable one-step power reduction of lamps (FL, CFL, LED, HS, HI and C-HI) with the help of the respective electronic ballast or converter.

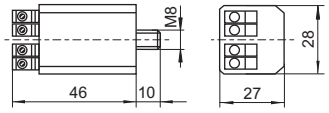
To this end, the switch units utilises the 1–10 V interface of the control gear unit. The switch unit is mainly intended for outdoor luminaires in systems with or without a control phase.

Shape: 56×28×27 mm
Casing: PC
Screw terminals: 0.75–2.5 mm²
Max. permissible casing temperature t_C: 80 °C
Min. permissible ambient temperature t_a: –30 °C
Fastening: plastic male nipple with pre-assembled washer and nut

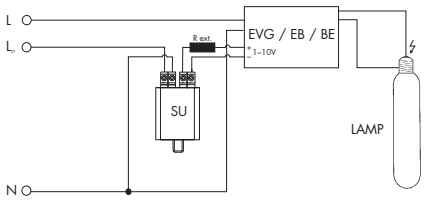
Power reduction SU 1–10 V K for lighting systems featuring an L_{ST} control phase
The switch unit employs a positive switching to reduce power, i.e. power is reduced when the control phase is switched off (L_{ST} = 0 V).
The 1–10 V interface of the electronic ballast is addressed at the moment that power reduction is effected.

Power reduction PR 1–10 V K LC for lighting systems without a control phase
This switch unit can be used to effect power reduction in lighting systems that do not feature a control phase.

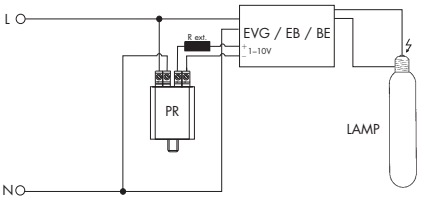
The 1–10 V interface is addressed on the basis of the fundamental operating principle used by Vossloh-Schwabe's PR 12 K LC power switch (details of which can be made available on request). This power switch is capable of determining the starting time of reduced-power operation over the measured operating time of a lighting system. As a result, it is no longer necessary to spend valuable time modifying the power-reduction unit to suit the continually changing day-night cycle; changing the clocks in line with daylight saving measures in the summer and winter is equally unnecessary. The 1–10 V interface of the electronic ballast is addressed as soon as the system is switched to reduced power.



Circuit diagram SU 1–10 V K



Circuit diagram PR 1–10 V K LC



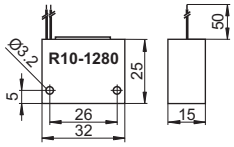
Type	**Ref. No.**	Control voltage L_{ST} V, 50/60 Hz	Externally (on site) connected resistor (Rext.) kΩ (min. 0.1 W)	Self-heating K	Weight g
For lighting systems with control phase					
SU 1–10 V K	**149992**	220–240 V ±10%	1–70	< 10	50
For lighting systems without control phase					
PR 1–10 V K LC	**149993**	–	1–70	< 10	50

Resistor Network for LED Drivers

This resistor network is used to adjust the output currents of LED drivers. 255 different resistance values can be adjusted in 10-Ohm steps within a range from 0 to 2550 Ohm by connecting the SU 1-10 V K and PR 1-10 V LC power switches. As an example, this makes it possible to even out differences in luminous flux common to LED luminaires.

The component is designed for use in protection class II luminaires.

R10-1280
Casing: PC
Dimensions: 32x25x15 mm
Weight: 20 g
Connection leads, solid: 0,5 mm²
Lead length: 50 mm
Ref. No.: 149800



Type	Ref. No.	Number of dip switch V, 50/60 Hz	Max. internal loss of resistors W	Max. voltage at resistors V	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)
R10-1280	**149800**	8	0.25	200	80	-30

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

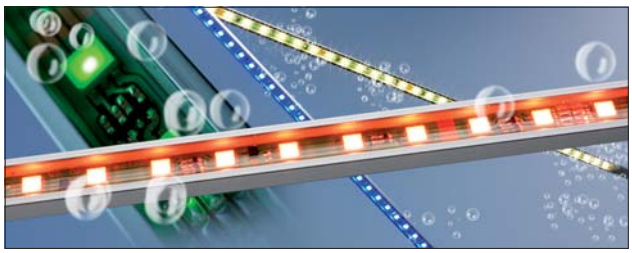
Light modules for IP67-compliant outdoor lighting

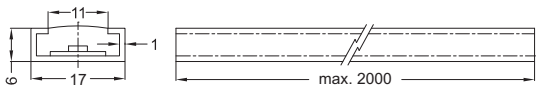
Vossloh-Schwabe provides an IP67-compliant encapsulation for LED frames destined for outdoor lighting projects (e.g. architectural lighting).

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.

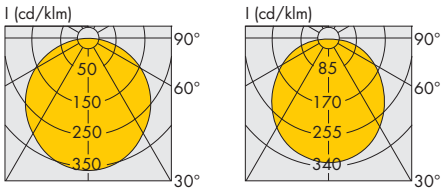
The round design with 3 or 10 High Power LEDs is particularly suitable for installation in luminaires and spots. The linear design with 6 LEDs is, for instance, suitable for wall-washing and linear luminaires, etc.

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 86–88) are available to create individual lighting solutions.

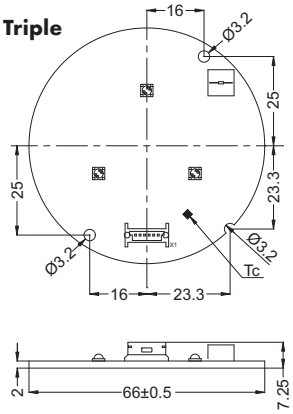
Technical notes
Triple WU-M-440: Ø 66 mm, 3 LEDs
Line WU-M-441: 300x26 mm, 6 of LEDs
Flood WU-M-442: Ø 110 mm, 10 of LEDs
Allowed operating temperature at t_c point:
–10 to 85 °C
Aluminium PCB
For improved thermal management VS recommends an additional cooling element, which is suitable for the application.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

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

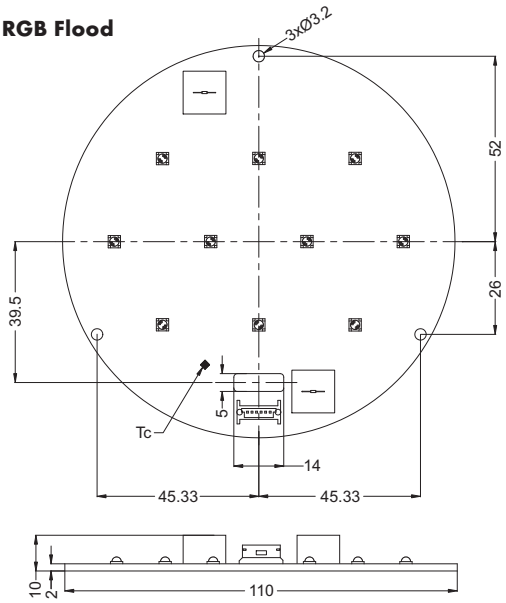


White RGB

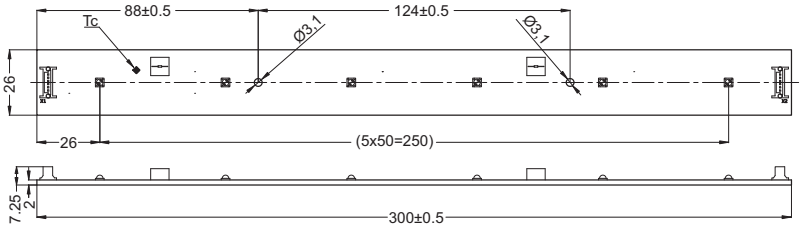
Triple



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

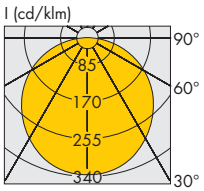
Emission data at t_j = 25 °C | * Measurement tolerance of luminous flux: ± 7%
Suitable thermal tapes for these LED modules see page 90.

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	70	115	42	130	5
RGB Line													
WU-M-441-RGB	**548521**	6	RGB	620 - 630	520 - 535	465 - 485	1.10	0.65	200	300	115	130	15
RGB Flood													
WU-M-442-RGB	**548524**	10	RGB	620 - 630	520 - 535	465 - 485	1.40	1.10	305	595	175	130	25

Emission data at t_j = 25 °C | * Measurement tolerance of luminous flux: ± 7%
Suitable thermal tapes for these LED modules see page 90.

LEDLine Flex SMD Professional Indoor White



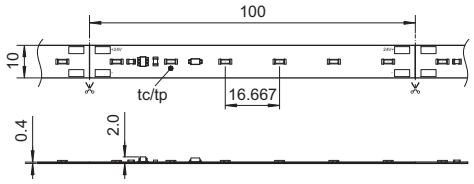
Built-in PCB lighting modules

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 65 °C
Wide beam angle (120°)
Voltage supply: 24 V
Power consumption per step (100 mm): 0.53 W

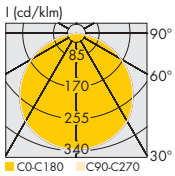
Typical applications

- 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 Indoor White – High Brightness



Built-in PCB lighting modules

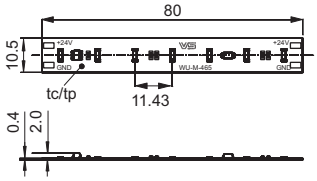
The LEDLine Flex SMD Professional Indoor High Brightnes sis fitted with SMD LEDs on a flexible printed circuit board of only approx. 0.4 mm thickness. Even the most complex structures can be illuminated thanks to the use of an extremely pliable foil. LEDLine Flex SMD Professional Indoor High Brightness can be separated into segments of 80 mm lengths without loss of function.

This product is available in a continuous length of up to 3.2 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.
3200x10	280	40	80	7



Allowed operating temperature at t_c point:
–20 to 65 °C
Wide beam angle (120°)
Voltage supply: 24 V
Power consumption per step (80 mm): 1.02 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-465-27K	**554932**	warm white	2700 -55/+90	1.7	3500	120	40.8	> 80
WU-M-465-30K	**554933**	warm white	3000 -50/+125	1.7	3600	120	40.8	> 80
WU-M-465-40K	**554934**	neutral white	4000 -165/+105	1.7	3800	120	40.8	> 80
WU-M-465-50K	**554935**	cool white	5000 -130/+150	1.7	3900	120	40.8	> 80
WU-M-465-65K	**554936**	cool white	6500 -265/+220	1.7	3900	120	40.8	> 80

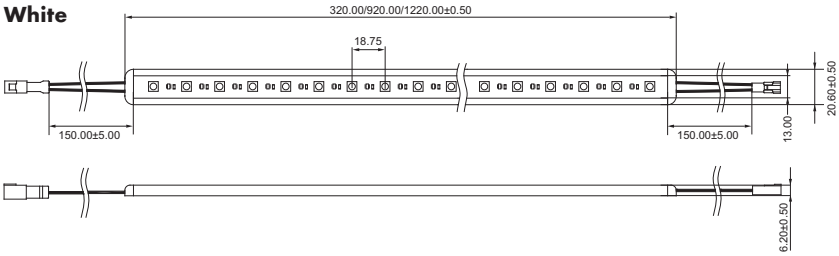
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes.
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

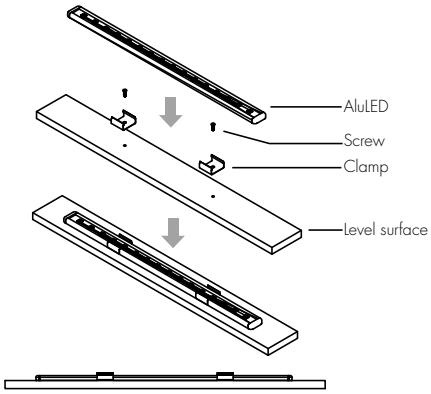
AluLED IP20

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 requepcs.

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





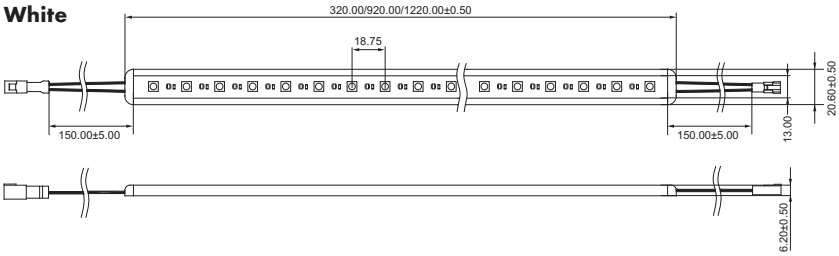
White Modules											
Type	**Ref. No.**	Length mm	No. of LEDs	Current mA	Colour	Colour temperature K	Luminous flux lm	Beam angle °	Power W	Cover	Packing unt pcs.
AluLED-320-4000-IP20 - D	**552092**	320	18	180	neutral white	4000	220	120	4.3	Diffuse	1
AluLED-320-4000-IP20 - C	**552093**	320	18	180	neutral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

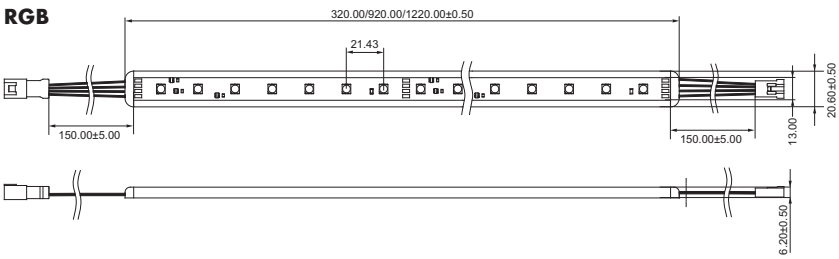
Note: Further colours for AluLED are available on request

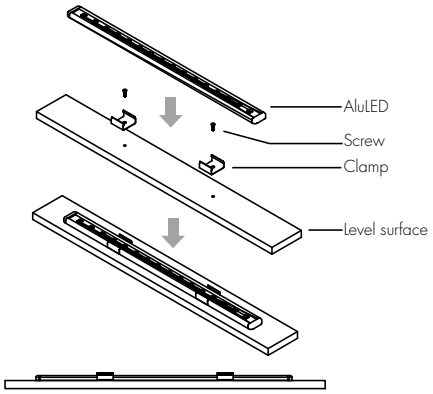
AluLED IP64

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 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	70	120	3.8	1
AluLED-920-3000	**543315**	920	48	480	warm white	3000	505	120	11.5	1
AluLED-1220-3000	**543316**	1220	64	640	warm white	3000	675	120	15.3	1
AluLED-320-6000	**543317**	320	16	160	cool white	6000	225	120	3.8	1
AluLED-920-6000	**543318**	920	48	480	cool white	6000	670	120	11.5	1
AluLED-1220-6000	**543319**	1220	64	640	cool white	6000	895	120	15.3	1

RGB Modules												
Type	**Ref. No.**	Length mm	No. of LEDs	Current mA	Luminous flux (lm) red	green	blue	Dom. wavelength (nm) red	green	blue	Beam angle °	Power W	Packing unit pcs
AluLED-320-RGB	**543320**	320	14	120	18	40	9	620-630	520-535	465-475	120	2.8	1
AluLED-920-RGB	**543321**	920	42	360	54	120	28	620-630	520-535	465-475	120	8.6	1
AluLED-1220-RGB	**543322**	1220	56	480	72	160	36	620-630	520-535	465-475	120	11.5	1

Note: Further colours for AluLED are available upon request

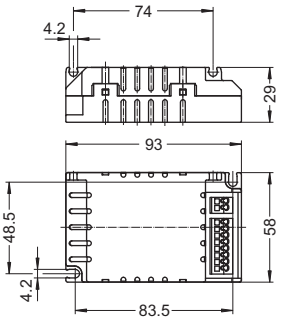
Colour Control Modules – DigiLED CA

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.

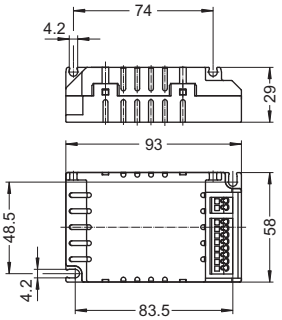
Furthermore the DigiLED Mono is available. The DigiLED Mono enables the dimming of single-colour (e. g. white) LED modules.

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



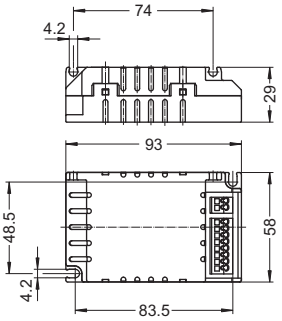
DigiLED Manual CA

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



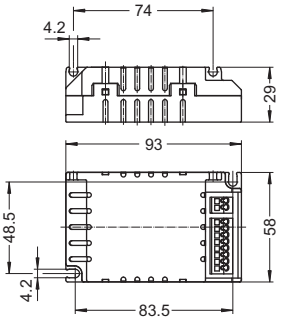
DigiLED DALI CA

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

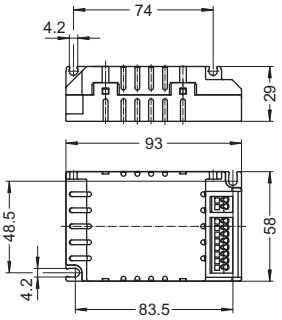
DigiLED DMX CA
Digital colour controls via DMX light management
t_c = 60 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-003-Digi-DMX-CA
Ref. No.: 186153



DigiLED IR CA

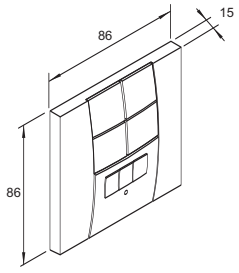
DigiLED IR CA
Colour adjustment by a portable remote control
Call up of pre-adjusted setting possible
Data transfer via infra-red
t_c = 55 °C max.
Max. current per control channel: 1.25 A
Type: WU-ST-005-Digi-IR-CA
Ref. No.: 186154

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



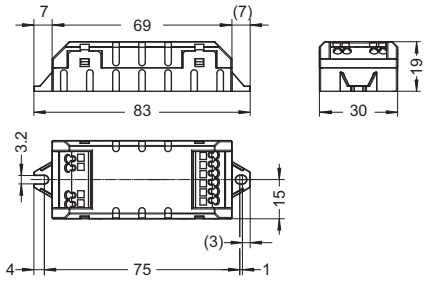

DigiLED RF CA

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



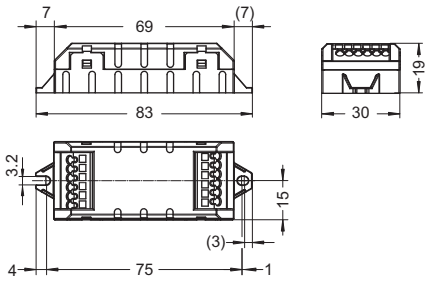

Walltransmitter

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



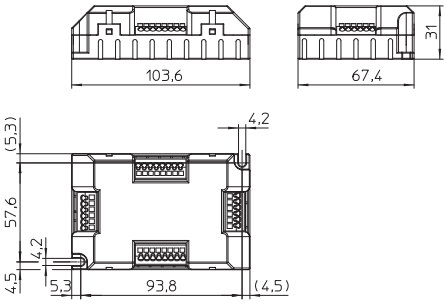

DigiLED Push CA

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



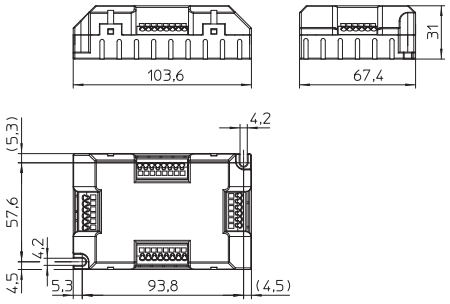

DigiLED Mono CA

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



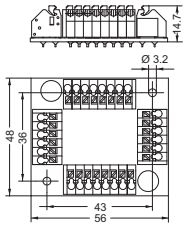

DigiLED Slave CA

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.: flatband cable



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

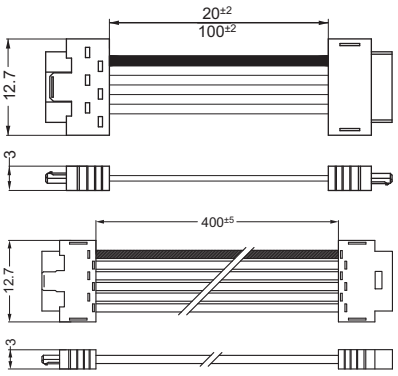
LED Connection Technology for 24 V CA System

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.

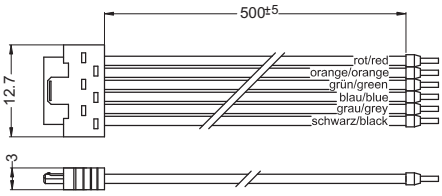
Flatband and feed-in cables are designed to ensure that LED built-in modules can be connected to a DigiLED CA colour control unit or a PCB distributor or slave board up to the maximum current-carrying capacity specified in Table 1.

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.

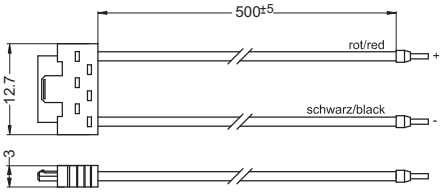
Flatband system cables
For reverse-polarity protected connections between LED built-in modules and/or groups and for connection to PCB distributors. The six-strand flatband cable is fitted with pre-assembled connectors that plug directly in to the sockets of the LED built-in modules and PCB distributors.
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



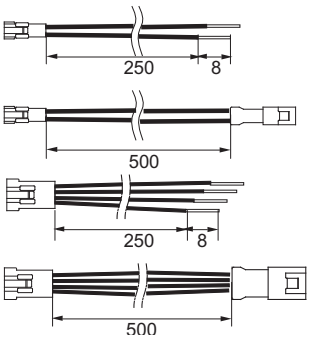
Feed-in cable
For connecting LED built-in modules and groups to a DigiLED CA colour control unit or slave board. The reverse-polarity protected connector attached to the feed-in cable is plugged on the LED built-in module. The other side of the cable is then connected to the slave board or DigiLED CA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



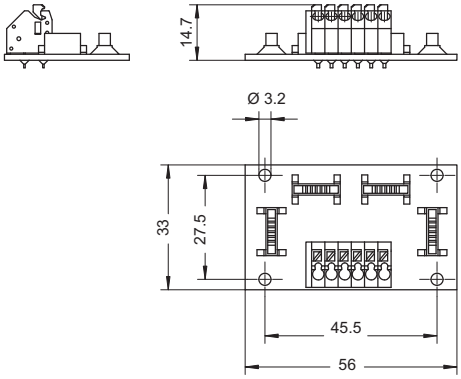
Feed-in cable Mono
For reverse polarity protected connection between monochromatic LED built-in modules and 24 V voltage supply. The dimming function is not supported.
Type: WU-VB-006-HP-Feed-in-500mm mono
Ref. No.: 542267 cable length: 500 mm

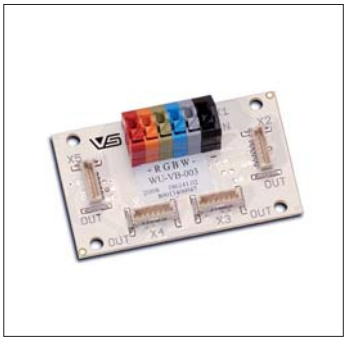


EasyConnect Cable for AluLED
Max. permissible current: 3 A
Number of strands: 2/4
(Strand diameter: 0.35 mm²/22 AWG)
For monochrome modules with 2 strands
Ref. No.: 543426 25 cm, male connector
Ref. No.: 543427 50 cm, male/female connector
For RGB modules with 4 strands
Ref. No.: 543428 25 cm, male connector
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 202) 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





ComfortLine LED Constant Voltage Drivers

24 V / max. 20 W
These flat LED constant-voltage drivers are designed for use in applications with small capacity range of up to 20 W.

Electronic characteristics
Power factor at full load: > 0.5

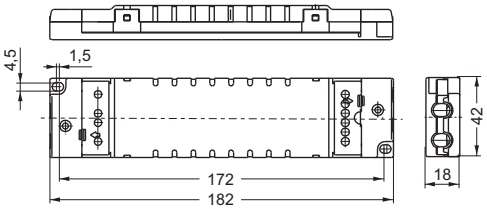
Connection details
Mains voltage: 220–240 V ±10 %
With connection lead on primary side
Mains frequency: 50–60 Hz

Safety features
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of proteciton: IP20
Protection class II
SELV-equivalent

Expected service life time
at operation temperatures at t_c point

	Ref. No. 186129	
t_c temperature	75 °C	65 °C
hrs.	50,000	100,000

K62 with cord grip



Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K62 with cord grip – Dimensions: 182x42x18 mm									
20	EDXe 120/24.009	**186129**	220–240	24 $^{\pm 0,5}$	230–210	0.0–0.85	- 20 to 45	75	155

ComfortLine LED Constant Voltage Drivers

24 V / max. 50 W, max. 70 W and max. 130 W

These LED constant-voltage drivers are designed for use in applications with medium and high capacity range of up to 50 W, 70 W or 130 W.

Electronic characteristics

Power factor at full load: > 0.97

Connection details

Mains voltage: 220–240 V ±10 %
Mains frequency: 50–60 Hz
(EDXe 150: secondary 0 Hz)

Safety features

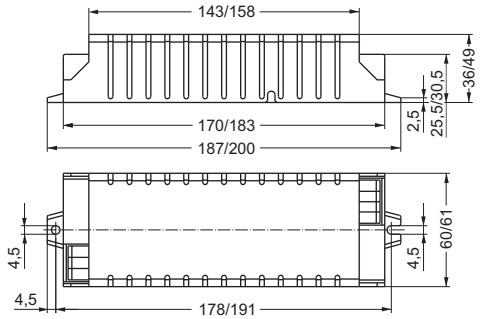
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
SELV

Expected service life time

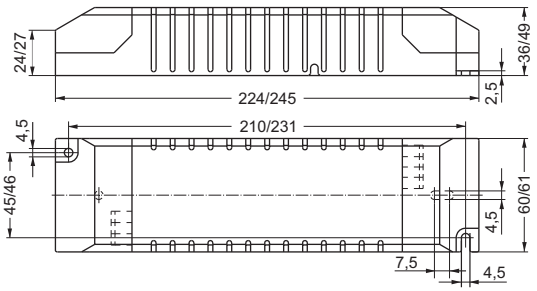
at operation temperatures at t_c point

	Ref. No.			
	186103, 186104, 186218, 186219		186131, 186132	
t_c temperature	70 °C	60 °C	75 °C	65 °C
hrs.	50,000	100,000	50,000	100,000

K30 / K30.1



K30 / K30.1 with cord grip



Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K30 – Dimensions (L x W x H): 187 x 60 x 36 mm									
50	EDXe 150/24.035	**186218**	220–240	24 ±0,72	260–235	0.0–2.1	–40 to 45	70	320
K30.1 – Dimensions (L x W x H): 200x61x49 mm									
70	EDXe 170/24.010	**186103**	220–240	24 ±0,48	360–310	0.0–2.9	–20 to 45	70	340
130	EDXe 1130/24.014	**186131**	220–240	24 ±0,48	640–585	0.0–5.4	–20 to 45	75	370
K30 with cord grip – Dimensions (L x W x H): 224x60x36 mm									
50	EDXe 150/24.035	**186219**	220–240	24 ±0,72	260–235	0.0–2.1	–40 to 45	70	370
K30.1 with cord grip – Dimensions (L x W x H): 245x61x49 mm									
70	EDXe 170/24.010	**186104**	220–240	24 ±0,48	360–310	0.0–2.9	–20 to 45	70	360
130	EDXe 1130/24.015	**186132**	220–240	24 ±0,48	640–585	0.0–5.4	–20 to 45	75	390

ComfortLine LED Constant Voltage Drivers

24 V / max. 70 W and max. 130 W – IP67
These LED constant-voltage drivers are designed for use in IP67 applications with medium and high capacity range of up to 70 W or 130 W.

Electronic characteristics
Power factor at full load: > 0.97

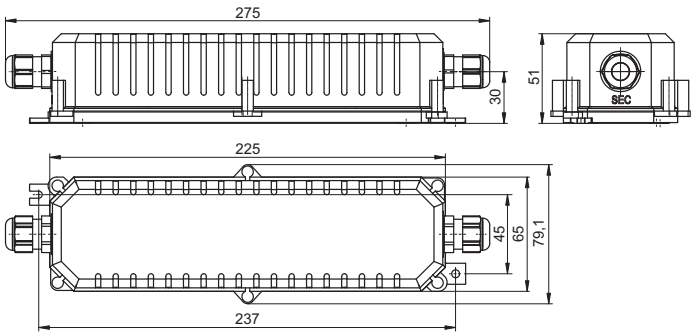
Connection details
Mains voltage: 220–240 V ±10 %
Mains frequency: 50–60 Hz
Preassembled connection leads
primary side: 5x1 mm², length: 200 mm
secondary side: 2x1 mm², length: 200 mm

Safety features
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of protection: IP67
Protection class I
SELV

Expected service life time
at operation temperatures at t_c point

	Ref. No. 186105, 186133	
t_c temperature	70 °C	60 °C
hrs.	50,000	100,000

K37 with cord grip



Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K37 with cord grip – Dimensions (L x W x H): 275 x 79.1 x 51 mm									
70	EDXe 170/24.010	**186105**	220–240	24 ±0.48	360–330	0.0–2.9	-20 to 45	70	515
130	EDXe 1130/24.016	**186133**	220–240	24 ±0.48	640–585	0.0–5.4	-20 to 45	70	545

EasyLine LED Constant Voltage Drivers

24 V / max. 75 W, max. 100 W and max. 150 W – IP67

These LED constant-voltage drivers are designed for use in IP67 applications with high capacity range of up to 75 W, 100 W or 150 W.

Electronic characteristics

Power factor at full load: > 0.95

Connection details

Mains voltage: 220–240 V ± 10%
Mains frequency: 50–60 Hz
Preassembled connection leads:
K30.2: H05RN-F
primary: 2x0.75 mm²
secondary: 2x1 mm²
M58.1:
primary: 2x2.08 mm²
secondary: 2x2.08 mm²

Safety features

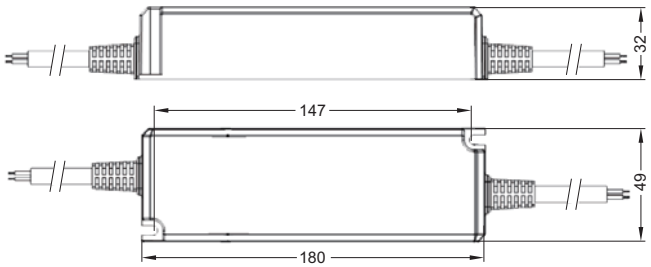
Short-circuit protection: electronic
Overload protection
Protection against "no load" operation
Degree of protection: IP67
Protection class I
Protection class II (186432)
SELV

Expected service life time

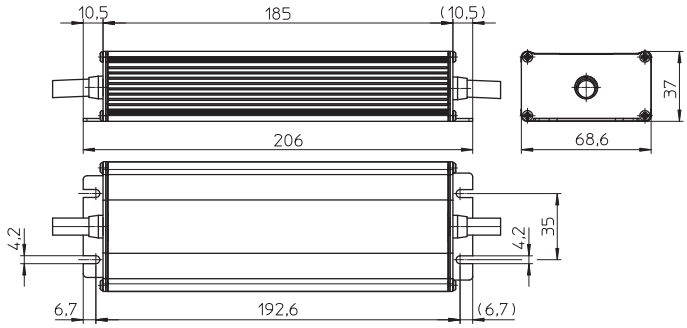
at operation temperatures at t_c point

	Ref. No. all types	
t_c temperature	80 °C	70 °C
hrs.	30,000	50,000

K30.2



M58.1



Products under development; preliminary technical datas

Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Output current A	Ambient temperature ta (°C)	Casing temperature tc (°C)	Efficiency at full load % (230 V)	Weight g
K30.2 – Dimensions (L x W x H): 180x52x32 mm										
75	EDXe 175/24.040	**186432**	220–240	24 ±0.5	385–355	0.0–3.125	-15 to 45	80	89	440
M58.1 – Dimensions (L x W x H): 206 x 68.6 x 37 mm										
100	EDXe 1100/24.041	**186433**	220–240	24 ±0.5	505–465	0.0–4.2	-15 to 45	85	90	840
150	EDXe 1150/24.042	**186434**	220–240	24 ±0.5	760–700	0.0–6.25	-15 to 45	80	90	840

ComfortLine LED Constant Voltage Drivers

12 V / max. 12 W
The compact LED constant-voltage drivers are designed for use in applications with small capacity range of up to 12 W.

Electronic characteristics
Power factor at full load: > 0.57

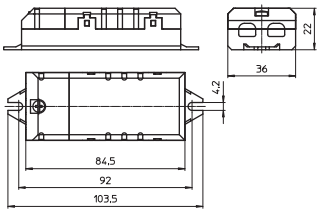
Connection details
Mains voltage: 220–240 V ±10 %
Mains frequency: 50–60 Hz

Safety features
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of proteciton: IP20
Protection class II
SELV-equivalent

Expected service life time
at operation temperatures at t_c point

	Ref. No. 186204	
t_c temperature	75 °C	65 °C
hrs.	50,000	100,000

K39.1



Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K39.1 – Dimensions (L x W x H): 103.5 x 36 x 22 mm									
12	EDXe 112/12.033	**186204**	220–240	12 ±0,6	120	0.0–1.0	- 20 to 50	75	60

EasyLine LED Constant Voltage Drivers

12 V / max. 15 W and max. 30 W
The slim LED constant-voltage drivers are designed for use in applications with capacity range of up to 15 W or 30 W.

Electronic characteristics
Power factor at full load:
> 0,5 (186413)
> 0.95 (183457)

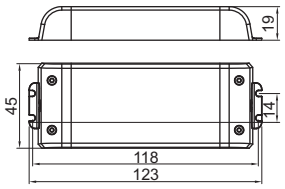
Connection details
Mains voltage: 220-240 V ± 10%
Mains frequency: 50-60 Hz

Safety features
Short-circuit protection: electronic
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV

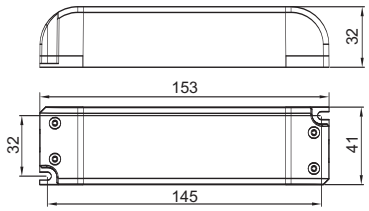
Expected service life time
at operation temperatures at t_c point

	Ref. No. 186413, 186457	
t_c temperature	80 °C	70 °C
hrs.	30,000	50,000

K52



K53



Products under development; preliminary technical datas

Max. output W	Type	**Ref. No.**	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Output current A	Ambient temperature t_a °C	Casing temperature t_c °C	Efficiency at full load % (230 V)	Weight g
K52 – Dimensions (L x W x H): 123x45x192 mm										
15	EDXe 115/12.038	**186413**	220-240	12 ±0.5	85-75	0.0-1.25	-15 to 45	80	83	170
K53 – Dimensions (L x W x H): 153x41x32 mm										
30	EDXe 130/12.043	**186457**	220-240	12 ±0.5	165-150	0.0-2.5	-15 to 45	80	83	170

ComfortLine LED Constant Voltage Drivers

12 V / max. 50 W and max. 70 W
The compact LED constant-voltage drivers are designed for use in applications with medium capacity range of up to 50 W or 70 W.

Electronic characteristics
Power factor at full load: > 0.97

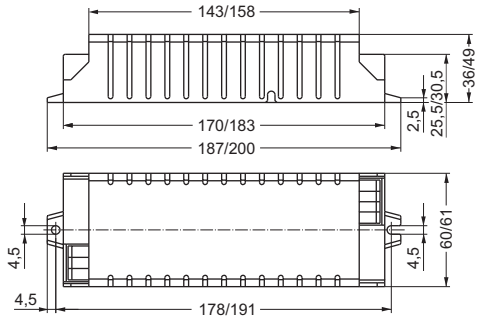
Connection details
Mains voltage: 220–240 V ±10 %
Mains frequency: 50–60 Hz
(EDXe 150: secondary 0 Hz)

Safety features
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
SELV

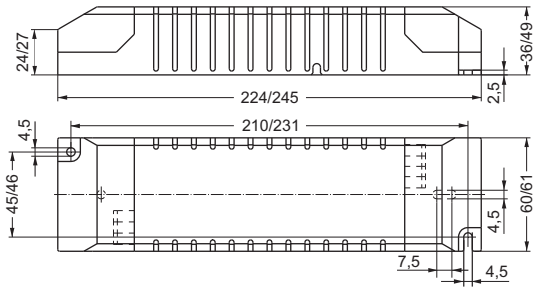
Expected service life time
at operation temperatures at t_c point

	Ref. No. all types	
t_c temperature	70 °C	60 °C
hrs.	50,000	100,000

K30 / K30.1



K30 / K30.1 with cord grip



Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K30 – Dimensions (L x W x H): 187x60x36 mm									
50	EDXe 150/12.034	**186216**	220–240	12,1 $^{\pm 0,24}$	260–230	0.0–4.2	- 40 to 45	70	375
K30.1 – Dimensions (L x W x H): 200x61x49 mm									
70	EDXe 170/12.011	**186112**	220–240	12,1 $^{\pm 0,24}$	365–335	0.0–5.8	- 20 to 45	70	340
K30 with cord grip – Dimensions (L x W x H): 224x60x36 mm									
50	EDXe 150/12.034	**186217**	220–240	12,1 $^{\pm 0,24}$	250–240	0.0–4.2	- 40 to 45	70	425
K30.1 with cord grip – Dimensions (L x W x H): 245x61x49 mm									
70	EDXe 170/12.012	**186113**	220–240	12,1 $^{\pm 0,24}$	365–335	0.0–5.8	- 20 to 45	70	360

ComfortLine LED Constant Voltage Drivers

12 V / max. 70 W – IP67
These LED constant-voltage drivers are designed for use in IP67 applications with medium capacity range of up to 70 W.

Electronic characteristics
Power factor at full load: > 0.97

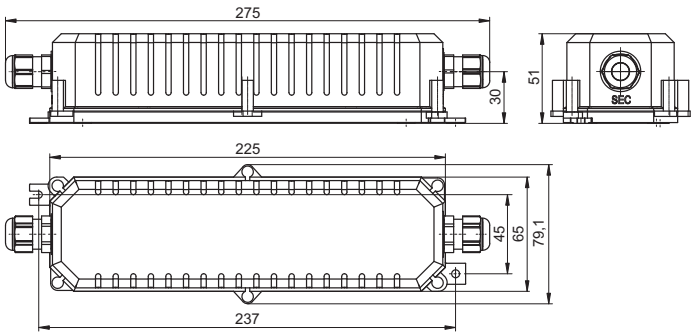
Connection details
Mains voltage: 220–240 V ±10 %
Mains frequency: 50–60 Hz
Preassembled connection leads
primary side: 5x1 mm², length: 200 mm
secondary side: 2x1 mm², length: 200 mm

Safety features
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of protection: IP67
Protection class I
SELV-equivalent

Expected service life time
at operation temperatures at t_c point

	Ref. No. 186114	
t_c temperature	70 °C	60 °C
hrs.	50,000	100,000

K37 with cord grip



Max. output W	Type	Ref. No.	Mains voltage 50, 60 Hz V	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K37 with cord grip – Dimensions (L x W x H): 275 x 79.1 x 51 mm									
70	EDXe 170/12.013	**186114**	220–240	12.1 $^{\pm 0,24}$	365–335	0.0–5.8	– 20 to 45	70	515

EMERGENCY LIGHTING DEVICES FOR LED APPLICATIONS

ELECTRONIC EMERGENCY LIGHTING DEVICES FOR LED APPLICATIONS

For nominal operating periods of 1 hour or 3 hours

Emergency lighting systems spring to life any time normal main lighting systems fail. Emergency lighting is designed to ensure that staff can safely leave any rooms and that there is sufficient lighting to illuminate rescue paths/routes as well as to avoid panic situations.

VS emergency lighting devices are designed for use with LED applications and can be operated as part of a combined system with electronic LED drivers.

VS emergency lighting devices test the presence of and the charge left on batteries during regular cycles and display the existing status via a bi-colour LED (self-testing function). This both simplifies battery maintenance and ensures necessary emergency lighting in the event of a mains power cut. During normal operation, the batteries are recharged with mains power.

Emergency Lighting Modules for 3 Hours Operating Time

50, 130 or 220 V voltage output
VS emergency lighting modules are suitable for LED luminaires.
Dimensions (LxWxH): 210x31.4x21.5 mm
Fixing hole distance: 205.5 mm
Ambient temperature: 5 to 50 °C

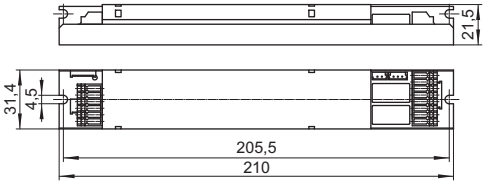
Electrical characteristics
Power consumption: 4 VA
Constant output: 3 W
Weekly automatic self-diagnosis and daily testing of system status
Battery charge is checked during regular testing cycles.
Optical status display via two-colour

Connection details
Mains voltage: 220–240 V ± 10 %
Mains frequency: 50–60 Hz
LED emergency light devices must be connected in line with the installation manual.

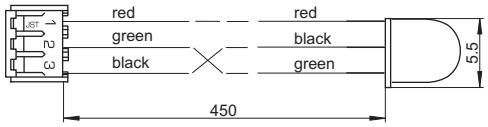
Technical notes – Rechargeable batteries
Choice of rechargeable battery depends on the operating device.
Charging time of rechargeable batteries: max. 24 hrs.
Rechargeable batteries: nickel-cadmium (NiCd)

Safety features
Protection class I
Degree of protection: IP20
SELV (186498)

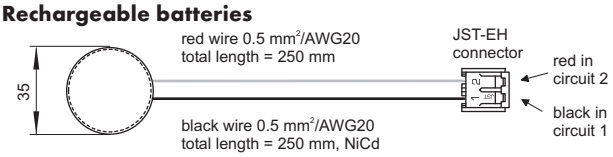
M5.1

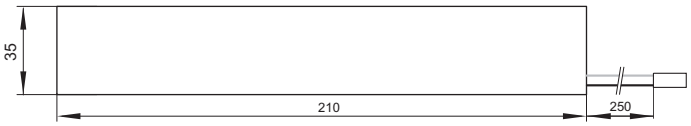


LED



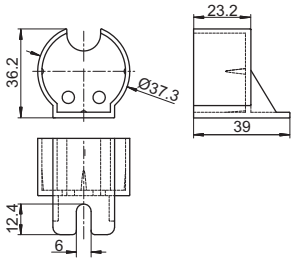
Rechargeable batteries



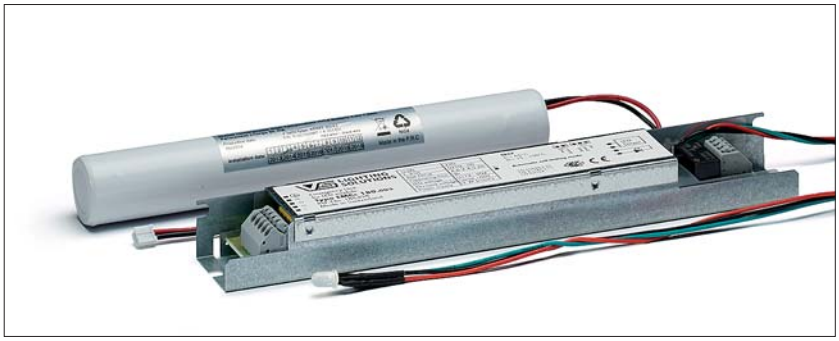


Type	Ref. No. EL Module	Ref. No. Battery	Battery type	Nominal operating period (hrs.)	Mains current at 230 V (mA)	Current output (mA)	Voltage output (V)	Weight (g) EL Module	Battery
M5.1 – Dimensions (LxWxH): 210x31.4x21.5 mm									
EMCc 180.003	**186498**	**188824**	4.8V/4.5Ah	3	22	250-60	12-50	145	490
EMCc 180.004	**186499**	**188824**	4.8V/4.5Ah	3	22	150-23	20-130	145	490
EMCc 180.005	**186500**	**188824**	4.8V/4.5Ah	3	22	100-13	30-220	145	490

Holders for rechargeable batteries for emergency LED lighting modules
It is recommended to use two holders per rechargeable battery to ensure optimum hold.
Material: PBT
For rechargeable battery type: 4.8V/4.5Ah NiCd
Ref. No.: 188828



Emergency Lighting Modules for 1 Hour Operating Time



50, 130 or 220 V voltage output
VS emergency lighting modules are suitable for LED luminaires..
Dimensions (LxWxH): 210x31.4x21.5 mm
Fixing hole distance: 205.5 mm
Ambient temperature: 5 to 50 °C

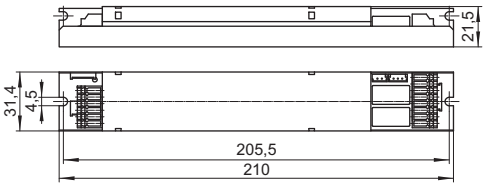
Electrical characteristics
Power consumption: 3.5 VA
Constant output: 3 W
Weekly automatic self-diagnosis and daily testing of system status
Battery charge is checked during regular testing cycles.
Optical status display via two-colour

Connection details
Mains voltage: 220–240 V ± 10 %
Mains frequency: 50–60 Hz
LED emergency light devices must be connected in line with the installation manual.

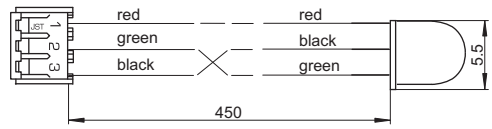
Technical notes – Rechargeable batteries
Choice of rechargeable battery depends on the operating device.
Charging time of rechargeable batteries: max. 24 hrs.
Rechargeable batteries: nickel-cadmium (NiCd)

Safety features
Protection class I
Degree of protection: IP20
SELV (186495)

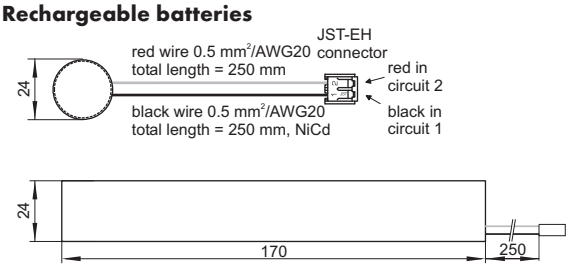
M5.1



LED

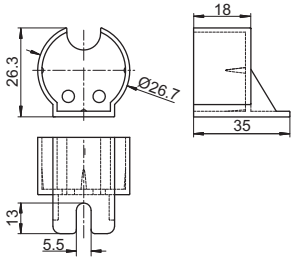


Rechargeable batteries



Type	Ref. No. EL Module	Ref. No. Battery	Battery type	Nominal operating period (hrs.)	Mains current at 230 V (mA)	Current output (mA)	Voltage output (V)	Weight (g) EL Module	Battery
M5.1 – Dimensions (LxWxH): 210x31.4x21.5 mm									
EMCc 60.000	**186495**	**188823**	4.8V/1.8Ah	1	16	250-60	12-50	145	200
EMCc 60.001	**186496**	**188823**	4.8V/1.8Ah	1	16	150-23	20-130	145	200
EMCc 60.002	**186497**	**188823**	4.8V/1.8Ah	1	16	100-13	30-220	145	200

Holders for rechargeable batteries for emergency LED lighting modules
It is recommended to use two holders per rechargeable battery to ensure optimum hold.
Material: PC
For rechargeable battery type: 4.8V/1.8Ah NiCd
Ref. No.: 188827



LED LAMPS

MR16, AR111, PAR30, PAR38, GU10

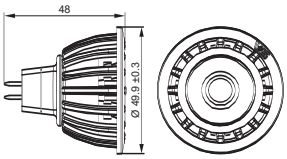
LED – THE GREEN FUTURE LIGHTING

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.

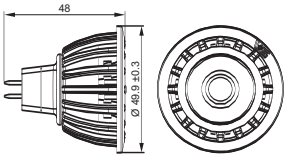
In addition to providing UV- and IR-free light, LEDs are vibration-proof and have a very long service life that further increases the overall efficiency of any lighting system. As LED lamps are now powerful enough to replace both incandescent and low-voltage halogen lamps, they are becoming increasingly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

Low-voltage LED Lamps

Suitable for magnetic halogen transformers, electronic halogen converters (12 V AC) and electronic LED drivers (12 V DC)



MR16, 5.5 W
Design style: COB lens
Operating temperature: 0 to 40 °C
Storage temperature: –20 to 60 °C
Input voltage: 12 V AC/DC
Non dimmable
Base: GU5.3



MR16, 7 W
Design style: COB reflector
Operating temperature: 0 to 40 °C
Storage temperature: –20 to 60 °C
Input voltage: 12 V AC/DC
Dimmable (Magnetic with leading-edge dimmers/ Electronic preferred with trailing-edge dimmers)
Base: GU5.3

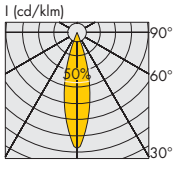
Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Light intensity cd	Beam angle (°)	Field angle (°)	Power factor	Power W	Energy efficiency
MR16, 5.5 W											
MR16-5-3000-24-III	**553212**	warm white	3000	≥ 80	350	1300	24	48	0.7	5.5	A
MR16-5-3000-36-III	**553213**	warm white	3000	≥ 80	350	700	36	72	0.7	5.5	A+
MR16, 7 W											
MR16-7-3000-24-III	**553214**	warm white	3000	≥ 80	500	1280	24	48	0.9	7.0	A
MR16-7-3000-36-III	**553215**	warm white	3000	≥ 80	500	1000	36	72	0.9	7.0	A

Note: Further colour temperatures are available on request.

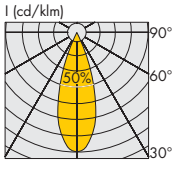
Typical luminance of MR16 at 1, 2 and 3 meters

Intensity (lux)												
Colour temperature	**MR16, 5.5 W**						**MR16, 7 W**					
	24°			**36°**			**24°**			**36°**		
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
Warm White 3000 K	1300	325	140	700	175	80	1280	320	150	1000	250	110

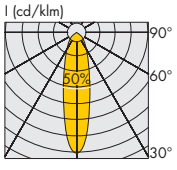
Typical light distribution curves



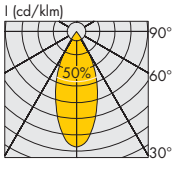
MR16, 5.5 W 24°



MR16, 5.5 W 36°



MR16, 7 W 24°

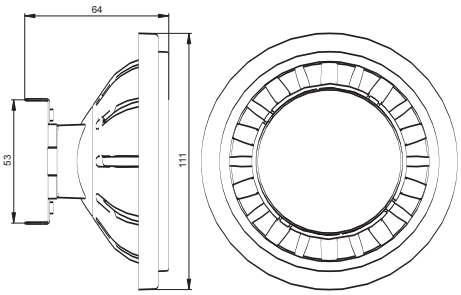


MR16, 7 W 36°

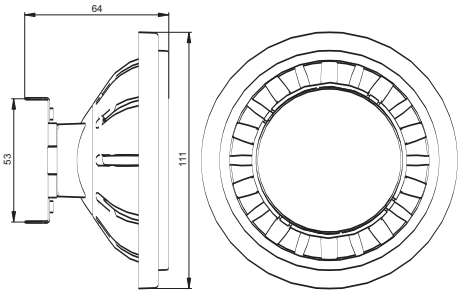
LED Lamps

Replacement for low-voltage incandescent lamps

Suitable for 12 V AC magnetic transformers,
12 V DC electronic drivers and
12 V AC electronic converters



AR111, 16 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 12 V AC/DC
Not dimmable
Base: G53



AR111, 13 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 12 V AC/DC
Phase-cut dimmable (trailing-edge dimmers are preferred)
Base: G53

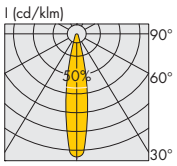
Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Light intensity cd	Beam angle °	Field angle °	Power factor	Power W	Energy efficiency
AR111, 16 W											
AR111-16-3000-24-III	**556794**	warm white	3000	≥ 80	1000	3200	24	48	> 0.9	16	A
AR111-16-3000-36-III	**556795**	warm white	3000	≥ 80	1000	1600	36	72	> 0.9	16	A
AR111, 13 W											
AR111-13-3000-24-III	**556796**	warm white	3000	≥ 80	800	2600	24	48	> 0.9	13	A
AR111-13-3000-36-III	**556797**	warm white	3000	≥ 80	800	1400	36	72	> 0.9	13	A

Further colour temperatures are available on request.

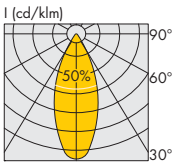
Typical luminance of AR111 at 1, 2 and 3 meters

Intensity (lux)												
Colour temperature	**AR111, 16 W**						**AR111, 13 W**					
	24°			**36°**			**24°**			**36°**		
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
Warm White 3000 K	3200	800	360	1600	400	180	2600	650	290	1400	350	160

Typical light distribution curves



AR111, 24°



AR111, 36°

Electronic Converters for LED Lamps 12 V

You will find LED converters for the LED lamps MR16
and AR111 on page 209–212.

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

- 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

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

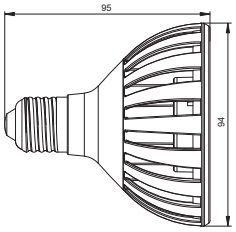
- Unsuitable for operation with an additional driver
- Integrated high-frequency driver
- Do not use in ambient temperatures of more than 40 °C
- Unsuitable for installation in enclosed or airtight luminaires
- For indoor use only
- Unsuitable for use outdoors or in high-moisture environments
- Dimmable with phase-cutting dimmers (E27 PAR and GU10 7 W 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. Trailing-edge dimmers are preferred.

Caution: Always disconnect equipment from the mains before replacing lamps!

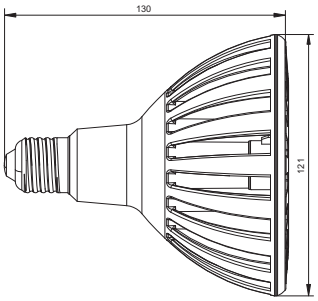
LED Lamps

With integrated driver for replacement of mains voltage halogen incandescent lamps

LED lamps made by Vossloh-Schwabe will fit most standard E27 and GU10 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
Phase-cut dimmable (trailing-edge dimmers are preferred)
Base: E27



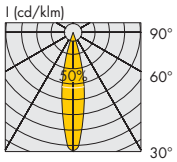
PAR38, 17 W
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Phase-cut dimmable (trailing-edge dimmers are preferred)
Base: E27

Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Light intensity cd	Beam angle °	Field angle °	Power W	Energy efficiency
PAR30, 12 W										
PAR30-12-2700-38-II	**549107**	warm white	2700	≥ 80	420	3320	20	38	12	A
PAR30-12-3000-38-II	**549108**	warm white	3000	≥ 80	460	3670	20	38	12	A
PAR30-12-4000-38-II	**549109**	neutral white	4000	≥ 75	570	4530	20	38	12	A
PAR30-12-6000-38-II	**549110**	cool white	6000	≥ 70	680	5400	20	38	12	A
PAR30-12-2700-60-II	**549111**	warm white	2700	≥ 80	420	980	40	60	12	A
PAR30-12-3000-60-II	**549112**	warm white	3000	≥ 80	460	1200	40	60	12	A
PAR30-12-4000-60-II	**549113**	neutral white	4000	≥ 75	570	1325	40	60	12	A
PAR30-12-6000-60-II	**549114**	cool white	6000	≥ 70	680	1580	40	60	12	A
PAR38, 17 W										
PAR38-17-2700-38-II	**549131**	warm white	2700	≥ 80	560	4425	20	38	17	A
PAR38-17-3000-38-II	**549133**	warm white	3000	≥ 80	630	5000	20	38	17	A
PAR38-17-4000-38-II	**549134**	neutral white	4000	≥ 75	720	5700	20	38	17	A
PAR38-17-6000-38-II	**549136**	cool white	6000	≥ 70	790	6300	20	38	17	A
PAR38-17-2700-60-II	**549138**	warm white	2700	≥ 80	560	1350	40	60	17	A
PAR38-17-3000-60-II	**549140**	warm white	3000	≥ 80	630	1500	40	60	17	A
PAR38-17-4000-60-II	**549141**	neutral white	4000	≥ 75	720	1770	40	60	17	A
PAR38-17-6000-60-II	**549142**	cool white	6000	≥ 70	790	1900	40	60	17	A

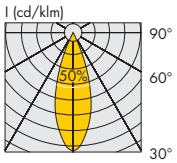
Typical luminance of PAR30, PAR38 at 1, 2 and 3 meters

Intensity (lux)												
Colour	**PAR30, 12 W**						**PAR38, 17 W**					
temperature	**20°**			**40°**			**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
Warm White 2700 K	3320	830	368	980	245	108	4425	1106	491	1350	337	150
Warm White 3000 K	3670	918	408	1200	300	133	5000	1250	566	1500	375	167
Neutral White 4000 K	4530	1133	503	1325	331	147	5700	1425	633	1770	443	197
Cool White 6000 K	5400	1350	600	1580	395	176	6300	1575	700	1900	475	211

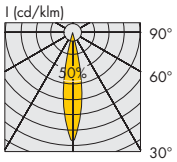
Typical light distribution curves of PAR30, PAR38 lamps



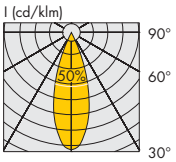
PAR30, 12 W 20°



PAR30, 12 W 40°



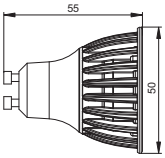
PAR38, 17 W 20°



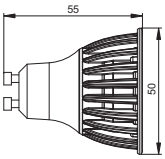
PAR38, 17 W 40°

Mains Voltage LED Lamps

With integrated driver



GU10, 5.5 W
Design style: COB lens
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Non dimmable
Base: GU10



GU10, 7 W
Design style: COB reflector
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Phase-cut dimmable (trailing-edge dimmers are preferred)
Base: GU10

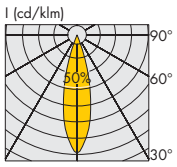
Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Light intensity cd	Beam angle °	Field angle °	Power factor	Power W	Energy efficiency
GU10, 5.5 W											
GU10-5-3000-24-III	**553218**	warm white	3000	≥ 80	350	1300	24	48	0.5	5.5	A+
GU10-5-3000-36-III	**553219**	warm white	3000	≥ 80	350	700	36	72	0.5	5.5	A+
GU10, 7 W											
GU10-7-3000-24-III	**553220**	warm white	3000	≥ 80	450	1000	24	48	0.9	7	A+
GU10-7-3000-36-III	**553221**	warm white	3000	≥ 80	450	800	36	72	0.9	7	A+

Further colour temperatures are available on request.

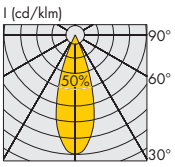
Typical luminance of GU10 at 1, 2 and 3 meters

Intensity (lux)												
Colour temperature	**GU10, 5.5 W**						**GU10, 7 W**					
	24°			**36°**			**24°**			**36°**		
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
Warm White 3000 K	1300	325	140	700	175	80	1000	250	120	800	200	90

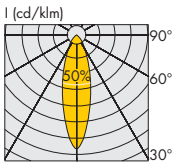
Typical light distribution curves



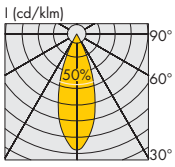
GU10, 5,5 W 24°



GU10, 5,5 W 40°



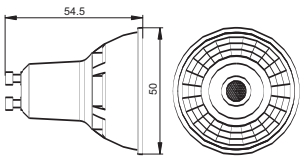
GU10, 7 W 24°



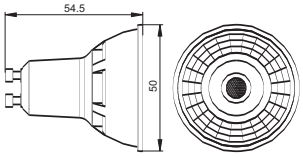
GU10, 7 W 36°

Mains Voltage LED Lamps

With integrated driver



GU10, 4 W
Design style: SMD reflector
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Non dimmable
Base: GU10



GU10, 4.5 and 6 W
Design style: SMD reflector
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Phase-cut dimmable (trailing-edge dimmers are preferred)
Base: GU10

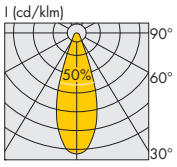
Type	**Ref. No.**	Colour	Colour temperature K	CRI R_a	Luminous flux lm	Light intensity cd	Beam angle °	Field angle °	Power factor	Power W	Energy efficiency
GU10, 4 W											
GU10-4-3000-36-R	**556798**	warm white	3000	≥ 80	290	550	36	72	0.4	4	A+
GU10, 4.5 W											
GU10-4.5-2700-36-R	**554601**	warm white	2700	≥ 80	230	520	36	72	0,4	4,5	A+
GU10, 6 W											
GU10-6-3000-36-R	**556799**	warm white	3000	≥ 80	380	680	36	72	0.6	6	A+

Further colour temperatures are available on request.

Typical luminance of GU10 at 1, 2 and 3 meters

Intensity (lux)									
Colour temperature K	**GU10, 4 W 36°**			**GU10, 4.5 W 36°**			**GU10, 6 W 36°**		
	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm White 3000 K / 2700 K	550	140	60	520	130	60	680	170	80

Typical light distribution curves



GU10, 36°

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.

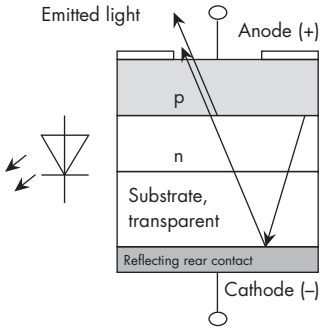
The key basis of modern optoelectronics is the availability of high-performance LEDs in the three primary colours red, green and blue as well as white and warm white. By assembling these on circuit boards and in combination with converters and control systems, lighting systems can be created for the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



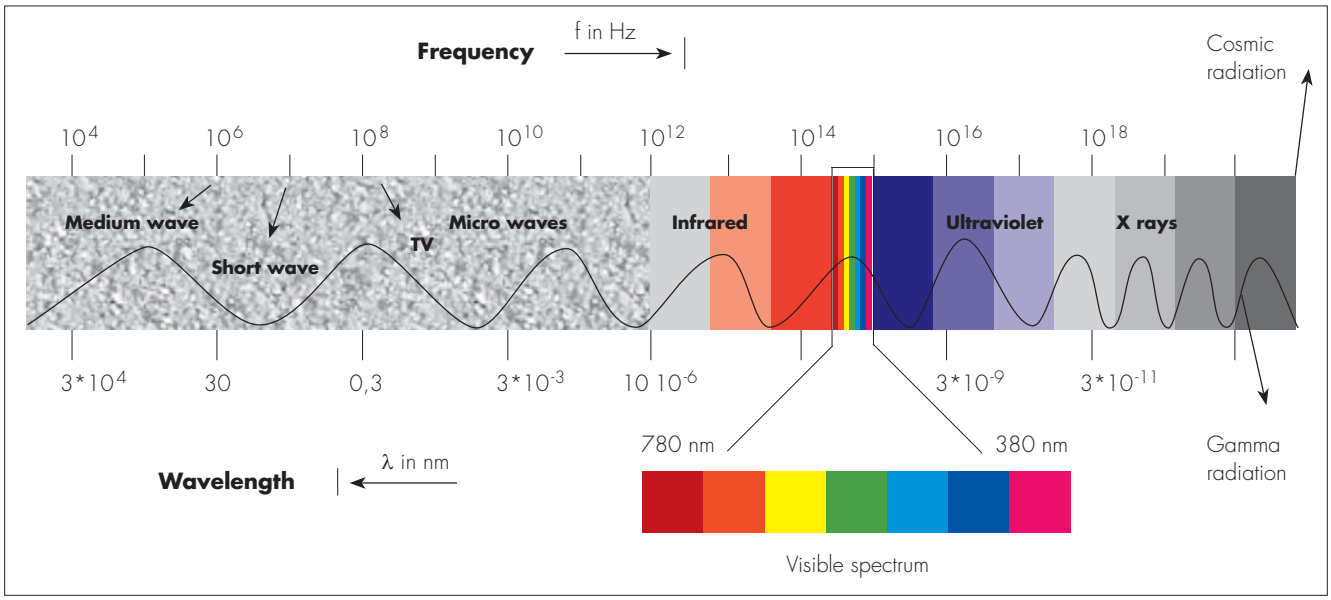
Cross-sectional Detail
Cross-section of an LED semi-conductor chip
Light emission at the pn depletion layer

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

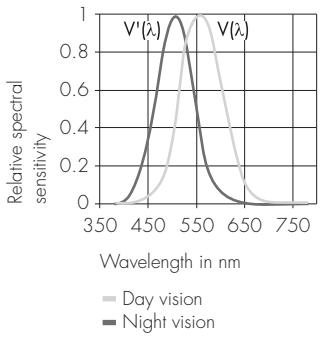
Visible light only accounts for a small part of the electromagnetic spectrum. The part of the electromagnetic spectrum that is visible for humans ranges from ultraviolet (λ = 380 nm) to dark red (λ = 780 nm).



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 typically to 70% of its original value.

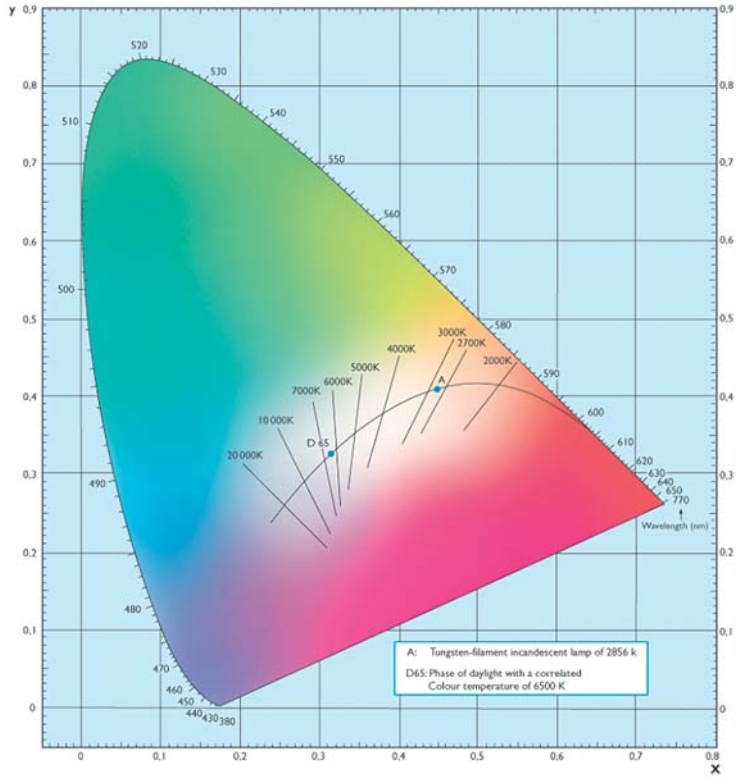
LED efficiency

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) 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, assembly and handling information for LED modules

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.

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 modules can get hot. Please provide warning notices at the luminaire body if necessary.

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).

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 (Safety Extra Low Voltage)

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 maximum output of the power supply must be observed.

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.

A parallel connection of the modules is not allowed.

The modules are not protected against dust or moisture (except LEDLine Flex SMD Professional Outdoor, LEDSpots IP54, Roadway Light and Industrial Light IP66/IP67). 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 LED modules can be mounted on a flat metal surface (heat sink) that must, however, provide a large enough surface area to ensure the generated heat can be dissipated to the surroundings.

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

Please ensure adhesive pads or other products with adhesive areas (LEDLine Flex SMD Professional, LEDLine Flex SMD Professional 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.

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

DALI LIGHT CONTROL GEAR AND ACCESSORIES

INTELLIGENT INDOOR LIGHTING

The VS Light Controllers are light management systems that were developed as a convenient means of controlling and regulating light.

Communication between the Light Controller and the luminaire is achieved using the standard DALI protocol. The Light Controllers comply with the standard IEC 62386:2008. Within this standard, the number of maximum possible luminaires is defined as 64 per DALI line. The controllers are designed for mounting on a 35 mm DIN installation rail.

The entire lighting system was designed to permit easy and convenient configuration. Any later modifications to the system can thus be carried out without any problems.

Typical applications

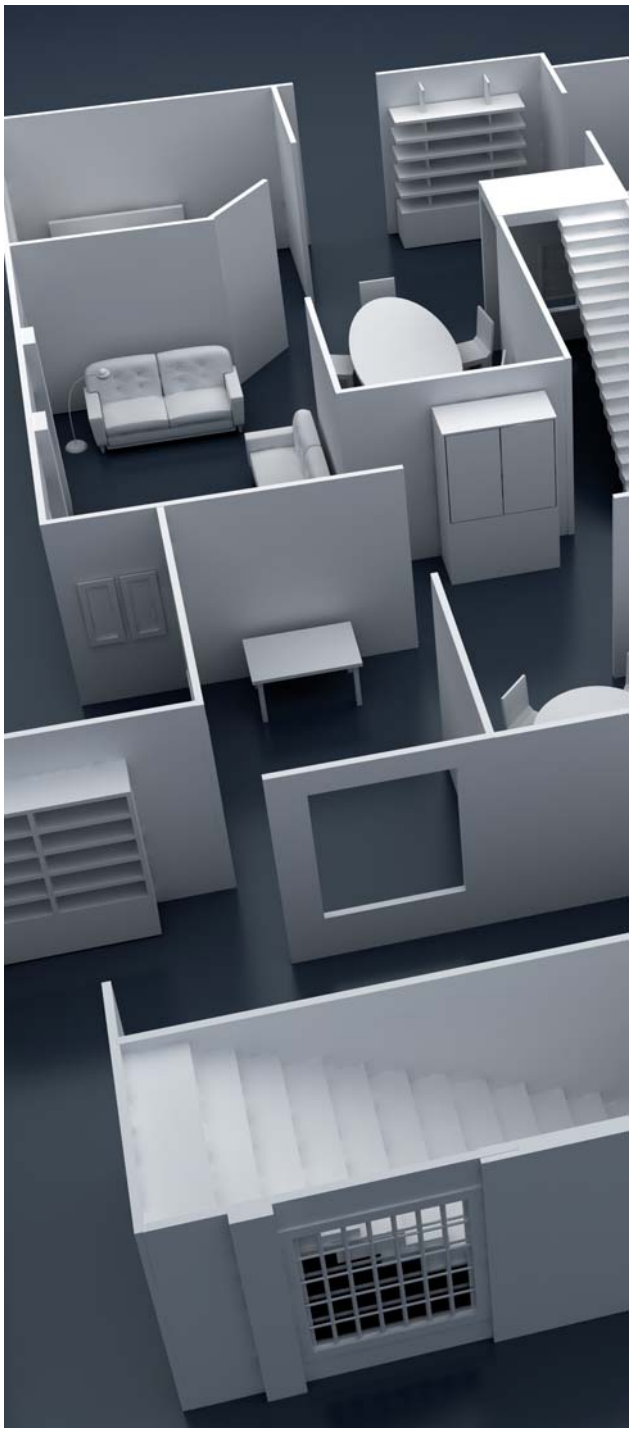
- Offices, industrial spaces and warehouses
- Supermarkets
- Public buildings (e.g. schools and hospitals)
- Stairwells and hallways
- Sanitary facilities

LiCS INDOOR

- Adjustment of lighting levels to suit human needs
- Energy savings and cost reductions
- More convenience thanks to automation

Light Controller IP/DALI and LightBox

Walltransmitter



Overview of the LiCS Indoor System

Product matrix	**Light Controller L / LS**	**Light Controller LW / LSW**	**Light Controller S**	**Light Controller XS**
				
	for integration into the distribution board	for integration into the distribution board – EnOcean wireless version	for independent operation	for built-in into luminaires
MultiSensors	 MultiSensors (movement and brightness)			
High Bay Sensors	 High Bay Sensors (movement) or brightness (constant light control)			
Extender				
Input devices	max. 6 buttons (mains voltage-compatible)	antenna (magnetic-base or screw-base); max. 6 buttons (mains voltage-compatible); EnOcean wireless modules (max. 16 pcs.)	button (mains voltage-compatible)	button (mains voltage-compatible)

Functions	**Light Controller**		**Light Controller**		**Light Controller**	**Light Controller**
	L	**LS**	**LW**	**LSW**	**S**	**XS**
Control options	single and group	group	single and group	group	broadcast	broadcast
No. of groups	max. 16		max. 16		–	–
No. of operating devices (DALI-EBs, LiCS-Extender, HB sensors)	max. 64		max. 64		max. 64	max. 10
No. of MultiSensors	max. 36		max. 36		max. 36	max. 4
Motion detection (automatic and semi-automatic)	●		●		●	●
Constant light control	●		●		●	●
Scene settings	●	–	●	–	–	–
Push function (on/off, up and down)	●		●		●	●
Dimming (only up or only down)	●		●		–	–
ON/OFF function	●		●		●	●
Overriding central control	●		●		–	–
Stairwell function (timer)	●		●		–	–
With integrated timer clock	–	●	–	●	–	–
Discourage burglaries	–	●	–	●	–	–
System analysis software	●		●		–	–
Password protection	●		●		–	–
Minimising standby losses	●		●		–	–
Menu navigation in	German, English, French, Italian, Spanish		German, English, French, Italian, Spanish		–	–
Configuration using	rotary push key and screen		rotary push key and screen		dip switch	dip switch

Overview of the LiCS Indoor System Network

Product matrix	Light Controller IP/DALI	Light Controller IP/DALI W
		
MultiSensors	 MultiSensors (movement and brightness)	
High Bay Sensors	 Industrial Sensors (movement or constant light control)	
Extender*		
Input devices	8 buttons (mains voltage-compatible) DALI buttons (4 channel)	8 buttons (mains voltage-compatible) EnOcean wireless modules DALI buttons (4 channel)

* Functionality limitations of the system possible; please observe the notes in the controller operation manuals.

SYSTEM INFORMATION

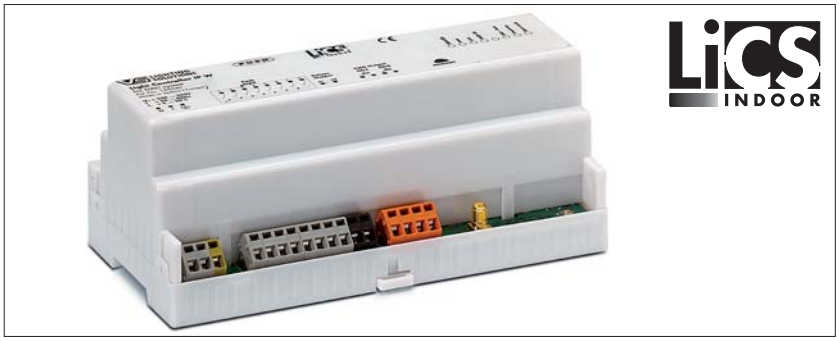
Server (Win 7) or LightBox
Optional: Access Point for operating elements

FUNCTIONS LIGHT CONTROLLER IP/DALI

- Network-compliant
  - Intelligent networking of DALI devices

  Lighting control:
  - 3 level Motion detection (automatic and semi-automatic)
  - Constant light control
  - Intelligent day- and time-dependent switching functions
  - Astro function
  - Scene settings
  - Push function (on/off, up and down)
  - Dimming (only up or only down)
  - ON/OFF function, ON function, OFF function
  - Light value
  - Stairwell function (timer)
  - Retrieval of various sensor-gauged values
  - Logic functions
- Push-key and operating element:
  - Classic push buttons
  - Touch4Light
  - Tablet
  - EnOcean
  - DALI buttons
- Documentation
  - Device documentation
  - Save/Load
  - Automated error detection (email report)
  - User accounts (password protection)
- Language:
  - German
  - English
  - Further language on request
- Further functions
  - Minimising standby losses
- Intelligent device exchange

Light Controller IP/DALI

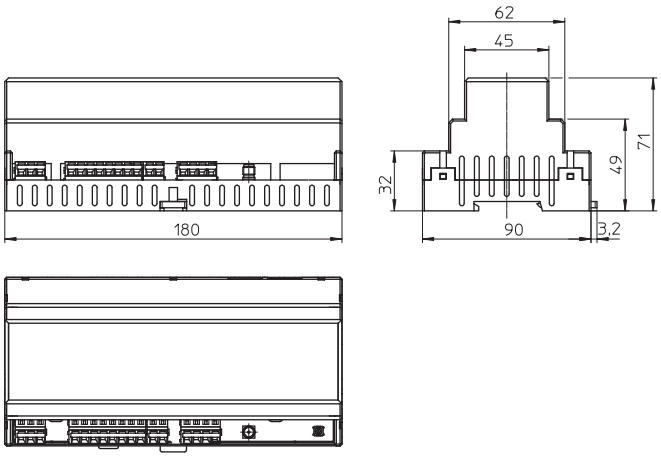


For installation in a distribution board
This light control gear (gateways) is designed for installation in a distribution board.

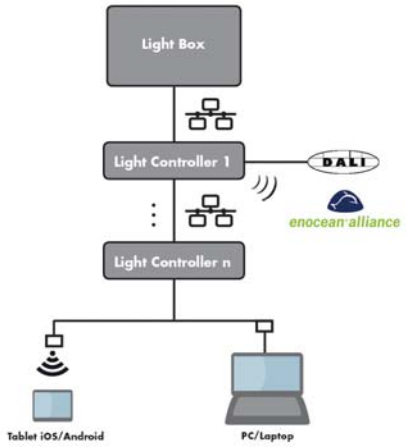
Technical notes
Configuration interface: via browser via tablet/PC
Ambient temperature t_a: 5 to 50 °C
(186484, 186485 t_a: 5 to 45 °C)
Push-in terminals with lever opener: 0.5–2.5 mm²
Degree of protection: IP20, Protection class I
RFI-suppressed
The MultiSensors and DALI push-button interfaces are connected directly to the DALI bus.

Connections
- Mains connection: 220–240 V AC, 50–60 Hz
- Max. power consumption 12 W
- 2xRJ45 (Ethernet TCP/IP) 10/100MBit/s, Daisy Chain
- 1 DALI bus: max. current on DALI bus = 200 mA (see the respective data sheet for current consumption of individual components)
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- The DALI bus features reversible electronic overload and short-circuit protection.
- 8 independently configurable push button inputs, cables must be rated for mains voltage
- Minimising standby losses
- For Light Controllers with RF operation Antenna jack: radio signal with a frequency of 868 MHz

Software download
www.vossloh-schwabe.com/en/home/products/light-management-systems-for-indoor-applications/light-controller.html



System architecture



Light Controller	**Ref. No.**	Max. No. of operating devices pcs./controller	No. of MultiSensors or DALI push-butten interfaces (pcs./controller)	EnOcean	Dimensions mm (LxWxH)	Horizontal pitches (hp)	Weight g
IP/DALI 2CH	**186484**	2x64	2x36	no	180x90x71	10	340
IP/DALI	**186339**	64	36	no	180x90x71	10	340
IP/DALI W 2CH	**186485**	2x64	2x36	yes	180x90x71	10	340
IP/DALI W	**186340**	64	36	yes	180x90x71	10	340

LightBox

For operating Light Controllers of the IP/DALI series

The LightBox serves to manage the tasks performed by the Light Controller IP and is pre-configured for plug-and-play operation.

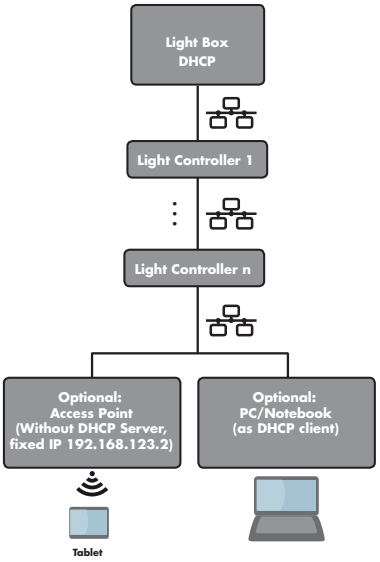
Technical notes

- Mains switch for powering up the LightBox (activates automatically once mains power is restored following a power cut).
- Indicator: green status LED at the front
- As an alternative to client-based configuration (e.g. using a tablet, etc.), a monitor or input device can be connected during operation for configuration purposes.
- Optional wake-on LAN
- The Windows 8.1N operating system merely needs to be personalised and activated by telephone.

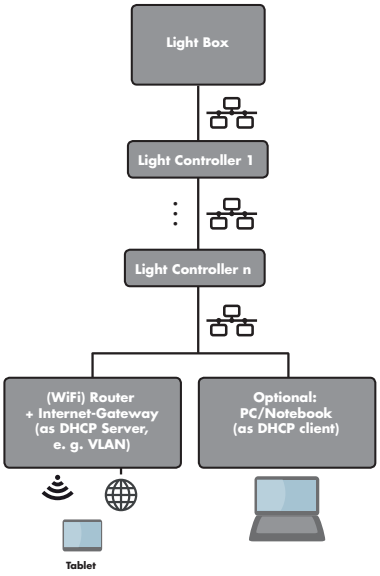
Connections

- Mains switch
- Mains connection with power supply unit
- RJ45 connection (Ethernet)
- 6 x USB
- HDMI output
- Display port
- Wi-Fi antenna

System architecture LightBox with DHCP



System architecture LightBox without DHCP

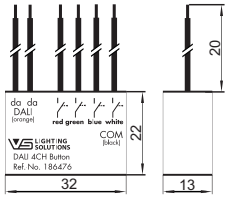


Type	Suitable for	Ref. No.	Max. No. of Light Controller per LightBox (pcs.)	Dimensions (LxWxH) mm	Weight g
LightBox	network- and internet-based operation (as a DHCP client)	**186512**	5	127x127x45	600
LightBox DHCP	stand-alone light management (as a DHCP server)	**186513**	5	127x127x45	600

DALI Push-button Interface

For connecting up to 4 push buttons to a Light Controller IP/DALI

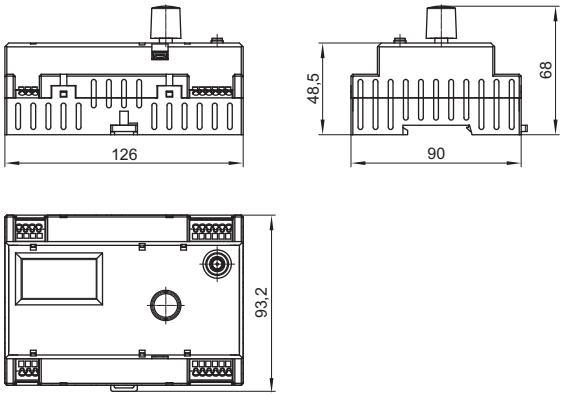
DALI push-button interfaces make it possible to install push-buttons at any point along the DALI bus without needing to connect an additional power supply source.
Designed for flush-mounted installation.
For built-in into flushtype boxes
Control input: DALI acc. to IEC 62386:2008
DALI current consumption: 4 mA
With built-in LED (red) for configuration
Dimensions (LxWxH): 32x22x13 mm, weight: 30 g
Connection leads: 0,5 mm², ferrules on bare end of core
Protection class II
Ref. No.: 186476



Light Controller L/LW and LS/LSW

For installation in a distribution board
This light control gear is designed for installation in a distribution board.

Technical notes
Configuration interface:
and rotary push key (on the controller)
Ambient temperature t_a: 5 to 50 °C
Push-in terminals with lever opener: 0.5–1.5 mm²
Degree of protection: IP20, Protection class I
RFI-suppressed
The MultiSensors are connected directly to the DALI bus.



Connections
- Mains connection: 220–240 V AC, 50–60 Hz
- Max. power consumption 9 W
- 1 DALI bus to 3 pairs of terminals: max. current on DALI bus = 200 mA (see the respective data sheet for current consumption of individual components)
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- The DALI bus features reversible electronic overload and short-circuit protection.
- 6 independently configurable push button inputs, cables must be rated for mains voltage
- Minimising standby losses
- For Light Controllers with RF operation
  Antenna jack: Radio signal with a frequency of 868 MHz

General functions
Automatic and semi-automatic motion detection, constant light control, push function, ON/OFF function, stairwell function (timer), system analysis software, password protection
Software languages: German, English, French, Spanish, Italian

Additional functions
Scene settings, control options (single and/or group) (Light Controller L/LW)
Discourage burglaries, timer clock, control options (group) (Light Controller LS/LSW)

Light Controller LW/LWS
Suitable for wireless operation with EnOcean
No. of wireless modules: 16 pcs.
Antenna needed

enocean alliance

DALI Group Configuration Tool

FMH4-rw Ref. No.: 555534

Light Controller	Ref. No.	Max. No. of operating devices pcs./lead	No. of MultiSensors pcs./lead	EnOcean	Dimensions mm (LxWxH)	horizontal pitches hp	Weight g
L	**186189**	64	36	no	126x90x68	7	250
LS	**186276**	64	36	no	126x90x68	7	250
LW	**186190**	64	36	yes	126x90x68	7	250
LSW	**186323**	64	36	yes	126x90x68	7	250

Antennas

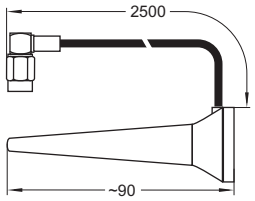
To supplement LiCS Indoor System

To ensure faultless wireless operation, an antenna must be connected that is set to the respective frequency.

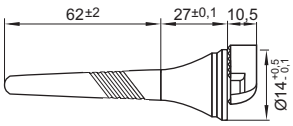
When fitting the antenna, care must be taken that it is not shielded by metal objects, e.g. steel cabinets, radiators, ventilation shafts etc., to ensure optimum signal reception.

The requisite antenna is provided by Vossloh-Schwabe in two models: the screw-base model comes with a detachable connection cable, while the magnetic-base model is fitted with a non-detachable connection cable.

Magnetic-base antenna with connection cable
Antenna dimensions (ØxH): 29x88 mm
Cable diameter: Ø 6 mm, length: 2.5 m
Min. bending radius of the cable: 50 mm
Impedance: 50 Ω
Capacity: 10 W pulsed
Ambient temperature t_a: -40 to 80 °C
Storage temperature: -40 to 80 °C
Degree of protection: IP66
Weight: 62 g
Ref. No.: 186211

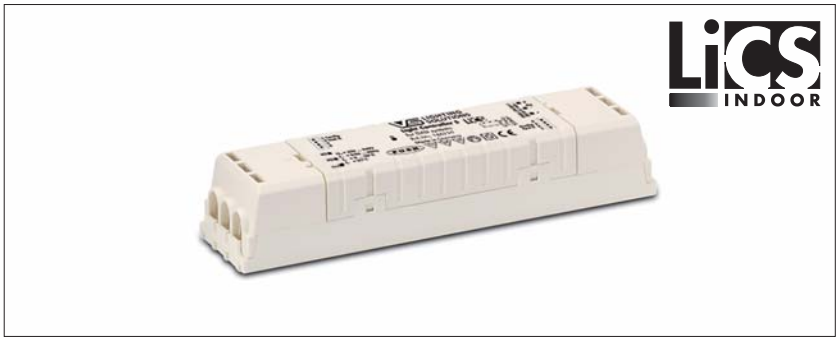


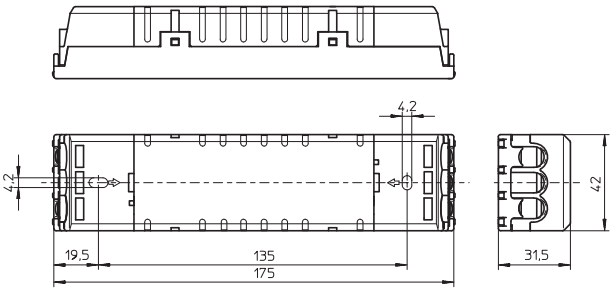
Screw-base antenna
Antenna dimensions (ØxH): 33x89 mm
Impedance: 50 Ω
Capacity: 8 W pulsed
Ambient temperature t_a: -40 to 70 °C
Storage temperature: -40 to 80 °C
Degree of protection: IP66
Weight: 41 g
Ref. No.: 186212



Connection cable for the screw-base antenna
Cable diameter: Ø 6 mm, length: 1.5 m
Min. bending radius of the cable 50 mm
Weight: 66 g
Ref. No.: 186213

Light Controller S





For independent operation
These light control devices are suitable for independent operation (e.g. in false ceilings).

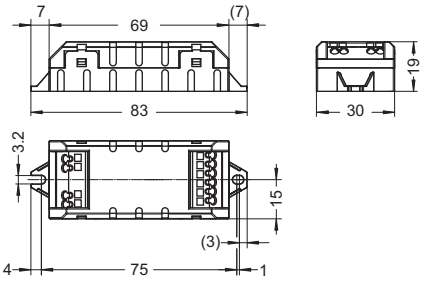
Technical notes
Configuration interface: dip switch (on the device)
Ambient temperature t_a: 0 to 50 °C
Max. casing temperature t_c: 65 °C
Screw terminals: 0.75–2.5 mm²
Degree of protection: IP20, Protection class II
RFI-suppressed
The MultiSensors are connected directly to the DALI bus.

Connections
- Mains connection: 220–240 V AC/DC, 0/50–60 Hz
- Max. power consumption 6,5 W
- 1 DALI bus : max. current on DALI bus = 200 mA (see the respective data sheet for current consumption of individual components)
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- The DALI bus features reversible electronic overload and short-circuit protection.
- 1 configurable push button input: cables must be rated for mains voltage

Functions
Automatic and semi-automatic motion detection, constant light control, push function (64 EBs synchronously), ON/OFF function, stairwell function (timer), control option (broadcast)

Light Controller	**Ref. No.**	Max. No. of operating devices pcs./lead	No. of MultiSensors pcs./lead	EnOcean	Dimensions mm (LxWxH)	Weight g
S	**186210**	64	36	no	175x42x31,5	150

Light Controller XS



For luminaire installation
These light control devices are suitable for operation in luminaires.

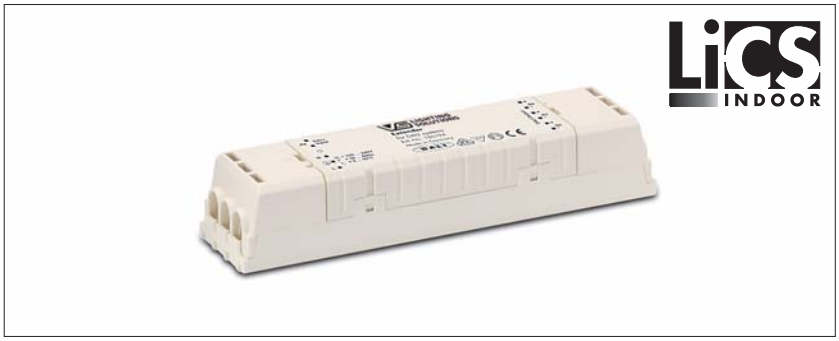
Technical notes
Configuration interface: dip switch (on the device)
Ambient temperature t_a: 5 to 50 °C
Max. casing temperature t_c: 60 °C
Lifetime: 50,000 hrs.
Push-in terminals with lever opener: 0.5–1.5 mm²
Degree of protection: IP20
RFI-suppressed
For luminaires of protection class I and II
The MultiSensors are connected directly to the DALI bus.

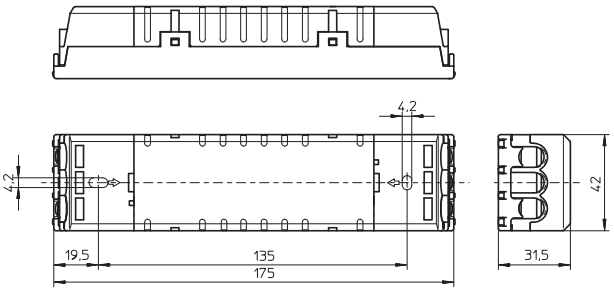
Connections
- Mains connection: 220–240 V AC/DC, 0/50–60 Hz
- Max. power consumption 0.8 W
- 1 DALI bus: max. current on DALI bus = 20 mA (see the respective data sheet for current consumption of individual components)
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- The DALI bus features reversible electronic overload and short-circuit protection.
- 1 configurable push button input

Functions
Automatic and semi-automatic motion detection, constant light control, push function (10 EBs synchronously), ON/OFF function, control option (broadcast)

Light Controller	**Ref. No.**	Max. No. of operating devices pcs./lead	No. of MultiSensors pcs./lead	EnOcean	Dimensions mm (LxWxH)	Weight g
XS	**186220**	10	4	no	83x30x19	30

Extender





To extend LiCS Indoor system

An extender enables the maximum number of DALI-compliant control gear units within a standard DALI system to be increased.

This means the DALI extender is installed and addressed in instead of the ballast. Up to 64 DALI control gear units can be connected to an extender output. All of these control gear units will either respond in the same way to an incoming signal (Ref. No.: 186194) or, given changed characteristics, will transfer values to the addressed DALI control gear units (Ref. No.: 186481).

The extender for DALI systems can only be used in combination with a DALI controller. When DALI commands are received, the extender behaves just like a DALI-compliant ballast.

Technical notes

Configuration interface:
via a DALI controller
Ambient temperature t_a: 0 to 50 °C
Max. casing temperature t_c: 65 °C
Screw terminals: 0.75–2.5 mm²
Degree of protection: IP20, Protection class II
RFI-suppressed

Connections

- Mains connection: 220–240 V AC/DC, 0/50–60 Hz
- Max. power consumption: 6.5 W
- For DALI signals in acc. with IEC 62386
- DALI current consumption: 2 mA
- 1 DALI bus to 3 terminal pairs: max. current on the DALI bus = 200 mA
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- The DALI bus features reversible electronic overload and short-circuit protection.

Functions

Connection of up to 64 ballasts to a single DALI address
Extender Flex serves to transfer characteristics, which permit light to be staged in a more flexible manner, to the connected DALI addresses.
Example: group devices can be dimmed to varying degrees.

Type	**Ref. No.**	Max. No. of secondary control gear units per Extender pcs./lead	Functions	Dimensions LxWxH mm	Weight g
Extender	**186194**	64	Broadcast Classic	175x42x31.5	150
Extender Flex	**186481**	64	Broadcast Flexible: a compilation of characteristics can be made available on request	175x42x31,5	150

MultiSensors

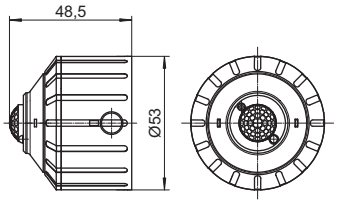
To supplement LiCS Indoor system
Daylight and motion sensors increase both energy savings and convenience.

VS MultiSensors detect both light levels and motion. In addition, MultiSensors feature a space-saving design and were specifically developed to work with VS Light Controllers. No external power supply is required, as the sensors are supplied via the DALI bus.

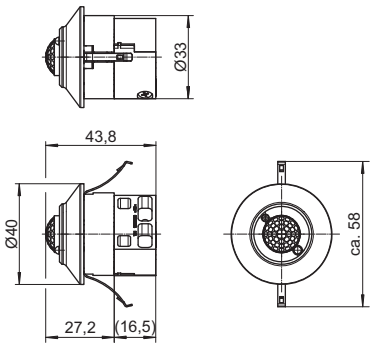
Technical notes
Configuration interface:
via the Light Controller
Ambient temperature t_a: 0 to 50 °C
Push-in terminals with lever opener: 0.5–1.5 mm²
DALI current consumption: 4 mA

Functions
Motion detection and monitoring of lighting levels. With built-in LED (red): the light flashes during configuration when the sensor is selected.

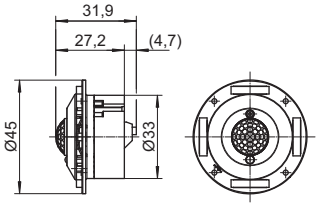
MultiSensor SM-E
For surface mounting
Dimensions (ØxH): 53x48.5 mm
Weight: 30 g
Ref. No.: 186320



MultiSensor FM-E
For ceiling installation
With cord grip
Dimensions (ØxH): 40x43.8 mm
Weight: 30 g
Ref. No.: 186321



MultiSensor IL-E
For luminaire installation
Dimensions (ØxH): 45x31.9 mm
Weight: 30 g
Ref. No.: 186322



Industrial Sensors High Bay for Industrial Applications

To supplement LiCS Indoor system
Using DALI MovementSensors increases both energy savings and application flexibility.

Vossloh-Schwabe MovementSensors are even capable of detecting motion in rooms with high ceilings (up to 8 m in height). Specifically developed for use with VS Light Controllers, these MovementSensors have been optimised for unprotected installation (HB 65) and to deal with obstructions in the detection field.

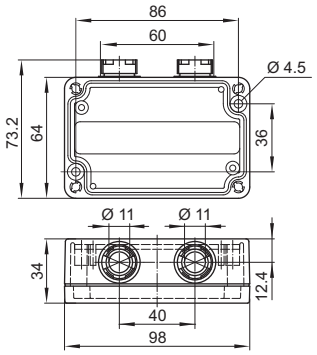
VS BrightnessSensors detect light levels in difficult environments that require an IP65 degree of protection. VS Brightness systems do not require an external power supply as the DALI lead can simply be connected through.

The fact that the sensors are connected via the DALI bus now makes it possible – and for the very first time – to manage an entire warehouse with just one Light Controller and to define individually adjustable or uniform lighting levels.

Technical notes
Configuration interface: via the Light Controller
Ambient temperature t_a: –5 to 50 °C
Push-in terminals with lever opener: 0.5–1.5 mm²
DALI current consumption: HB 65: 2 mA / IP65: 4 mA

Functions
Reliable HF motion detection with indication LED (red) (MovementSensor)
Reliable monitoring of light levels with indication LED (red) (BrightnessSensor)

MovementSensor HB 65
For surface mounting
With cord grip
Degree of protection: IP65
Protection class II
Dimensions (LxWxH): 98x73.2x34 mm
Weight: 151 g
Ref. No.: 186311



BrightnessSensor IP65
For surface mounting
With cord grip
Degree of protection: IP65
Protection class II
Dimensions (LxWxH): 98x73x34 mm
Weight: 140 g
Ref. No.: 186370

General safety information

- LiCS products may only be installed and commissioned by authorised and fully qualified staff.
- These instructions must be carefully read before installing and commissioning the system, as this is the only way to ensure safe and correct handling.
- Before any work is carried out on the equipment, it must be disconnected from the mains.
- All valid safety and accident-prevention regulations must be observed.
- The products should never be inexpertly opened as this poses lethal danger due to electrical shock. Repairs may only be undertaken by the manufacturer.
- On no account may the DALI control lead be used to carry mains voltage or any other external voltage as this can destroy individual system components.

Light Controller IP/DALI

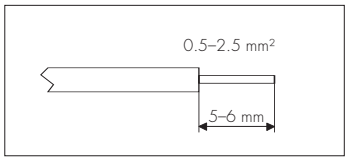
Installation

- In a distribution board on a 35-mm mounting rail in acc. with DIN 43880; required installation space: 10 hp (horizontal pitches) (180 mm)
- Hook the light controller over the upper edge of the rail using the two mounting notches. Then carefully press the controller onto the lower part of the rail until the mounting spring on the controller snaps into place over the rail. If required, use a screwdriver to help you with the spring.

Removal

To remove the controller from the mounting rail, use a screwdriver to loosen the spring and ease the controller over the rail flange from the bottom.

Installation instructions



- Conductor cross-section for all terminals: 0.5–2.5 mm² for rigid or flexible conductors
- Cable preparation (see right)
- To protect the equipment, a 10 A or 16 A, Type B automatic circuit breaker must be fitted.
- Push button inputs 1–8: cables must be rated for mains voltage; max. cable length = 100 m.
- As a standard DALI bus is not SELV-compliant, the DALI lead must be rated for mains voltage.
- A max. of 64 DALI operating devices in aggregate can be connected as well as up to 36 MultiSensors or DALI push-button interfaces, which in total must not exceed 200 mA. The exact number of components can be found in the manual.
- The power supply and the DALI lead can be laid in a single cable provided the cable does not exceed a maximum length of 100 m, e.g. using 5x1.5 mm².
- Please observe the maximum lengths of the DALI lead during installation:

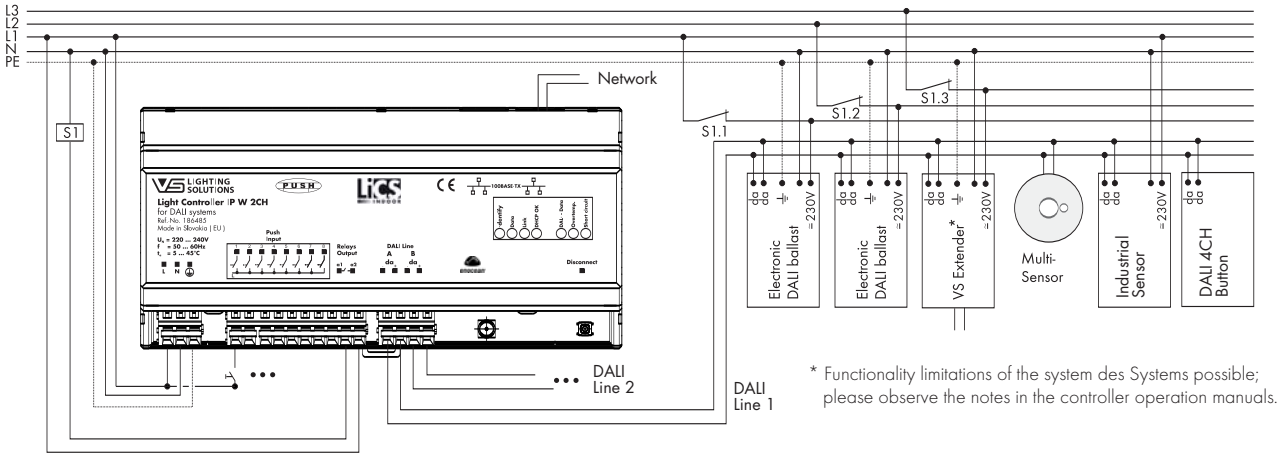
	2.5 mm²	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	300 m	180 m	130 m	80 m

- The relay contact is a potential-free closing contact. The current load of the relay contact must not exceed an Ohmic load of $I_{max.}$ = 3 A. When using the standby contact, an additional external power relay should be used.
- Connection to the LightBox (e.g.) is effected via RJ45 (Ethernet TCP/IP) 10/100 Mbit/s.
- The two RJ45 ports can be used as a (daisy chain) switch.
- It is not recommended to connect atypical network components of a light management system (e.g. printers) directly to the Light Controller.

Additional information

- To ensure faultless wireless operation, an antenna must be connected that is set to the respective frequency. This antenna is not included in the scope of delivery.
- Please refer to the manual at **www.vossloh-schwabe.com/en/home/products/light-management-systems-for-indoor-applications.html** for exact instructions on how to configure the system using the controller.
- The outputs of different controllers must not be connected with each other.
- To ensure safe operation of the controller, the maximum ambient temperature must not be exceeded.
- Integration of VS Extenders limits the whole system to its basic funcitions for control. Please observe the notes in the appendix of the controller operation manuals.

Circuit diagram of Light Controller IP/DALI



* Functionality limitations of the system des Systems possible; please observe the notes in the controller operation manuals.

Technical details Light Controller PI/DALI

Light Controller	IP/DALI	IP/DALI W	IP/DALI 2 CH	IP/DALI W 2 CH
Ref. No.	186339	186340	186484	186485
Supply voltage	220–240 V AC, 50–60 Hz			
Power consumption	12 W			
Ambient temperature t_a	5 to 50 °C		5 to 45 °C	
DALI output (da+–)	max. 200 mA current drain		2 x max. 200 mA current drain	
No. of operating devices (DALI-EBs, LiCS-Extender, HB sensors)	max. 64 pcs. per Controller (expandable with the Extender)		max. 2 x 64 pcs. per Controller (expandable with the Extender)	
No. of MultiSensors or DALI push-button interfaces	max. 36 pcs.		max. 2 x 36 pcs.	
RF input	–	Antenna for a reception range of 868 MHz	–	Antenna for a reception range of 868 MHz
Wireless modules	–	All radio buttons with PT radio sensors by EnOcean with 868 MHz	–	All radio buttons with PT radio sensors by EnOcean with 868 MHz
No. of wireless modules	–	max. 16 pcs. with up to 4 buttons	–	max. 16 pcs. with up to 4 buttons
Relais (Output a1, a2)	250 V, max. 3 A ohmic load			
Push inputs 1–8	220–240 V AC, 50–60 Hz			
Degree of protection	IP20			
Protection class	I			
Weight	340 g			
CE requirements	EMC in acc. with EN 61547, RFI in acc. with EN 55015, Safety in acc. with EN 61347-2-11			

Light Controller L/LS and LW/LSW

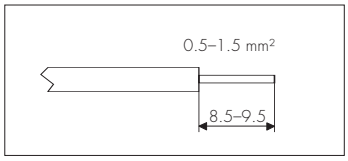
Installation

- In a distribution board on a 35-mm mounting rail in acc. with DIN 43880; required installation space: 7 hp (horizontal pitches) (126 mm)
- The controller must be installed so the display screen is in the upper left corner.
- Hook the light controller over the upper edge of the rail using the two mounting notches. Then carefully press the controller onto the lower part of the rail until the mounting spring on the controller snaps into place over the rail. If required, use a screwdriver to help you with the spring.

Removal

To remove the controller from the mounting rail, use a screwdriver to loosen the spring and ease the controller over the rail flange from the bottom.

Installation instructions



- Conductor cross-section for all terminals: 0.5–1.5 mm² for rigid or flexible conductors
- Cable preparation (see right)
- To protect the equipment, a 10 A or 16 A, Type B automatic circuit breaker must be fitted.
- Push button inputs 1–6: cables must be rated for mains voltage; max. cable length = 100 m.
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- A max. of 64 DALI operating devices in aggregate can be connected as well as up to 36 MultiSensors, which in total must not exceed 200 mA. The exact number of components can be found in the manual.
- The power supply and the DALI lead can be laid in a single cable provided the cable does not exceed a maximum length of 100 m, e.g. using 5x1.5 mm².
- Three electrically connected DALI outputs make it easier to connect DALI control gear. Please observe the maximum lengths of the DALI bus during installation:

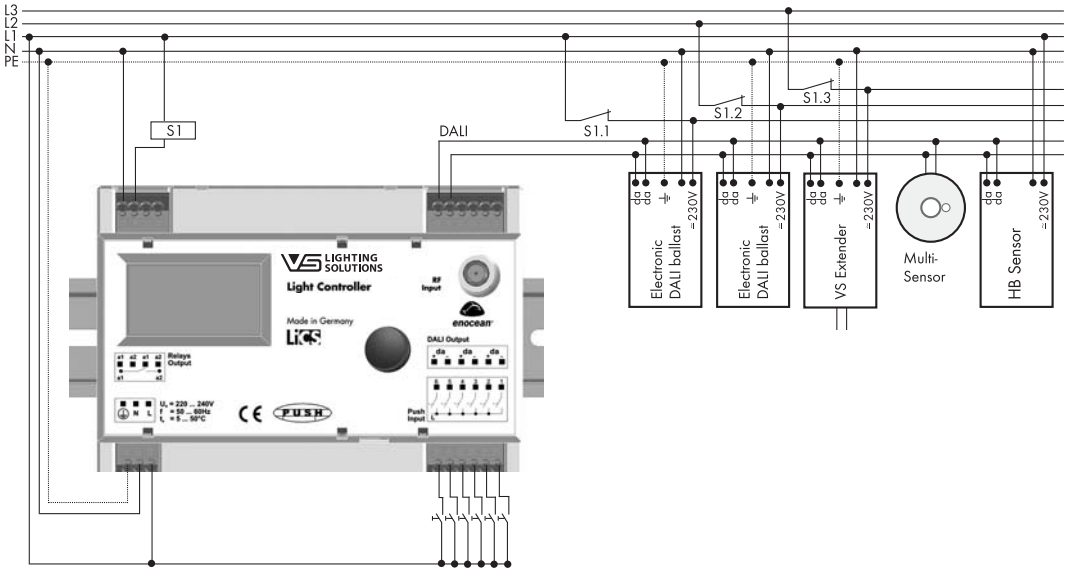
	1.5 mm²	**1 mm²**	**0.75 mm²**	**0.5 mm²**
6.2 Ω max.	300 m	180 m	130 m	80 m

- The relay contact is a potential-free closing contact. The current load of the relay contact must not exceed an Ohmic load of $I_{max.}$ = 3 A. When using the standby contact, an additional external power relay should be used.
- Although models of the Light Controller L/LS and LW/LSW feature an antenna-connection jack (located top right on the front), only the jack on the LW/LSW model is functional. This is where the antenna is connected to enable wireless operation (EnOcean) of the Light Controller LW/LSW.

Additional information

- To ensure faultless wireless operation, an antenna must be connected that is set to the respective frequency. This antenna is not included in the scope of delivery.
- Please refer to the manual at **www.vossloh-schwabe.com/en/home/products/light-management-systems-for-indoor-applications.html** for exact instructions on how to configure the system using the controller.
- The outputs of different controllers must not be connected with each other.
- To ensure safe operation of the controller, the maximum ambient temperature must not be exceeded.

Circuit diagram of Light Controller L/LS and LW/LSW



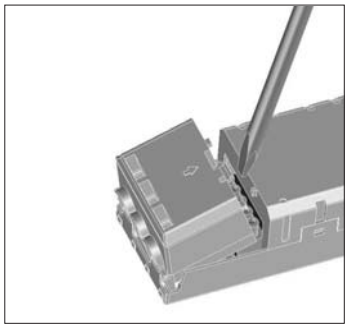
Technical details Light Controller L/LS and LW/LSW

Light Controller	L	LS	LW	LSW
Ref. No.	186189	186276	186190	186323
Supply voltage	220–240 V AC, 50–60 Hz			
Power consumption	9 W			
Ambient temperature t_a	5 to 50 °C			
DALI output (da+–)	max. 200 mA current drain			
No. of operating devices (DALI-EBs, LiCS-Extender, HB sensors)	max. 64 pcs. per Controller (expandable with the Extender)			
No. of MultiSensors	max. 36 pcs.			
RF input	–		Antenna for a reception range of 868 MHz	
Wireless modules	–		All radio buttons with PTM radio sensors by EnOcean with 868 MHz	
No. of wireless modules	–		max. 16 pcs. with up to 4 buttons	
Relais (Output a1, a2)	250 V, max. 3 A ohmic load			
Push inputs 1–6	220–240 V AC, 50–60 Hz			
Degree of protection	IP20			
Protection class	I			
Weight	250 g			
CE requirements	EMC in acc. with EN 61547, RFI in acc. with EN 55015, Safety in acc. with EN 61347-2-11			

Light Controller S

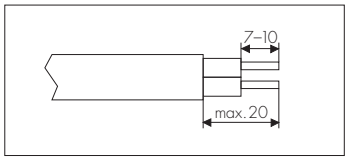
Installation

- Independent installation, e.g. in false ceilings
- Easy and time-saving installation thanks to end caps that snap into place without needing tools.
- Clearance: min. 0.1 m to walls, ceilings, insulation and other electronic devices; min. 0.25 m to sources of heat (e.g. lamps)
- Surface: solid, must not let the controller sink into insulation material
- Fastening: using 4-mm screws



Installation instructions

- Conductor cross-section for all terminals: 0.75–2.5 mm²
- Cable preparation (see right)
- Screw terminals: max. tightening torque = 0.4 Nm
- A standard DALI bus only features basic insulation. All DALI cables must be rated for mains voltage.
- A max. of 64 DALI operating devices in aggregate can be connected as well as up to 36 MultiSensors, which in total must not exceed 200 mA. The exact number of components can be found in the manual.
- The power supply and the DALI lead can be laid in a single cable provided the cable does not exceed a maximum length of 100 m, e.g. using NYM 5x1.5 mm². Please observe the maximum lengths of the DALI bus during installation:



	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	180 m	130 m	80 m

- Push button inputs: cables must be rated for mains power; maximum 100 m.

Light Controller XS

Installation

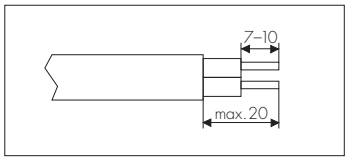
- Any installation location
- Suitable for installation only in dry rooms or in luminaires, cases, casings or similar. If destined for use in outdoor applications or spaces subject to higher degrees of moisture, the Light Controller XS must be installed in a casing with a suitable degree of protection.
- Fastening with 3 mm or 4 mm screw
- Take care to ensure a solid, flat surface.

Application/Function

- Suitable only for installation in a luminaire; unsuitable for independent operation.
- For constant light control or motion detection, or a combination of both.
- In addition, a target value for constant light control can be set via manual dimming.

Installation instructions

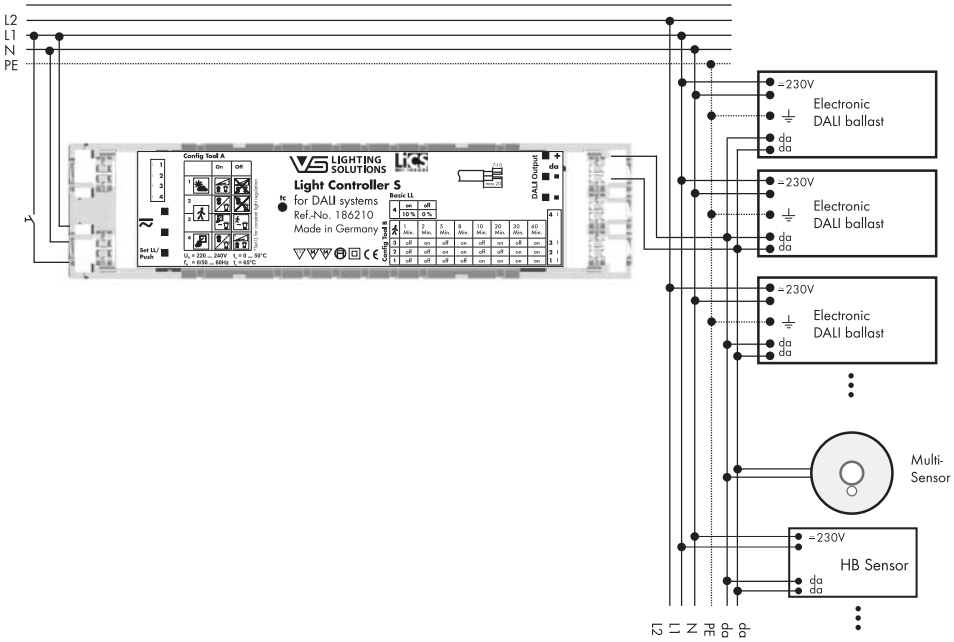
- Conductor cross-section for all terminals: 0.5–1.5 mm²
- Cable preparation (see right)
- A standard DALI bus only features basic insulation. All DALI cables must be rated for mains voltage.
- Operation without sensors: A max. of 10 DALI operating devices can be connected; no MultiSensors are allowed.
- Operation with sensors: If one VS MultiSensor is connected a max of 8 DALI ballasts can be connected in addition.
- Push button inputs: cables must be rated for mains power; maximum 15 m.
- Please observe the maximum lengths of the DALI bus during installation: The DALI lead does not exceed a maximum length of 95 m, e.g. using NYM 5x1.5 mm²
- The power supply and the DALI lead can be laid in a single cable, e.g. using 5x1.5 mm².



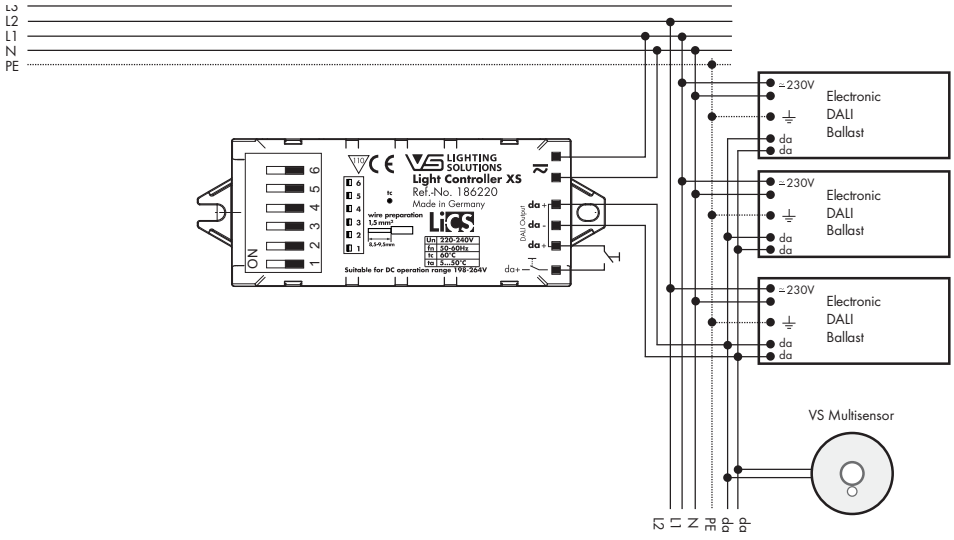
Additional information

- The outputs of different Light Controllers S/XS must not be connected with each other.
- All control gear that is connected to the output of the DALI Extender is synchronously operated in "broadcast" mode; the output side is not addressed.
- To ensure safe operation of the Light Controller S/XS, the maximum casing temperature at the measuring point (t_c) must not be exceeded.
- Please refer to the manual at **www.vossloh-schwabe.com/en/home/products/light-management-systems-for-indoor-applications.html** for exact instructions on how to configure the system using the controller.

Circuit diagram of Light Controller S



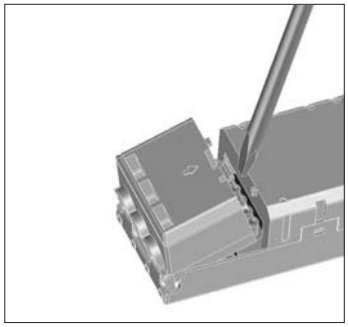
Circuit diagram of Light Controller XS



Technical details Light Controller S

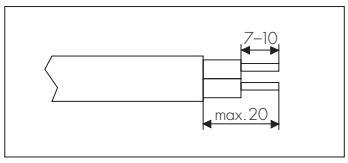
Light Controller	S	XS
Ref. No.	186210	186220
Supply voltage	220–240 V AC/DC, 0/50–60 Hz	
Power consumption	6.5 W	0.8 W
Ambient temperature t_a	0 to 50 °C	
DALI output (da+–)	max. 200 mA current drain	max. 20 mA current drain
No. of operating devices (DALI-EBs, LiCS-Extender, HB sensors)	max. 64 pcs. per Controller (expandable with the Extender)	max. 10 pcs. per Controller (without sensors)
No. of MultiSensors	max. 36 pcs.	max. 4 pcs.
RF input	–	
Wireless modules	–	
No. of wireless modules	–	
Relais (Output a1, a2)	–	
Push inputs	220–240 V AC/DC, 0/50–60 Hz	
Degree of protection	IP20	
Protection class	II	I and II
Weight	150 g	30 g
CE requirements	EMC in acc. with EN 61547, RFI in acc. with EN 55015, Safety in acc. with EN 61347-2-11	

Extender



Installation

- Independent installation, e.g. in false ceilings
- Easy and time-saving installation due to end caps that snap into place without needing tools
- Clearance: min. 0.1 m to walls, ceilings, insulation and to other electronic devices; min. 0.25 m to sources of heat (e.g. lamps)
- Surface: solid, must not permit the extender to sink into insulation material
- Fastening: using 4-mm screws



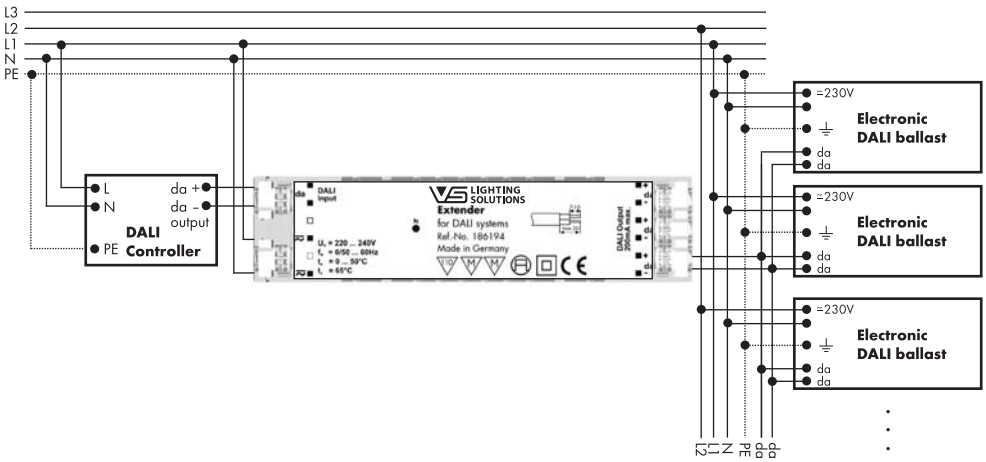
Installation instructions

- Cross-section of primary/secondary conductor: 0.75–2.5 mm²
- Cable preparation (see right)
- Screw terminals: max. tightening torque = 0.4 Nm
- Length of the secondary bus cable: max. 300 m
- A standard DALI bus only features basic insulation. All DALI cables must be rated for mains voltage. The power supply and the DALI lead can be laid in a single cable (max. 100 m).
- Mains power cables and DALI cables should not be laid directly parallel to lamp cables (min. clearance = 0.25 m).
- A maximum of 64 DALI operating devices in total can be connected.

Additional information

- The extender can only be operated if connected to a DALI control unit. Please refer to the respective operating instructions for information on the control unit.
- The DALI extender is integrated into the DALI system using the "random address" assignment method.
- Three electrically connected DALI outputs make it easier to connect DALI ballasts. A maximum of 64 DALI operating devices in total can be connected.
- The outputs of several extenders must not be connected with each other.
- All control gear that is connected to the output of the DALI Extender is synchronously operated in "broadcast" mode; the output side is not addressed.
- To ensure safe operation of the Extender, the maximum casing temperature at the measuring point (t_c) must not be exceeded.

Circuit diagram of the Extender



Technical details Extender

Extender	
Ref. No.	186194/186481
Supply voltage	220–240 V AC/DC, 0/50–60 Hz
Power consumption	6.5 W
Control input	DALI in. acc. with IEC 62386-102/-201
DALI output	max. 64 pcs. DALI operating devices or max. 200 mA (expandable with the Extender)
Ambient temperature t_a	0 to 50 °C
Casing temperature t_c	max. 65 °C
Degree of protection	IP20
Protection class	II
Weight	150 g
CE requirements	EMC in acc. with EN 61547, RFI in acc. with EN 55015, Safety in acc. with EN 61347-2-11

MultiSensors

Installation

SM-E (Surface Mounted)
Prepare the cable accordingly and thread it through the back plate of the sensor at the side or from behind. Attach the back plate in the selected position using the two screws provided, then connect the cable to the sensor. Use two fingers to lightly press the springs of the sensor cover together and allow to lock into place along the guide rails inside the sensor's bottom face (see Fig. 1).

FM-E (Flush Mounted), with or without cord grip
Prepare the cable, connect to the sensor and attach cord grip if appropriate. Use two fingers to lightly press the sensor together and allow to lock into place in the pre-drilled hole (35 mm) in the selected position (see Fig. 2).

IL-E (In Luminaire)
Heed the dimension of the drilling template when inserting the sensor in the metal plate, which is 0.5–1 mm thick. Allow the sensor to lock into place in the precisely pre-drilled hole in the metal plate. Allow the sensor cover ring to lock into place from the other side in the recesses provided (see Fig. 3).

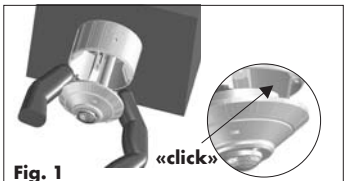


Fig. 1


Fig. 2

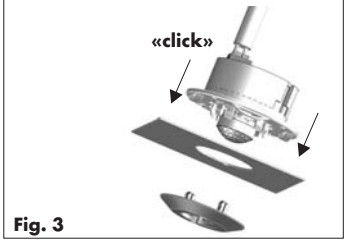
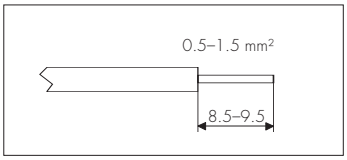


Fig. 3

Installation instructions

- Conductor cross-section of all terminals: 0.5–1.5 mm² for both rigid and flexible conductors
- Preparation of the sensor cables (see right)
- As a standard DALI bus is not SELV-compliant, cables must be rated for mains voltage.
- The power supply and the DALI lead can be laid in a single cable provided the cable does not exceed a maximum length of 100 m, e.g. using NYM 5x1.5 mm².
  Please observe the maximum lengths of the DALI bus during installation:

	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	180 m	130 m	80 m



Additional information

- VS MultiSensors can only be operated in combination with a VS Light Controller from the LiCS indoor range.
- Please refer to the manual at **www.vossloh-schwabe.com/en/home/products/light-management-systems-for-indoor-applications.html** for exact instructions on how to configure the sensors.
- To ensure safe operation of the sensors, the maximum permitted ambient temperature must not be exceeded.
- The sensor must be positioned to ensure its reception range is not obstructed by objects, furniture, etc.
- See Fig. 4 for the sensor range.
  The height specified in Fig. 4 is a reference value. For other and specifically greater heights, it may be necessary to test the sensitivity of the sensors on site as the sensitivity of the motion sensor decreases the higher up it is mounted.

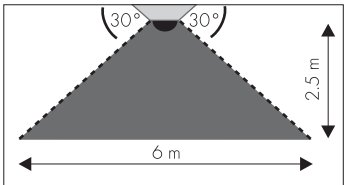
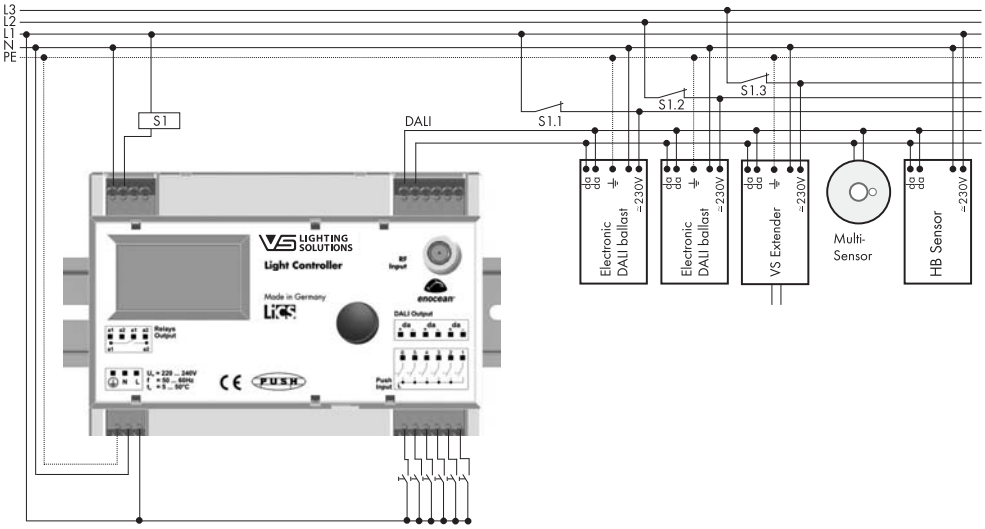


Fig. 4

Circuit diagram of Sensors



Technical details MultiSensors

MultiSensor	SM-E	FM-E	IL-E
Ref. No.	186320	186321	186322
Control input	DALI in acc. with IEC 62386		
DALI current consumption	4 mA		
Ambient temperature t_a	0 to 50 °C		
Casing temperature t_c	max. 50°C		
Degree of protection	IP20		
Protection class	II		
Weight	30 g		
CE requirements	Safety in acc. with EN 61347-2-11		

MovementSensors HB

Installation **MovementSensor HB 65**

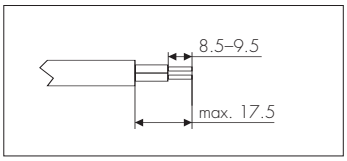
Prepare the cable accordingly. Open the housing cover and the protective caps for the connections. Thread the connection cables (230 V L, N + DALI control cable) through the protective cap closure and connect with push terminals. Close the protective caps. Before the housing cover is closed, attach the housing with the aid of 4 mm screws in the holes provided. During installation make sure that the sensor component is not touched.
Installation position: any
See operating manual for the sensor range.

Installation instructions

- To protect the device, please use a Type B circuit breaker (10 A or 16 A).
- Conductor cross-section of all terminals: 0.5–1.5 mm² for both rigid and flexible conductors
- Preparation of the sensor cables (see on the right)
- As a standard DALI bus is not SELV-compliant, cables must be rated for mains voltage.
- The power supply and the DALI lead can be laid in a single cable provided the cable does not exceed a maximum length of 100 m, e.g. using NYM 5x1.5 mm².
  Please observe the maximum lengths of the DALI bus during installation:

	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	180 m	130 m	80 m

- The sensor must never be placed inside a luminaire.
- The sensor must be installed with a clearance of 1 m to the respective luminaire.



Additional information

- VS HB sensors can only be operated in combination with a VS Light Controller from the LiCS indoor range.
- Please refer to the controller manual for exact instructions on how to configure the sensor.
- To ensure safe operation of the sensors, the maximum permitted ambient temperature must not be exceeded.
- The sensor must be positioned to ensure its reception range is not obstructed by objects, furniture, etc.
- Moving objects e.g. fans may be enough to lead to movement detection.
- See Fig. 1 to 3 for detection range.

Ceiling suspension:
Sensing range MovementSensors
in meters (sensor leads on the left side)

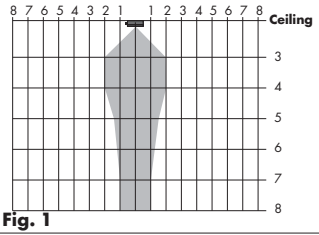


Fig. 1

Wall mounting:
Sensing range MovementSensor
in meters (sensor connections on bottom side)

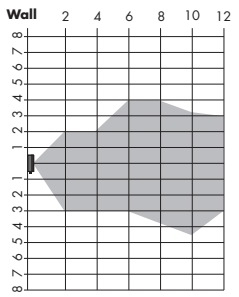


Fig. 2

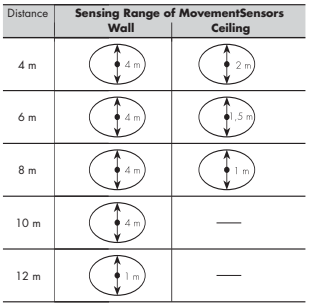
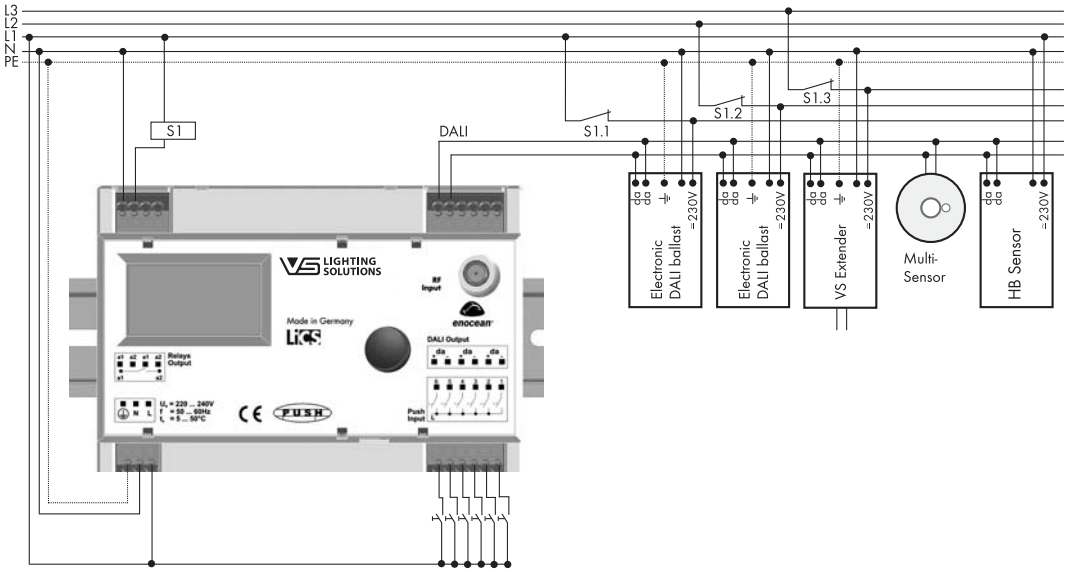


Fig. 3

Circuit diagram of MovementSensors HB



Technical details MovementSensors HB

MovementSensor	HB 65
Ref. No.	186311
Control input	DALI in acc. with IEC 62386
DALI current consumption	2 mA
Ambient temperature t_a	–5 to 50 °C
Degree of protection	IP65
Protection class	II
Weight	151 g
CE requirements	Safety in acc. with EN 61347-1 and EN 61347-2-11

BrightnessSensors IP65

Installation **BrightnessSensors IP65**

Prepare the cable accordingly. Open the housing cover and the protective caps for the connections. Thread the connection cables (DALI control cable) through the protective cap closure and connect with push terminals. Close the protective caps. Before the housing cover is closed, attach the housing with the aid of 4 mm screws in the holes provided. During installation make sure that the sensor component is not touched.
Installation position: any
See operating manual for the sensor range.

Installation instructions

- Conductor cross-section of all terminals: 0.5–1.5 mm² for both rigid and flexible conductors
- Preparation of the sensor cables (see Fig. 1)
- As a standard DALI bus is not SELV-compliant, cables must be rated for mains voltage.
- The power supply and the DALI lead can be laid in a single cable provided the cable does not exceed a maximum length of 100 m, e.g. using NYM 5x1.5 mm².
  Please observe the maximum lengths of the DALI bus during installation:

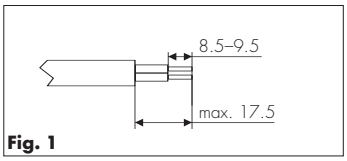


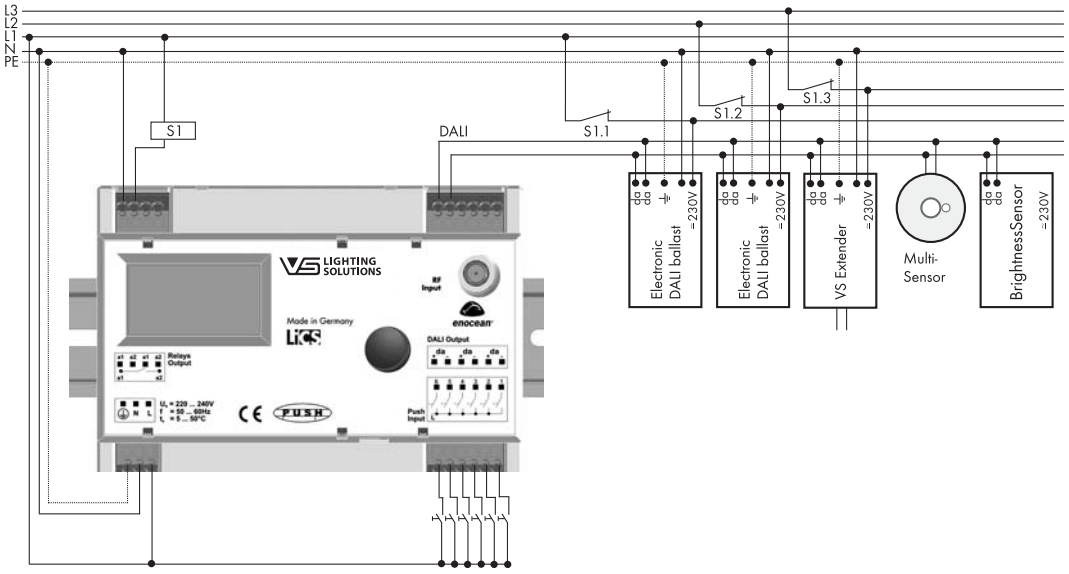
Fig. 1

	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	180 m	130 m	80 m

Additional information

- VS sensors can only be operated in combination with a VS Light Controller from the LiCS indoor range.
- Please refer to the controller manual for exact instructions on how to configure the sensor: **www.vossloh-schwabe.com/en/home/products/light-management-systems-for-indoor-applications.html**
- To ensure safe operation of the sensors, the maximum permitted ambient temperature must not be exceeded.
- Installation location: the sensor must detect the differences in the artificial light.

Circuit diagram of BrightnessSensors IP65



Technical details BrightnessSensors IP65

BrightnessSensor	IP65
Ref. No.	186370
Control input	DALI in acc. with IEC 62386
DALI current consumption	4 mA
Ambient temperature t_a	–5 to 50 °C
Degree of protection	IP65
Protection class	II
Weight	140 g
CE requirements	Safety in acc. with EN 61347-1 and EN 61347-2-11

ELECTRONIC CONTROL OF OUTDOOR LIGHTING

ECO-FRIENDLY AND ECONOMICAL LIGHTING

Many street lighting facilities are outdated and are therefore highly inefficient. This not only results in higher energy requirements, but also more maintenance work and higher investment costs. All this adds up to street lighting accounting for approx. 30–50% of the entire power consumption recorded by municipal and other types of local authority – which amounts to a huge cost factor for public budgets to cover.

The lighting solutions provided by Vossloh-Schwabe ensure that local authorities can save energy, achieve sustainable cost reductions and at the same time make a valuable contribution to reducing CO_2 output. Using various lighting situations as examples, energy savings of up to 80% can be achieved.

Vossloh-Schwabe's light management systems enable centralised control of individual luminaires with the advantage of a constant online link and the ability to monitor the lighting system. But these intelligent, multifunctional VS controllers provide the same savings potential and high flexibility even without online connectivity.

Typical Applications

- General lighting in public spaces
- Lighting in the vicinity of buildings
- Lighting in tunnels
- Lighting for sports' venues
- Industrial lighting

LiCS OUTDOOR

Targeted Use of Light and Optimisation of Maintenance Processes

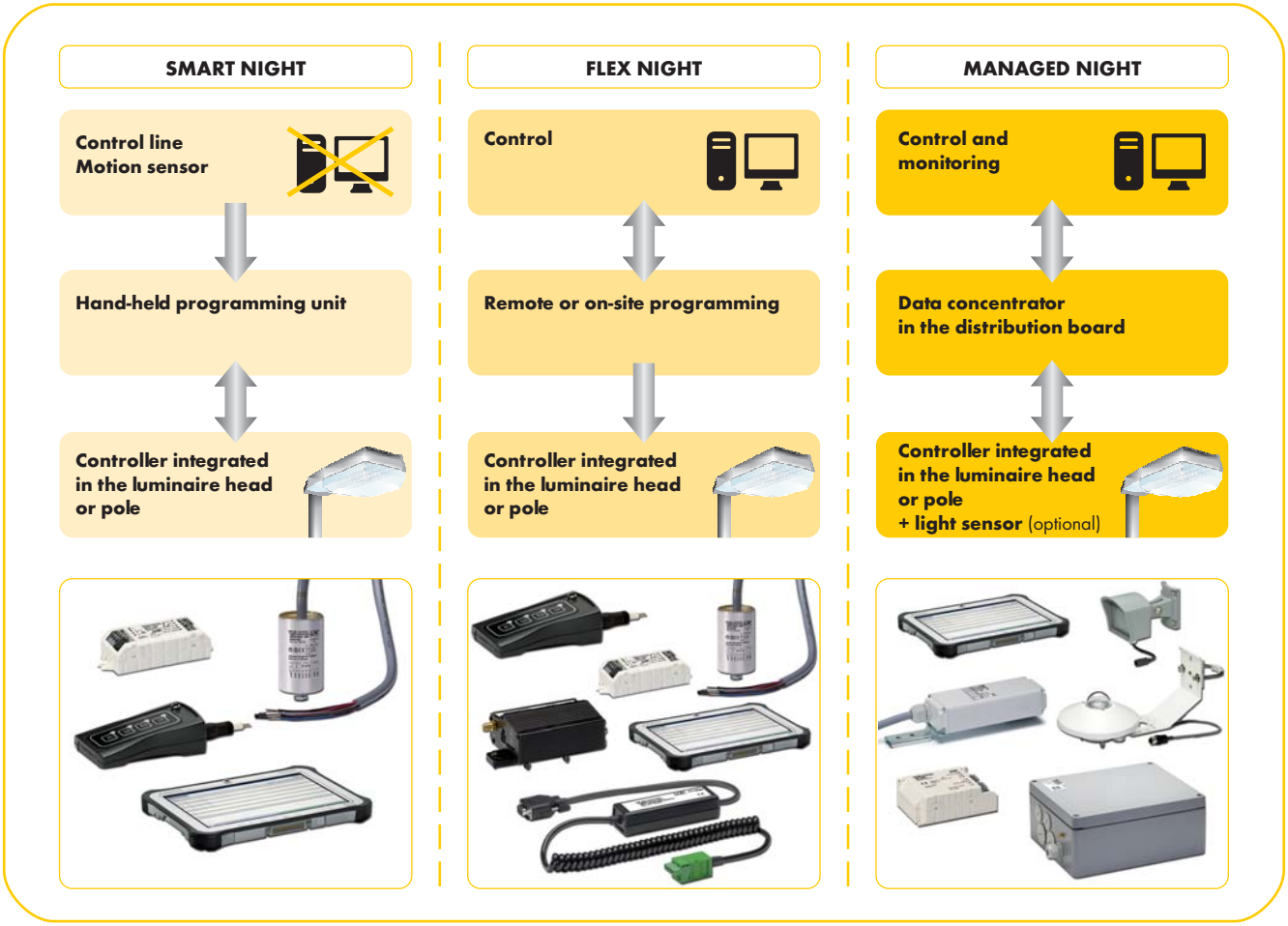
Vossloh-Schwabe's LiCS Outdoor system makes it possible to dim individual luminaires or entire luminaire groups. Depending on the requirements, the degree to which the lighting level is dimmed can be sensor-controlled or can comply with a preset level; the burn-in periods of discharge lamps can also be taken into consideration.

Considerable savings potential can be harnessed by need-driven programming and/or lighting control. Thanks to the system's convenient remote monitoring functions, it is possible to optimise maintenance processes as well as better plan maintenance work and budget for it in more detail.

Flexible Structure

The complete LiCS Outdoor system is suitable both for new installations as well as for classic retrofits. The particularly flat designs of the controllers enable installation in almost all luminaires, especially luminaires featuring LED technology.

The system enables control of luminaires operated with magnetic ballasts as well as luminaires with up to four dimmable electronic ballasts with a 1–10 V or DALI interface.



FUNCTIONS OF THE LIGHT CONTROLLERS

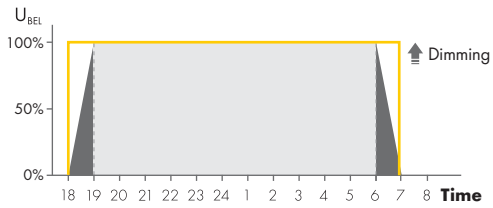
Vossloh-Schwabe's LiCS Outdoor System is based on mature system technology that has already proved itself in millions of applications around the world in the most diverse of areas.

Overview of functions

Independent functions form an integral part of the LiCS Outdoor controller and are common to almost all products. The parameters of these functions can be (re)set at any time by the customer using various tools or via the power line carrier network.

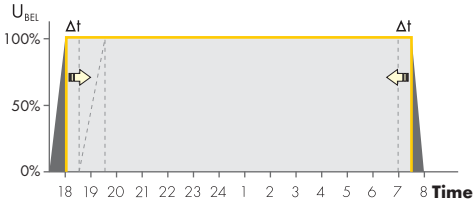
DOO (Dimmed ON/OFF)

Lighting can be faded up to the desired brightness level after being switched on and can also be faded down before being switched off; the duration of the fade-in/-out can be set to suit.



DPC (Delayed Switching for Pedestrian Crossing)

Delayed switching on and/or earlier switching off of lighting in the vicinity of pedestrian crossings.

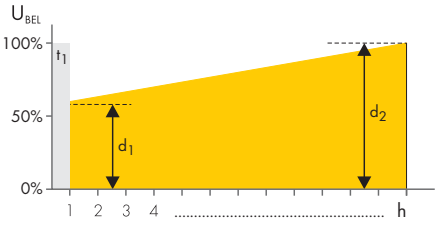


BBT (Burn-in Block Time)

Adjustable dimming block for conventional light sources (discharge lamps) to prevent the lamp from being dimmed during its burn-in period (function can later be deactivated again).

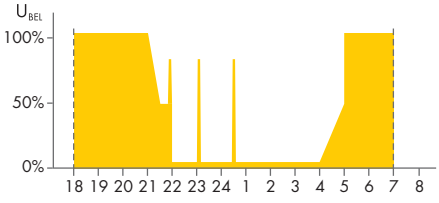
MFF (Maintenance Factor Function)

With prolonged service life, light sources suffer a decrease in luminous flux and, as a result, in brightness. But thanks to the maintenance factor function, this can be compensated by the light management system so as to ensure luminous flux remains stable over the lamp's service life and, additionally, save energy. The flux reduction curve can be adjusted to the real luminous flux reduction by 3 support points.



ISD (Intelligent Switching Time Dimming)

During any one night phase, brightness and with that the output of the lighting system can be altered or the luminaire can be switched on/off up to a maximum of 10 times.



LST (Control input)

In addition, using a control input (e.g. with a push button or motions ensor) the system can be switched to a certain lighting level for a freely configurable period of time.

RCR (Ripple Control Receiver)

Sound frequency reception module for typical sound frequencies of 100 Hz to 1.7 kHz; TFR protocols on request.

Smart Night

Independent, pre-programmed controllers are used for lighting control purposes. These controllers can also be individually reconfigured at a later point in time. In this regard, up to 4 lighting profiles can be transferred to the hand-held control unit and then transferred to each individual controller on site. In this case, data transfer is purely unidirectional.

Flex Night

New lighting profiles can be transferred to several iMCU-series controllers at the same time. All iMCUs that are installed on the same supply line are then programmed with a new profile, while still allowing individual iMCUs to be excluded from receiving the new profile.

This can be achieved on site using a laptop and the iCTT, or using the iCTT connection at the control point of the street lighting or, remotely, using the iMICO, in which case the iMICO controller would be firmly installed at the control point.

Managed Night

Power-line technology enables bidirectional data transfer using the 230 V supply line. As a result, controllers can be grouped together to form a high-performance network using just the cables provided (**without needing any additional control lines**) in almost any environment.

Data can thus be transferred to each controller connected to the network with a very high degree of reliability; if necessary, signal strength is automatically boosted, thus removing any restrictions in terms of distance.

Accessories

iMCU – intelligent Multifunctional Controller Units

For outdoor luminaire control

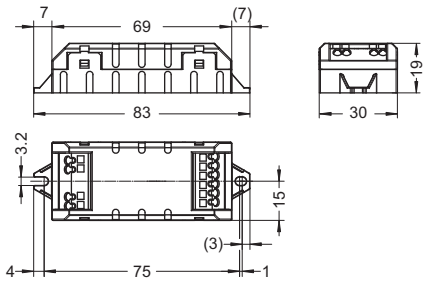
These light controllers were specifically designed for independent operation to enable control of street lighting or lighting close to buildings.

Depending on the given task, the product can replace one or more individual products. The controllers are suitable for use with almost all electronic ballasts and LED drivers with a DALI or a 1–10 Volt interface. They also enable control of conventional magnetic ballasts that are with coil tapping points without needing any other components.

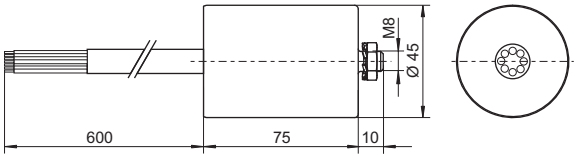
The control input LST can be used to connect a control phase, a motion detector, a key switch or a light sensor, but can also be used to receive simple data protocols.

iMCU – IP20 **IP67**

IP20 version



IP67 version



Technical Notes

Control output: DALI, 1–10 V or PWM for max. 1 EB, short-circuit-proof
Relay contacts: potential-free (input, opener, closing contact)
Storage temperature: –25 to 85 °C
Operating temperature: –25 to 80 °C
Humidity: non-condensing
Degree of protection: IP20 or IP67
Upgradeable firmware

Galvanic Isolation

The electronic ballast does not feature potential isolation between input and output: as soon as the electronic ballast is connected to the controller, the control input of the electronic ballast is not potential-free.

Typical Applications

Street lighting or lighting in the vicinity of buildings

DPC **MFF** **ISD** **DOO**
BBT **LST** **RCR** (s. p. 258)

Type	Ref. No.	Voltage AC V, Hz	Power consumption mW	Control input LST V	Switching current A (λ = 0.8)	Connection	Weight g
IP20 – Dimensions (LxWxH): 83x30x19 mm							
iMCU IP20	**186232**	220–230, 50	< 500	230	4	Push-in terminals: 0.5–1.5 mm²	30
IP67 – Dimensions (LxØ): 85x45 mm							
iMCU IP67	**186338**	220–230, 50	< 500	230	4	9-core lead, 600 mm	250

iCTI – intelligent Hand-held Operating Device

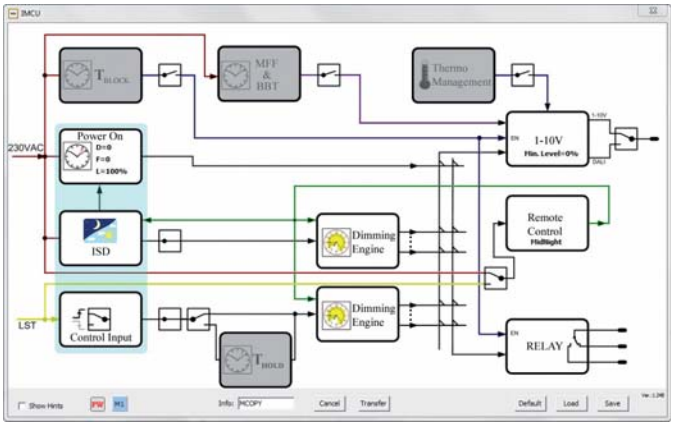
For subsequent controller configuration

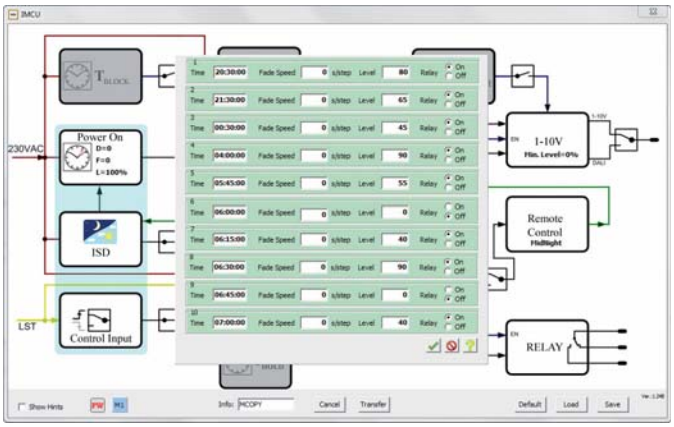
The iCTI features 4 memory cells for different lighting situations.

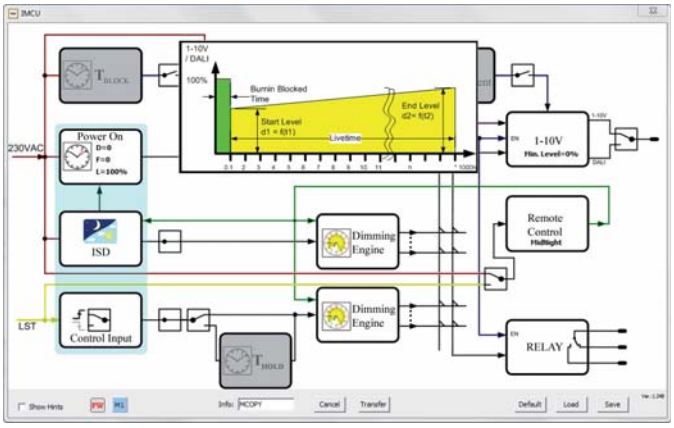
Standard connection: USB 2
OS: upgradeable firmware
The continually updated programming software can be downloaded at www.vossloh-schwabe.com/en/home/products/light-management-systems-for-outdoor-applications/smart-night.html
Dimensions: 180x65x40 mm
Weight: 0.2 kg
Ref. No.: 186246

For subsequent controller configuration especially for luminaire manufacturing and maintenance
Standard connection: USB 2
OS: upgradeable firmware
The continually updated programming software can be downloaded at www.vossloh-schwabe.com/en/home/products/light-management-systems-for-outdoor-applications/smart-night.html
Ref. No.: 186392 iCTI-USB

iCTI iCTI-USB







iCTT – intelligent Configuration Technician Tool

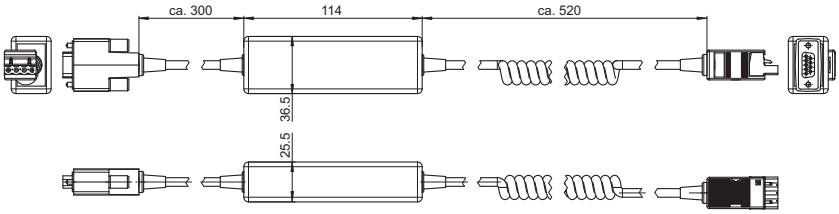

iCTT

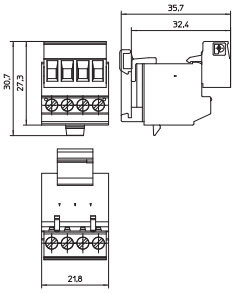
For subsequent configuration of lighting scenes

The push-in terminal delivered along with this portable configuration tool is located on a DIN rail (top-hat section) in the distribution board and is connected to the lighting circuit.

Reconfiguring lighting scenes at a later point in time involves using the push-in terminal and the iCTT's connector to make a connection to a laptop or PC. The MidNight Configurator software is then used to adjust the relevant settings and transfer these new values to the lighting system.

Once the configuration process has been completed, the iCTT is disconnected again and the protective cover of the push-in terminal is replaced.





Technical Notes

Portable use
Dimensions (LxWxH): 103x35x25 mm
Connection to the lighting system:
- Push-in terminal with protection cover: MSTB 2.5/4-ST-5.08
- Plug: MSTBVK 2.5/4-G-5.08, lead length: 1 mm

Connection to a laptop/PC:
- RS-232 One DB9 male (Standard EIA),
- lead length: approx. 0.3 m

Operating temperature: -20 to 70 °C
Humidity: 5-90% RH at max. 50 °C
Degree of protection: IP20

Type	**Ref. No.**	Voltage AC V, Hz	Power consumption mW	Control input L_{ST} V	Switching current A (λ = 0.8)	Weight g
iCTT	**186241**	220-230, 50	< 500	230	4	250
iCTT Terminal Block	**186391**	Terminal block for iCTT				

iMICO – intelligent Multifunctional Controller Units

For outdoor luminaire control

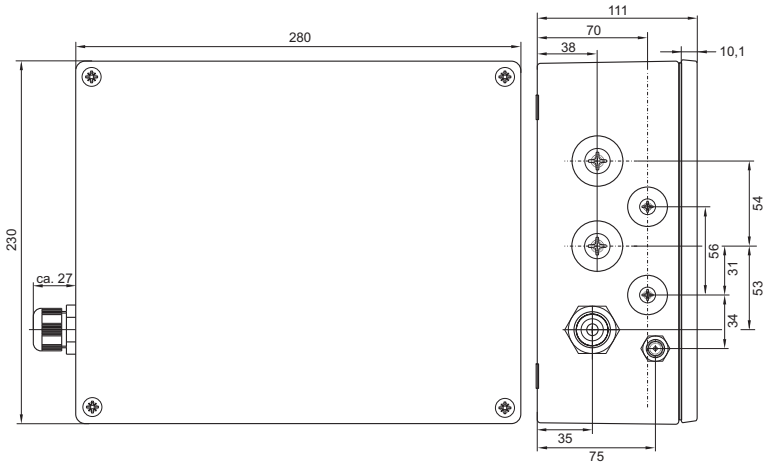
By installing the iMICO in a street-side distribution board and using the MidNight function, it is possible to update the lighting profiles of an iMCU controller or of a dimmable electronic ballast from a central location without needing to install any additional wiring in the street.

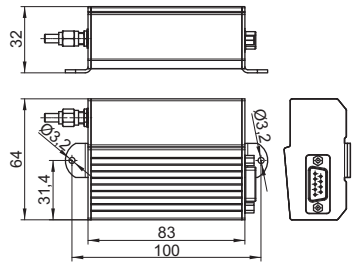
This function is typically used in cases that require the lighting profile to be changed several times per year or if it needs to remain possible to deactivate dimmed output periods of a city's lighting system in a targeted manner, e.g. during city festivals or other events.

The web-based iMICO works on the iSITE web platform. To reconfigure a lighting profile, the server sends a text message to the iMICO via the mobile phone network. The iMICO then transfers the new configuration to the connected controllers or Mid-Night electronic ballasts by switching the mains phase or another free phase on and off. These controllers will even prevent any flickering in luminaires during signal transfer.

iMICO BI – incl. transformer and relay, completely pre-wired

iMICO – single controller without transformer and relay





Technical Notes

Operating temperature: –20 to 50 °C
Storage temperature: –25 to 75 °C
Humidity during operation: 5–75%
Protection class I
1 relay contact: potential-free (input, opener, closing contact)
Material: aluminium AlSi12 (Fe)
Drill holes for cables for iMICO-BI:
- 2 PG metric fittings (25x1.5 mm)
- 2 PG metric fittings (32x1.5 mm)
- 1 PG metric fittings (20x1.5 mm)
- 1 fixing hole for antenna connection

Interfaces

Transmission: mobile phone network, requires quad band SIM card
Protocols: SMS, GPRS
Internal modem: Telit 862
Internal and external antenna: MMCX

Type	**Ref. No.**	Voltage AC V, Hz	Max. switching output A/V	Overvoltag protection kV	Degree of protection	Dimensions LxWxH (mm)	Weight g
iMICO-BI	**186250**	220-230, 50	16/250	4	IP65	280x230x112	4400
iMICO	**186240**	220-230, 50	–	2	IP20	90x65x50	450

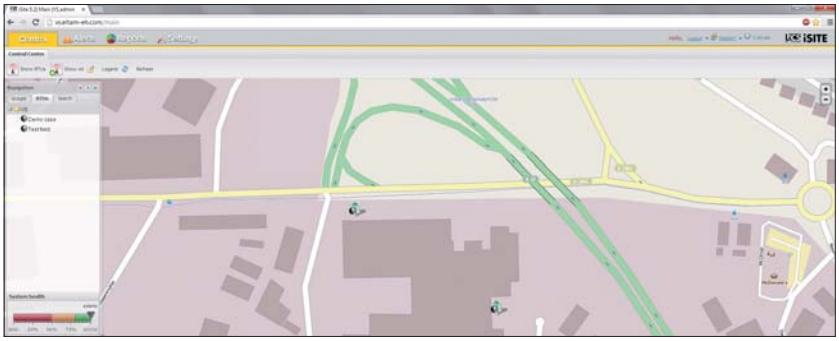
iSITE MidNight – intelligent Configuration Software

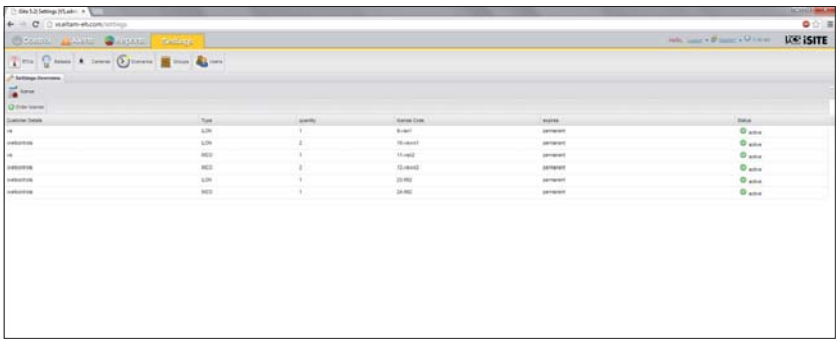
For programming lighting situations using iMICO

iSITE can be accessed using any PC with an internet browser (preferably Google Chrome) and was developed to configure the iMICO controller.
This convenient and quick method enables all lumi-n aires to be reprogrammed with new lighting profiles. The server-based supports Windows Server operat-ing systems. The following actions can be controlled using the software:

- Creating various timer programs
- Group allocation of various iMICOs
- Assignment of groups and timer programs
- Graphic representation (maps) showing the positions of luminaires and iMICOs
- Sending text messages to groups or to individual iMICOs to transfer settings
- Generating notifications (text messages) to confirm that settings were successfully transmitted

Ref. No.: 186244





System requirements

- Memory RAM: 4GB
  Memory HD: 2TB
- CPU: min. Dual Core,depending on the scope of the project
- Operating system: Windows server
- Data security: min. RAID 1 recommended RAID 5

iLC – intelligent Luminaire Controller (built-in)

Vossloh-Schwabe's light control units of the "Managed Night" series work with power-line communication using the C/B CENELEC band. Communication occurs in accordance with standardised directives EN 14908-1, EN 14908-3 and the Lonmark® OLC profile (outdoor luminaire controller profile).

iLC can be used as independent control unit in a light management system. The controller is integrated into a LON power-line light management system that requires a network connection to a central module (iDC)

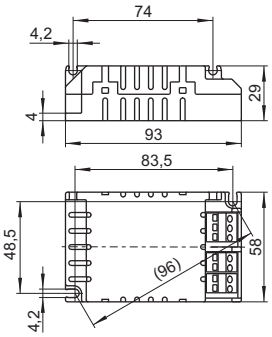
Once installed in a light management system, the controller delivers various performance data and status reports, for example voltage, current, power factor, energy consumption, lighting hours and temperature. Limits must be defined for each measured value, which are then monitored in the controller with a report being transmitted to the master system if limits are exceeded. As a result, the controller itself already intelligently monitors the luminaire. The calibrated performance data are available within a tolerance of 1 %

Technical Notes

Dimensions (LxWxH): 93x58x30 mm
Control output: DALI or 1–10 V for max. 4 EBs, short-circuit-proof
Bistable relay output: closing contact
Low-voltage control input: 1 x 5 V DC for sensors with "open collector" output or potential-free relay
Connection terminals: 0.5–1.5 mm²
Storage temperature: –25 to 85 °C
Operating temperature: –25 to 80 °C
Humidity: non-condensing
Degree of protection: IP20

iLC – intelligent Luminaire Controller (built-in)

Control input L_{ST} can be used for a control phase, a motion detector, a key switch, a light sensor or, if operated independently, to receive simple protocols.



Galvanic Isolation

The electronic ballast does not feature potential isolation between input and output: as soon as the electronic ballast is connected to the controller, the control input of the electronic ballast is not potential-free.

Typical Applications

Lighting for public spaces
Lighting in the vicinity of buildings
Lighting for tunnels

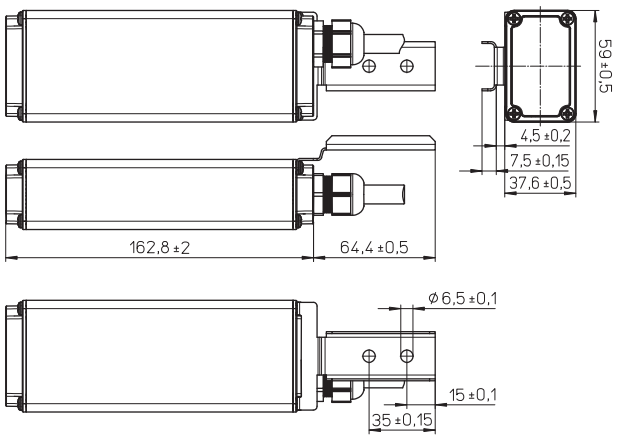
DPC MFF ISD DOO
BBT LST RCR
(s. p. 258)

Type	Ref. No.	Voltage AC V, 50 Hz	Power consumption W	Control input L_{ST} V	Switching output V	Switching current A (λ = 0.8)	Weight g
iLC	**186233**	110–250	< 1.0	230	230	4	100

iPC – intelligent Pole Controller

This light controller was developed for installation in a luminaire pole and features the same functions (and in full scope) as the iLC Controller on page 265.

iPC – intelligent Pole Controller



Technical Notes

Dimensions (LxWxH): 250x60x55 mm
Control output: DALI or 1–10 V for max. 4 EBs, short-circuit-proof
Bistable relay output: closing contact
Control output ECO ballast: 10 mA for power reduction relays
Connection cable: 1 m (special configurations are available on request)
Storage temperature: –25 to 85 °C
Operating temperature: –25 to 80 °C
Humidity: non-condensing
Degree of protection: IP67, Protection class I

Galvanic Isolation

The electronic ballast does not feature potential isolation between input and output: as soon as the electronic ballast is connected to the controller, the control input of the electronic ballast is not potential-free.

Typical Applications

Lighting for public spaces
Lighting in the vicinity of buildings

DPC **MFF** **ISD** **DOO**
BBT **LST** **RCR**
(s. p. 258)

Type	Suitable for	**Ref. No.**	Voltage AC V, 50 Hz	Power consumption W	Control input L_{ST} V	Switching output* V	Switching current A (λ = 0.8)	Weight g
iPC		**186234**	110–230	< 1.0	230	230	4	360
iPC-Lux	iLUX light sensors	**186235**	110–230	< 1.0	230	230	4	360
iPC-RC	ripple-control sound frequency**	**186236**	110–230	< 1.0	230	230	4	360
iPC-HFS	iHFS high frequency sensor	**186357**	110–230	< 1.0	230	230	4	360

* Optionally available with a second switching output on request

** Protocols on request

iDC – intelligent Data Concentrator

The iDC forms the master of the "Managed Night" light managment system and functions as the central connection interface to the software of the master system. The iDC can be programmed and also features application programs that are perfect for controlling lighting systems.

The following functions are an integral part of the product: timer programs, monitoring of limit values plus alarm function and alarm transmission, data conversion, data logging and email client.

Fitted with various interfaces such as S0 for counter registration, the M bus for remote counter reading or the MOD bus for extended sensor and actuating functions, the iDC can adapt to suit almost any control task.

Technical Notes

Dimensions (BxHxT): 280x230x112 mm
Material: aluminium AlSi12 (Fe)
Drill holes for cables:
- 2 PG metric fittings (25x1.5 mm)
- 2 PG metric fittings (32x1.5 mm)
- 1 PG metric fittings (20x1.5 mm)
- 1 fixing hole for antenna connection

Interfaces for power-line carriers
Inputs: 2 digital inputs 30 V DC
- Optionally extendable using a cut-off relay for 230 V AC: 2 impulse-counter inputs typ. of S0

Outputs: 2 relay outputs 230 V AC; 10 A
- Ethernet Port 10/100BaseT, auto-selecting,
- RS232 Interface for GSM/GPRS modem,
- for up to 200 controllers

LON power line carrier communication:
Protocols: in acc. with ANSI CEA 709.1 / EN 14908-1
- on the supply voltage (tri/single phase)

Transmission: in acc. with ANSI CEA 709.3 / EN 14908-3
IP communication: XML / SOAP, http, FTP, UDP
FME antenna connection: Male
Storage temperature: –25 to 85 °C
Operating temperature: –25 to 60 °C
Humidity: non-condensing
Degree of protection: IP65, Protection class I

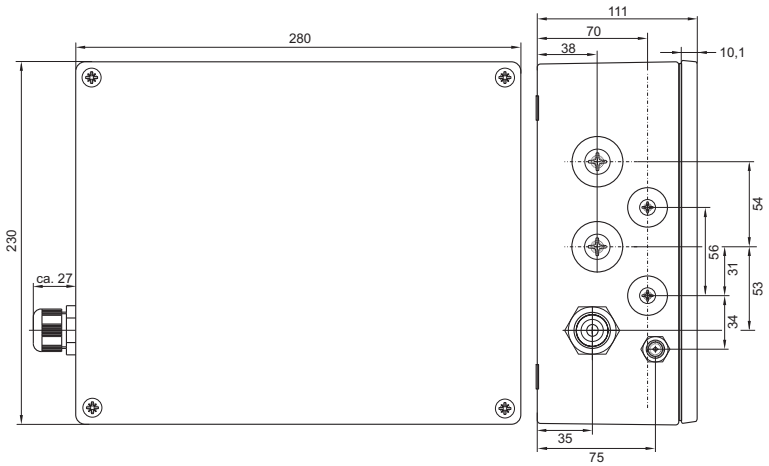
iDC – intelligent Data Concentrator

The iDC also provides a very well documented, web-based XML/SOAP interface or an optionally available OPC driver (open process control) to the SCADA (Supervisory Control and Data Acquisition) system. This makes it possible to integrate the iDC also into any BA (Building Automation) or control system.

The iLIC software was specifically developed to enable control of the iDC. Various extension options are available to suit common communication requirements: GPRS...G3, IP (CAT5), Fibre optic (FO) Single Mode, Fibre optic (FO) Multi Mode, and optionally also WLAN on request.

iCT – intelligent Configuration Software

- Specifically developed for commissioning an iDC
- Convenient and quick installation of all controllers in a network segment
- Quick commissioning thanks to clear identification of every controller with a barcode (scanner optional)
- The controller is configured in accordance with OLC-Lonmark® conventions



Type	Ref. No.	Voltage AC V, Hz	Average power consumption W	Transmission mode VA	Weight g
iDC-GPRS.3G	**186230**	230±10%, 50±1%	7	12	4400
iDC-IP	**186237**	230±10%, 50±1%	6.5	12	4400
iDC-FO-MM	**186238**	230±10%, 50±1%	7	12	4400
iDC-FO-SM	**186239**	230±10%, 50±1%	7	12	4400
iCT	**186242**	iDC commissioning software; the software can only be delivered along with the iDC and must be ordered separately.			
iLIC	**186243**	Software for visualizing; Operating system: independent (Linux derivate and Microsoft)			
iOPC	**186...**	Software for integration into the BA (Building Automation) (see page 270)			

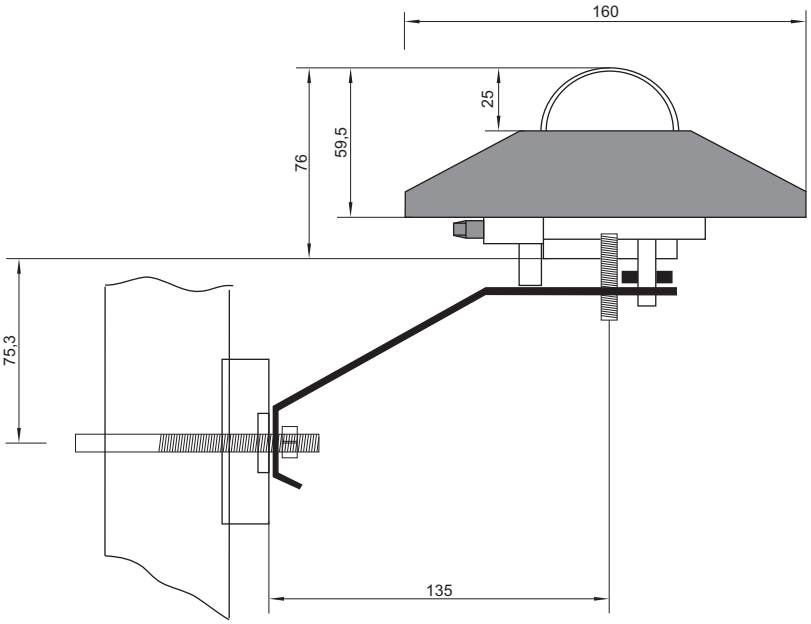
iLUX – intelligent Lux Meter with Power Line Interface

iLUX – Light sensor

The high-quality light sensor directly measures and delivers digital light metrics in lux to a light management system for the purpose of lighting control.

Lighting systems operated with or without a light management system can be switched on or off at a specific lux value via internal relays. The measured lux values can then be transmitted to the lighting system via the power line. Depending on the respective lighting level required in each case, it is therefore possible to independently control luminaires in different areas, e.g. at major and minor roads, pedestrian crossings and in parks.

The compact sensor can be fixed to the luminaire pole or a wall using the enclosed mounting bracket.

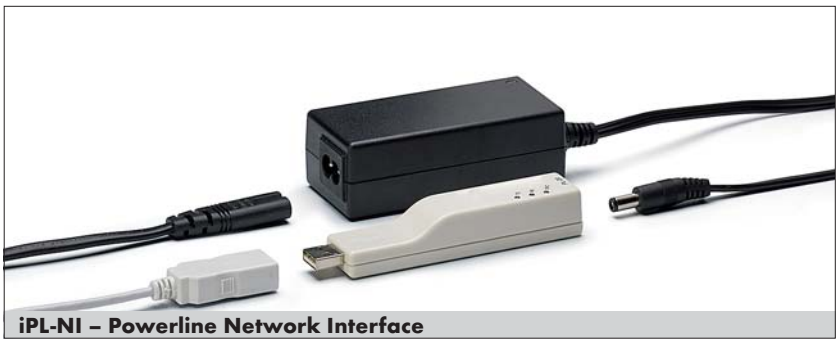


Technical Notes
Dimensions (LxWxH): 165x165x104 mm
Sensor casing: aluminium with a PC cover, sensor unit protected by opal glass
Connection cable to the controller: 10 m (special configurations available on request)
Storage temperature: –25 to 85 °C
Operating temperature: –25 to 80 °C
Humidity: non-condensing
Degree of protection: IP65
Weight of mounting bracket: 300 g
Casing and connection details of the iPC controller (intended for installation in luminaire poles), see page 208

Typical Applications
Lighting for public spaces
Lighting in the vicinity of buildings

Type	**Ref. No.**	Note	Weight g
iLUX	**186231**	Use only in combination with iPC-LUX (Ref. No.: 186235)	1000

iPL-NI Powerline Network Interface
For subsequent iLUX configuration without network operation
Data communication: notebook / PC and iLUX using a 230 V AC power supply cable
Operating system: XP and higher
For parameter configuration and firmware updates
Ref. No.: 186265



iPL-NI – Powerline Network Interface

LiCS OUTDOOR

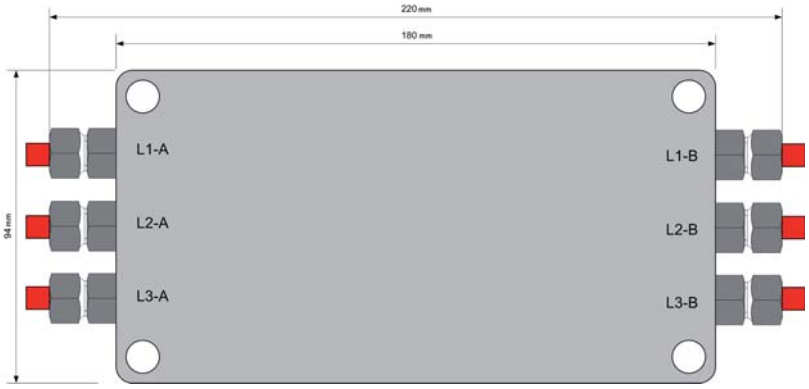
iCCU – intelligent, Capacitive Coupling Unit

Intelligent, capacitive coupling unit for powerline communication.
Powerline signals are transferred using the B/C frequency range in acc. with Cenelec specifications. The unit is suitable for direct installation without requiring configuration and is transparent for data transfer purposes. The unit draws no power when operated in standby mode.
No software-based configuration required
Connection with an NH fuse possible on request

Technical notes
Casing: PC
Dimensions (LxWxH): 180x94x60 mm
Mains voltage: 230 V AC ±10%, 50 Hz
Power consumption: 0.0 W
Leads: High-voltage silicone cable,
stranded conductors 1 mm², length: 80 mm
Storage temperature: –25 to 85 °C
Operating temperature: –25 to 65 °C
Degree of protection: IP65, Protection class I
Weight: 770 g
Resistance against surge voltage: 3 kV
Ref. No.: 186345


iCCU – Capacitive Coupling Unit

Typical applications
Lighting for public spaces, street lighting
Lighting in the vicinity of buildings
Company premises, warehouses, sports facilities



iBRIDGE – intelligent Wireless Bridge

For wireless signal transfer

iBRIDGE enables wireless transfer of control signals of the power-line network to adjacent lighting circuits without requiring a cable connection.

This makes it possible to jointly control several smaller, independent circuits within a larger lighting network and serves to reduce the number of required iDCs (data concentrators) since a larger number of controllers can be configured using a single iDC.

Sections of the lighting cable that are not suitable for power-line communication due to severe local interference can also be bridged using iBRIDGE.

Just like a controller, iBRIDGE is commissioned using the light management system and does not require any special software installation.


iBRIDGE

Technical Notes
Dimensions (ØxH): 105x120 mm
Mains voltage:120–277 V AC ±10%
Mains frequency: 50–60 Hz
Wireless frequency: 2.4 GHz
Power line communication frequency: Dual 115 kb/s and 132 kb/s
Wireless output: 10 mW
Operating temperature: –40 to 85 °C
Humidity during the operation: non-condensing
Connection: in acc. with NEMA Socket Standard BS5972
Degree of protection: IP66
Weight: 190 g
Ref. No.: 186275

iLIC – intelligent Luminaire Information Centre

For outdoor luminaire control

The luminaire information centre is the central control instrument of a light management system. All connected luminaires can be controlled, monitored and displayed using a web-based server application.

The server-based software supports both Windows and Linux operating systems. Firefox or Internet Explorer are the frontend applications to operate, control or display the light management system. The following actions can be controlled via the software:

- Switching individual luminaires on or off ahead of defined luminaire groups
- Defining the most diverse timer settings
- Evaluation and display of the lighting system status depending on various types of error message
- Evaluation of energy consumption at individual luminaire and luminaire-group level
- Graphic display of all acquired data over time (voltage, current, power, temperature, power factor, lighting hours, ...)

Ref. No.: 186243

Based on the software design, the lighting system displays information as a tree-like structure showing city, suburb, street, luminaire or can be broken down according to other criteria. The multi-client software also makes it possible to restrict rights and functions for different people or groups of people depending on their level of authorisation.

As the software is a wholly web-based application, system maintenance can be carried out via the web (global) or can be restricted to just the company using its LAN network, all depending on the system structure. Numerous users can access the system at the same time. Optional interfaces are also available to connect to other asset management systems.

System requirements

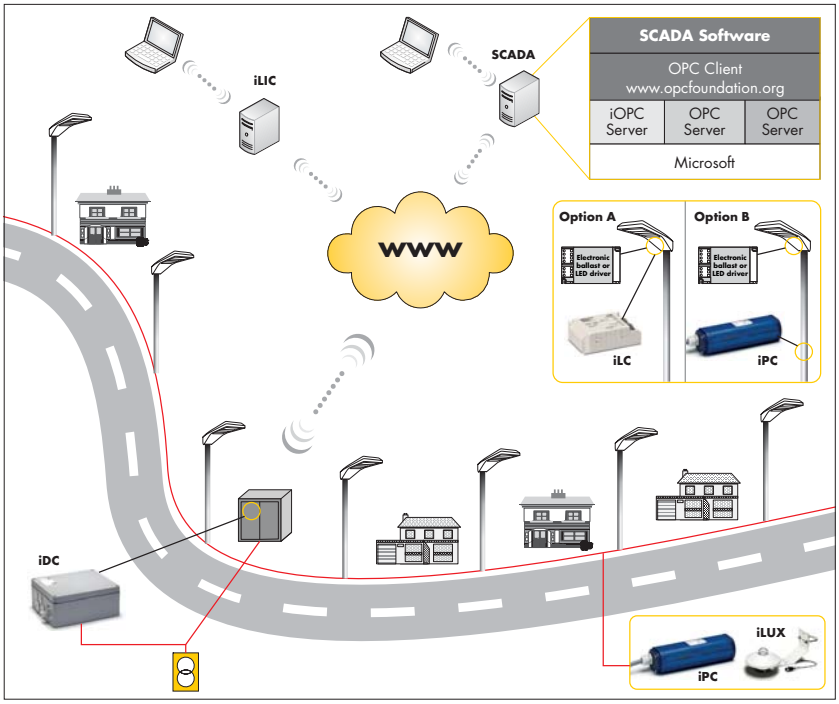
- Server: state-of-the-art
- Memory RAM: 4GB
  Memory HD: 2TB
- CPU: min. Dual Core, depending on the scope of the project
- Operating system: XP, Windows 7, Linux, Distribution, VM operation is possible
- Data security: min. RAID 1 recommended RAID 5

iOPC – intelligent OPC DA Server

iOPC DA Sever for connecting iDCs to typical control technology systems

The iOPC Server is used to integrate iDCs into standardised SCADA/control technology systems. The software runs on Microsoft® operating systems and provides a standard interface for integrating data points.
OPC DA specification: DA 2.05
Type: iOPC 1.001 Tool

Ref. No.: 186358 for max. 3 iDC
Ref. No.: 186359 for max. 10 iDC
Ref. No.: 186385 for max. 20 iDC



iHFS – intelligent High-Frequency Sensor

Motion sensor for street lighting

The iHFS enables energy-efficient and need-driven control of street lighting and lighting in the vicinity of buildings using intelligent high-frequency-based object detection. The sensor system functions reliably at all times irrespective of light and weather conditions.

The iHFS is available as a modular and an integrated system. With the modular version, up to 3 sensor modules can be attached to the luminaire pole, which enables simultaneous detection of objects from different directions. The detection field can be individually defined via the sensor's mounting angle.

With the integrated version, one sensor is typically mounted per luminaire. The sensor is installed directly in the luminaire.

Technical Notes

For Light Controller iPC-HFS (s. p. 266)
Dimensions (LxWxH): 83x75x67 mm
plus holder
Operating temperature: -20 to 70 °C
HF technology: 5.8 GHz
Cable length: 10 m

iHFS

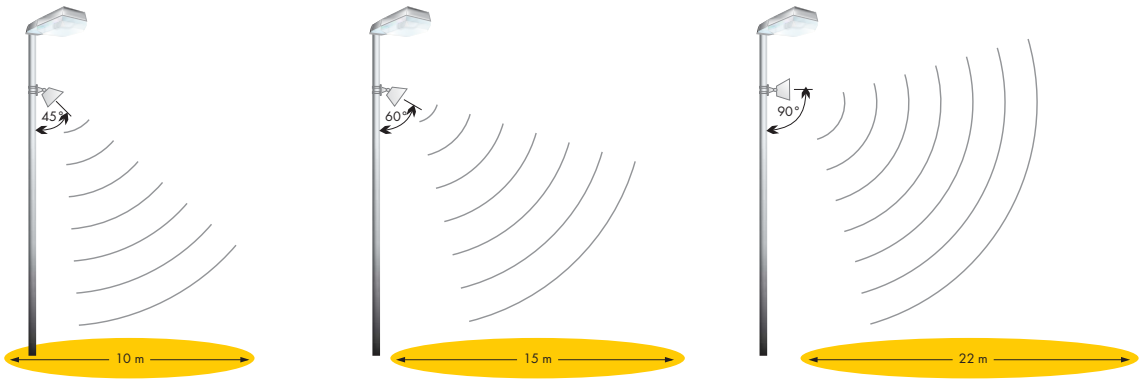
Installation

The sensors are attached to the luminaire pole using stainless steel tension bands (included in the scope of delivery). The direction of a sensor's detection field can be individually adjusted via the swivel-head holder.

Type	Note	**Ref. No.**	Power consumption W	Reach	Opening angle
iHFS-120 1	Sensor	**186253**	0.7 - 1.5 (1 - 3 sensors)	up to 22 m	120°

Sensor for built-in into luminaires on request.

Detection area



iSCT – intelligent Software Configurations Tool

The Managed Night power-line system as well as the two Smart and Flex Night systems can be controlled using the extremely robust tablet PC made by Panasonic and the associated software.

iSCT

Panasonic toughpad FZ-G1 for software configuration

- Full-ruggedized Windows 8 Tablet
- Intel® Core™ i5-3437U vPro processor
- Windows 8 Pro, Intel HD 4000 Graphic
- Daylight-readable 10,1" WUXGA outdoor display with IPSa technology (1920 x 1200) with up to 800 cd/m²
- Capacitive 10-point multi-touch screen and digitizer
- Standard connections: USB 3.0, HDMI and headphones
- Pre-configurable port (serial, LAN, microSD or USB 2.0)
- Up to 8 hours of battery life; battery can be changed by user
- Protected against water and dust
- Will survive being dropped from a height of up to 120 cm without suffering damage (as tested by Panasonic)
- With preinstalled and configured light management software

Dimensions: 270x188x9 mm, Weight: approx. 1.1 kg

Ref. No.: 186251

Further details can be found under:
http://business.panasonic.co.uk/computer-product/toughpad/fz-g11

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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 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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