LIGHTING SOLUTIONS

Innovative Systems 2016

LED Constant-current Systems
LED modules, optics and constant-current drivers

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 and colour control units

Emergency Lighting Devices for LED Applications

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

LiCS Indoor
Lighting control systems for indoor applications

LiCS Outdoor
Lighting control systems for outdoor applications

03/2016 | 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, OPTICS, 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 continual basis.

LED modules are used in a variety of applications 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 driver and a matching control unit.

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

Precise optics from Vossloh-Schwabe enable efficient implementation of application-specific light distributions for shops, offices, industrial plants and street lighting.

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.

Supermarket, Moscow
VS products: LED Line SMD Kits, LED drivers and optics Retail SYM

Castle Vollrads, Germany

Pjatjorotschka Supermarket, Moscow, Russia

Castle Vollrads, Germany

Surrounded by forest and vineyards, Vollrads Castle lies in the middle of Germany's beautiful Rheingau region in the federal state of Hesse. Apart from the historical castle itself, the vineyard, restaurant and a broad range of events go to make Vollrads Castle an extremely popular sightseeing destination.

The vineyard at Vollrads Castle is one of the world's oldest and documentary proof exists that wine was traded here as early as 1211. Nowadays, the Vollrads winery concentrates solely on the cultivation of Riesling vines over an area of some 80 hectares.

Almost the entire outdoor and façade lighting, including the castle's emblematic and imposing tower, features energy-efficient LED modules and drivers made by Vossloh-Schwabe.

Luminaires and lighting solutions: Arne Fiedler
Photos: Matthias Klenke

Pjatjorotschka Supermarket, Moscow, Russia

Energy efficiency is an important topic in the retail trade and substantial energy savings can be achieved in the area of shop lighting. For that reason, an ever increasing number of retail companies are switching to energy efficient technology. In this vein, the entire lighting system was replaced with energy-saving LED technology in the course of refurbishment work at a shop of the Pjatjorotschka supermarket chain.

One of Russia's largest supermarket chains is now using one of the most efficient lighting systems on the market. And Vossloh-Schwabe components feature in the entire system – from simple lamps right up to the central controller.

The aim of the project was to install an automated and efficient lighting system that guarantees ideal lighting during business hours, protects the shop from burglars at night and increases shop visibility.

ALU-MAXi-SP luminaires in a length of 2.8 m – fitted with VS LEDLine SMD Kit LED modules, corresponding VS LED drivers and VS optics featuring Standard and Retail SYM beam characteristics – now provide general lighting in the retail area, at the tills and in the fresh vegetable area.

LED System Overview by Application Fields

STREET

+ LICS OUTDOOR

LED modules
- M-Class: IP20, IP66, IP67, IP69, Allround, LightEngine
- S-Class: IP20, IP66, IP67, IP69, Allround, LightEngine
- AreaLED: IP20, IP66, IP67, IP69, Allround, LightEngine
- LUGA C

LED drivers
- Capacity range: 40–150 W
- Current supply: 350–1400 mA
- Dimming: DALI, PUSH, 1–10 V, power-reduction
- Variants: PrimeLine and ComfortLine
- Functions: 3C, NTC, MFF

Accessories
Optics (silicone, PMMA), luminaire protection device, power switches, switch units

ARCHITECTURE

+ LICS OUTDOOR

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

LED converters
- 24 V: ComfortLine and EasyLine
  Capacity range: 20, 50, 70, 75, 100, 130, 150 W
  Degree of protection: IP20, IP67
- 12 V: ComfortLine and EasyLine
  Capacity range: 6, 12, 50, 70 W
  Degree of protection: IP20, IP67

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

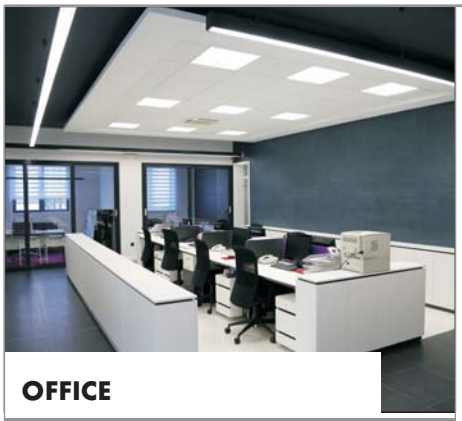
INDUSTRY

+ LICS INDOOR

LED modules
- SYM I: IP20, IP66, IP67, IP69, Allround, LightEngine
- SYM II: IP20, IP66, IP67, IP69, Allround, LightEngine
- LUGA C

LED drivers
- Capacity range: 19.95–230 W
- Current supply: 350–3200 mA
- Dimming: DALI, PUSH, 1–10 V
- Variants: ComfortLine and EasyLine

Accessories
Optics (silicone, PMMA), Luminaire protection device, inrush current limiter, resistor network



OFFICE

+ LICS INDOOR

LED modules
- LUGA Line, LUGA Line RX and LUGA Line Food: Linear COB modules
- LED Line SMD: Kit, Kit 3R, L14/28/56, Slim
- LED Line Fix: LUGA and SMD
- LED Line AluFix: LUGA, LUGA RX and SMD
- LED Line SMD LightBar
- LED Light Panel SMD

LED drivers
- Capacity range: 9–107 W
- Current supply: 60–700 mA
- Dimming: DALI, PUSH, 1–10 V, power-reduction
- Variants: PrimeLine and ComfortLine
- Functions: 3C, NTC, MFF

Accessories
Optics, luminaire protection device, power switches, switch units

RETAIL

+ LICS INDOOR

LED modules
- LUGA Shop
- LUGA C

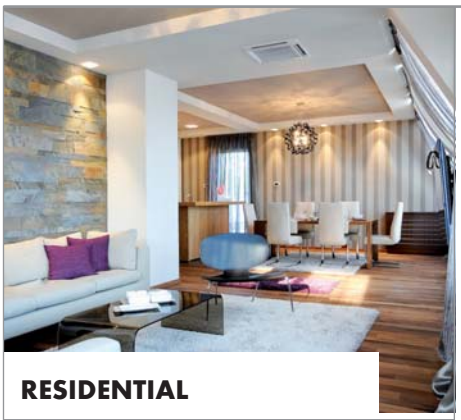
LEDSpots and Downlights
- ShopLine, NEXT 111
- EVO75, EVO90
- ActiveLine: LUGA, COB 9.1, COB 7.1, COB 6.1, HALO, Quad
- Downlights Pro and Prime

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

LED modules for direct connection to mains
- NEXT 111 R
- EVO75 R, EVO90 R

LED Lamps
- AR111
- GU10

Accessories
Optics, luminaire protection device, inrush current limiter, resistor network



RESIDENTIAL

+ LICS INDOOR

LED modules
- PowerEmitter
- TriplePowerEmitter

LED drivers
- Capacity range: 5.6–36 W
- Current supply: 150–1050 mA
- Dimming: Phase-cut dimmable
- Variants: ComfortLine and EasyLine

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

LEDSpots and Downlights
- Single LEDSpots: IPLine, SmartLine, StartLine, FlatLine, DiscLine, EffectLine
- ActiveLine Pro
- DecoLEDs

LED Lamps
- MR16
- GU10

Accessories
Optics, reflectors, heat sinks

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 15,000 lm can be achieved.

Various brightness levels can be set by selecting the requested operating current. 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

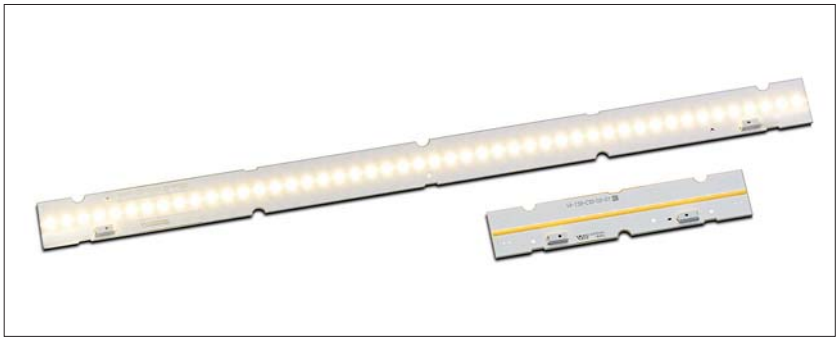
To ensure safe operation of LEDs that are connected in series, the operating current must be kept at a constant value by the driver. It is recommended to operate all high-performance LED modules in combination with an external constant-current driver.

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 voltage 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 with reflectors in luminaires constructed for T5 and T8 lamps.

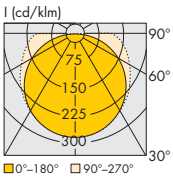


Technical notes

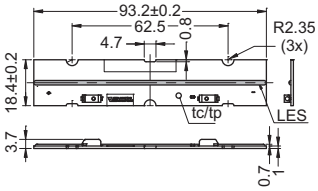
Dimensions: 280x18.4 mm and 93x18.4 mm
On-board push-in terminals (WAGO 2059)
Allowed operating temperature at t_c point:
-40 to 85 °C (> 700 mA)
-40 to 105 °C (≤ 700 mA)
Use of external LED constant-current drivers
Efficiency up to 148 lm/W
Colour rendering index R_a: > 80/> 90
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L80/B10:
50,000 hrs. (I_F 700 mA)
Packaging unit: 60 pcs.

Typical applications

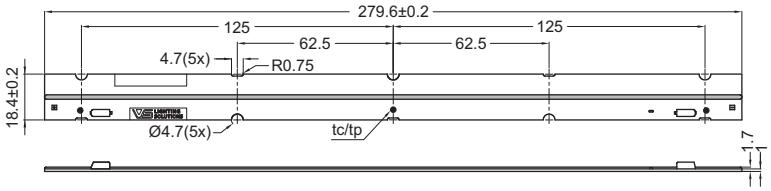
- Office lighting
- Retail lighting
- T5/T8 replacement as built-in module
- Furniture lighting



DML028



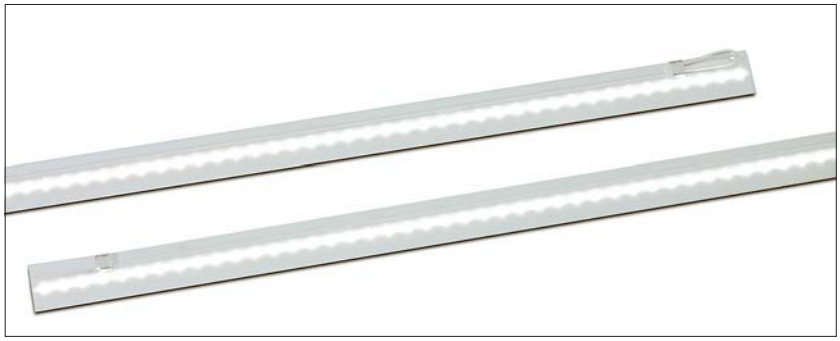
DML068



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 °	Typ. CRI R_a
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
DML068S31FPR	**557987**	pearl white	3100	680	115	935	109	1260	102	1730	91	120	95
DML028				P_{el} = 2 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	475	116	655	103	120	82
DML028C30FBR	**558102**	warm white	3000 (below BBL)	245	125	340	119	455	111	625	98	120	82
DML028C35FR	**559892**	neutral white	3500	265	135	370	130	490	119	680	107	120	82
DML028C40FR	**558103**	neutral white	4000	270	138	375	132	500	122	685	108	120	84
DML028C40FBR	**558104**	neutral white	4000 (below BBL)	260	133	360	126	485	118	665	104	120	84
DML028C50FR	**558105**	cool white	5000	275	140	380	133	510	124	700	110	120	84
DML028C65FR	**559893**	cool white	6500	275	140	380	133	510	124	700	110	120	84
DML028S31FPR	**558106**	pearl white	3100	215	110	300	105	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



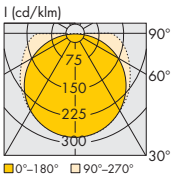
Built-in PCB lighting modules

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 with reflectors in luminaires constructed for T5 and T8 lamps.

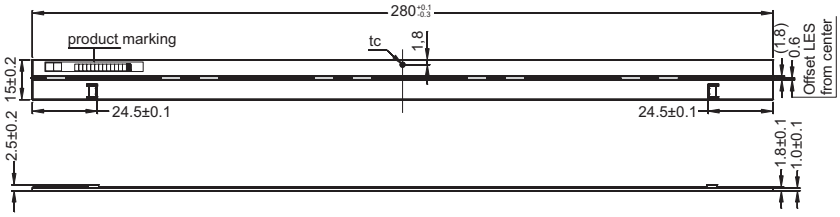
Typical applications

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

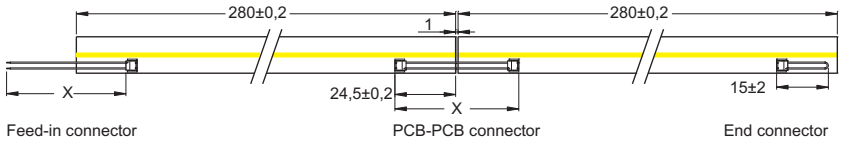


Technical notes

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
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)
Packaging unit: 60 pcs.



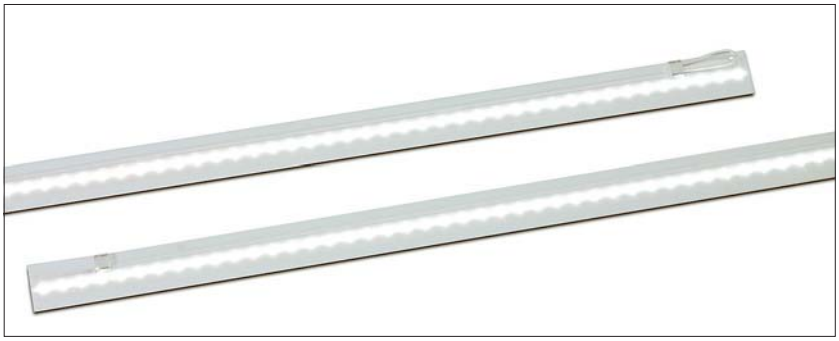
Connection example



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).

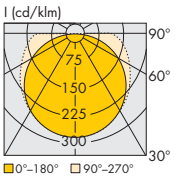
The ceramic PCB ensures optimum thermal management. Thanks to producing a homogeneous light field without any discernible individual light points, these LED modules are ideal for use with reflectors in luminaires constructed for T5 and T8 lamps.

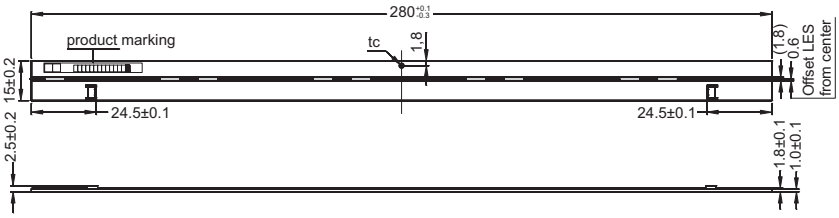
Technical notes

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
Ceramic PCB for optimum thermal management
Colour rendering index R_a: > 80/> 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)
Packaging unit: 60 pcs.

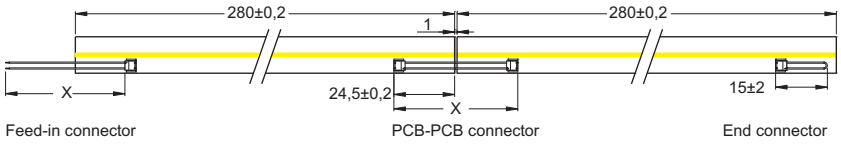
Typical applications

- 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

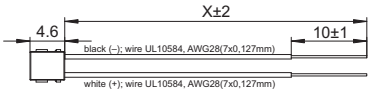


Type	Ref. No.	Colour	Correlated colour tempera-ture* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})** 700 mA lm	lm/W	1050 mA lm	lm/W	Typ. beam angle °	Typ. CRI R_a	Typical applications
LUGA Line 2015 – FOOD				P_{el} = 11.5 W $U_{typ.}$ = 16.4 V		P_{el} = 19.1 W $U_{typ.}$ = 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**	"pink effect"	2000	675	59	965	51	120	82	Meat
DML059M40EC	**556935**	"white effect"	4000	790	69	1125	59	120	70 (special spectrum: HiGa)	Meat

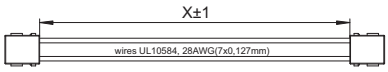
Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ±10%

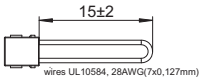
Accessories for LUGA Line Modules

Other lead lengths on request



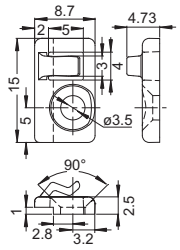
Feed-in connector
Feed in connector for power supply
Colour: – black
+ white
Max. permissible current: 1.5 A
Number of strands: 2
(Strand diameter: 0.09 mm²/AWG28)
Type: 893
Ref. No.: 551131 X = 310 mm
Ref. No.: 550952 X = 610 mm



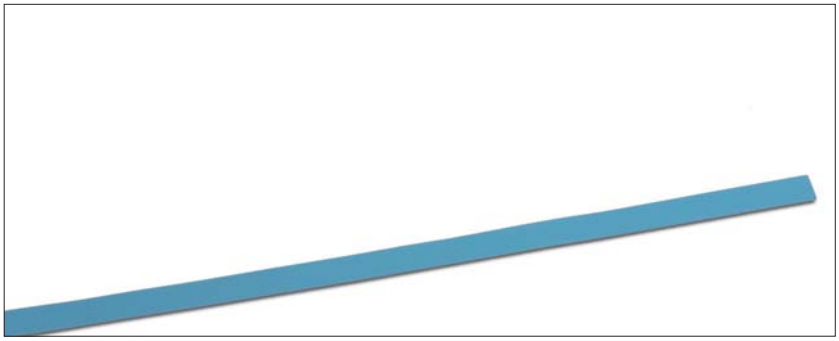


PCB–PCB connector
Max. permissible current: 1.5 A
Type: 893
Ref. No.: 551129 X = 43 mm
Ref. No.: 549993 X = 61 mm
Ref. No.: 549992 X = 220 mm

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
Minimum required
3 pcs. per 1 LUGA Line module
5 pcs. per 2 LUGA Line modules
7 pcs. per 3 LUGA Line modules
Ref. No.: 551039



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

LED Line SMD Kit Gen. 2

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.

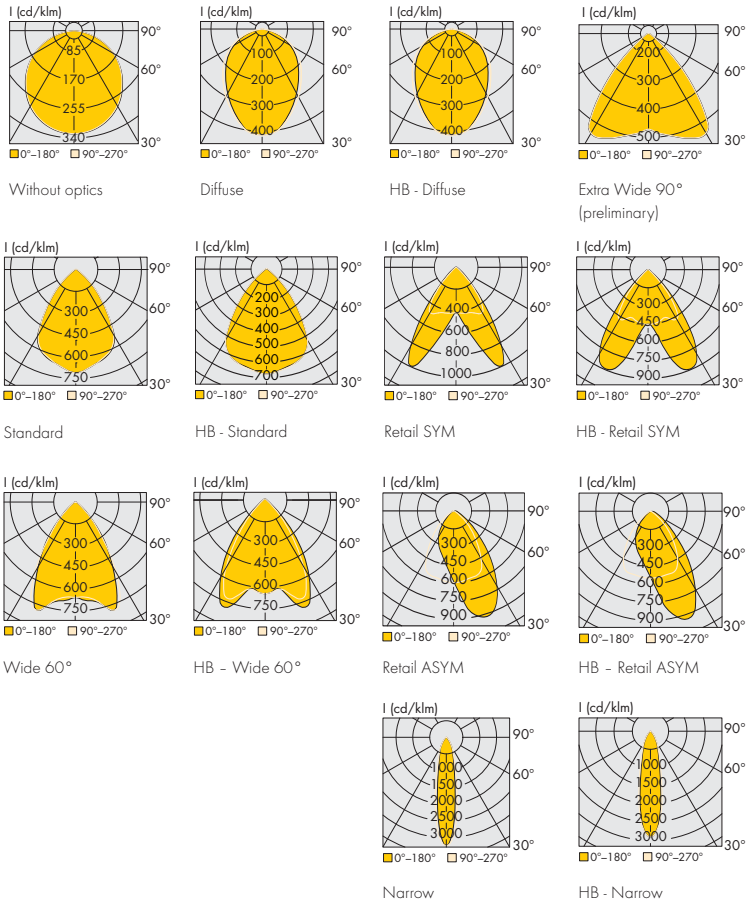
VS also provides optics that are perfect for office, industrial and shop (e.g. supermarket) lighting.

Technical notes

Dimensions (LxW):
WU-M-480-G/501-G: 280x39.6 mm
WU-M-481-G/502-G: 560.6x39.6 mm
On-board push terminal system
Allowed operating temperature at t_c point:
-20 to 75 °C
Use of external LED constant-current drivers
Efficiency up to 183 lm/W
Colour rendering index R_a: > 80
Lumen maintenance L80/B10:
60,000 hrs. (I_F 350 mA; t_p 50 °C)

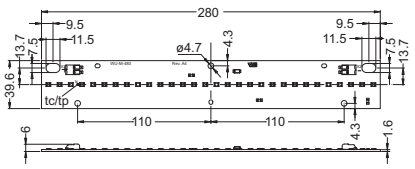
Typical applications

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

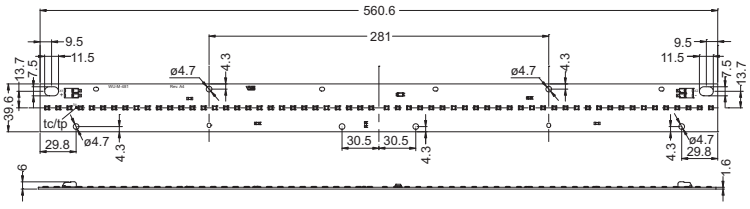


Dimensions of SMD board

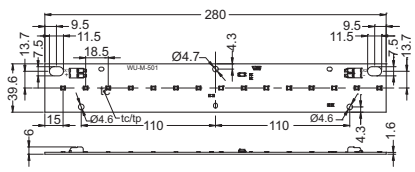
WU-M-480-G



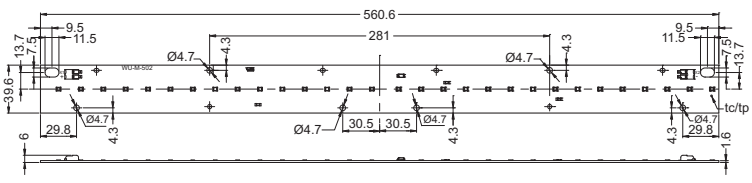
WU-M-481-G



WU-M-501-G



WU-M-502-G



LED Line SMD Kit Gen. 2

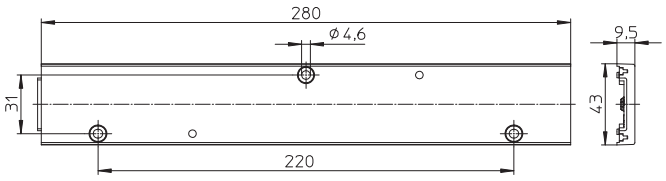
Built-in PCB lighting modules with optics

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	
					350 mA			500 mA			700 mA					
					min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W		min. R_a	typ. R_a
		pcs.		K										°		
280 mm – 30 LEDs					P_{el} = 4.9 W $U_{typ.}$ = 13.9 V			P_{el} = 7.2 W $U_{typ.}$ = 14.4 V			P_{el} = 10.5 W $U_{typ.}$ = 15 V					
WU-M-480-G-830	**560115**	30	warm white	3000	720	780	160	1010	1100	152	1385	1500	143	120	80	85
WU-M-480-G-840	**560116**	30	neutral white	4000	750	820	168	1055	1150	159	1445	1570	150	120	80	85
WU-M-480-G-850	**560117**	30	neutral white	5000	780	890	183	1100	1255	174	1500	1715	164	120	80	85
WU-M-480-G-865	**560118**	30	cool white	6500	780	860	176	1100	1205	168	1500	1650	158	120	80	85
560 mm – 60 LEDs					P_{el} = 9.8 W $U_{typ.}$ = 27.9 V			P_{el} = 14.4 W $U_{typ.}$ = 28.8 V			P_{el} = 20.9 W $U_{typ.}$ = 29.9 V					
WU-M-481-G-830	**560123**	60	warm white	3000	1440	1565	160	2020	2195	152	2765	3005	143	120	80	85
WU-M-481-G-840	**560124**	60	neutral white	4000	1500	1635	168	2110	2295	159	2885	3145	150	120	80	85
WU-M-481-G-850	**560125**	60	neutral white	5000	1565	1785	183	2195	2505	174	3005	3430	164	120	80	85
WU-M-481-G-865	**560126**	60	cool white	6500	1565	1720	176	2195	2415	168	3005	3300	158	120	80	85
280 mm – 15 LEDs					P_{el} = 3 W $U_{typ.}$ = 8.5 V			P_{el} = 4.4 W $U_{typ.}$ = 8.8 V			P_{el} = 6.4 W $U_{typ.}$ = 9.2 V					
WU-M-501-G-830	**560131**	15	warm white	3000	430	465	156	600	650	148	815	885	138	120	80	85
WU-M-501-G-840	**560132**	15	neutral white	4000	445	485	164	625	680	155	850	930	144	120	80	85
WU-M-501-G-850	**560133**	15	neutral white	5000	465	530	179	650	745	169	885	1010	157	120	80	85
WU-M-501-G-865	**560134**	15	cool white	6500	465	510	172	650	715	162	885	975	151	120	80	85
560 mm – 30 LEDs					P_{el} = 6 W $U_{typ.}$ = 17 V			P_{el} = 8.8 W $U_{typ.}$ = 17.6 V			P_{el} = 12.9 W $U_{typ.}$ = 18.4 V					
WU-M-502-G-830	**560135**	30	warm white	3000	855	930	156	1200	1300	148	1635	1775	138	120	80	85
WU-M-502-G-840	**560136**	30	neutral white	4000	895	975	164	1250	1365	155	1705	1855	144	120	80	85
WU-M-502-G-850	**560137**	30	neutral white	5000	930	1065	179	1300	1485	169	1775	2025	157	120	80	85
WU-M-502-G-865	**560138**	30	cool white	6500	930	1025	172	1300	1430	162	1775	1950	151	120	80	85
High Brightness – 280 mm – 30 LEDs					P_{el} = 9.7 W $U_{typ.}$ = 27.8 V			P_{el} = 14.3 W $U_{typ.}$ = 28.6 V			P_{el} = 20.7 W $U_{typ.}$ = 29.6 V					
WU-M-480-G-HB-830	**560119**	30	warm white	3000	1305	1455	149	1835	2040	143	2505	2790	135	120	80	85
WU-M-480-G-HB-840	**560120**	30	neutral white	4000	1360	1535	158	1910	2155	151	2610	2945	142	120	80	85
WU-M-480-G-HB-850	**560121**	30	neutral white	5000	1420	1605	165	1990	2255	158	2720	3080	149	120	80	85
WU-M-480-G-HB-865	**560122**	30	cool white	6500	1420	1570	161	1990	2205	154	2720	3010	145	120	80	85
High Brightness – 560 mm – 60 LEDs					P_{el} = 19.5 W $U_{typ.}$ = 55.6 V			P_{el} = 28.6 W $U_{typ.}$ = 57.1 V			P_{el} = 41.4 W $U_{typ.}$ = 59.2 V					
WU-M-481-G-HB-830	**560127**	60	warm white	3000	2610	2905	149	3665	4080	143	5010	5575	135	120	80	85
WU-M-481-G-HB-840	**560128**	60	neutral white	4000	2720	3070	158	3815	4310	151	5215	5890	142	120	80	85
WU-M-481-G-HB-850	**560129**	60	neutral white	5000	2840	3210	165	3985	4505	158	5445	6160	149	120	80	85
WU-M-481-G-HB-865	**560130**	60	cool white	6500	2840	3140	161	3985	4410	154	5445	6025	145	120	80	85
High Brightness – 280 mm – 15 LEDs					P_{el} = 5.9 W $U_{typ.}$ = 16.9 V			P_{el} = 8.8 W $U_{typ.}$ = 17.5 V			P_{el} = 12.7 W $U_{typ.}$ = 18.2 V					
WU-M-501-G-HB-830	**560139**	15	warm white	3000	775	865	146	1085	1210	139	1480	1645	129	120	80	85
WU-M-501-G-HB-840	**560140**	15	neutral white	4000	810	915	155	1130	1280	146	1540	1735	137	120	80	85
WU-M-501-G-HB-850	**560141**	15	neutral white	5000	845	955	162	1180	1335	153	1605	1815	143	120	80	85
WU-M-501-G-HB-865	**560142**	15	cool white	6500	845	935	158	1180	1305	150	1605	1775	140	120	80	85
High Brightness – 560 mm – 30 LEDs					P_{el} = 11.8 W $U_{typ.}$ = 33.8 V			P_{el} = 17.4 W $U_{typ.}$ = 34.9 V			P_{el} = 25.4 W $U_{typ.}$ = 36.3 V					
WU-M-502-G-HB-830	**560143**	30	warm white	3000	1555	1730	146	2175	2420	139	2955	3285	129	120	80	85
WU-M-502-G-HB-840	**560144**	30	neutral white	4000	1620	1825	155	2260	2555	146	3075	3470	137	120	80	85
WU-M-502-G-HB-850	**560145**	30	neutral white	5000	1690	1910	162	2360	2670	153	3210	3630	143	120	80	85
WU-M-502-G-HB-865	**560146**	30	cool white	6500	1690	1870	158	2360	2615	150	3210	3550	140	120	80	85

* Measurement tolerance: ± 7% | CRI > 90 on request

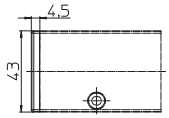
LED Line SMD Kit Gen. 2

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



Optics type	**Ref. No.**	Efficiency %	Weight g	Packaging unit pcs.
Standard	**555437**	95	50	192
Diffus	**559972**	88	50	192
Extra Wide 90°	**560570**	95	50	192
Wide 60°	**560573**	95	50	192
Narrow 30°	**560571**	95	50	192
Retail SYM	**555438**	95	50	192
Retail ASYM	**555439**	95	50	192

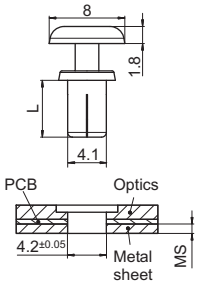
End cap
Lateral tongue and groove for optics attachment
Weight: 0.9 g, packaging unit: 500 pcs.
Type: 98810
Ref. No.: 555482



Fixing Clip
For fastening LED optics of type 998 and LED PCBs to luminaire sheets without needing screws
Vibration resistant version
Material: PA, natural (UL-94 V-2)
Weight: 0.2 g, Packaging unit: 1000 pcs.

Type	**Ref. No.**	For luminaire sheet thickness (MS) mm	Length L mm
98002	**562558**	1.4–2.2	9
98003	**562559**	2.3–3.1	10

Fixing Clip



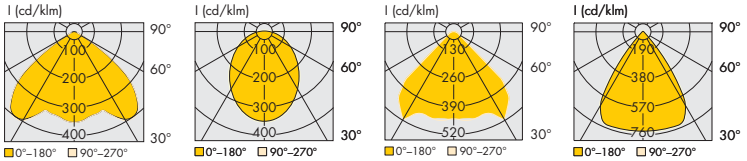
LED Line SMD Kit 3R

Built-in PCB lighting modules with optics

The LED Line SMD Kit 3R consists of an SMD module (length: 280 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.

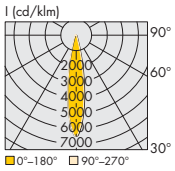


Extra Wide 110°

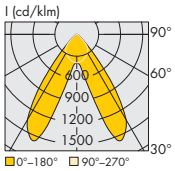
Diffuse

Wide 90° (preliminary)

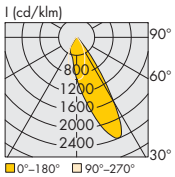
Wide 60°



Narrow 30°



Retail SYM



Retail ASYM

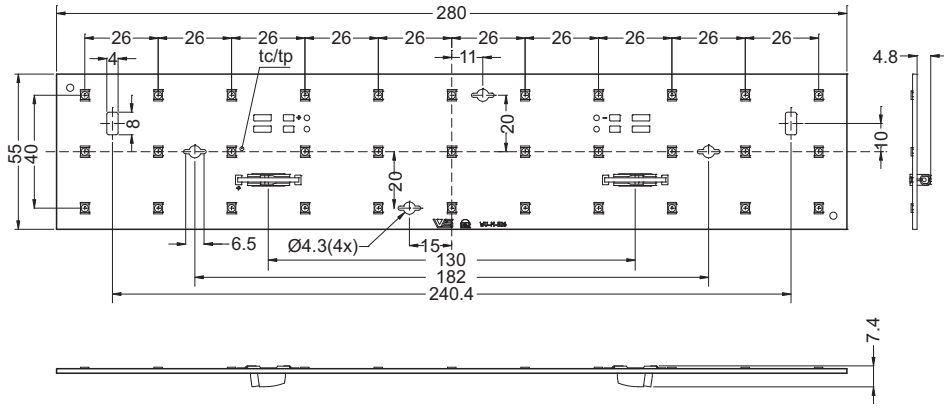
Technical notes

Dimensions: 280×55 mm
On-board push terminal system
Allowed operating temperature at t_c point:
–20 to 75 °C
Use of external LED constant-current drivers
Efficiency up to 186 lm/W
Colour rendering index R_a: > 80
Lumen maintenance L80/B10:
60,000 hrs. (I_F 350 mA; t_p 50 °C)

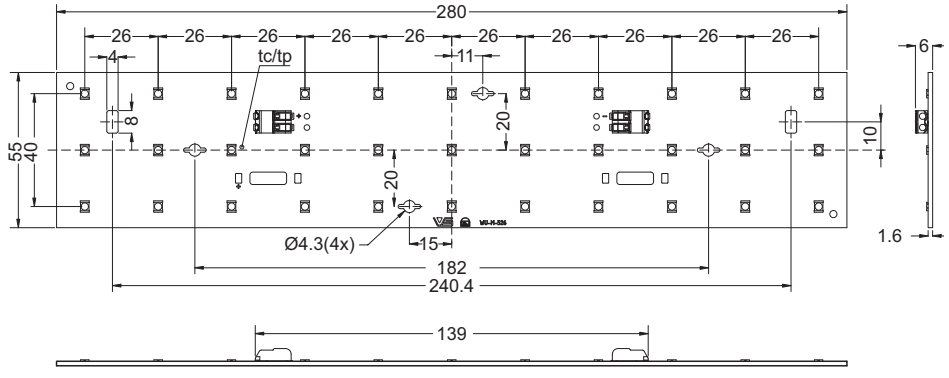
Typical applications

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

WU-M-526-BC



WU-M-526-TC



LED Line SMD Kit 3R

Type	Ref. No.	Colour	Correlated colour temperature	Luminous flux* (lm) and typical efficiency (lm/W), typical voltage ($U_{typ.}$) and power consumption (P_{el})												Beam angle*	CRI	
				150 mA			200 mA			350 mA			500 mA					
				min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	°	min. R_a	typ. R_a
			K	P_{el} = 4.5 W $U_{typ.}$ = 30.3 V			P_{el} = 6.2 W $U_{typ.}$ = 31 V			P_{el} = 11.5 W $U_{typ.}$ = 32.9 V			P_{el} = 17.3 W $U_{typ.}$ = 34.5 V					
WU-M-526 TopConnected (TC)																		
WU-M-526-TC-830	**560366**	warm white	3000	680	740	163	900	975	157	1520	1650	143	2095	2280	132	120	80	85
WU-M-526-TC-840	**560680**	neutral white	4000	710	775	170	940	1020	165	1585	1730	150	2190	2385	138	120	80	85
WU-M-526-TC-850	**561056**	neutral white	5000	740	845	186	975	1115	180	1650	1885	164	2280	2600	151	120	80	85
WU-M-526-TC-865	**561057**	cool white	6500	740	815	179	975	1075	173	1650	1815	158	2280	2505	145	120	80	85
WU-M-526 BottomConnected (BC)																		
WU-M-526-BC-830	**561061**	warm white	3000	680	740	163	900	975	157	1520	1650	143	2095	2280	132	120	80	85
WU-M-526-BC-840	**560716**	neutral white	4000	710	775	170	940	1020	165	1585	1730	150	2190	2385	138	120	80	85
WU-M-526-BC-850	**561062**	neutral white	5000	740	845	186	975	1115	180	1650	1885	164	2280	2600	151	120	80	85
WU-M-526-BC-865	**561063**	cool white	6500	740	815	179	975	1075	173	1650	1815	158	2280	2505	145	120	80	85

* Measurement tolerance: ±7% | CRI > 90 on request

Technical notes for optics

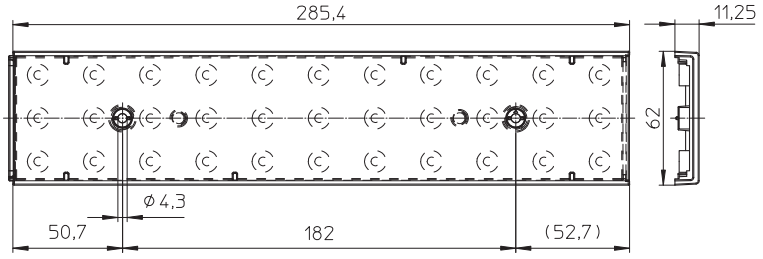
Dimensions (LxWxH): 285.4x62x11.25 mm
can be joined together,
for modules 280 mm, 560 mm and module chains.
Material: PMMA
Front-side groove or tongue to attach optics in series
Max. allowed ambient temperature $t_{a\ max.}$ = 55 °C
Fixation with flat or cylinder head screws (M4) or fixing clip
Max. torque: 1.2 Nm (M4)

Optics type	Ref. No.	Efficiency %	Weight g	Packaging unit (pcs.)
Extra Wide 110°	**560371**	95	105	120
Diffuse	**562543**	85	105.8	120
Wide 90°	**560376**	95	80	120
Wide 60°	**560372**	95	88	120
Narrow 30°	**560375**	95	94	120
Retail SYM	**560373**	95	93	120
Retail ASYM	**560374**	95	99	120

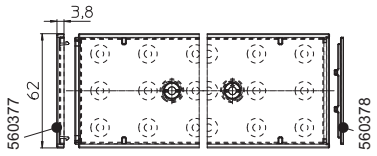
End cap

Lateral attachment on the optics
(on the side of the groove or tongue)
With fixing clips
Weight: 1.6/1 g, Packaging unit: 250/500 pcs.
Type: 994
Ref. No.: 560377 end cap for tongue side
Ref. No.: 560378 end cap for groove side

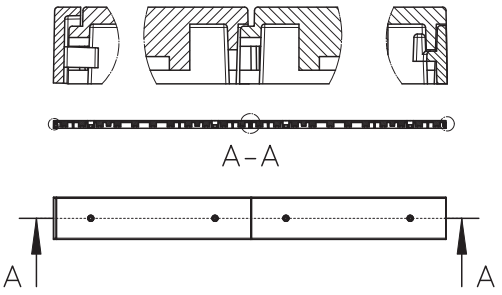
Optics



End cap



Assembly



Fixing Clip

For fastening LED optics of type 994 and LED PCBs
to luminaire sheets without needing screws
Ref. No.: 562557 For luminaire sheet thickness (MS) 0.5–1.3 mm
Ref. No.: 562558 For luminaire sheet thickness (MS) 1.4–2.2 mm
Ref. No.: 562559 For luminaire sheet thickness (MS) 2.3–3.1 mm

LED Line SMD Gen. 2 – 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

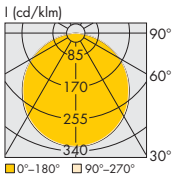
Dimensions:
- WU-M-G-507/508: 140×20 mm
- WU-M-G-509/510: 280×20 mm
- WU-M-G-511/512: 560×20 mm

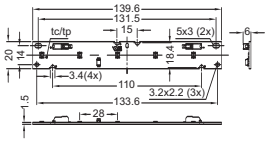
Fixation with M3 screws, screw head: Ø 6 mm
On-board push-in terminals (WAGO 2060)
Allowed operating temperature at t_c point:
- -20 to 75 °C

Use of external LED constant-current drivers required
Efficiency up to 179 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)

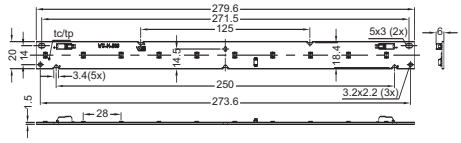
Typical applications

- 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



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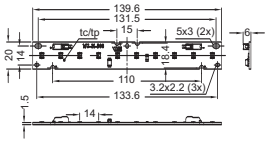
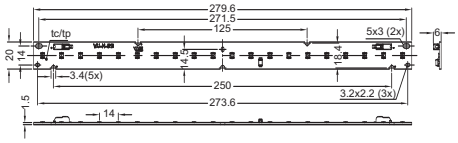
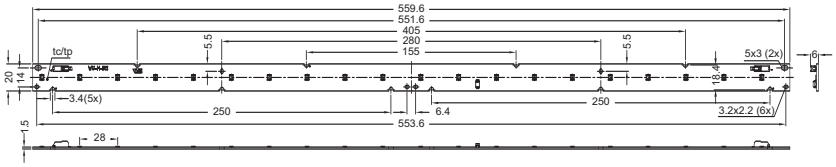


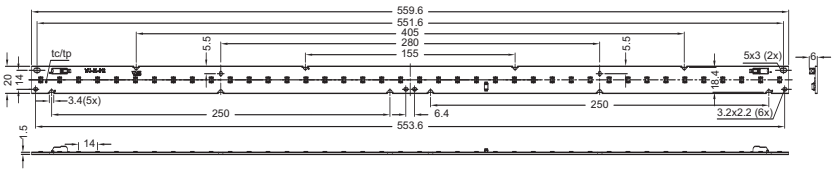
WU-M-508



WU-M-510

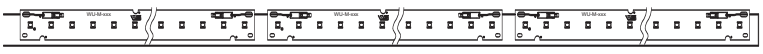


WU-M-511



WU-M-512

Connection example



LED Line SMD Gen. 2 – 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), typ. voltage ($U_{typ.}$) and power consumption (P_{el})									Beam angle	CRI	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.		min.	typ.
		pcs.		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	R_a	R_a
					P_{el} = 0.99 W			P_{el} = 1.47 W			P_{el} = 2.15 W					
L14 W2 – 5 SMDs					$U_{typ.}$ = 2.83 V			$U_{typ.}$ = 2.94 V			$U_{typ.}$ = 3.07 V					
WU-M-507-G-830	**560176**	5	warm white	3000	145	155	156	200	215	148	270	295	138	120	80	85
WU-M-507-G-840	**560177**	5	neutral white	4000	150	160	164	210	225	155	285	310	144	120	80	85
WU-M-507-G-850	**560179**	5	neutral white	5000	155	175	179	215	250	169	295	335	157	120	80	85
WU-M-507-G-865	**560180**	5	cool white	6500	155	170	172	215	240	162	295	325	151	120	80	85
					P_{el} = 1.98 W			P_{el} = 2.94 W			P_{el} = 4.29 W					
L14 W2 – 10 SMDs					$U_{typ.}$ = 5.67 V			$U_{typ.}$ = 5.88 V			$U_{typ.}$ = 6.13 V					
WU-M-508-G-830	**560164**	10	warm white	3000	285	310	156	400	435	148	545	590	138	120	80	85
WU-M-508-G-840	**560165**	10	neutral white	4000	300	325	164	415	455	155	570	620	144	120	80	85
WU-M-508-G-850	**560166**	10	neutral white	5000	310	355	179	435	495	169	590	675	157	120	80	85
WU-M-508-G-865	**560167**	10	cool white	6500	310	340	172	435	475	162	590	650	151	120	80	85
					P_{el} = 1.98 W			P_{el} = 2.94 W			P_{el} = 4.29 W					
L28 W2 – 10 SMDs					$U_{typ.}$ = 5.67 V			$U_{typ.}$ = 5.88 V			$U_{typ.}$ = 6.13 V					
WU-M-509-G-830	**560181**	10	warm white	3000	285	310	156	400	435	148	545	590	138	120	80	85
WU-M-509-G-840	**560182**	10	neutral white	4000	300	325	164	415	455	155	570	620	144	120	80	85
WU-M-509-G-850	**560183**	10	neutral white	5000	310	355	179	435	495	169	590	675	157	120	80	85
WU-M-509-G-865	**560184**	10	cool white	6500	310	340	172	435	475	162	590	650	151	120	80	85
					P_{el} = 3.97 W			P_{el} = 5.88 W			P_{el} = 8.58 W					
L28 W2 – 20 SMDs					$U_{typ.}$ = 11.33 V			$U_{typ.}$ = 11.76 V			$U_{typ.}$ = 12.26 V					
WU-M-510-G-830	**560168**	20	warm white	3000	570	620	156	800	870	148	1090	1180	138	120	80	85
WU-M-510-G-840	**560169**	20	neutral white	4000	595	650	164	835	910	155	1135	1235	144	120	80	85
WU-M-510-G-850	**560170**	20	neutral white	5000	620	710	179	870	990	169	1180	1350	157	120	80	85
WU-M-510-G-865	**560171**	20	cool white	6500	620	680	172	870	955	162	1180	1300	151	120	80	85
					P_{el} = 3.97 W			P_{el} = 5.88 W			P_{el} = 8.58 W					
L56 W2 – 20 SMDs					$U_{typ.}$ = 11.33 V			$U_{typ.}$ = 11.76 V			$U_{typ.}$ = 12.26 V					
WU-M-511-G-830	**560185**	20	warm white	3000	570	620	156	800	870	148	1090	1180	138	120	80	85
WU-M-511-G-840	**560186**	20	neutral white	4000	595	650	164	835	910	155	1135	1235	144	120	80	85
WU-M-511-G-850	**560187**	20	neutral white	5000	620	710	179	870	990	169	1180	1350	157	120	80	85
WU-M-511-G-865	**560188**	20	cool white	6500	620	680	172	870	955	162	1180	1300	151	120	80	85
					P_{el} = 7.93 W			P_{el} = 11.76 W			P_{el} = 17.17 W					
L56 W2 – 40 SMDs					$U_{typ.}$ = 22.66 V			$U_{typ.}$ = 23.51 V			$U_{typ.}$ = 24.53 V					
WU-M-512-G-830	**560172**	40	warm white	3000	1140	1240	156	1600	1735	148	2175	2365	138	120	80	85
WU-M-512-G-840	**560173**	40	neutral white	4000	1190	1300	164	1670	1815	155	2270	2475	144	120	80	85
WU-M-512-G-850	**560174**	40	neutral white	5000	1240	1415	179	1735	1985	169	2365	2700	157	120	80	85
WU-M-512-G-865	**560175**	40	cool white	6500	1240	1365	172	1735	1910	162	2365	2600	151	120	80	85

* Measuring tolerance of luminous flux: ± 7% | CRI > 90 on request

LED Line SMD Gen. 2 – 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	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.		min.	typ.
		pcs.		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	R_a	R_a
					P_{el} = 1.97 W			P_{el} = 2.91 W			P_{el} = 4.24 W					
High Brightness – L14 W2 – 5 SMDs					$U_{typ.}$ = 5.63 V			$U_{typ.}$ = 5.82 V			$U_{typ.}$ = 6.05 V					
WU-M-507-G-HB-830	**560201**	5	warm white	3000	260	290	146	360	405	139	495	550	129	120	80	85
WU-M-507-G-HB-840	**560202**	5	neutral white	4000	270	305	155	375	425	146	515	580	137	120	80	85
WU-M-507-G-HB-850	**560203**	5	neutral white	5000	280	320	162	395	445	153	535	605	143	120	80	85
WU-M-507-G-HB-865	**560204**	5	cool white	6500	280	310	158	395	435	150	535	590	140	120	80	85
					P_{el} = 3.94 W			P_{el} = 5.82 W			P_{el} = 8.47 W					
High Brightness – L14 W2 – 10 SMDs					$U_{typ.}$ = 11.26 V			$U_{typ.}$ = 11.36 V			$U_{typ.}$ = 12.10 V					
WU-M-508-G-HB-830	**560189**	10	warm white	3000	520	575	146	725	805	139	985	1095	129	120	80	85
WU-M-508-G-HB-840	**560190**	10	neutral white	4000	540	610	155	755	850	146	1025	1160	137	120	80	85
WU-M-508-G-HB-850	**560191**	10	neutral white	5000	565	635	162	785	890	153	1070	1210	143	120	80	85
WU-M-508-G-HB-865	**560192**	10	cool white	6500	565	625	158	785	870	150	1070	1185	140	120	80	85
					P_{el} = 3.94 W			P_{el} = 5.82 W			P_{el} = 8.47 W					
High Brightness – L28 W2 – 10 SMDs					$U_{typ.}$ = 11.26 V			$U_{typ.}$ = 11.36 V			$U_{typ.}$ = 12.10 V					
WU-M-509-G-HB-830	**560205**	10	warm white	3000	520	575	146	725	805	139	985	1095	129	120	80	85
WU-M-509-G-HB-840	**560206**	10	neutral white	4000	540	610	155	755	850	146	1025	1160	137	120	80	85
WU-M-509-G-HB-850	**560207**	10	neutral white	5000	565	635	162	785	890	153	1070	1210	143	120	80	85
WU-M-509-G-HB-865	**560208**	10	cool white	6500	565	625	158	785	870	150	1070	1185	140	120	80	85
					P_{el} = 7.89 W			P_{el} = 11.64 W			P_{el} = 16.94 W					
High Brightness – L28 W2 – 20 SMDs					$U_{typ.}$ = 22.53 V			$U_{typ.}$ = 23.27 V			$U_{typ.}$ = 24.20 V					
WU-M-510-G-HB-830	**560193**	20	warm white	3000	1035	1155	146	1450	1610	139	1970	2190	129	120	80	85
WU-M-510-G-HB-840	**560194**	20	neutral white	4000	1080	1220	155	1510	1705	146	2050	2315	137	120	80	85
WU-M-510-G-HB-850	**560195**	20	neutral white	5000	1125	1275	162	1575	1780	153	2140	2420	143	120	80	85
WU-M-510-G-HB-865	**560196**	20	cool white	6500	1125	1245	158	1575	1745	150	2140	2370	140	120	80	85
					P_{el} = 7.89 W			P_{el} = 11.64 W			P_{el} = 16.94 W					
High Brightness – L56 W2 – 20 SMDs					$U_{typ.}$ = 22.53 V			$U_{typ.}$ = 23.27 V			$U_{typ.}$ = 24.20 V					
WU-M-511-G-HB-830	**560209**	20	warm white	3000	1035	1155	146	1450	1615	139	1970	2190	129	120	80	85
WU-M-511-G-HB-840	**560210**	20	neutral white	4000	1080	1220	155	1510	1705	146	2050	2315	137	120	80	85
WU-M-511-G-HB-850	**560211**	20	neutral white	5000	1125	1275	162	1575	1780	153	2140	2420	143	120	80	85
WU-M-511-G-HB-865	**560212**	20	cool white	6500	1125	1245	158	1575	1745	150	2140	2370	140	120	80	85
					P_{el} = 15.77 W			P_{el} = 23.27 W			P_{el} = 33.88 W					
High Brightness – L56 W2 – 40 SMDs					$U_{typ.}$ = 45.05 V			$U_{typ.}$ = 46.53 V			$U_{typ.}$ = 48.40 V					
WU-M-512-G-HB-830	**560197**	40	warm white	3000	2075	2305	146	2900	3225	139	3940	4385	129	120	80	85
WU-M-512-G-HB-840	**560198**	40	neutral white	4000	2155	2435	155	3015	3405	146	4100	4630	137	120	80	85
WU-M-512-G-HB-850	**560199**	40	neutral white	5000	2250	2550	162	3150	3565	153	4280	4840	143	120	80	85
WU-M-512-G-HB-865	**560200**	40	cool white	6500	2250	2490	158	3150	3485	150	4280	4735	140	120	80	85

* Measuring tolerance of luminous flux: ± 7% | CRI > 90 on request

LED Line SMD Slim Gen. 2

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.

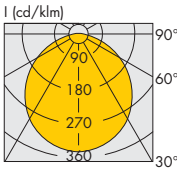
The light module is fitted with either a clear or diffuse cover that serves to protect it and, in the diffuse version, to reduce glare and distribute light in a similar manner to a fluorescent lamp.

Technical notes

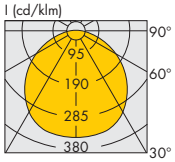
Dimensions
- WU-M-499-G: 280x14.5 mm
- WU-M-500-G: 560x14.5mm

On-board push-in terminals
Allowed operating temperature at t_c point:
- –20 at 75 °C

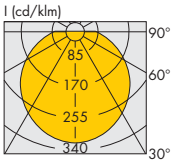
Use of external LED constant-current drivers required
Efficiency up to 183 lm/W
Colour rendering index R_a: min. 80
Lumen maintenance L80/B10:
- > 60,000 hrs. (I_F 700 mA, t_p = 50 °C)



Without cover



With clear cover



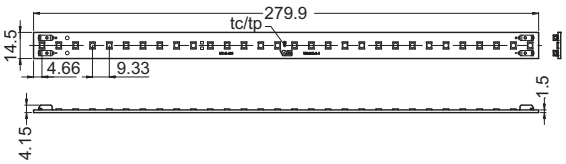
With diffuse cover

Typical applications

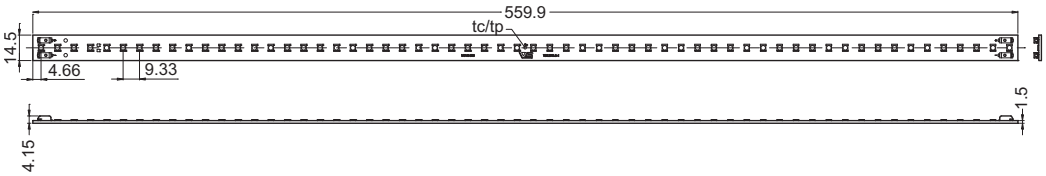
Built-in luminaires/general illumination:
- Office lighting
- Retail, corridor and shelf lighting
- T5/T8 replacement as built-in module
- Furniture lighting
- Backlighting for advertising

Mechanical dimensions of SMD board

WU-M-499-G



WU-M-500-G



LED Line SMD Slim Gen. 2

Optical characteristics

at t_p = 50 °C; without secondary optics

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	
					350 mA			500 mA			700 mA					
					min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.		min.	typ.
		pcs		K	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	°	R_a	R_a
280 mm					P_{el} = 4.9 W $U_{typ.}$ = 13.9 V			P_{el} = 7.2 W $U_{typ.}$ = 14.4 V			P_{el} = 10.5 W $U_{typ.}$ = 15 V					
WU-M-499-G-830	**560147**	30	warm white	3000	720	780	160	1010	1100	152	1385	1500	143	120	80	85
WU-M-499-G-840	**560148**	30	neutral white	4000	750	820	168	1055	1150	159	1445	1570	150	120	80	85
WU-M-499-G-850	**560149**	30	neutral white	5000	780	890	183	1100	1255	174	1500	1715	164	120	80	85
WU-M-499-G-865	**560150**	30	cool white	6500	780	860	176	1100	1205	168	1500	1650	158	120	80	85
560 mm					P_{el} = 9.8 W $U_{typ.}$ = 27.9 V			P_{el} = 14.4 W $U_{typ.}$ = 28.8 V			P_{el} = 20.9 W $U_{typ.}$ = 29.9 V					
WU-M-500-G-830	**560152**	60	warm white	3000	1440	1565	160	2020	2195	152	2765	3005	143	120	80	85
WU-M-500-G-840	**560153**	60	neutral white	4000	1500	1635	168	2110	2295	159	2885	3145	150	120	80	85
WU-M-500-G-850	**560154**	60	neutral white	5000	1565	1785	183	2195	2505	174	3005	3430	164	120	80	85
WU-M-500-G-865	**560155**	60	cool white	6500	1565	1720	176	2195	2415	168	3005	3300	158	120	80	85
High Brightness – 280 mm					P_{el} = 9.7 W $U_{typ.}$ = 27.8 V			P_{el} = 14.3 W $U_{typ.}$ = 28.6 V			P_{el} = 20.7 W $U_{typ.}$ = 29.6 V					
WU-M-499-G-HB-830	**560156**	30	warm white	3000	1305	1455	149	1835	2040	143	2505	2790	135	120	80	85
WU-M-499-G-HB-840	**560157**	30	neutral white	4000	1360	1535	158	1910	2155	151	2610	2945	142	120	80	85
WU-M-499-G-HB-850	**560158**	30	neutral white	5000	1420	1605	165	1990	2255	158	2725	3080	149	120	80	85
WU-M-499-G-HB-865	**560159**	30	cool white	6500	1420	1570	161	1990	2205	154	2725	3015	146	120	80	85
High Brightness – 560 mm					P_{el} = 19.5 W $U_{typ.}$ = 55.6 V			P_{el} = 28.6 W $U_{typ.}$ = 57.1 V			P_{el} = 41.4 W $U_{typ.}$ = 59.2 V					
WU-M-500-G-HB-830	**560160**	60	warm white	3000	2610	2905	149	3665	4080	143	5010	5575	135	120	80	85
WU-M-500-G-HB-840	**560161**	60	neutral white	4000	2720	3070	158	3815	4310	151	5215	5890	142	120	80	85
WU-M-500-G-HB-850	**560162**	60	neutral white	5000	2840	3210	165	3985	4505	158	5445	6160	149	120	80	85
WU-M-500-G-HB-865	**560163**	60	cool white	6500	2840	3140	161	3985	4410	154	5445	6025	145	120	80	85

* Measurement tolerance of luminous flux: ± 7% | CRI > 90 on request

Reference numbers – Module length: 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
280 mm						
SMD0283000	**561199**	**561203**	**561207**	**561211**	**561215**	**561219**
SMD0284000	**561200**	**561204**	**561208**	**561212**	**561216**	**561220**
SMD0285000	**561201**	**561205**	**561209**	**561213**	**561217**	**561221**
SMD0286500	**561202**	**561206**	**561210**	**561214**	**561218**	**561222**
High Brightness – 280 mm						
SMD0283000	**561223**	**561227**	**561231**	**561235**	**561239**	**561243**
SMD0284000	**561224**	**561228**	**561232**	**561236**	**561240**	**561244**
SMD0285000	**561225**	**561229**	**561233**	**561237**	**561241**	**561245**
SMD0286500	**561226**	**561230**	**561234**	**561238**	**561242**	**561246**

LED Line SMD Slim Gen. 2

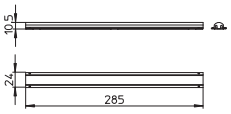
Reference numbers – Module length: 560 mm

Fixing	**For tape fixing** - type: 89560		**For screw fixing** - type: 89561		**For clip fixing** - type: 89562	
Cover	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
560 mm						
SMD0563000	**561247**	**561251**	**561255**	**561259**	**561263**	**561267**
SMD0564000	**561248**	**561252**	**561256**	**561260**	**561264**	**561268**
SMD0565000	**561249**	**561253**	**561257**	**561261**	**561265**	**561269**
SMD0566500	**561250**	**561254**	**561258**	**561262**	**561266**	**561270**
High Brightness – 560 mm						
SMD0563000	**561271**	**561275**	**561279**	**561283**	**561287**	**561291**
SMD0564000	**561272**	**561276**	**561280**	**561284**	**561288**	**561292**
SMD0565000	**561273**	**561277**	**561281**	**561285**	**561289**	**561293**
SMD0566500	**561274**	**561278**	**561282**	**561286**	**561290**	**561294**

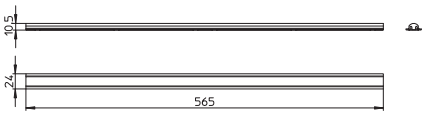
LED Line SMD Slim for tape fixing
With cover for tape fixing
With base thermal tapes pre-assembled
Degree of protection: IP20
Weight: 30.5/67 g, packaging unit: 6 pcs.
Type: 89510/89560

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



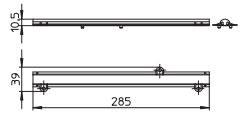
B – For tape fixing - type 89560 – LED Line SMD Slim 560



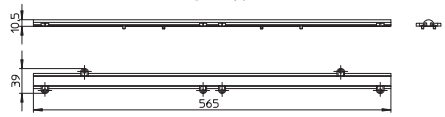
LED Line SMD Slim for screw fixing
With cover for screw fixing
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
With base thermal tapes pre-assembled
Degree of protection: IP20
Weight: 31/69 g, packaging unit: 4 pcs.
Type: 89511/89561

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



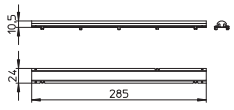
D – For screw fixing - type 89561 – LED Line SMD Slim 560



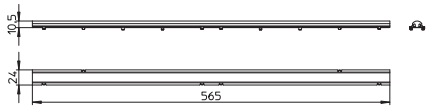
LED Line SMD Slim for clip fixing
With cover for clip fixing
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes pre-assembled
Degree of protection: IP20
Weight: 30.5/68 g, packaging unit: 6 pcs.
Type: 89512/89562

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

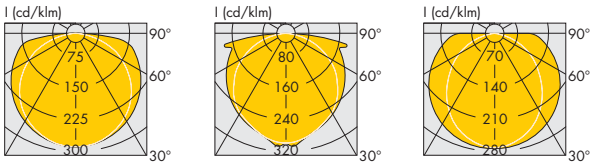
E – For clip fixing - type 89512 – LED Line SMD Slim 280



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 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

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
280 mm				P_{el} = 5.1 W $U_{typ.}$ = 14.7 V		P_{el} = 7.7 W $U_{typ.}$ = 15.4 V		P_{el} = 11.5 W $U_{typ.}$ = 16.4 V		P_{el} = 19.1 W $U_{typ.}$ = 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
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%

Reference numbers – Module length: 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**

Reference numbers – Module length: 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 pre-assembled
Weight: 43 g, packaging unit: 4 pcs.
Type: 89300, drawing A

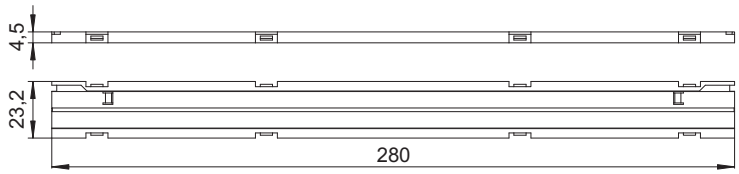
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 23.2 x16.1 mm
With base thermal tapes pre-assembled
Weight: 67 g, packaging unit: 4 pcs.
Type: 89300, drawing B

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, packaging unit: 4 pcs.
Type: 89301, drawing C

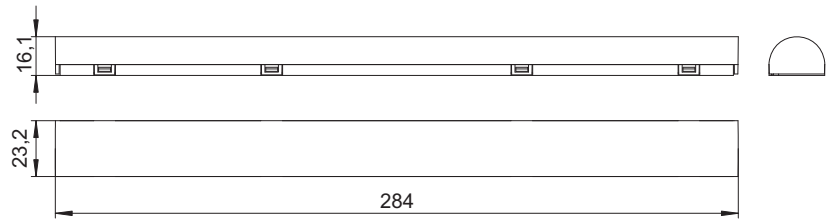
With cover
Degree of protection: IP40
Dimensions (LxWxH): 284 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 67 g, packaging unit: 4 pcs.
Type: 89301, drawing D

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

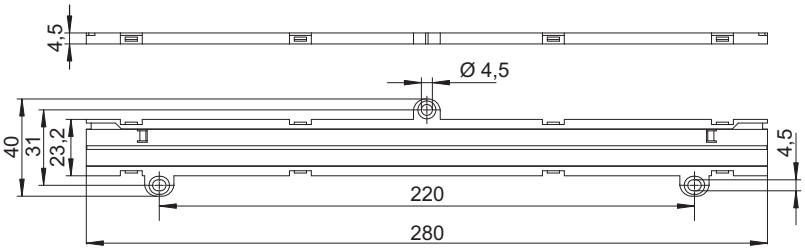
A – For tape fixing – type 89300 – LED Line Fix LUGA 2015 – 280



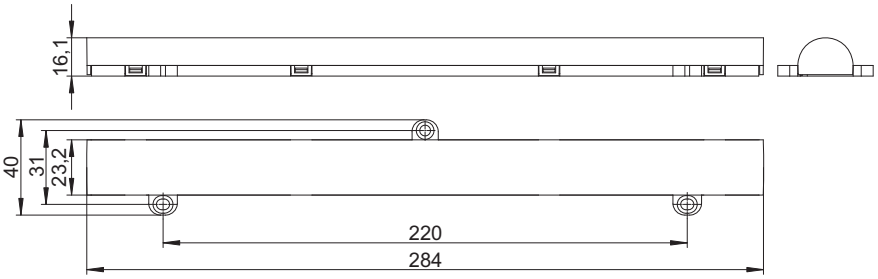
B – For tape fixing – type 89300 – LED Line Fix LUGA 2015 – 280



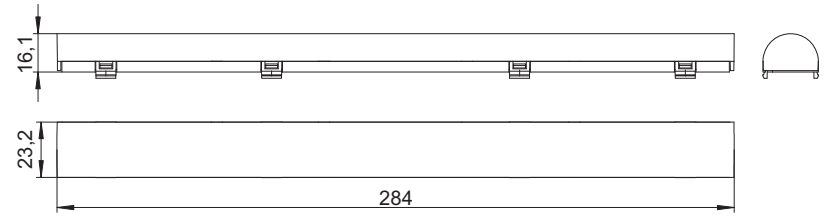
C – For screw fixing – type 89301 – LED Line Fix LUGA 2015 – 280



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 pre-assembled
Weight: 86 g, packaging unit: 4 pcs.
Type: 89350, drawing F

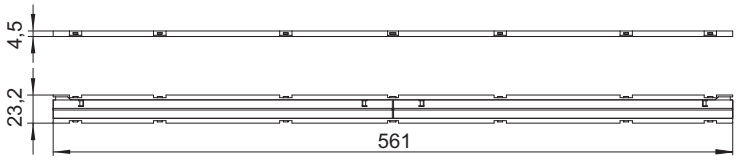
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 23.2 x16.1 mm
With base thermal tapes pre-assembled
Weight: 135 g, unit: 4 pcs.
Type: 89350, drawing G

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, packaging unit: 4 pcs.
Type: 89351, drawing H

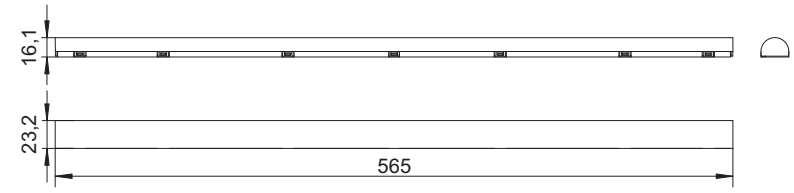
With cover
Degree of protection: IP40
Dimensions (LxWxH): 565 x 40 x16.1 mm
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 135 g, packaging unit: 4 pcs.
Type: 89351, drawing J

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 pre-assembled
Weight: 135 g, packaging unit: 4 pcs.
Type: 89352, drawing K

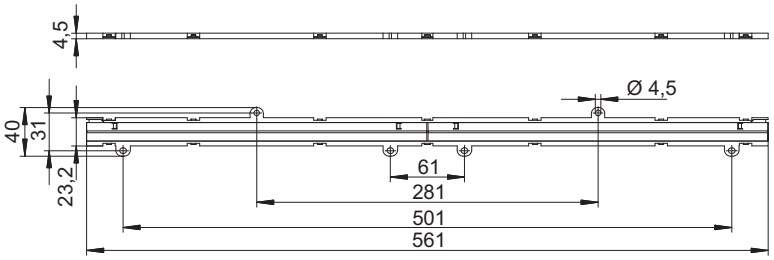
F – For tape fixing – type 89350 – LED Line Fix LUGA 2015 – 560



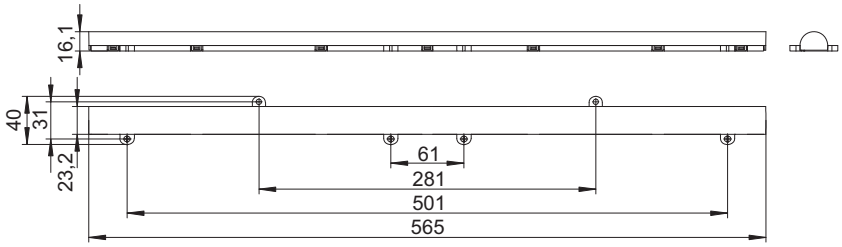
G – For tape fixing – type 89350 – LED Line Fix LUGA 2015 – 560



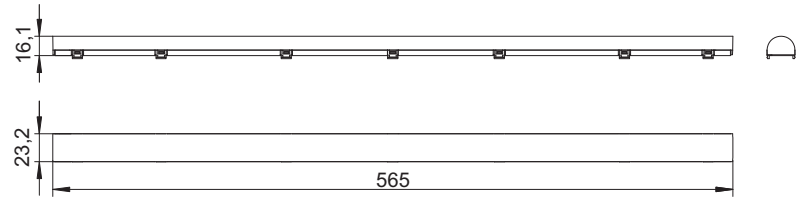
H – For screw fixing – type 89351 – LED Line Fix LUGA 2015 – 560



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

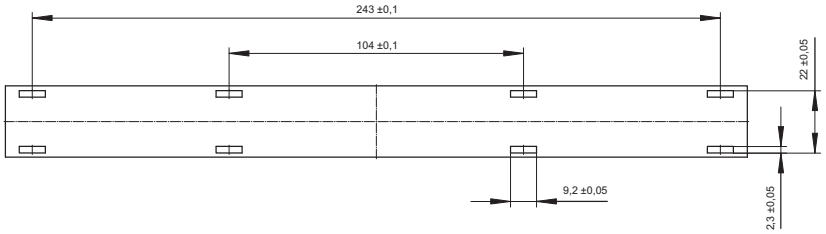
For type: 89350/89351, LED Line Fix 560 mm
Ref. No.: 550912 clear
Ref. No.: 550913 diffuse

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

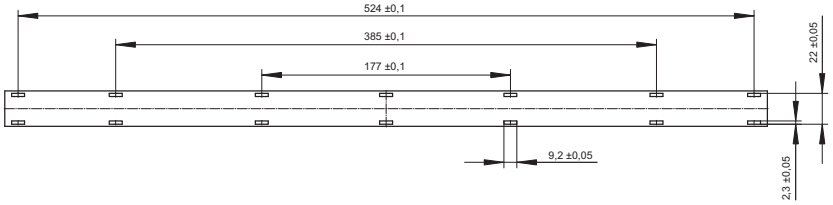
For type: 89352, LED Line Fix 560 mm
Ref. No.: 550914 clear
Ref. No.: 550915 diffuse

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.

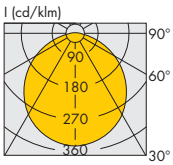
The light module forms a single unit consisting of a holder made of a thermoconductive polymer plus a clear or diffuse cover that protects the LED module and electrically isolates it from the luminaire.

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

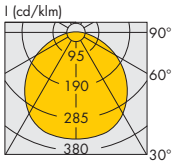
Electrical characteristics
at t_p = 50 °C
The specified values apply only to the version of the LED module without a cover.
The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

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
Efficiency up to 166 lm/W
Colour rendering index R_a: min. 80
Colour accuracy initially: 3 SDCM
Lumen maintenance L80/B10:
> 60,000 hrs. (I_F 700 mA, t_p = 50°C)

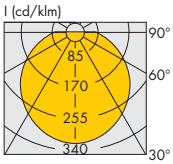
Typical applications
- Office and school lighting
- Retail lighting
- Industrial lighting
- For replacement of T5 and T8 lamps



Without cover



With clear cover



With diffuse cover

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	350 mA typ. lm	350 mA typ. lm/W	500 mA min. lm	500 mA typ. lm	500 mA typ. lm/W	700 mA min. lm	700 mA typ. lm	700 mA typ. lm/W	Beam angle °	CRI min. R_a	CRI typ. R_a
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
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%

Reference numbers – Module length: 280 mm

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**

Reference numbers – Module length: 560 mm

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

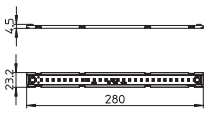
Technical notes LED Line Fix holder
Holder material: thermo-conductive resin
When joining linear modules in a row, a minimum clearance of 1 mm between the fixing units must be observed due to thermal expansion.

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

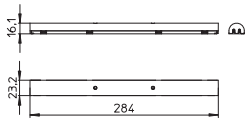
Module length mm	Drawing	Degree of protection	Dimensions (LxWxH) mm
Without cover			
280	A	–	280x23.2x4.5
560	C	–	561x23.2x4.5
With cover			
280	B	IP20	284x23.2x16.1
560	D	IP20	565x23.2x16.1

LED Line Fix SMD – For tape fixing

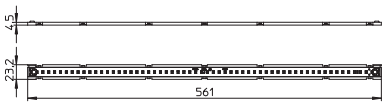
A – Type 89500 – 280 mm
Without cover



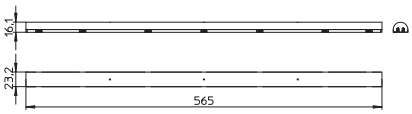
B – Type 89500 – 280 mm
With cover



C – Type 89550 – 560 mm
Without cover



D – Type 89550 – 560 mm
With cover

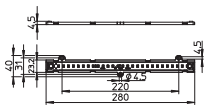


LED Line Fix SMD for screw fixing
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
Weight: 96/143 g, packaging unit: 4 pcs.
Type: 89501/89551

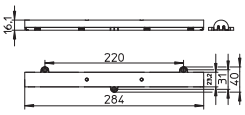
Module length mm	Drawing	Degree of protection	Dimensions (LxWxH) mm
Without cover			
280	E	–	280x40x4.5
560	G	–	561x40x4.5
With cover			
280	F	IP20	284x40x16.1
560	H	IP20	565x40x16.1

LED Line Fix SMD – For screw fixing

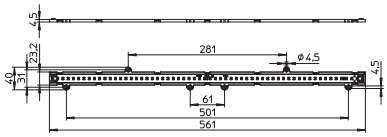
E – Type 89501 – 280 mm
Without cover



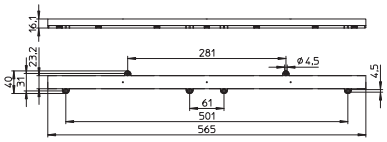
F – Type 89501 – 280 mm
With cover



G – Type 89551 – 560 mm
Without cover



H – Type 89551 – 560 mm
With cover

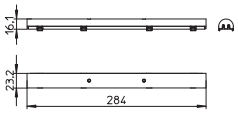


LED Line Fix SMD for clip fixing
With base thermal tapes pre-assembled
Base fixing clips for wall thickness 0.4–1 mm
Weight: 95/142 g, packaging unit: 4 pcs.
Type: 89502/89552

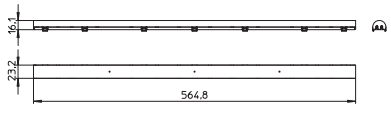
Module length mm	Drawing	Degree of protection	Dimensions (LxWxH) mm
With cover			
280	K	IP20	284x23.2x16.1
560	L	IP20	565x23.2x16.1

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

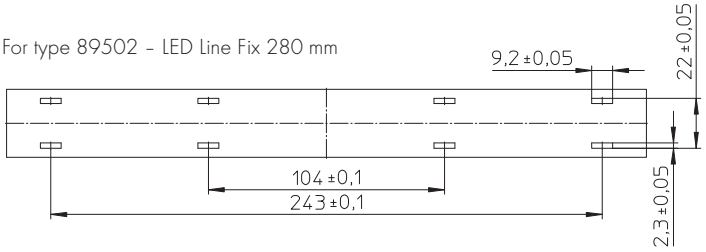
Technical notes LED Line Fix cover
Material: PC, clear or diffuse
Lead exit: lateral push-in holes
Efficency covers: clear 97%, diffuse 90%

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

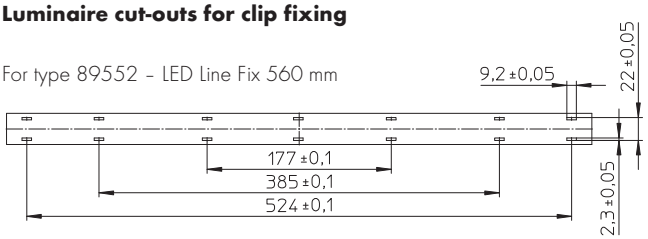


Covers for LED Line Fix for tape and screw fixing
For type: 89550/89551
Ref. No.: 551588 clear
Ref. No.: 551589 diffuse

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

Further shapes and optics on request.

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 1429 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: 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

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

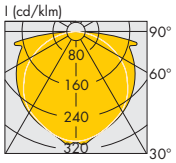
Type	Number of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})*							
				350 mA		500 mA		700 mA		1050 mA	
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W
305 mm				P_{el} = 5.1 W $U_{typ.}$ = 14.7 V		P_{el} = 7.7 W $U_{typ.}$ = 15.4 V		P_{el} = 11.5 W $U_{typ.}$ = 16.4 V		P_{el} = 19.1 W $U_{typ.}$ = 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
586 mm (2 wired LED modules per aluminium profile)				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	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
867 mm (3 wired LED modules per aluminium profile)				P_{el} = 15.3 W $U_{typ.}$ = 44.1 V		P_{el} = 23.1 W $U_{typ.}$ = 46.2 V		P_{el} = 34.5 W $U_{typ.}$ = 49.2 V		P_{el} = 57.3 W $U_{typ.}$ = 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
1148 mm (4 wired LED modules per aluminium profile)				P_{el} = 20.4 W $U_{typ.}$ = 58.8 V		P_{el} = 30.8 W $U_{typ.}$ = 61.6 V		P_{el} = 46 W $U_{typ.}$ = 65.6 V		P_{el} = 76.4 W $U_{typ.}$ = 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
1429 mm (5 wired LED modules per aluminium profile)				P_{el} = 25.5 W $U_{typ.}$ = 73.5 V		P_{el} = 38.5 W $U_{typ.}$ = 77 V		P_{el} = 57.5 W $U_{typ.}$ = 82 V		P_{el} = 95.5 W $U_{typ.}$ = 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%

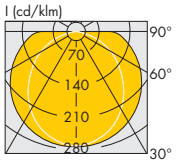
LED Line AluFix LUGA 2015

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



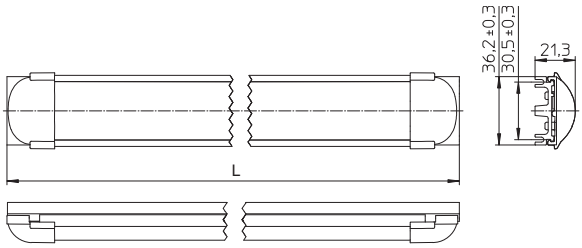
With clear cover



With diffuse cover

LED Line AluFix LUGA 2015 – Cover

Type	Dimensions (LxWxH) in mm			Packaging unit	Weight
	L	W	H	pcs.	g
89001	305	36.2	21.3	15	171
89002	586	36.2	21.3	15	330
89003	867	36.2	21.3	15	495
89004	1148	36.2	21.3	15	650
89005	1429	36.2	21.3	15	815



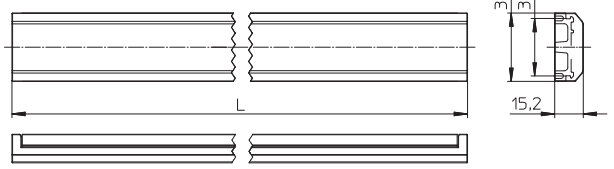
Reference numbers – LED Line AluFix LUGA 2015 – Cover

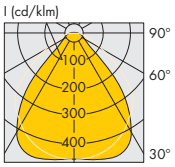
The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

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			Packaging unit	Weight
	L	W	H	pcs.	g
89011	305	36.2	15.2	15	165
89012	586	36.2	15.2	15	316
89013	867	36.2	15.2	15	466
89014	1148	36.2	15.2	15	617
89015	1429	36.2	15.2	15	767





Office

Reference numbers – 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**

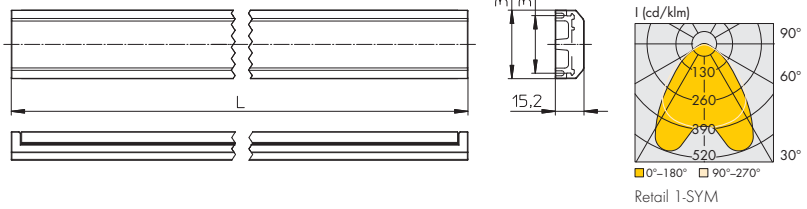
LED Line AluFix LUGA 2015

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			Packaging unit	Weight
	L	W	H	pcs.	g
89021	305	36.2	15.2	15	165
89022	586	36.2	15.2	15	316
89023	867	36.2	15.2	15	466
89024	1148	36.2	15.2	15	617
89025	1429	36.2	15.2	15	767



Retail 1-SYM

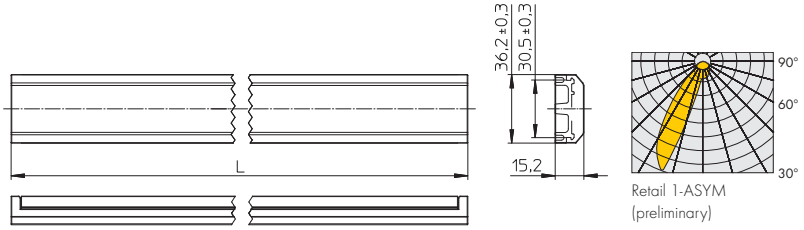
Reference numbers – LED Line AluFix LUGA 2015 – Optics Retail 1-SYM

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			Packaging unit	Weight
	L	W	H	pcs.	g
89031	305	36.2	15.2	15	165
89032	586	36.2	15.2	15	316
89033	867	36.2	15.2	15	466
89034	1148	36.2	15.2	15	617
89035	1429	36.2	15.2	15	767



Retail 1-ASYM
(preliminary)

Reference numbers – LED Line AluFix LUGA 2015 – Optics Retail 1-ASYM

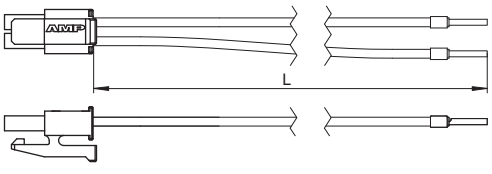
Efficency optics: 94%

Type / Total length	**89031** / 305 mm	**89032** / 586 mm	**89033** / 867 mm	**89034** / 1148 mm	**89035** / 1429 mm
DML059C27EC	**558644**	**558647**	**558650**	**558653**	**558656**
DML059C30EC	**558645**	**558648**	**558651**	**558654**	**558657**
DML059C40EC	**558646**	**558649**	**558652**	**558655**	**558658**

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 LUGA RX

Further shapes and optics on request.

Lighting modules with holder and cover
LED Line AluFix LUGA RX 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 RX modules in lengths of 305 to 1429 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 RX 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: for drivers with U_{OUT} < 150 V DC
Efficiency up to 146 lm/W
Colour rendering index R_a: > 80
Colour accuracy initially: 3 SDCM; after 50,000 hrs. operating time: 4 SDCM
Lumen maintenance L80/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 AluFix LUGA RX

Optical characteristics of LUGA Line RX LED modules

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

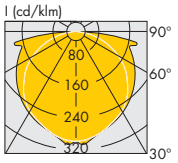
Type	Number of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})*							
				350 mA		500 mA		700 mA		1050 mA	
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W
				P_{el} = 5.9 W		P_{el} = 8.6 W		P_{el} = 12.3 W		P_{el} = 19 W	
305 mm				$U_{typ.}$ = 16.9 V		$U_{typ.}$ = 17.2 V		$U_{typ.}$ = 17.6 V		$U_{typ.}$ = 18.1 V	
DML068C27FR	48	warm white	2700	780	132	1075	125	1435	117	1980	104
DML068C30FR	48	warm white	3000	810	137	1115	130	1490	121	2055	108
DML068C40FR	48	neutral white	4000	860	146	1185	138	1585	129	2185	115
				P_{el} = 11.8 W		P_{el} = 17.2 W		P_{el} = 24.6 W		P_{el} = 38 W	
586 mm (2 wired LED modules per aluminium profile)				$U_{typ.}$ = 33.8 V		$U_{typ.}$ = 34.4 V		$U_{typ.}$ = 35.2 V		$U_{typ.}$ = 36.2 V	
DML068C27FR	2x48	warm white	2700	1560	132	2150	125	2870	117	3960	104
DML068C30FR	2x48	warm white	3000	1620	137	2230	130	2980	121	4110	108
DML068C40FR	2x48	neutral white	4000	1720	146	2370	138	3170	129	4370	115
				P_{el} = 17.7 W		P_{el} = 25.8 W		P_{el} = 36.9 W		P_{el} = 57 W	
867 mm (3 wired LED modules per aluminium profile)				$U_{typ.}$ = 50.7 V		$U_{typ.}$ = 51.6 V		$U_{typ.}$ = 52.8 V		$U_{typ.}$ = 54.3 V	
DML068C27FR	3x48	warm white	2700	2340	132	3225	125	4305	117	5940	104
DML068C30FR	3x48	warm white	3000	2430	137	3345	130	4470	121	6165	108
DML068C40FR	3x48	neutral white	4000	2580	146	3555	138	4755	129	6555	115
				P_{el} = 23.6 W		P_{el} = 34.4 W		P_{el} = 49.2 W		P_{el} = 76 W	
1148 mm (4 wired LED modules per aluminium profile)				$U_{typ.}$ = 67.6 V		$U_{typ.}$ = 68.8 V		$U_{typ.}$ = 70.4 V		$U_{typ.}$ = 72.4 V	
DML068C27FR	4x48	warm white	2700	3120	132	4300	125	5740	117	7920	104
DML068C30FR	4x48	warm white	3000	3240	137	4460	130	5960	121	8220	108
DML068C40FR	4x48	neutral white	4000	3440	146	4740	138	6340	129	8740	115
				P_{el} = 29.5 W		P_{el} = 43 W		P_{el} = 61.5 W		P_{el} = 95 W	
1429 mm (5 wired LED modules per aluminium profile)				$U_{typ.}$ = 84.5 V		$U_{typ.}$ = 86.2 V		$U_{typ.}$ = 88 V		$U_{typ.}$ = 90.5 V	
DML068C27FR	5x48	warm white	2700	3900	132	5375	125	7175	117	9900	104
DML068C30FR	5x48	warm white	3000	4050	137	5575	130	7450	121	10275	108
DML068C40FR	5x48	neutral white	4000	4300	146	5925	138	7925	129	10925	115

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

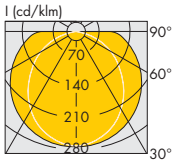
LED Line AluFix LUGA RX

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



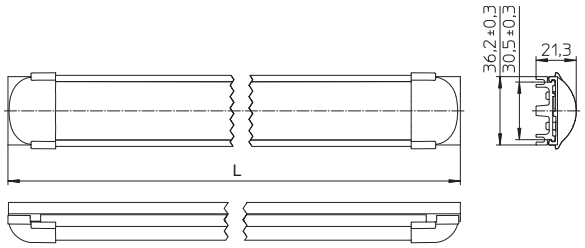
With clear cover



With diffuse cover

LED Line AluFix LUGA RX – Cover

Type	Dimensions (LxWxH) in mm			Packaging unit	Weight
	L	W	H	pcs.	g
89001	305	36.2	21.3	15	171
89002	586	36.2	21.3	15	330
89003	867	36.2	21.3	15	495
89004	1148	36.2	21.3	15	650
89005	1429	36.2	21.3	15	815



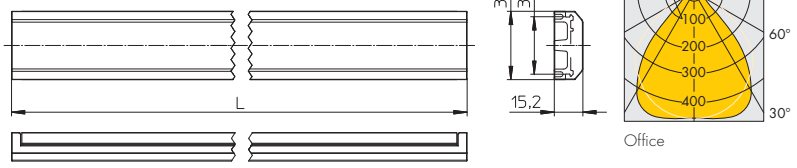
Reference numbers – LED Line AluFix LUGA RX – Cover

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
DML068C27FR	**561391**	**561400**	**561409**	**561418**	**561427**	**561436**	**561445**	**561454**	**561463**	**561472**
DML068C30FR	**561392**	**561401**	**561410**	**561419**	**561428**	**561437**	**561446**	**561455**	**561464**	**561473**
DML068C40FR	**561395**	**561404**	**561413**	**561422**	**561431**	**561440**	**561449**	**561458**	**561467**	**561476**

LED Line AluFix LUGA RX – Optics Office

Type	Dimensions (LxWxH) in mm			Packaging unit	Weight
	L	W	H	pcs.	g
89011	305	36.2	15.2	15	165
89012	586	36.2	15.2	15	316
89013	867	36.2	15.2	15	466
89014	1148	36.2	15.2	15	617
89015	1429	36.2	15.2	15	767



Office

Reference numbers – LED Line AluFix LUGA RX – Optics Office

Efficency optics: 94%

Type / Total length	**89011** / 305 mm	**89012** / 586 mm	**89013** / 867 mm	**89014** / 1148 mm	**89015** / 1429 mm
DML068C27FR	**561481**	**561490**	**561499**	**561508**	**561517**
DML068C30FR	**561482**	**561491**	**561500**	**561509**	**561518**
DML068C40FR	**561485**	**561494**	**561503**	**561512**	**561521**

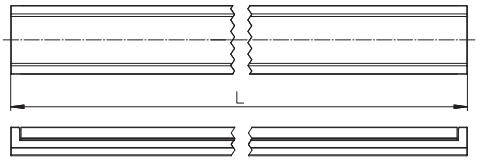
LEDLine AluFix LUGA RX

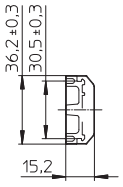
Technical notes

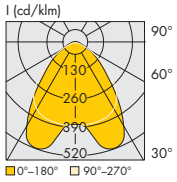
Material: Aluminium profile and PMMA cover
Rear connection leads, lead length: 70 mm
with 2-poles connector AMP Micro Mate-N-LOK 1445049-2
Degree of protection: IP40
Rear slots for screws M3
Tightening torque: 0.5 Nm

LED Line AluFix LUGA RX – Optics Retail 1-SYM

Type	Dimensions (LxWxH) in mm			Packaging unit	Weight
	L	W	H	pcs.	g
89021	305	36.2	15.2	15	165
89022	586	36.2	15.2	15	316
89023	867	36.2	15.2	15	466
89024	1148	36.2	15.2	15	617
89025	1429	36.2	15.2	15	767







Retail 1-SYM

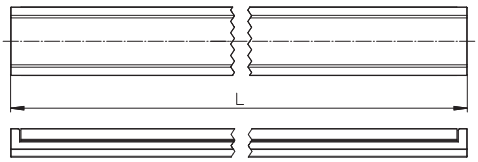
Reference numbers – LEDLine AluFix LUGA RX – Optics Retail 1-SYM

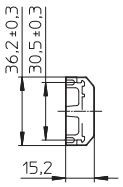
Efficency optics: 94%

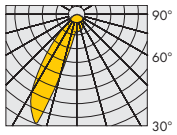
Type / Total length	**89021** / 305 mm	**89022** / 586 mm	**89023** / 867 mm	**89024** / 1148 mm	**89025** / 1429 mm
DML068C27FR	**561526**	**561535**	**561544**	**561553**	**561562**
DML068C30FR	**561527**	**561536**	**561545**	**561554**	**561563**
DML068C40FR	**561530**	**561539**	**561548**	**561557**	**561566**

LED Line AluFix LUGA RX – Optics Retail 1-ASYM

Type	Dimensions (LxWxH) in mm			Packaging unit	Weight
	L	W	H	pcs.	g
89031	305	36.2	15.2	15	165
89032	586	36.2	15.2	15	316
89033	867	36.2	15.2	15	466
89034	1148	36.2	15.2	15	617
89035	1429	36.2	15.2	15	767







Retail 1-ASYM
(preliminary)

Reference numbers – LEDLine AluFix LUGA RX – Optics Retail 1-ASYM

Efficency optics: 94%

Type / Total length	**89031** / 305 mm	**89032** / 586 mm	**89033** / 867 mm	**89034** / 1148 mm	**89055** / 1429 mm
DML068C27FR	**561571**	**562287**	**562296**	**562305**	**562314**
DML068C30FR	**561572**	**562288**	**562297**	**562306**	**562315**
DML068C40FR	**561575**	**562291**	**562300**	**562309**	**562318**

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 1429 mm and is thus an ideal component for LED lighting strips.

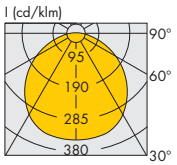
The robust aluminium holder serves to optimise thermal management and is easy to attach using M3 screws. The clear or diffuse cover protects LED modules from environmental factors.

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

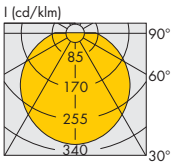
Typical applications
- Office and school lighting
- Retail lighting
- Industrial lighting
- For replacement of T5 and T8 lamps

Technical notes
Allowed operating temperature at t_c point:
–20 to 75 °C
Use of external LED constant-current drivers:
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

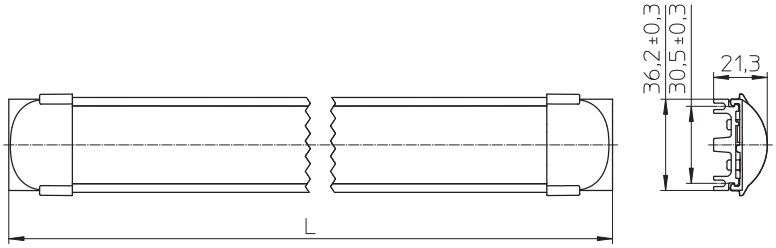
Optical characteristics
at t_p = 50 °C | The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

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
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
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
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
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
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 SMD – 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			Packaging unit	Weight
	L	W	H	pcs.	g
89001	305	36.2	21.3	15	171
89002	586	36.2	21.3	15	330
89003	867	36.2	21.3	15	495
89004	1148	36.2	21.3	15	650
89005	1429	36.2	21.3	15	815

Reference numbers – LED Line AluFix SMD – Cover

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 Line AluFix SMD Gen. 2 – 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 for 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 1429 mm and is thus an ideal component for LED lighting strips.

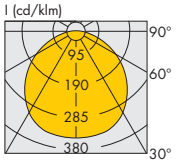
The robust aluminium holder serves to optimise thermal management and is easy to attach using M3 screws. The clear or diffuse cover protects LED modules from environmental factors.

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

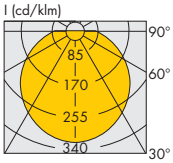
Typical applications
- Office and school lighting
- Retail lighting
- Industrial lighting
- For replacement of T5 and T8 lamps

Technical notes
Allowed operating temperature at t_c point:
–20 to 75 °C
Use of external LED constant-current drivers:
for driver with U_{OUT} < 250 V DC
Efficiency up to 183 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	No. of LEDs	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
305 mm (1 SMD module 280 mm)				P_{el} = 4.9 W $U_{typ.}$ = 13.9 V		P_{el} = 7.2 W $U_{typ.}$ = 14.4 V		P_{el} = 10.5 W $U_{typ.}$ = 15 V	
ALUFixSMD / 305 / 30	1x30	warm white	3000	780	160	1100	152	1500	143
ALUFixSMD / 305 / 40	1x30	neutral white	4000	820	168	1150	159	1570	150
ALUFixSMD / 305 / 50	1x30	neutral white	5000	890	183	1255	174	1715	164
ALUFixSMD / 305 / 65	1x30	cool white	6500	860	176	1205	168	1650	158
586 mm (1 SMD module 560 mm)				P_{el} = 9.8 W $U_{typ.}$ = 27.9 V		P_{el} = 14.4 W $U_{typ.}$ = 28.8 V		P_{el} = 20.9 W $U_{typ.}$ = 29.9 V	
ALUFixSMD / 586 / 30	1x60	warm white	3000	1565	160	2195	152	3005	143
ALUFixSMD / 586 / 40	1x60	neutral white	4000	1635	168	2295	159	3145	150
ALUFixSMD / 586 / 50	1x60	neutral white	5000	1785	183	2505	174	3430	164
ALUFixSMD / 586 / 65	1x60	cool white	6500	1720	176	2415	168	3300	158
867 mm (2 wired SMD modules 1x280 mm + 1x560 mm per aluminium profile)				P_{el} = 14.7 W $U_{typ.}$ = 41.8 V		P_{el} = 21.6 W $U_{typ.}$ = 43.2 V		P_{el} = 31.4 W $U_{typ.}$ = 44.9 V	
ALUFixSMD / 867 / 30	1x30 + 1x60	warm white	3000	2345	160	3295	152	4505	143
ALUFixSMD / 867 / 40	1x30 + 1x60	neutral white	4000	2455	168	3445	159	4715	150
ALUFixSMD / 867 / 50	1x30 + 1x60	neutral white	5000	2675	183	3760	174	5145	164
ALUFixSMD / 867 / 65	1x30 + 1x60	cool white	6500	2580	176	3620	168	4950	158

* Measurement tolerance of luminous flux: ±7%

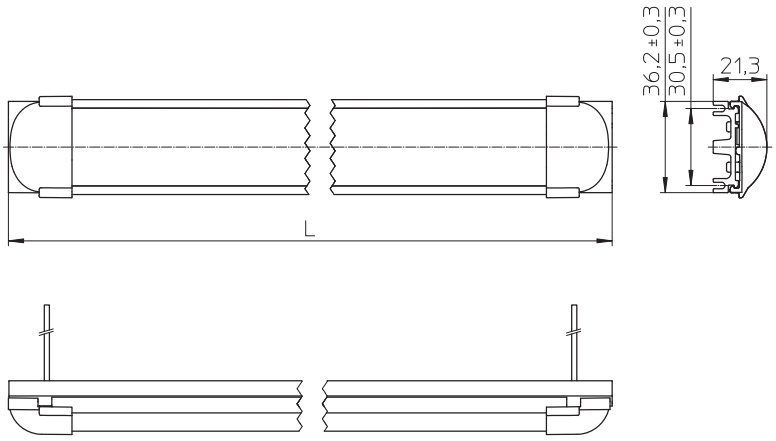
LED Line AluFix SMD Gen. 2 – Cover

Type	No. of LEDs	Colour	Correlated colour temperature	Typ. luminous flux* and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})					
				350 mA		500 mA		700 mA	
			K	lm	lm/W	lm	lm/W	lm	lm/W
				P_{el} = 19.6 W		P_{el} = 28.8 W		P_{el} = 41.8 W	
1148 mm (2 wired SMD modules 560 mm per aluminium profile)				$U_{typ.}$ = 55.8 V		$U_{typ.}$ = 57.6 V		$U_{typ.}$ = 59.8 V	
ALUFixSMD / 1148 / 30	2x60	warm white	3000	3130	160	4390	152	6010	143
ALUFixSMD / 1148 / 40	2x60	neutral white	4000	3270	168	4590	159	6290	150
ALUFixSMD / 1148 / 50	2x60	neutral white	5000	3570	183	5010	174	6860	164
ALUFixSMD / 1148 / 65	2x60	cool white	6500	3440	176	4830	168	6600	158
				P_{el} = 24.5 W		P_{el} = 36 W		P_{el} = 52.3 W	
1429 mm (3 wired SMD modules 1x280 mm + 2x560 mm per aluminium profile)				$U_{typ.}$ = 69.7 V		$U_{typ.}$ = 72 V		$U_{typ.}$ = 74.8 V	
ALUFixSMD / 1429 / 30	1x30 + 2x60	warm white	3000	3910	160	5490	152	7510	143
ALUFixSMD / 1429 / 40	1x30 + 2x60	neutral white	4000	4090	168	5740	159	7860	150
ALUFixSMD / 1429 / 50	1x30 + 2x60	neutral white	5000	4460	183	6265	174	8575	164
ALUFixSMD / 1429 / 65	1x30 + 2x60	cool white	6500	4300	176	6035	168	8250	158
				P_{el} = 9.7 W		P_{el} = 14.3 W		P_{el} = 20.7 W	
High Brightness – 305 mm (1 SMD module 280 mm)				$U_{typ.}$ = 27.8 V		$U_{typ.}$ = 28.6 V		$U_{typ.}$ = 29.6 V	
ALUFixSMD / 305 / 30	1x30	warm white	3000	1455	149	2040	143	2790	135
ALUFixSMD / 305 / 40	1x30	neutral white	4000	1535	158	2155	151	2945	142
ALUFixSMD / 305 / 50	1x30	neutral white	5000	1605	165	2255	158	3080	149
ALUFixSMD / 305 / 65	1x30	cool white	6500	1570	161	2205	154	3015	145
				P_{el} = 19.5 W		P_{el} = 28.6 W		P_{el} = 41.4 W	
High Brightness – 586 mm (1 SMD module 560 mm)				$U_{typ.}$ = 55.6 V		$U_{typ.}$ = 57.1 V		$U_{typ.}$ = 59.2 V	
ALUFixSMD / 586 / 30	1x60	warm white	3000	2905	149	4080	143	5575	135
ALUFixSMD / 586 / 40	1x60	neutral white	4000	3070	158	4310	151	5890	142
ALUFixSMD / 586 / 50	1x60	neutral white	5000	3210	165	4505	158	6160	149
ALUFixSMD / 586 / 65	1x60	cool white	6500	3140	161	4410	154	6025	145
				P_{el} = 29.2 W		P_{el} = 42.9 W		P_{el} = 62.1 W	
High Brightness – 867 mm (2 wired SMD modules 1x280 mm + 1x560 mm per aluminium profile)				$U_{typ.}$ = 83.4 V		$U_{typ.}$ = 85.7 V		$U_{typ.}$ = 88.8 V	
ALUFixSMD / 867 / 30	1x30 + 1x60	warm white	3000	4360	149	6120	143	8365	135
ALUFixSMD / 867 / 40	1x30 + 1x60	neutral white	4000	4605	158	6465	151	8835	142
ALUFixSMD / 867 / 50	1x30 + 1x60	neutral white	5000	4815	165	6760	158	9240	149
ALUFixSMD / 867 / 65	1x30 + 1x60	cool white	6500	4710	161	6615	154	9040	145
				P_{el} = 39 W		P_{el} = 57.9 W		P_{el} = 82.8 W	
High Brightness – 1148 mm (2 wired SMD modules 560 mm per aluminium profile)				$U_{typ.}$ = 111.2 V		$U_{typ.}$ = 114.2 V		$U_{typ.}$ = 118.4 V	
ALUFixSMD / 1148 / 30	2x60	warm white	3000	5810	149	8160	143	11,150	135
ALUFixSMD / 1148 / 40	2x60	neutral white	4000	6140	158	8620	151	11,780	142
ALUFixSMD / 1148 / 50	2x60	neutral white	5000	6420	165	9010	158	12,320	149
ALUFixSMD / 1148 / 65	2x60	cool white	6500	6280	161	8820	154	12,050	145
				P_{el} = 48.7 W		P_{el} = 72.2 W		P_{el} = 103.5 W	
High Brightness – 1429 mm (3 wired SMD modules 1x280 mm + 2x560 mm per aluminium profile)				$U_{typ.}$ = 139 V		$U_{typ.}$ = 142.8 V		$U_{typ.}$ = 148 V	
ALUFixSMD / 1429 / 30	1x30 + 2x60	warm white	3000	7265	149	10200	143	13940	135
ALUFixSMD / 1429 / 40	1x30 + 2x60	neutral white	4000	7675	158	10775	151	14725	142
ALUFixSMD / 1429 / 50	1x30 + 2x60	neutral white	5000	8025	165	11265	158	15400	149
ALUFixSMD / 1429 / 65	1x30 + 2x60	cool white	6500	7850	161	11025	154	15065	145

* Measurement tolerance of luminous flux: ±7%

LED Line AluFix SMD Gen. 2 – Cover

Technical notes
LED Line AluFix SMD Gen. 2 – 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			Packaging	Weight
	L	W	H	unit (pcs.)	g
89001	305	36.2	21,3	15	171
89002	586	36.2	21,3	15	330
89003	867	36.2	21,3	15	495
89004	1148	36.2	21,3	15	650
89005	1429	36.2	21,3	15	815

Reference numbers – LED Line AluFix SMD Gen. 2 – Cover

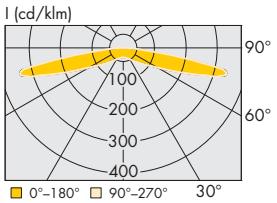
Type / Total length	**89001** / 305 mm		**89002** / 586 mm		**89003** / 867 mm		**89004** / 1148 mm		**89005** / 1429 mm	
Cover	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
For LED Line AluFix SMD Gen. 2 – Cover										
3000K	**561307**	**561311**	**561315**	**561319**	**561323**	**561327**	**561331**	**561335**	**561339**	**561343**
4000K	**561308**	**561312**	**561316**	**561320**	**561324**	**561328**	**561332**	**561336**	**561340**	**561344**
5000K	**561309**	**561313**	**561317**	**561321**	**561325**	**561329**	**561333**	**561337**	**561341**	**561345**
6500K	**561310**	**561314**	**561318**	**561322**	**561326**	**561330**	**561334**	**561338**	**561342**	**561346**
For LED Line AluFix SMD Gen. 2 – Cover – High Brightness										
3000K	**561347**	**561351**	**561355**	**561359**	**561363**	**561367**	**561371**	**561375**	**561379**	**561383**
4000K	**561348**	**561352**	**561356**	**561360**	**561364**	**561368**	**561372**	**561376**	**561380**	**561384**
5000K	**561349**	**561353**	**561357**	**561361**	**561365**	**561369**	**561373**	**561377**	**561381**	**561385**
6500K	**561350**	**561354**	**561358**	**561362**	**561366**	**561370**	**561374**	**561378**	**561382**	**561386**

LED Line SMD LightBar

LED built-in module

The new SMD LightBar modules constitute a highly effective SMD solution. Available in sets of six, the new modules are particularly suitable for installation in louvered luminaires (600x600 mm).

The SMD LightBar modules come in various shades of white and with a set of 6 leads (Ref. No. 559935) for easy, low-cost and solder-free connection. All six connectors must be attached (in series) to modules.



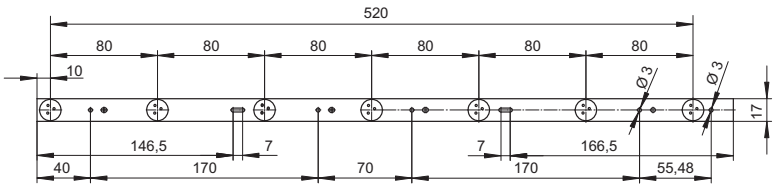
Technical notes

Dimensions: 520x17 mm
Driving current: up to 300 mA

Typical applications

Built-in luminaires/general illumination:

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



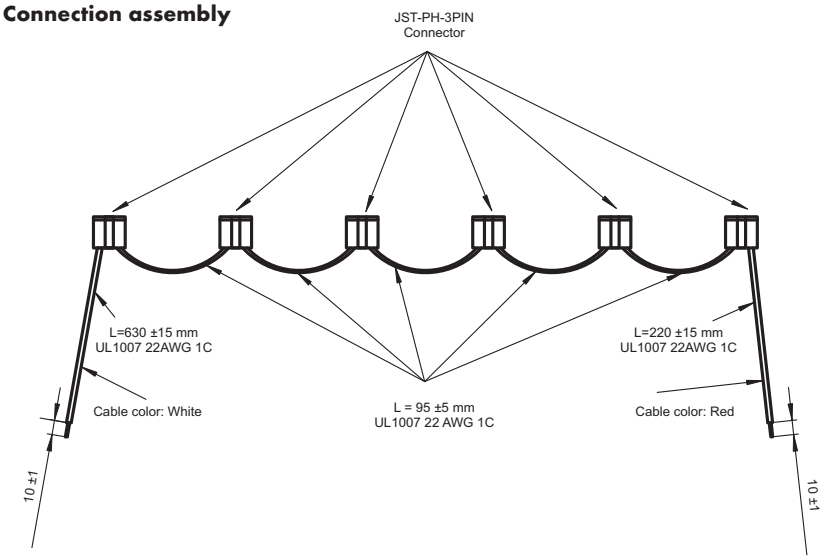
Type	Ref. No.	No. of LEDs pcs.	Colour	Correlated colour temperature K	Typ. luminous flux* and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el}) at 300 mA lm	lm/W	Typ. beam angle °	CRI R_a min.	typ.
					P_{el} = 6.9 W; $U_{typ.}$ = 23.1 V				
89520	**559932**	7	warm white	3000	595	86	145	80	85
89520	**559933**	7	neutral white	4000	630	91	145	80	85
89520	**557990**	7	cool white	5700	665	96	145	80	85
89520	**559509**	7	cool white	5700	700	102	145	80	85
89520	**559934**	7	cool white	11000	520	96	145	70	75

* Measurement tolerance of luminous flux: ±10% | Min. CRI R_a: > 70 / > 80

Connection lead

Lead with 6 plugs (connected in series)
Lead: UL 1007 22AWG 1C Red / White
JST-PH-3Pn-Serial MINI JST PH 3pin Male
Lead length (L): 1325 mm
Lead ends, tinned, 10 mm
All connectors must be attached to modules.
Type: 89520
Ref. No.: 559935

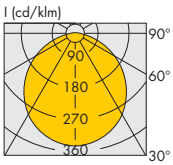
Connection assembly



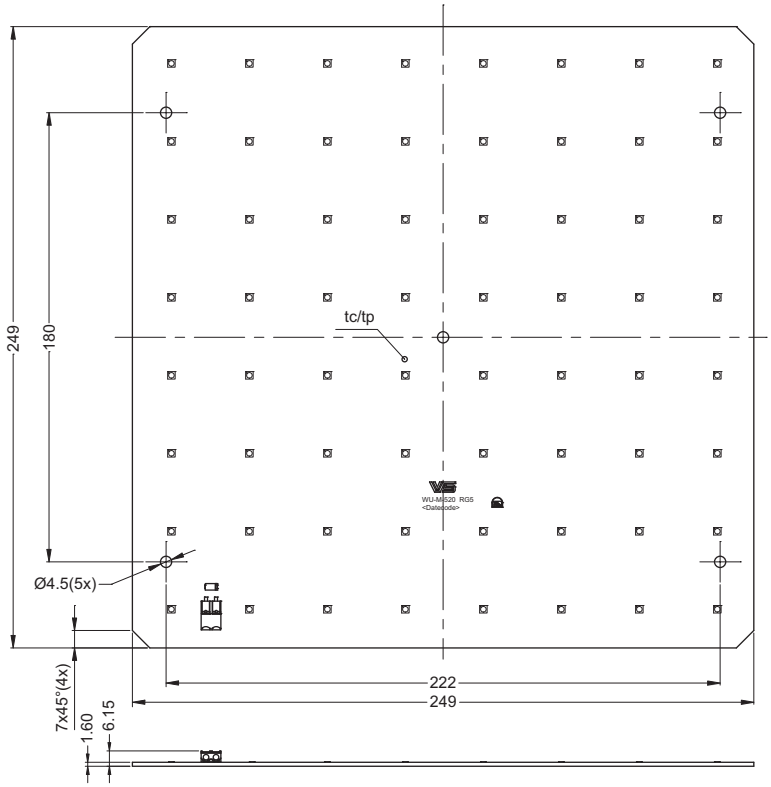
LED Light Panel SMD 250 x 250

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: 249 x 249 mm
On-board push-in terminals
Fixing holes: Ø 4.5 mm
Use of external LED constant-current drivers
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)
Packaging unit: 50 pcs.



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

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. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W		min. R_a	typ. R_a
				P_{el} = 7.1 - 8.5 W U = 20.4 - 24.4 V			P_{el} = 10.5 - 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

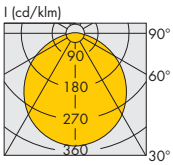
Emission data at t_p = 50 °C | Products under development; preliminary technical datas | * Measurement tolerance: ±7%

LED Light Panel SMD 270 x 270

Built-in lighting modules

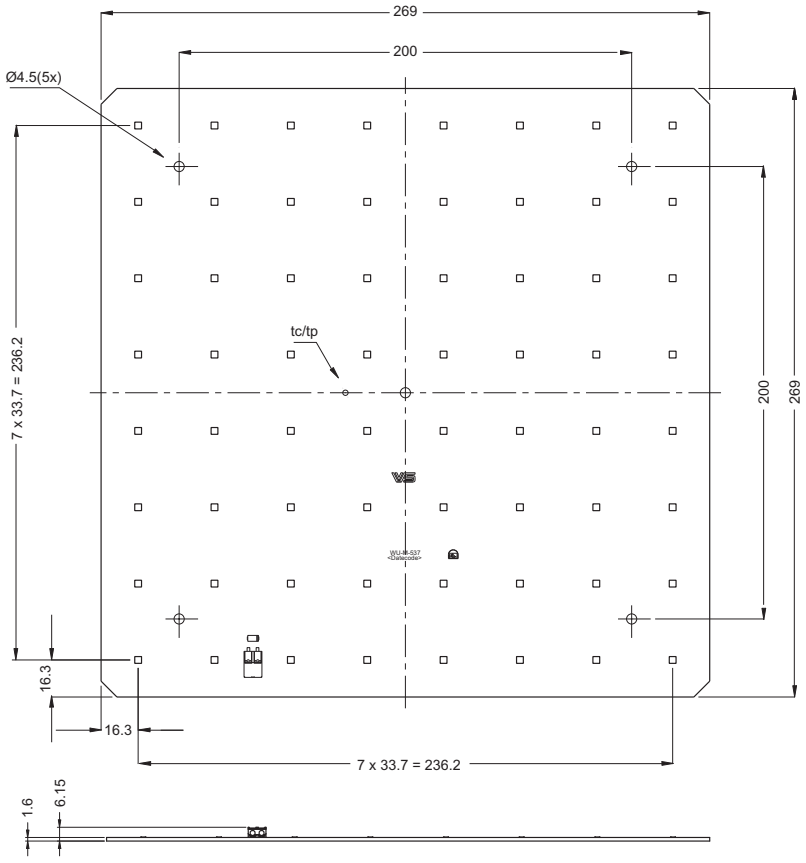
The new LED light panels are a highly effective SMD solution for producing very homogeneous, widely distributed light. They are particularly suitable for integration in louvered luminaires (600 x 600 mm).

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: 269 x 269 mm
On-board push-in terminals
Fixing holes: Ø 4.5 mm
Use of external LED constant-current drivers
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)
Packaging unit: 50 pcs.



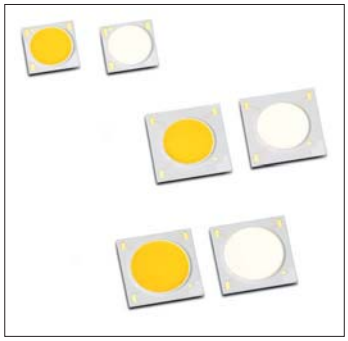
Typical applications

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

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. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W		min. R_a	typ. R_a
				P_{el} = 7.1 - 8.5 W U = 20.4 - 24.4 V			P_{el} = 10.5 - 12.5 W U = 21 - 25 V			P_{el} = 15.2 - 18 W U = 21.7 - 25.7 V					
WU-M-537-830	**561098**	warm white	3000 -80/+130	1160	1260	167	1630	1770	158	2235	2425	148	120	80	85
WU-M-537-840	**561099**	neutral white	4000 -160/+115	1210	1320	174	1700	1855	165	2330	2535	155	120	80	85
WU-M-537-850	**561100**	neutral white	5000 -125/+155	1260	1440	190	1770	2020	181	2425	2770	169	120	80	85
WU-M-537-865	**561101**	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: ±7%

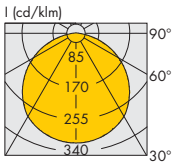
LUGA Shop 2015 PCB – 1000 lm to 8000 lm



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 53).



Technical notes

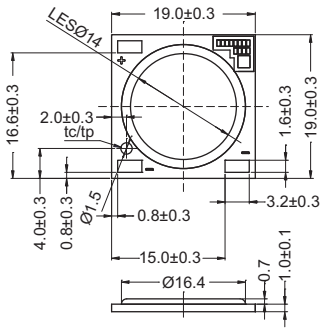
Dimensions: 19x19 mm, 28x28 mm
Light emitting surface (LES): Ø 14 mm, Ø 17 mm, Ø 20 mm
Beam angle: 120°
Allowed operating temperature at t_c point:
-40 to 80 °C
Use of external LED constant current driver
Efficiency up to 175 lm/W
Colour rendering index R_a: typ. > 70 / > 80 / > 90
Colour accuracy initially: 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)
Packaging unit: 175 pcs. (DMS099),
100 pcs. (DMS120/DMS150)

Typical applications

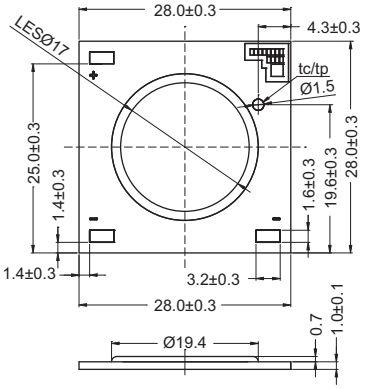
Integration in
- Reflector luminaires
- Flat surface-mounting luminaires
- Cladding illumination
- Suspended luminaire with external control gear

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

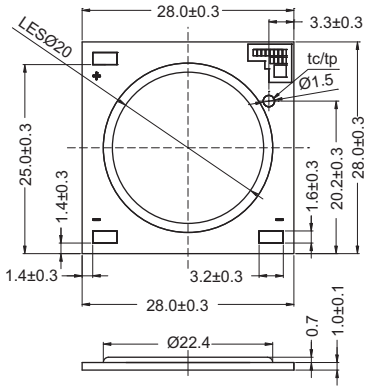
DMS099*F**



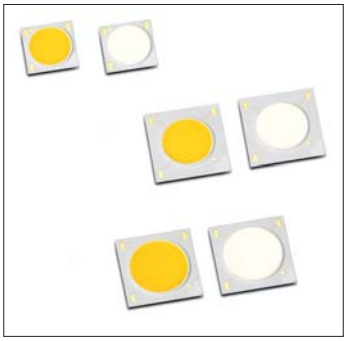
DMS120*F**



DMS150*F**



LUGA Shop 2015 PCB – 1000 lm to 8000 lm



Characteristics

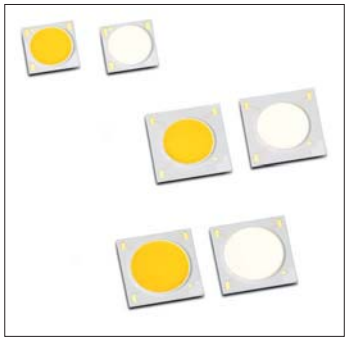
- Optimized for retail and furniture illumination
- CRI 70 version for industrial and outdoor lighting
- Highly efficient: up to 175 lm/W

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	
				P_{el} = 8.7 W		P_{el} = 12.6 W		P_{el} = 18.1 W		P_{el} = 28 W		P_{el} = 38.1 W		
DMS099C				$U_{typ.}$ = 24.7 V		$U_{typ.}$ = 25.3 V		$U_{typ.}$ = 25.8 V		$U_{typ.}$ = 26.7 V		$U_{typ.}$ = 27.3 V		
DMS099C27F	**558922**	warm white	2700	1195	137	1685	134	2265	125	3170	113	3920	103	82
DMS099C30F	**558231**	warm white	3000	1285	148	1810	144	2435	135	3410	122	4220	111	85
DMS099C30FB	**558232**	warm white	3000 (below BBL)	1220	140	1715	136	2305	127	3230	115	4010	105	85
DMS099C35F	**558923**	neutral white	3500	1320	152	1850	147	2485	137	3490	125	4320	113	85
DMS099C35FB	**558924**	neutral white	3500 (below BBL)	1245	143	1750	139	2350	130	3285	117	4070	107	85
DMS099C40F	**558925**	neutral white	4000	1335	153	1885	150	2530	140	3545	127	4380	115	85
DMS099C40FB	**558926**	neutral white	4000 (below BBL)	1260	145	1770	140	2380	131	3335	119	4130	108	85
DMS099C50F	**558927**	cool white	5000	1345	155	1900	151	2550	141	3575	128	4430	116	85
				P_{el} = 11.5 W		P_{el} = 16.7 W		P_{el} = 23.9 W		P_{el} = 37 W		P_{el} = 50.4 W		
DMS120C / DMS120B				$U_{typ.}$ = 32.9 V		$U_{typ.}$ = 33.4 V		$U_{typ.}$ = 34.1 V		$U_{typ.}$ = 35.3 V		$U_{typ.}$ = 36 V		
DMS120C27F	**558932**	warm white	2700	1665	145	2295	137	3090	129	4305	116	5315	105	82
DMS120C30F	**558234**	warm white	3000	1785	155	2470	148	3320	139	4635	125	5725	114	85
DMS120C30FB	**558235**	warm white	3000 (below BBL)	1695	147	2345	140	3150	132	4400	119	5435	108	85
DMS120C35F	**558933**	neutral white	3500	1830	159	2535	152	3405	142	4750	128	5865	116	85
DMS120C35FB	**558934**	neutral white	3500 (below BBL)	1720	150	2380	143	3205	134	4470	121	5515	109	85
DMS120C40F	**558935**	neutral white	4000	1860	162	2565	154	3450	144	4820	130	5955	118	85
DMS120C40FB	**558936**	neutral white	4000 (below BBL)	1750	152	2420	145	3260	136	4545	123	5605	111	85
DMS120C50F	**558937**	cool white	5000	1875	163	2590	155	3480	146	4865	131	6005	119	85
DMS120B50F	**on request**	cool white	5000	1980	172	2740	164	3685	154	5145	139	6355	126	70
				P_{el} = 14.4 W		P_{el} = 20.9 W		P_{el} = 29.9 W		P_{el} = 46.4 W		P_{el} = 63 W		
DMS150C / DMS150B				$U_{typ.}$ = 41.1 V		$U_{typ.}$ = 41.8 V		$U_{typ.}$ = 42.7 V		$U_{typ.}$ = 44.2 V		$U_{typ.}$ = 45 V		
DMS150C27F	**558943**	warm white	2700	2110	147	2925	140	3945	132	5560	120	6880	109	82
DMS150C30F	**558237**	warm white	3000	2275	158	3150	151	4245	142	5980	129	7410	118	85
DMS150C30FB	**558238**	warm white	3000 (below BBL)	2155	150	2990	143	4030	135	5675	122	7035	112	85
DMS150C35F	**558944**	neutral white	3500	2330	162	3230	155	4355	146	6125	132	7595	121	85
DMS150C35FB	**558945**	neutral white	3500 (below BBL)	2185	152	3040	145	4095	137	5770	124	7145	113	85
DMS150C40F	**558946**	neutral white	4000	2360	164	3275	157	4420	148	6210	134	7705	122	85
DMS150C40FB	**558947**	neutral white	4000 (below BBL)	2220	154	3085	148	4160	139	5865	126	7260	115	85
DMS150C50F	**558948**	cool white	5000	2380	165	3300	158	4450	149	6285	135	7775	123	85
DMS150B50F	**on request**	cool white	5000	2525	175	3500	167	4720	158	6640	143	8225	131	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 HiCRI – 1000 lm to 8000 lm



Characteristics

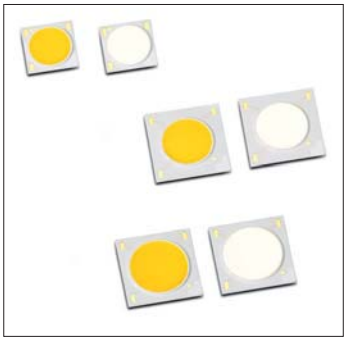
- Typ. colour rendering index (CRI): R_a > 90

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		
DMS099SF**				$U_{typ.}$ = 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)	970	111	1365	108	1835	101	2565	92	3185	84	95
DMS099S30F	**558929**	warm white	3000 (below BBL)	1040	120	1460	116	1965	109	2755	98	3415	90	95
DMS099S35F	**558930**	neutral white	3500 (below BBL)	1105	127	1560	124	2090	115	2930	105	3630	95	95
DMS099S40F	**558931**	neutral white	4000 (below BBL)	1145	132	1615	128	2165	120	3035	108	3750	98	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		
DMS120SF**				$U_{typ.}$ = 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)	1345	117	1860	111	2500	105	3500	95	4315	86	95
DMS120S30F	**558940**	warm white	3000 (below BBL)	1445	126	1995	119	2685	112	3755	101	4635	92	95
DMS120S35F	**558941**	neutral white	3500 (below BBL)	1535	133	2120	127	2855	119	3985	108	4915	98	95
DMS120S40F	**558942**	neutral white	4000 (below BBL)	1590	138	2190	131	2950	123	4120	111	5095	101	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		
DMS150SF**				$U_{typ.}$ = 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)	1715	119	2370	113	3195	107	4515	97	5590	89	95
DMS150S30F	**558239**	warm white	3000 (below BBL)	1835	127	2545	122	3430	115	4850	105	5995	95	95
DMS150S35F	**558950**	neutral white	3500 (below BBL)	1955	136	2705	129	3645	122	5140	111	6375	101	95
DMS150S40F	**558951**	neutral white	4000 (below BBL)	2020	140	2800	134	3775	126	5320	115	6585	105	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 131 lm/W

LUGA Shop 2015 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	1070	123	1500	119	2015	111	2825	101	3495	92	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	1480	129	2040	122	2745	115	3850	104	4745	94	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	1890	131	2625	126	3540	118	4985	107	6180	98	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	Correlated colour temperature* K	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})**						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	2540	85	3580	77	4440	70	85 (special spectrum: HiGa)	Bread, fruits, vegetables, cheese
DMS150G40F	**558953**	neutral white	4000	2625	88	3705	80	4585	73	85 (special spectrum: HiGa)	Fish, drugstore, textiles
DMS150P19F	**558954**	"pink effect"	2000	2370	79	3340	72	4145	66	82	Meat
DMS150P40F	**558955**	"white effect"	4000	2040	68	2870	62	3560	57	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%

PCB Holder for LUGA Shop 2015 and LUGA C 2015 Modules

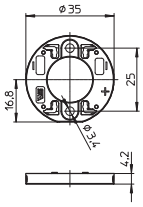
For LUGA Shop 2015: **DMS099***F / DMS120***F / DMS150***F
For LUGA C 2016: **DMC124***F / DMC125***F / DMC128***F (1500–4500 lm)
DMC12C*F / DMC18C***F (3000–15,000 lm)

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.

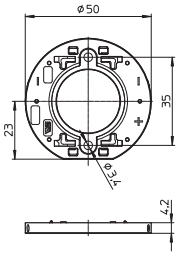
Dependent on the used thermal conductive material and the power classes the expected service life times can differ from the values on the data sheet LUGA C/Shop 2015.

Phase-change thermal pads (PC TIM)
For optimum heat dissipation
Softening temperature: 45 to 55 °C
Solid material at room temperature for easy assembly
Thermal conductivity R_{th}: 3 W/mK
Ref. No.: 561002 for Ø 35 mm
Ref. No.: 561003 for Ø 50 mm

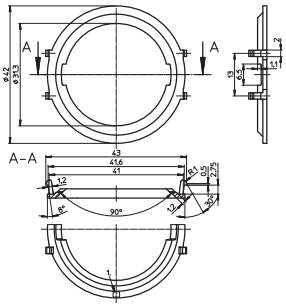
Holder
For LUGA C PCB DMC124***F, DMC125***F, DMC128***F and LUGA Shop 2015 DMS099***F
Dimensions (ØxH): 35 x 4.2 mm
Material: PBT, white
Fixing holes for screws M3
Hole distance: 25 mm
Packaging unit: 250 pcs.
Type: 89721
Ref. No.: 559165 Ø 35 mm



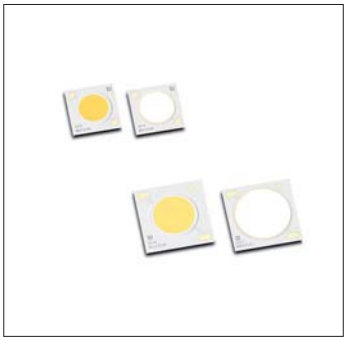
Holder
For LUGA C PCB DMC12C***F, DMC18C***F and LUGA Shop 2015 DMS120***F, DMS150***F
Dimensions (ØxH): 50 x 4.2 mm
Material: PBT, white
Fixing holes for screws M3
Hole distance: 35 mm
Packaging unit: 250 pcs.
Type: 89720
Ref. No.: 559164 Ø 50 mm



Ring reflector
For PCB holder, type: 89720, Ø 50 mm
For changing the height of the holder
Diameter: Ø 42 mm (incl. clip: 43 mm)
Height incl. holder: 7 mm
Material: PC, white
Beam angle: 90°
Packaging unit: 250 pcs.
Type: 89720
Ref. No.: 560347



LUGA C 2016 – 500 lm to 4500 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 delivering lumen packages of up to 4500 lm, they can also be used for retail lighting and in downlights.

Technical notes

Dimensions
- DMC122: 13.5x13.5x1.7 mm
- DMC124/DMC125/
- DMC128: 19x19x1.7 mm

Light emitting surface (LES)
- DMC122: Ø 8 mm
- DMC124/DMC125: Ø 11.1 mm
- DMC128: Ø 13.8 mm

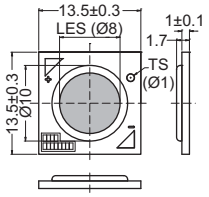
Allowed operating temperature at t_c point:
- -40 to 85 °C
- -40 to 80 °C (DMC104: > 500 mA)
- -40 to 75 °C (DMC118: > 700 mA)

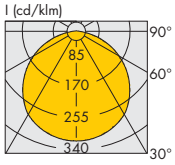
Use of external LED constant current driver
Efficiency up to 163 lm/W
Colour rendering index R_a: > 80 / > 90
Colour accuracy initially: 3 SDCM;
- after 50,000 hrs. operating time: 4 SDCM

Lumen maintenance L90/B10
- DMC122: 53.000 hrs. (I_F 150 mA)
- DMC124: 48.000 hrs. (I_F 350 mA)
- DMC125/DMC128: 50.000 hrs. (I_F 350 mA)

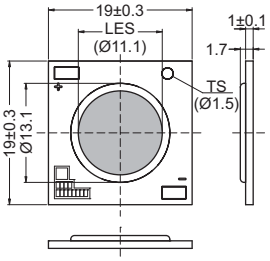
Packaging unit:
- 225 pcs. (DMC122)
- 175 pcs. (DMC124/DMC125/DMC118)

DMC122CF**

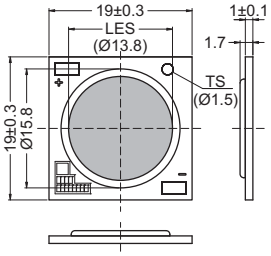




DMC124CF / DMC125C**F / DMC124D31FP / DMC125D31FP**



DMC128CF / DMC128D31FP**



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 2016 – 500 lm to 1000 lm

Characteristics

- Optimized for lumen packages ≤ 1000 lm
- Highly efficient: up to 140 lm/W

LUGA C 2016 – 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
DMC122CF**				P_{el} = 5.2 W $U_{typ.}$ = 34.4 V		P_{el} = 7 W $U_{typ.}$ = 35.2 V		P_{el} = 9 W $U_{typ.}$ = 35.8 V			
DMC122C27F	**560392**	warm white	2700	650	125	830	119	995	111	120	82
DMC122C30F	**560394**	warm white	3000	705	136	900	129	1080	120	120	85
DMC122C35F	**560395**	neutral white	3500	710	137	905	129	1085	121	120	85
DMC122C40F	**560396**	neutral white	4000	725	139	925	132	1105	123	120	85
DMC122C50F	**560397**	cool white	5000	730	140	935	134	1120	124	120	85

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ±10%

LUGA C 2016 – 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
DMC122SF**				P_{el} = 5.2 W $U_{typ.}$ = 34.4 V		P_{el} = 7 W $U_{typ.}$ = 35.2 V		P_{el} = 9 W $U_{typ.}$ = 35.8 V			
DMC122S27F	**560449**	warm white	2700 (below BBL)	510	98	650	93	775	86	120	95
DMC122S30F	**560450**	warm white	3000 (below BBL)	545	105	700	100	835	93	120	95
DMC122S35F	**560451**	neutral white	3500 (below BBL)	580	112	740	106	890	99	120	95
DMC122S40F	**560452**	neutral white	4000 (below BBL)	605	116	770	110	920	102	120	95

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ±10%

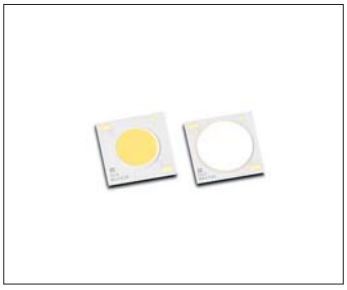
LUGA C 2016 – Pearl White

LUGA C 2016 – CRI R_a > 80 / > 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
DMC122*31FP				P_{el} = 5.2 W $U_{typ.}$ = 34.4 V		P_{el} = 7 W $U_{typ.}$ = 35.2 V		P_{el} = 9 W $U_{typ.}$ = 35.8 V			
DMC122C31FP	**560418**	pearl white	3100	690	133	880	126	1055	117	120	85
DMC122S31FP	**560465**	pearl white	3100	560	108	715	102	855	95	120	95

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ±10%

LUGA C 2016 – 1500 lm to 4500 lm



Characteristics

- Optimized for lumen packages from 1500 lm to 4500 lm
- Highly efficient: up to 163 lm/W

LUGA C 2016 – CRI R_a > 80

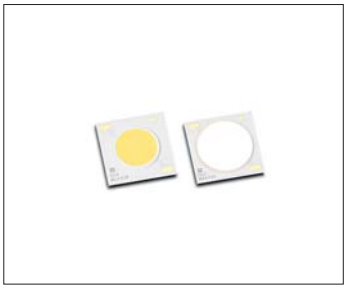
Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**								Typ. beam angle (°)	Typ. CRI R_a
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
DMC124CF**				P_{el} = 12.2 W $U_{typ.}$ = 34.8 V		P_{el} = 17.9 W $U_{typ.}$ = 35.8 V							
DMC124C27F	**560398**	warm white	2700	1515	124	2040	114	–	–	–	–	120	82
DMC124C30F	**560399**	warm white	3000	1645	135	2220	124	–	–	–	–	120	85
DMC124C35F	**560401**	neutral white	3500	1660	136	2240	125	–	–	–	–	120	85
DMC124C40F	**560403**	neutral white	4000	1700	139	2280	127	–	–	–	–	120	85
DMC124C50F	**560405**	cool white	5000	1715	141	2305	129	–	–	–	–	120	85
DMC125CF**				P_{el} = 12 W $U_{typ.}$ = 34.2 V		P_{el} = 17.6 W $U_{typ.}$ = 35.1 V		P_{el} = 25.2 W $U_{typ.}$ = 36 V					
DMC125C27F	**560406**	warm white	2700	1520	127	2035	116	2595	103	–	–	120	82
DMC125C30F	**560407**	warm white	3000	1650	138	2215	126	2810	112	–	–	120	85
DMC125C30FB	**560408**	warm white	3000 (below BBL)	1555	130	2090	119	2660	106	–	–	120	85
DMC125C35F	**560409**	neutral white	3500	1670	139	2235	127	2840	113	–	–	120	85
DMC125C40F	**560410**	neutral white	4000	1700	142	2280	130	2900	115	–	–	120	85
DMC125C50F	**560411**	cool white	5000	1715	143	2300	131	2920	116	–	–	120	85
DMC128CF**				P_{el} = 11.6 W $U_{typ.}$ = 33.2 V		P_{el} = 16.9 W $U_{typ.}$ = 33.9 V		P_{el} = 24.3 W $U_{typ.}$= 34.7 V		P_{el} = 37.5 W $U_{typ.}$= 35.7 V			
DMC128C27F	**560412**	warm white	2700	1665	144	2285	135	3025	124	4040	108	120	82
DMC128C30F	**560413**	warm white	3000	1810	156	2480	147	3275	135	4380	117	120	85
DMC128C30FB	**560414**	warm white	3000 (below BBL)	1710	147	2340	138	3095	127	4145	111	120	85
DMC128C35F	**560415**	neutral white	3500	1820	157	2505	148	3315	136	4430	118	120	85
DMC128C40F	**560416**	neutral white	4000	1865	161	2550	151	3375	139	4515	120	120	85
DMC128C50F	**560417**	cool white	5000	1885	163	2580	153	3405	140	4560	122	120	85

LUGA C 2016 – 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 R_a
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
DMC124SF**				P_{el} = 12.2 W $U_{typ.}$ = 34.8 V		P_{el} = 17.9 W $U_{typ.}$ = 35.8 V							
DMC124S27F	**560453**	warm white	2700 (below BBL)	1190	98	1605	90	–	–	–	–	120	95
DMC124S30F	**560454**	warm white	3000 (below BBL)	1275	105	1715	96	–	–	–	–	120	95
DMC124S35F	**560455**	neutral white	3500 (below BBL)	1355	111	1825	102	–	–	–	–	120	95
DMC124S40F	**560456**	neutral white	4000 (below BBL)	1400	115	1890	106	–	–	–	–	120	95
DMC125SF**				P_{el} = 12 W $U_{typ.}$ = 34.2 V		P_{el} = 17.6 W $U_{typ.}$ = 35.1 V		P_{el} = 15.2 W $U_{typ.}$ = 36 V					
DMC125S27F	**560457**	warm white	2700 (below BBL)	1195	100	1600	91	2035	81	–	–	120	95
DMC125S30F	**560458**	warm white	3000 (below BBL)	1280	107	1710	97	2180	87	–	–	120	95
DMC125S35F	**560459**	neutral white	3500 (below BBL)	1360	113	1825	104	2325	92	–	–	120	95
DMC125S40F	**560460**	neutral white	4000 (below BBL)	1405	117	1885	107	2405	95	–	–	120	95
DMC128SF**				P_{el} = 11.6 W $U_{typ.}$ = 33.2 V		P_{el} = 16.9 W $U_{typ.}$ = 33.9 V		P_{el} = 24.3 W $U_{typ.}$ = 34.7 V		P_{el} = 37.5 W $U_{typ.}$ = 35.7 V			
DMC128S27F	**560461**	warm white	2700 (below BBL)	1310	113	1790	106	2370	98	3165	84	120	95
DMC128S30F	**560462**	warm white	3000 (below BBL)	1405	121	1920	114	2545	105	3390	90	120	95
DMC128S35F	**560463**	neutral white	3500 (below BBL)	1490	128	2040	121	2705	111	3610	96	120	95
DMC128S40F	**560464**	neutral white	4000 (below BBL)	1545	133	2115	125	2800	115	3740	100	120	95

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ±10%

LUGA C 2016 – 1500 lm to 4000 lm – Pearl White



Characteristics

- Brilliant white light

LUGA C 2016 – CRI R_a > 80 / > 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 R_a
				350 mA		500 mA		700 mA		1050 mA			
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
				P_{el} = 12.2 W		P_{el} = 17.9 W							
DMC124*31FP				$U_{typ.}$ = 34.8 V		$U_{typ.}$ = 35.8 V							
DMC124C31FP	**560419**	pearl white	3100	1610	132	2170	121	–	–	–	–	120	85
DMC124S31FP	**560466**	pearl white	3100	1310	107	1765	99	–	–	–	–	120	95
				P_{el} = 12 W		P_{el} =17.6 W		P_{el} = 25.2 W					
DMC125*31FP				$U_{typ.}$ = 34.2 V		$U_{typ.}$ = 35.1 V		$U_{typ.}$ = 36 V					
DMC125C31FP	**560420**	pearl white	3100	1620	135	2165	123	2755	109	–	–	120	85
DMC125S31FP	**560467**	pearl white	3100	1315	110	1760	100	2245	89	–	–	120	95
				P_{el} = 11.6 W		P_{el} = 16.9 W		P_{el} = 24.3 W		P_{el} = 37.5 W			
DMC128*31FP				$U_{typ.}$ = 33.2 V		$U_{typ.}$ = 33.9 V		$U_{typ.}$ = 34.7 V		$U_{typ.}$ = 35.7 V			
DMC128C31FP	**560421**	pearl white	3100	1770	153	2430	144	3215	132	4295	115	120	85
DMC128S31FP	**560468**	pearl white	3100	1440	124	1975	117	2615	108	3485	93	120	95

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux, efficiency, voltage and power consumption: ±10%

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 are designed for built-in into luminaire casings. They enable a modular luminaire design.

The modules are available in four shapes (4, 8, 16 or 32 LEDs) and in three white colour tones.

Technical notes

LED built-in module for integration into luminaires
4, 8, 16 or 32 high-efficient High Power LEDs
Allowed operating temperature at t_c point
at I_F = 700 mA: –30 to 85 °C
Use of external LED constant current driver
Design for optimum thermal management
Efficiency up to 135 lm/W
Lumen maintenance L80/B10:
50,000 hrs. (I_F 1050 mA) at t_p 60 °C
Colour accuracy initially: 5 SDCM
ESD protection class 2
Surge protection: 4 kV (except WU-M-479)

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*	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})**								CRI***	Photometric code
IP20	IP67 (IP66)		K	350 mA		700 mA		1050 mA		1400 mA		R_a	
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W		
4 LEDs				P_{el} = 3.9 W $U_{typ.}$ = 11 V		P_{el} = 8.1 W $U_{typ.}$ = 11.5 V		P_{el} = 12.5 W $U_{typ.}$ = 11.9 V		P_{el} = 17.2 W $U_{typ.}$ = 12.3 V			
WU-M-479/4-C-830	–	warm white	3000	490	127	925	115	1305	104	1625	94	≥ 80	830 / 579
WU-M-479/4-C-840	–	neutral white	4000	520	135	980	122	1385	111	1730	100	≥ 80	840 / 579
WU-M-479/4-C-850	–	cool white	5000	500	130	845	118	1335	107	1665	97	≥ 80	850 / 579
8 LEDs				P_{el} = 7.7 W $U_{typ.}$ = 21.9 V		P_{el} = 16.1 W $U_{typ.}$ = 23 V		P_{el} = 25.1 W $U_{typ.}$ = 23.9 V		P_{el} = 34.4 W $U_{typ.}$ = 24.6 V			
WU-M-479/8-C-830	–	warm white	3000	975	127	1845	115	2605	104	3250	94	≥ 80	830 / 579
WU-M-479/8-C-840	–	neutral white	4000	1040	135	1965	122	2770	111	3455	100	≥ 80	840 / 579
WU-M-479/8-C-850	–	cool white	5000	1000	130	1895	118	2675	107	3335	97	≥ 80	850 / 579
16 LEDs				P_{el} = 15.4 W $U_{typ.}$ = 43.9 V		P_{el} = 32.2 W $U_{typ.}$ = 46 V		P_{el} = 50.1 W $U_{typ.}$ = 47.7 V		P_{el} = 68.9 W $U_{typ.}$ = 49.2 V			
WU-M-475-C-830	WU-M-425-C-830	warm white	3000	1955	127	3690	115	5210	104	6500	94	≥ 80	830 / 579
WU-M-475-C-840	WU-M-425-C-840	neutral white	4000	2075	135	3925	122	5540	111	6910	100	≥ 80	840 / 579
WU-M-475-C-850	WU-M-425-C-850	cool white	5000	2005	130	3790	118	5345	107	6670	97	≥ 80	850 / 579
WU-M-479/16-C-830	–	warm white	3000	1955	127	3690	115	5210	104	6500	94	≥ 80	830 / 579
WU-M-479/16-C-840	–	neutral white	4000	2075	135	3925	122	5540	111	6910	100	≥ 80	840 / 579
WU-M-479/16-C-850	–	cool white	5000	2005	130	3790	118	5345	107	6670	97	≥ 80	850 / 579
32 LEDs				P_{el} = 30.7 W $U_{typ.}$ = 87.7 V		P_{el} = 64.3 W $U_{typ.}$ = 91.9 V		P_{el} = 100.3 W $U_{typ.}$ = 95.5 V		P_{el} = 137.9 W $U_{typ.}$ = 98.5 V			
–	WU-M-496-C-830	warm white	3000	3905	127	7385	115	10420	104	13000	94	≥ 80	830 / 579
–	WU-M-496-C-840	neutral white	4000	4155	135	7855	122	11080	111	13825	100	≥ 80	840 / 579
–	WU-M-496-C-850	cool white	5000	4005	130	7580	118	10695	107	13340	97	≥ 80	850 / 579

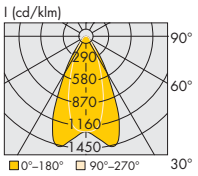
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.
** Production tolerance of voltage and power consumption: +10%/–4%; Measuring tolerance of luminous flux: ±7%
*** Measuring tolerance of CRI: ±2 | CRI > 70 on request

LED Industrial Light SYM I – IP20

Technical notes

Dimensions (incl. optics) LxWxH
- WU-M-479/4: 50x62.3x12 mm
- WU-M-479/8: 50x113.2x12 mm
- WU-M-479/16: 50x215x12 mm
- WU-M-475: 120x120x12 mm

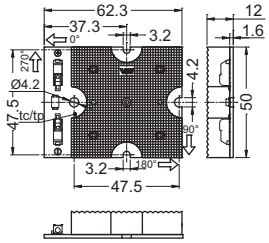
Degree of protection: IP20
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:1 (height to distance) on the 0–180° layer (lengthwise) or 8:5 (height to distance) on the 90–270° layer (crosswise)



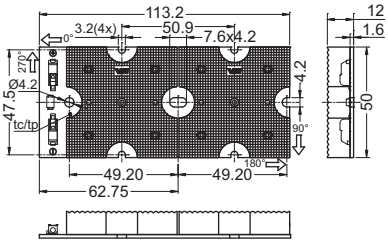
Reference numbers

Type	Ref. No.	Number of LEDs
WU-M-479/4-C-830	**561972**	4
WU-M-479/4-C-840	**561979**	4
WU-M-479/4-C-850	**561986**	4
WU-M-479/8-C-830	**561993**	8
WU-M-479/8-C-840	**562000**	8
WU-M-479/8-C-850	**562007**	8
WU-M-479/16-C-830	**562014**	16
WU-M-479/16-C-840	**562021**	16
WU-M-479/16-C-850	**562028**	16
WU-M-475-C-830	**561904**	16
WU-M-475-C-840	**561909**	16
WU-M-475-C-850	**561914**	16

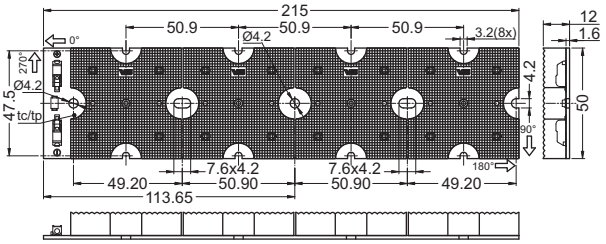
WU-M-479/4



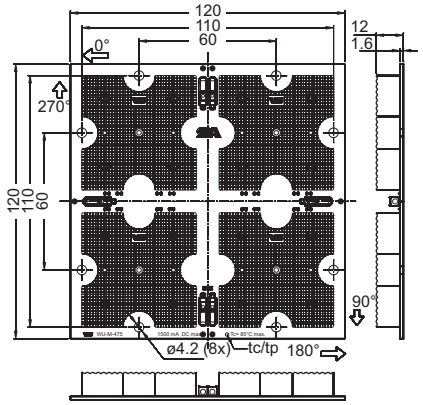
WU-M-479/8



WU-M-479/16



WU-M-475



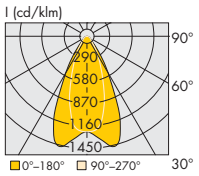
LED Industrial Light SYM I – Water Protected

Technical notes

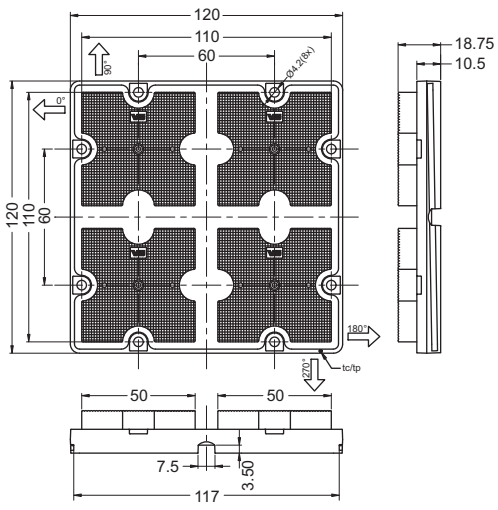
Dimensions (incl. optics) LxWxH
WU-M-425: 120 x120 x18.75 mm
WU-M-496: 240x120x62 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for hall lighting
Optimum illumination – 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).

Reference numbers

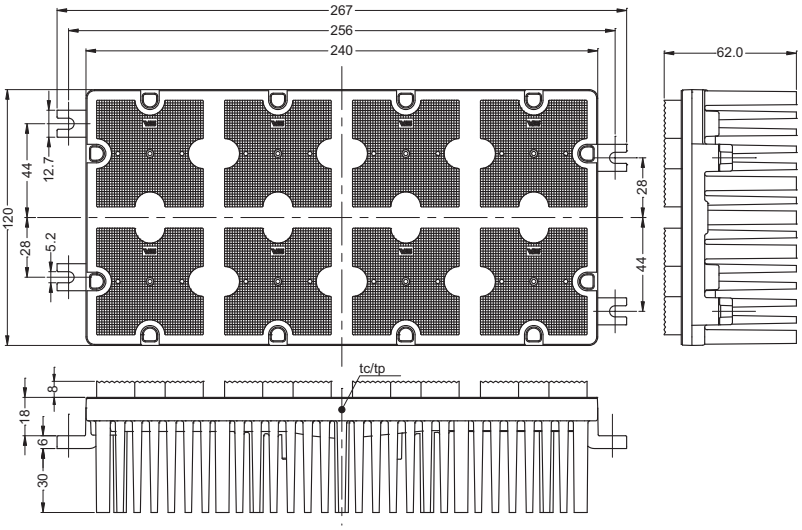
Type	**Ref. No.**	Number of LEDs
WU-M-425-C-830	**562034**	16
WU-M-425-C-840	**562041**	16
WU-M-425-C-850	**562048**	16
WU-M-496-C-830	**562088**	32
WU-M-496-C-840	**562098**	32
WU-M-496-C-850	**562108**	32



WU-M-425



WU-M-496



LED Industrial Light SYM II – IP20

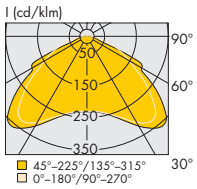
Technical notes

Dimensions (incl. optics) LxWxH
- WU-M-479/4: 50x62.3x6.2 mm
- WU-M-479/8: 50x113.2x6.2 mm
- WU-M-479/16: 50x215x6.2 mm
- WU-M-475: 120 x120 x 6.2 mm

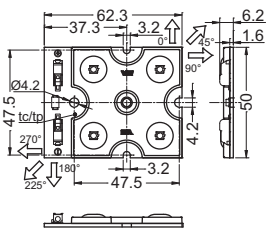
Degree of protection: IP20
Push-in terminals (WAGO series 2060)
Optics for hall lighting
Optimum illumination – installation ratio:
1:2 (height to distance)

Reference numbers

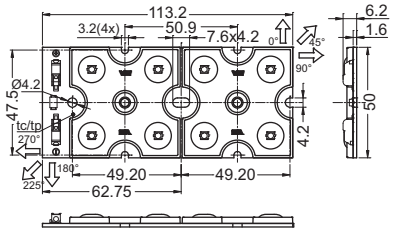
Type	Ref. No.	Number of LEDs
WU-M-479/4-C-830	**561973**	4
WU-M-479/4-C-840	**561980**	4
WU-M-479/4-C-850	**561987**	4
WU-M-479/8-C-830	**561994**	8
WU-M-479/8-C-840	**562001**	8
WU-M-479/8-C-850	**562008**	8
WU-M-479/16-C-830	**562015**	16
WU-M-479/16-C-840	**562022**	16
WU-M-479/16-C-850	**562029**	16
WU-M-475-C-830	**561905**	16
WU-M-475-C-840	**561910**	16
WU-M-475-C-850	**561915**	16



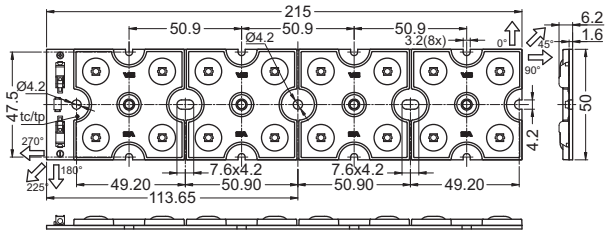
WU-M-479/4



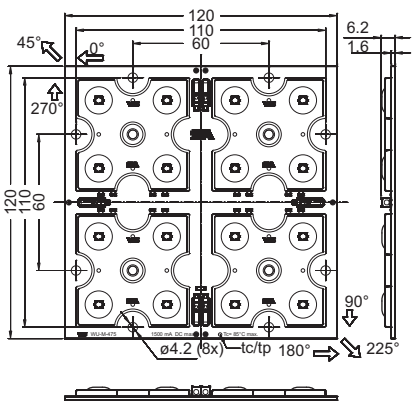
WU-M-479/8



WU-M-479/16



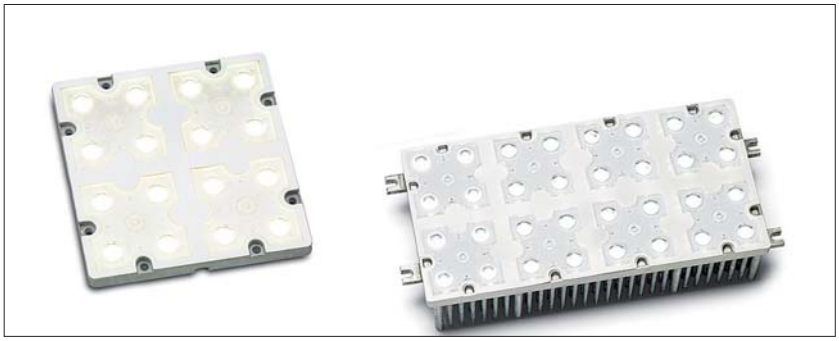
WU-M-475

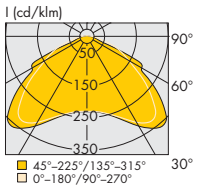


LED Industrial Light SYM II – Water Protected

Technical notes

Dimensions (incl. optics) LxWxH
WU-M-425: 120 x120 x14 mm
WU-M-496: 240x120x54.6 mm
Encapsulated for outdoor applications
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)

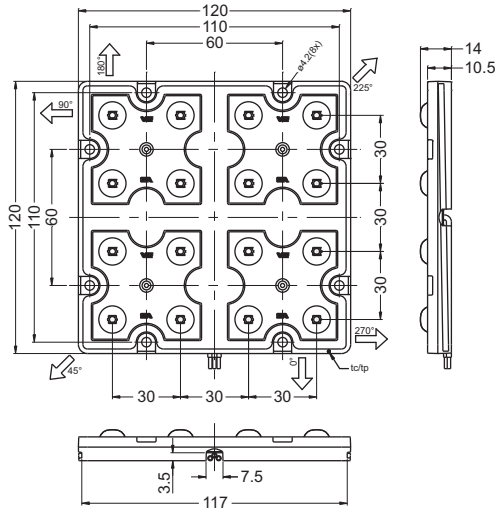




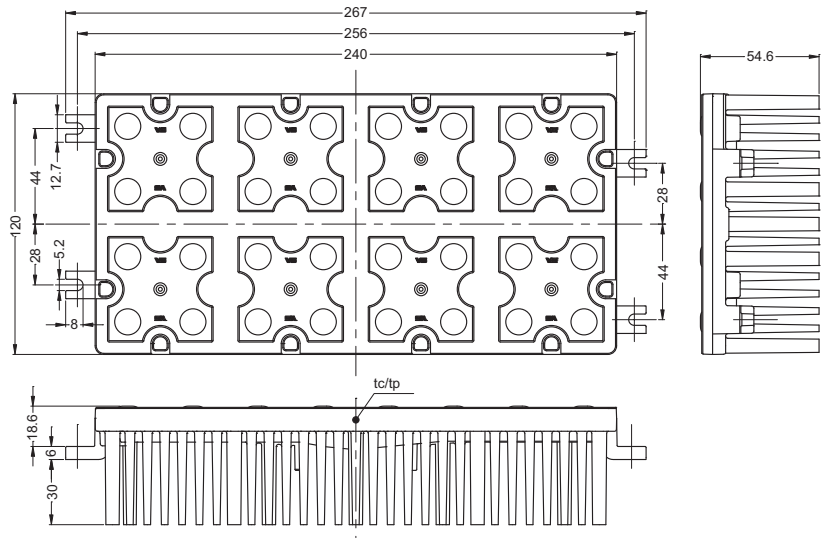
Reference numbers

Typ	Ref. No.	Number of LEDs	Degree of protection
With PMMA optics			
WU-M-425-C-830	**562035**	16	IP66/IK05
WU-M-425-C-840	**562042**	16	IP66/IK05
WU-M-425-C-850	**562049**	16	IP66/IK05
WU-M-496-C-830	**562089**	32	IP66/IK05
WU-M-496-C-840	**562099**	32	IP66/IK05
WU-M-496-C-850	**562109**	32	IP66/IK05
With silicone optics			
WU-M-425-C-830	**562036**	16	IP67/IP69/IK08
WU-M-425-C-840	**562043**	16	IP67/IP69/IK08
WU-M-425-C-850	**562050**	16	IP67/IP69/IK08
WU-M-496-C-830	**562090**	32	IP67/IP69/IK08
WU-M-496-C-840	**562100**	32	IP67/IP69/IK08
WU-M-496-C-850	**562110**	32	IP67/IP69/IK08

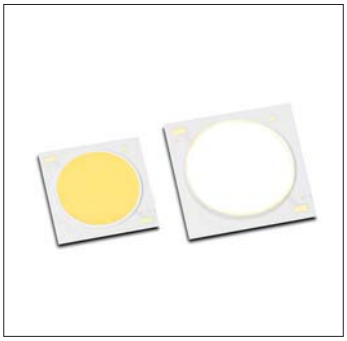
WU-M-425



WU-M-496



LUGA C 2016 – 3000 lm to 15,000 lm



Built-in lighting modules

LUGA C modules with lumen values ranging from 3000 to 15,000 lm are especially designed as a 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.

Technical notes

Dimensions
- DMC12C/DMC18C: 28 x 28 x 1.7 mm
- DMC18Q: 38 x 38 x 1.7 mm

Light emitting surface (LES)
- DMC12C/DMC18C: Ø 22 mm
- DMC18Q: Ø 33 mm

Typ. beam angle: 120°

Allowed operating temperature at t_c point:
- –40 to max. 105 °C (at 700 mA)

Use of external LED constant current driver

Efficiency up to 184 lm/W

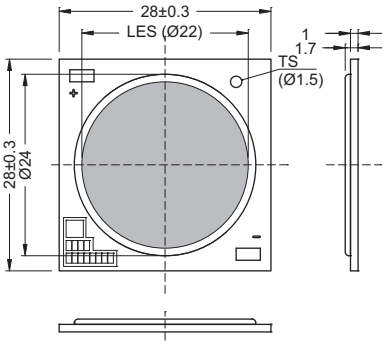
Colour rendering index R_a: > 80 / > 65

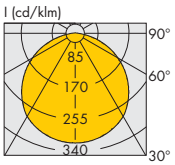
Colour accuracy initially: 3 SDCM;
- after 50,000 hrs. operating time: 4 SDCM

Lumen maintenance L90/B10
- DMC12C: 43,000 hrs. (I_F 1050 mA)
- DMC18C: 44,000 hrs. (I_F 1050 mA)
- DMC18Q: 54,000 hrs. (I_F 1050 mA)

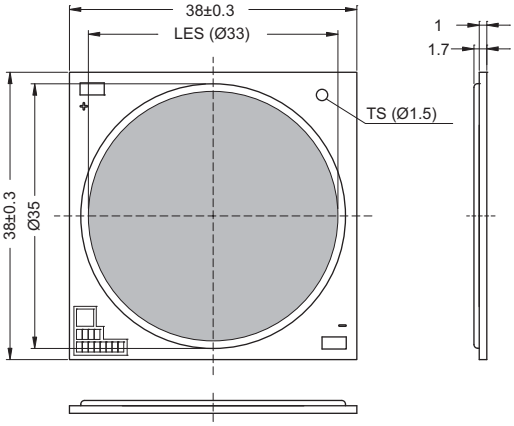
Packaging unit:
- 100 pcs. (DMC12C/DMC18C)
- 75 pcs. (DMC18Q)

DMC12C*F / DMC18C***F**





DMC18Q*F**

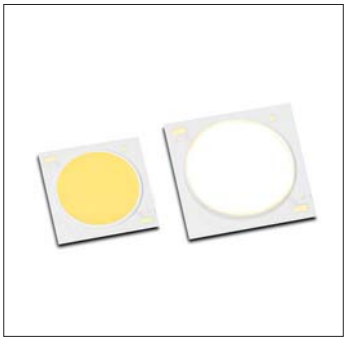


Typical applications

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
- Street and Outoor Lighting

LUGA C 2016 – 3000 lm to 15,000 lm

Holder for LUGA C modules DMC12C and DMC18C
see page 53.



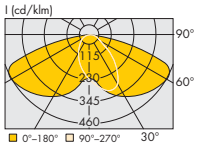
Type	Ref. No.	Colour	Correlated colour temp.* (K)	Typ. luminous flux and efficiency, typ. voltage ($U_{typ.}$) and power consumption (P_{el})**										Typ. CRI R_a
				700 mA		1050 mA		1400 mA		1700 mA		2100 mA		
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	
				P_{el} = 23.4 W		P_{el} = 36.1 W		P_{el} = 49.1 W		P_{el} = 60.5 W				
DMC12C*F**				$U_{typ.}$ = 33.4 V		$U_{typ.}$ = 34.4 V		$U_{typ.}$ = 35.1 V		$U_{typ.}$ = 35.6 V				
DMC12CC27F	**560425**	warm white	2700	3260	139	4620	128	5810	118	6655	110	–	–	82
DMC12CC30F	**560426**	warm white	3000	3535	151	5015	139	6305	128	7235	120	–	–	85
DMC12CC30FB	**560427**	warm white	3000 (below BBL)	3330	142	4730	131	5950	121	6820	113	–	–	85
DMC12CC35F	**560428**	neutral white	3500	3575	153	5065	140	6370	130	7300	121	–	–	85
DMC12CC40F	**560429**	neutral white	4000	3645	156	5170	143	6495	132	7440	123	–	–	85
DMC12CC50F	**560430**	cool white	5000	3715	159	5270	146	6615	135	7590	125	–	–	85
DMC12CB40F	**560431**	neutral white	4000	3735	160	5300	147	6665	136	7645	126	–	–	70
DMC12CB50F	**560432**	cool white	5000	3855	165	5465	151	6875	140	7880	130	–	–	70
				P_{el} = 35.1 W		P_{el} = 54.2 W		P_{el} = 73.7 W		P_{el} = 90.7 W				
DMC18C*F**				$U_{typ.}$ = 50.2 V		$U_{typ.}$ = 51.6 V		$U_{typ.}$ = 52.6 V		$U_{typ.}$ = 53.4 V				
DMC18CC27F	**560433**	warm white	2700	4775	136	6775	125	8475	115	9610	106	–	–	82
DMC18CC30F	**560434**	warm white	3000	5180	148	7360	136	9195	125	10440	115	–	–	85
DMC18CC30FB	**560435**	warm white	3000 (below BBL)	4890	139	6945	128	8680	118	9855	109	–	–	85
DMC18CC35F	**560436**	neutral white	3500	5230	149	7425	137	9290	126	10535	116	–	–	85
DMC18CC40F	**560437**	neutral white	4000	5345	152	7575	140	9470	128	10755	119	–	–	85
DMC18CC50F	**560438**	cool white	5000	5445	155	7720	142	9660	131	10960	121	–	–	85
DMC18CB40F	**560439**	neutral white	4000	5485	156	7780	144	9725	132	11025	122	–	–	70
DMC18CB50F	**560440**	cool white	5000	5645	161	8020	148	10030	136	11365	125	–	–	70
				P_{el} = 34 W		P_{el} = 52 W		P_{el} = 70.3 W		P_{el} = 86.3 W		P_{el} = 108 W		
DMC18Q*F**				$U_{typ.}$ = 48.6 V		$U_{typ.}$ = 49.5 V		$U_{typ.}$ = 50.2 V		$U_{typ.}$ = 50.7 V		$U_{typ.}$ = 51.4 V		
DMC18QC27F	**560441**	warm white	2700	5275	155	7605	146	9770	139	11445	133	13370	124	82
DMC18QC30F	**560442**	warm white	3000	5725	168	8255	159	10600	151	12425	144	14510	134	85
DMC18QC30FB	**560443**	warm white	3000 (below BBL)	5400	159	7795	150	9995	142	11730	136	13690	127	85
DMC18QC35F	**560444**	neutral white	3500	5790	170	8335	160	10700	152	12545	145	14660	136	85
DMC18QC40F	**560445**	neutral white	4000	5900	174	8505	164	10920	155	12795	148	14950	138	85
DMC18QC50F	**560446**	cool white	5000	6015	177	8665	167	11125	158	13035	151	15240	141	85
DMC18QB40F	**560447**	neutral white	4000	6055	178	8730	168	11205	159	13135	152	15350	142	70
DMC18QB50F	**560448**	cool white	5000	6250	184	9000	173	11555	164	13535	157	15820	146	70

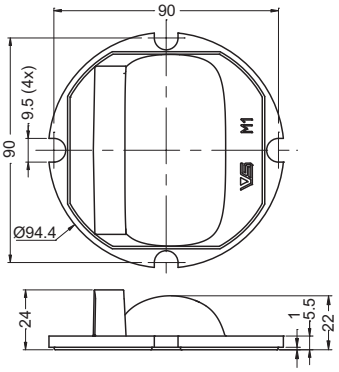
Emission data at t_p = 65 °C | * Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ±15%; of voltage and power consumption: ±10% | Min. CRI R_a: > 80 / > 65

Optics for LUGA C 2016 – 3000 lm to 15,000 lm

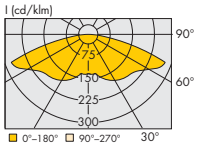
Silicone optics especially designed and
optimized for the use of COB modules with LES
sizes up to Ø 23 mm (e.g. LUGA C: DMC12C***F
and DMC18C***F)
Material: silicone
Self sealing ability (IP65)

COB silicone optics M-Class (M1)
M-Class silicone optics
Optical efficiency: 93%
Optimum illumination – installation ratio:
4:1 (pole distance to pole height)
Ref. No.: 559042

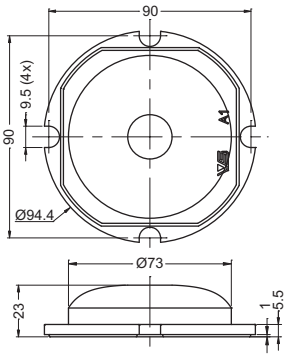




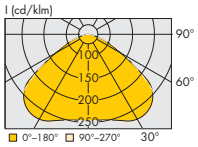
COB silicone optics Area*
Area silicone optics
Optical efficiency: 96%
Optimum illumination – installation ratio:
4.5:1 (distance between luminaire poles
to the height of the luminaire pole)
Ref. No.: 562512
* Products under development;
preliminary technical data



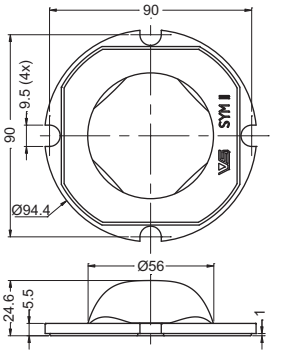
simulated LDC



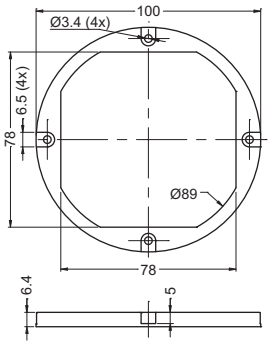
COB silicone optics SYM II
SYM II silicone optics
Optical efficiency: 97%
Optimum illumination – installation ratio:
2:1 (distance to height)
Ref. No.: 562513



simulated LDC



Support for COB silicone optics
Material: PC, black
Ref. No.: 558607



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 are 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, 8, 16 or 32 LEDs) and in three white colour tones.

Technical notes

LED built-in module for integration into luminaires
4, 8, 16 or 32 high-efficient High Power LEDs
Allowed operating temperature at t_c point
at I_F = 700 mA: –30 to 85 °C
Use of external LED constant current driver
Design for optimum thermal management
Efficiency up to 154 lm/W
Lumen maintenance L80/B10:
50,000 hrs. (I_F 1050 mA) at t_p 60 °C
Colour accuracy initially: 5 SDCM
ESD protection class 2
Surge protection: 4 kV (except WU-M-479)

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*	Typ. luminous flux and efficiency, typical voltage ($U_{typ.}$) and power consumption (P_{el})**								CRI***	Photometric code
IP20	IP67 (IP66)			350 mA		700 mA		1050 mA		1400 mA			
			K	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	R_a	
				P_{el} = 3.9 W		P_{el} = 8.1 W		P_{el} = 12.5 W		P_{el} = 17.2 W			
4 LEDs				$U_{typ.}$ = 11 V		$U_{typ.}$ = 11.5 V		$U_{typ.}$ = 11.9 V		$U_{typ.}$ = 12.3 V			
WU-M-479/4-C-730	–	warm white	3000	545	141	1025	128	1450	116	1805	105	≥ 70	730 / 579
WU-M-479/4-C-740	–	neutral white	4000	580	151	1095	136	1545	123	1930	112	≥ 70	740 / 579
WU-M-479/4-C-650	–	cool white	5000	590	154	1120	139	1580	126	1970	114	≥ 65	650 / 579
				P_{el} = 7.7 W		P_{el} = 16.1 W		P_{el} = 25.1 W		P_{el} = 34.4 W			
8 LEDs				$U_{typ.}$ = 21.9 V		$U_{typ.}$ = 23 V		$U_{typ.}$ = 23.9 V		$U_{typ.}$ = 24.6 V			
WU-M-479/8-C-730	–	warm white	3000	1085	141	2055	128	2895	116	3615	105	≥ 70	730 / 579
WU-M-479/8-C-740	–	neutral white	4000	1160	151	2190	136	3090	123	3855	112	≥ 70	740 / 579
WU-M-479/8-C-650	–	cool white	5000	1185	154	2240	139	3160	126	3940	114	≥ 65	650 / 579
				P_{el} = 15.4 W		P_{el} = 32.2 W		P_{el} = 50.1 W		P_{el} = 68.9 W			
16 LEDs				$U_{typ.}$ = 43.9 V		$U_{typ.}$ = 46 V		$U_{typ.}$ = 47.7 V		$U_{typ.}$ = 49.2 V			
WU-M-475-C-730	WU-M-425-C-730	warm white	3000	2170	141	4105	128	5795	116	7230	105	≥ 70	730 / 579
WU-M-475-C-740	WU-M-425-C-740	neutral white	4000	2315	151	4380	136	6180	123	7715	112	≥ 70	740 / 579
WU-M-475-C-650	WU-M-425-C-650	cool white	5000	2370	154	4480	139	6320	126	7880	114	≥ 65	650 / 579
WU-M-479/16-C-730	–	warm white	3000	2170	141	4105	128	5795	116	7230	105	≥ 70	730 / 579
WU-M-479/16-C-740	–	neutral white	4000	2315	151	4380	136	6180	123	7715	112	≥ 70	740 / 579
WU-M-479/16-C-650	–	cool white	5000	2370	154	4480	139	6320	126	7880	114	≥ 65	650 / 579
				P_{el} = 30.7 W		P_{el} = 64.3 W		P_{el} = 100.3 W		P_{el} = 137.9 W			
32 LEDs				$U_{typ.}$ = 87.7 V		$U_{typ.}$ = 91.9 V		$U_{typ.}$ = 95.5 V		$U_{typ.}$ = 98.5 V			
–	WU-M-496-C-730	warm white	3000	4340	141	8210	128	11585	116	14455	105	≥ 70	730 / 579
–	WU-M-496-C-740	neutral white	4000	4635	151	8760	136	12365	123	15425	112	≥ 70	740 / 579
–	WU-M-496-C-650	cool white	5000	4735	154	8955	139	12635	126	15765	114	≥ 65	650 / 579

* 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%/-4%; Measuring tolerance of luminous flux: ±7%
*** Measuring tolerance of CRI: ±2 | CRI > 80 on request

LED Roadway Light M-Class – IP20

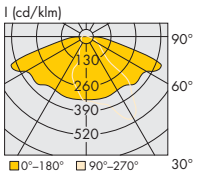
Technical notes

Dimensions (incl. optics) LxWxH
- WU-M-479/4: 50x62.3x10.3 mm
- WU-M-479/8: 50x113.2x10.3 mm
- WU-M-479/16: 50x215x10.3 mm
- WU-M-475: 120x120x10.3 mm

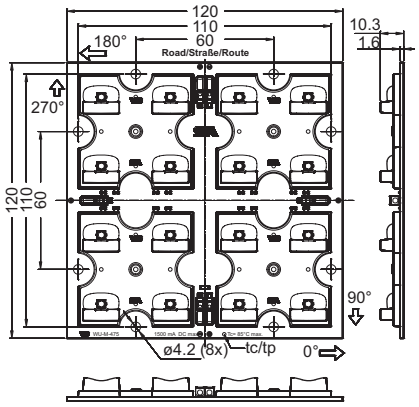
Degree of protection: IP20
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole)

Reference numbers

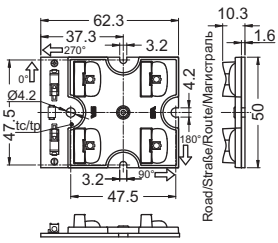
Type	Ref. No.		Number
	lengthwise	crosswise	of LEDs
WU-M-479/4-C-730	**561967**	**561969**	4
WU-M-479/4-C-740	**561974**	**561976**	4
WU-M-479/4-C-650	**561981**	**561983**	4
WU-M-479/8-C-730	**561988**	**561990**	8
WU-M-479/8-C-740	**561995**	**561997**	8
WU-M-479/8-C-650	**562002**	**562004**	8
WU-M-479/16-C-730	**562009**	**562011**	16
WU-M-479/16-C-740	**562016**	**562018**	16
WU-M-479/16-C-650	**562023**	**562025**	16
WU-M-475-C-730	**561901**	**–**	16
WU-M-475-C-740	**561906**	**–**	16
WU-M-475-C-650	**561911**	**–**	16



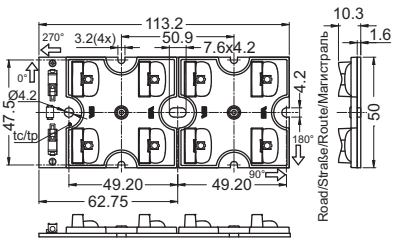
WU-M-475



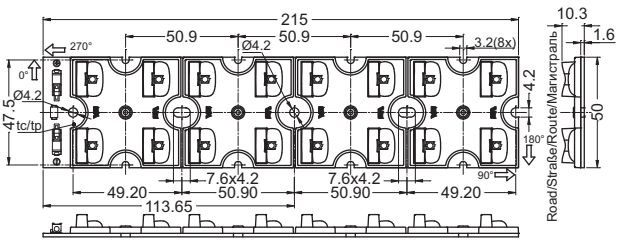
WU-M-479/4 – crosswise



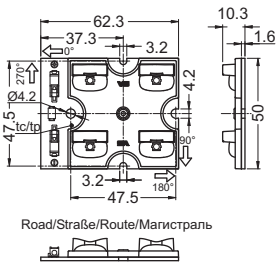
WU-M-479/8 – crosswise



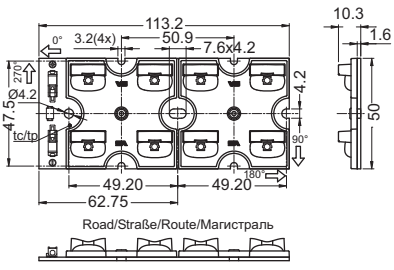
WU-M-479/16 – crosswise



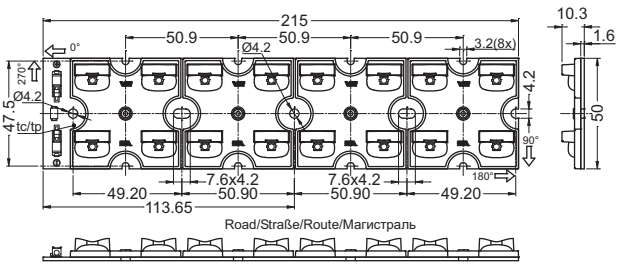
WU-M-479/4 – lengthwise



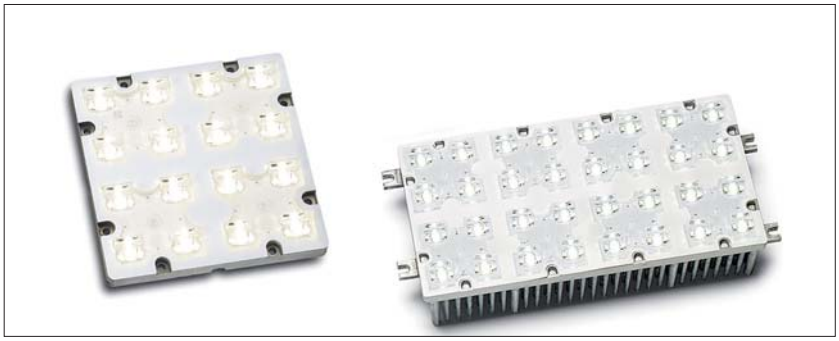
WU-M-479/8 – lengthwise



WU-M-479/16 – lengthwise

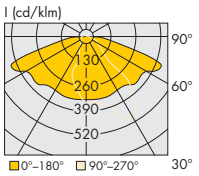


LED Roadway Light M-Class – Water Protected



Technical notes

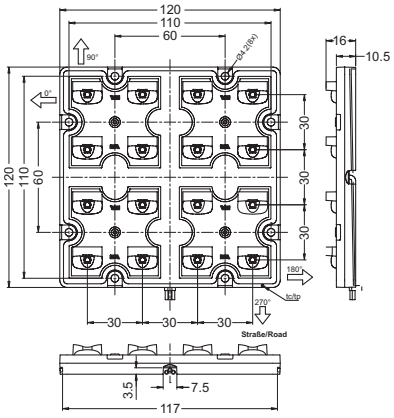
Dimensions (incl. optics) LxWxH
WU-M-425: 120 x 120 x 16 mm
WU-M-496: 240 x 120 x 61.7 mm
Encapsulated for outdoor applications
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for illumination of streets with M-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 4.5:1 (distance between luminaire poles to the height of the luminaire pole)



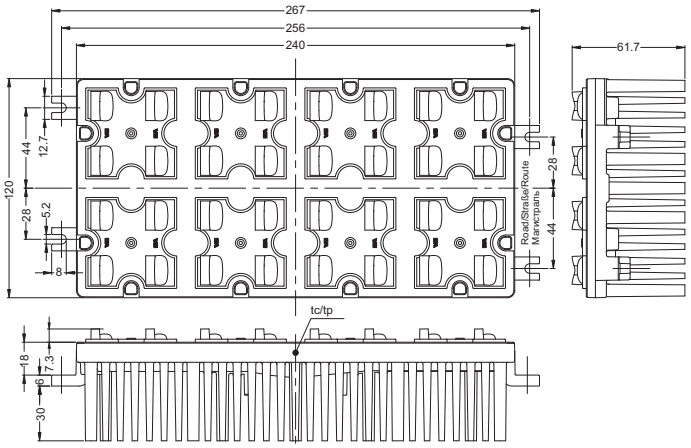
Reference numbers

Type Optics direction	Ref. No. lengthwise	 crosswise	Number of LEDs	Degree of protection
With PMMA optics				
WU-M-425-C-730	**562030**	**—**	16	IP66/IK05
WU-M-425-C-740	**562037**	**—**	16	IP66/IK05
WU-M-425-C-650	**562044**	**—**	16	IP66/IK05
WU-M-496-C-730	**562081**	**562082**	32	IP66/IK05
WU-M-496-C-740	**562091**	**562092**	32	IP66/IK05
WU-M-496-C-650	**562101**	**562102**	32	IP66/IK05
With silicone optics				
WU-M-425-C-730	**562032**	**—**	16	IP67/IP69/IK08
WU-M-425-C-740	**562039**	**—**	16	IP67/IP69/IK08
WU-M-425-C-650	**562046**	**—**	16	IP67/IP69/IK08
WU-M-496-C-730	**562083**	**562084**	32	IP67/IP69/IK08
WU-M-496-C-740	**562093**	**562094**	32	IP67/IP69/IK08
WU-M-496-C-650	**562103**	**562104**	32	IP67/IP69/IK08

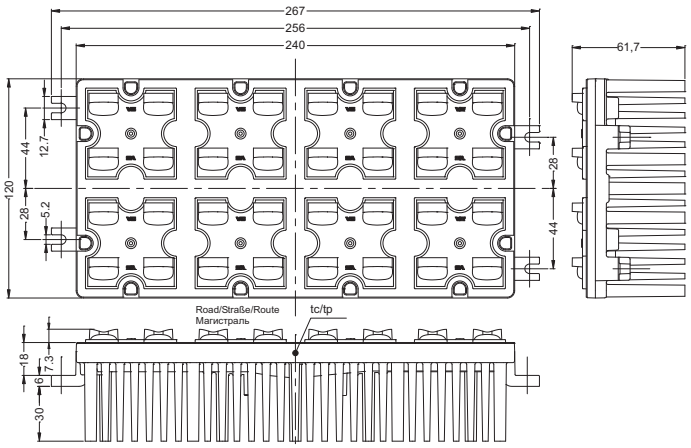
WU-M-425



WU-M-496 M-Class – crosswise



WU-M-496 M-Class – lengthwise



LED Roadway Light S-Class – IP20

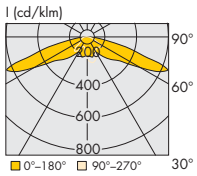
Technical notes

Dimensions (incl. optics) LxWxH
- WU-M-479/4: 50x62.3x12.4 mm
- WU-M-479/8: 50x113.2x12.4 mm
- WU-M-479/16: 50x215x12.4 mm
- WU-M-475: 120x120x12.4 mm

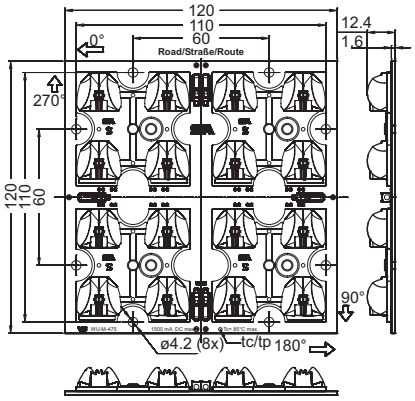
Degree of protection: IP20
Push-in terminals (WAGO series 2060)
Optics for illumination of streets with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 7.5:1 (distance between luminaire poles to the height of the luminaire pole)

Reference numbers

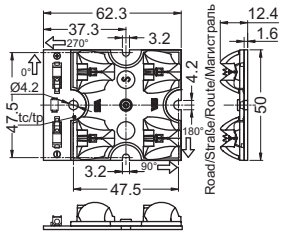
Type Optics direction	Ref. No. lengthwise	 crosswise	Number of LEDs
WU-M-479/4-C-730	**561968**	**561970**	4
WU-M-479/4-C-740	**561975**	**561977**	4
WU-M-479/4-C-650	**561982**	**561984**	4
WU-M-479/8-C-730	**561989**	**561991**	8
WU-M-479/8-C-740	**561996**	**561998**	8
WU-M-479/8-C-650	**562003**	**562005**	8
WU-M-479/16-C-730	**562010**	**562012**	16
WU-M-479/16-C-740	**562017**	**562019**	16
WU-M-479/16-C-650	**562024**	**562026**	16
WU-M-475-C-730	**561902**	**—**	16
WU-M-475-C-740	**561859**	**—**	16
WU-M-475-C-650	**561912**	**—**	16



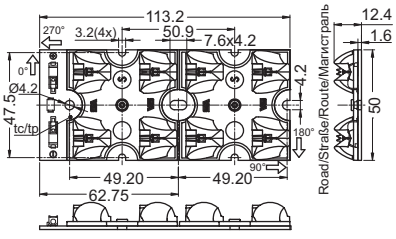
WU-M-475



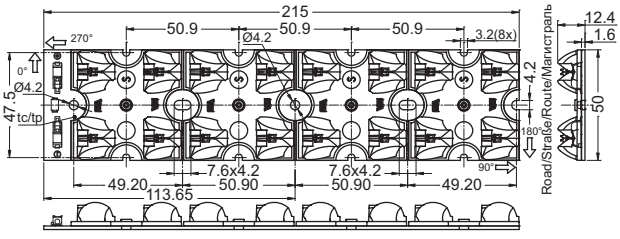
WU-M-479/4 – crosswise



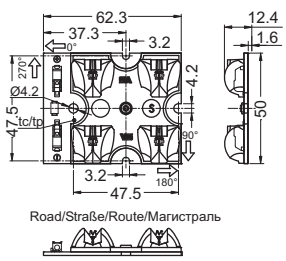
WU-M-479/8 – crosswise



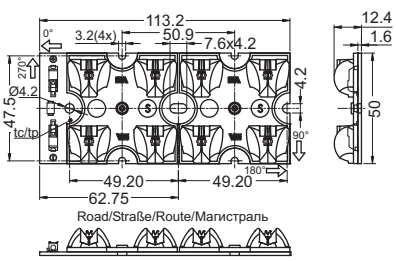
WU-M-479/16 – crosswise



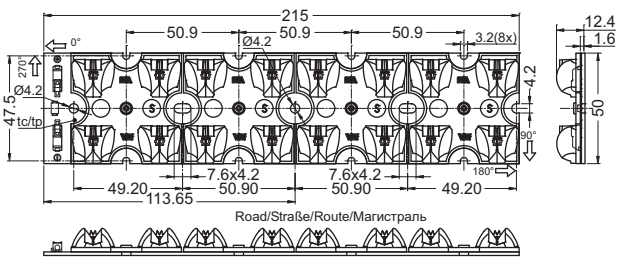
WU-M-479/4 – lengthwise



WU-M-479/8 – lengthwise



WU-M-479/16 – lengthwise



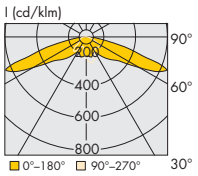
LED Roadway Light S-Class – Water Protected

Technical notes

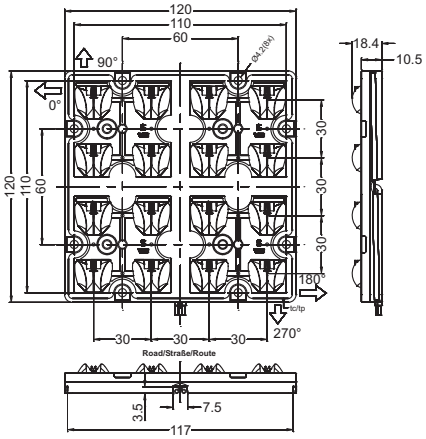
Dimensions (incl. optics) LxWxH
WU-M-425: 120x120x18.4 mm
WU-M-496: 240x120x61.3 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for illumination of streets with S-Class (acc. to EN 13201)
Optimum illumination – installation ratio: 7.5:1 (distance between luminaire poles to the height of the luminaire pole)

Reference numbers

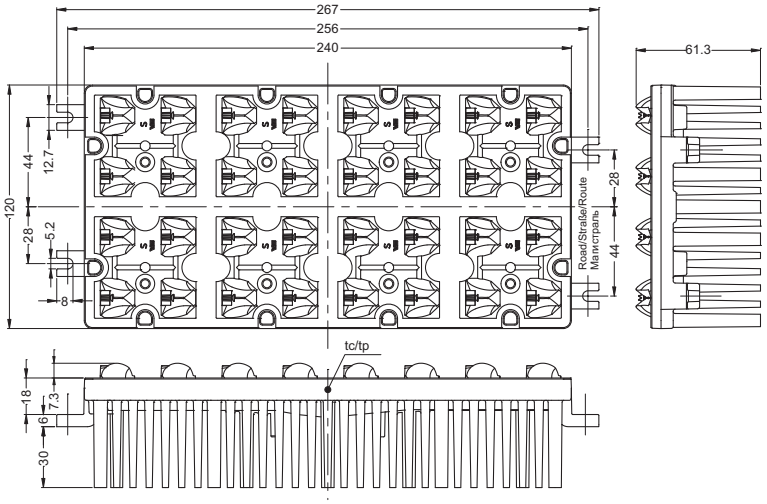
Type Optics direction	Ref. No. lengthwise	 crosswise	Number of LEDs
WU-M-425-C-730	**562031**	—	16
WU-M-425-C-740	**562038**	—	16
WU-M-425-C-650	**562045**	—	16
WU-M-496-C-730	**562085**	**562086**	32
WU-M-496-C-740	**562095**	**562096**	32
WU-M-496-C-650	**562105**	**562106**	32



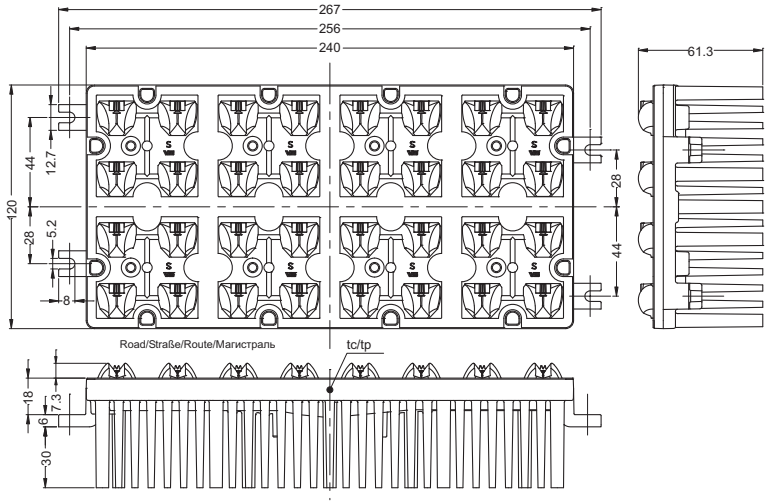
WU-M-425



WU-M-496 S-Class – crosswise



WU-M-496 S-Class – lengthwise



LED Roadway Light Area – IP20

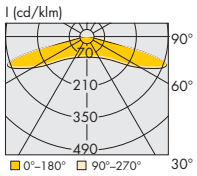
Technical notes

Dimensions (incl. optics) LxWxH
- WU-M-479/4: 50x62.3x6.7 mm
- WU-M-479/8: 50x113.2x6.7 mm
- WU-M-479/16: 50x215x6.7 mm
- WU-M-475: 120 x120 x 6.7 mm

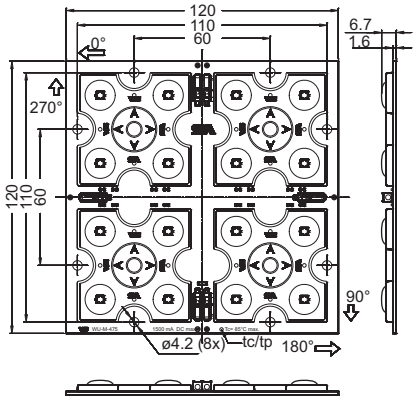
Degree of protection: IP20
Push-in terminals (WAGO series 2060)
Optics for illumination of public places
Optimum illumination – installation ratio: 5.5:1 (distance between luminaire poles to the height of the luminaire pole)

Reference numbers

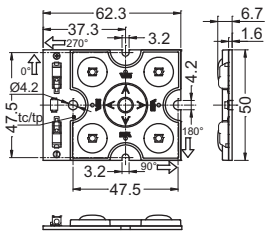
Type	Ref. No.	Number of LEDs
WU-M-479/4-C-730	**561971**	4
WU-M-479/4-C-740	**561978**	4
WU-M-479/4-C-650	**561985**	4
WU-M-479/8-C-730	**561992**	8
WU-M-479/8-C-740	**561999**	8
WU-M-479/8-C-650	**562006**	8
WU-M-479/16-C-730	**562013**	16
WU-M-479/16-C-740	**562020**	16
WU-M-479/16-C-650	**562027**	16
WU-M-475-C-730	**561903**	16
WU-M-475-C-740	**561860**	16
WU-M-475-C-650	**561913**	16



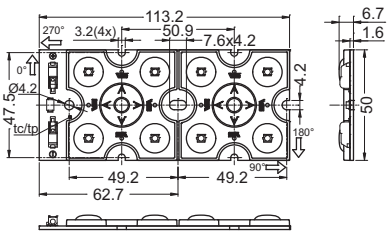
WU-M-475



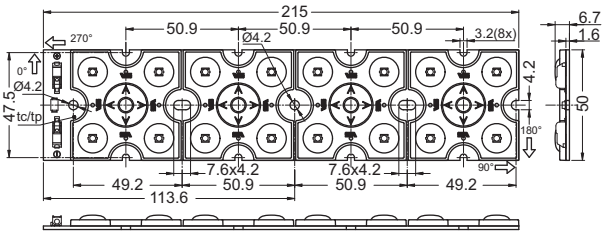
WU-M-479/4



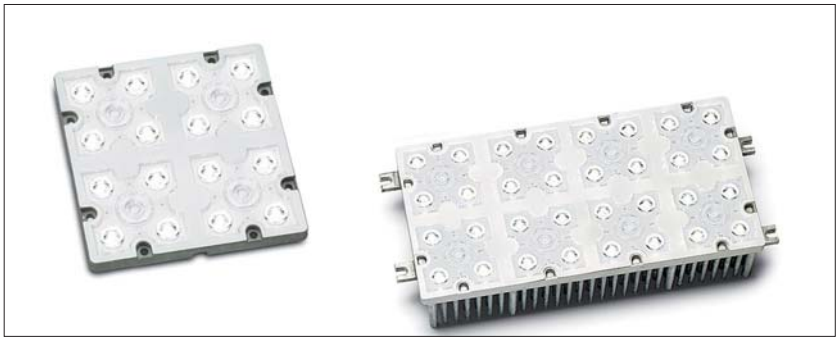
WU-M-479/8



WU-M-479/16



LED Roadway Light Area – Water Protected

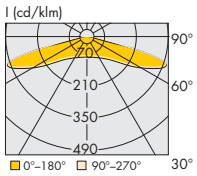


Technical notes

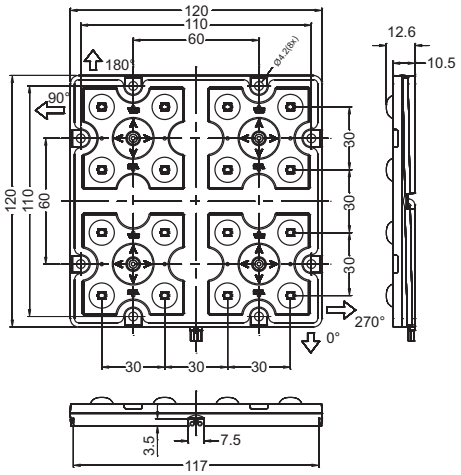
Dimensions (incl. optics) LxWxH
WU-M-425: 120 x120 x12.6 mm
WU-M-496: 240 x120 x 54.6 mm
Encapsulated for outdoor applications with degree of protection: IP66/IK05
Pre-assembled leads:
2 leads: + (red); – (blue)
for luminaires of protection class II, length: 500 mm
Optics for illumination of public places
Optimum illumination – installation ratio: 5.5:1 (distance between luminaire poles to the height of the luminaire pole).

Reference numbers

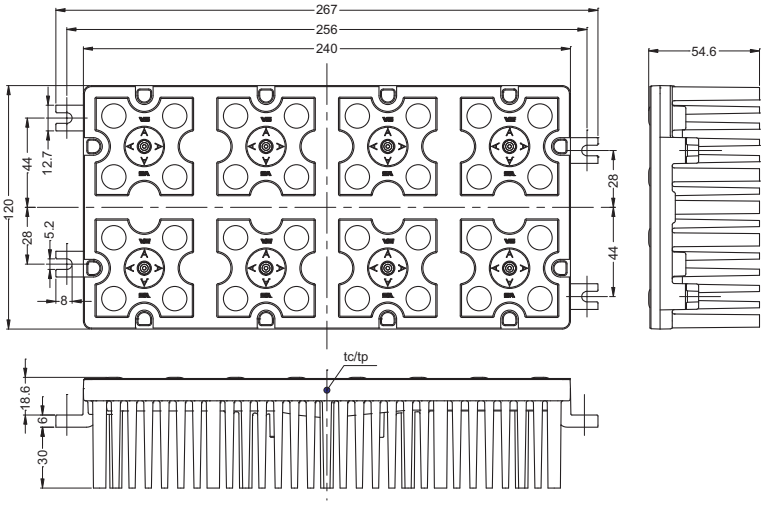
Type	**Ref. No.**	Number of LEDs
WU-M-425-C-730	**562033**	16
WU-M-425-C-740	**562040**	16
WU-M-425-C-650	**562047**	16
WU-M-496-C-730	**562087**	32
WU-M-496-C-740	**562097**	32
WU-M-496-C-650	**562107**	32



WU-M-425



WU-M-496



PowerEmitter XP and XML

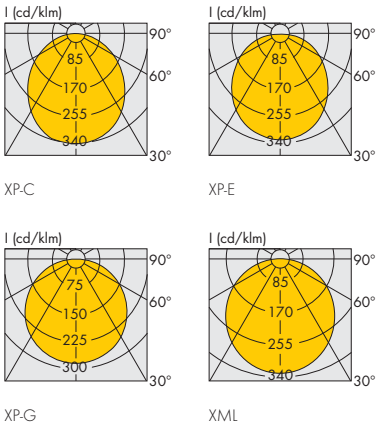
Built-in PCB lighting modules

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 78–80).

Typical applications

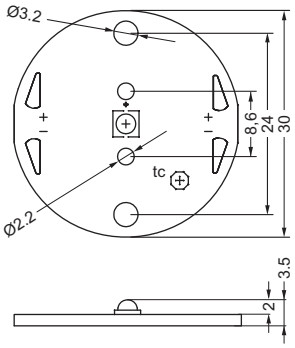
- Integration in luminaires
- Architectural lighting
- Marking paths, stairs, etc.
- Furniture lighting
- Light advertising
- Entertainment, retail lighting



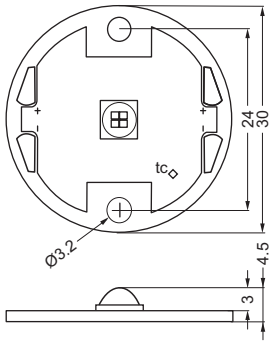
Technical notes

PCB diameter: 30 mm
Allowed operating temperature at t_c point:
–20 to 60 °C for PowerEmitter XP
–20 to 65 °C for 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.	350 mA typ.	500 mA min.	500 mA typ.	700 mA min.	700 mA typ.	1050 mA min.	1050 mA 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	–		–		110
WU-M-421-XPC-NW	**546671**	neutral white	3700...4260	73.9	87.4	96.1	113.6	–		–		110
WU-M-421-XPC-CW	**546673**	cool white	5650...6950	100.0	114.0	130.0	148.2	–		–		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	–		115
WU-M-421-XPE-NW	**546685**	neutral white	3700...4260	93.9	107.0	122.1	139.1	159.6	181.9	–		115
WU-M-421-XPE-CW	**546680**	cool white	5650...6950	107.0	122.0	139.1	158.6	181.9	207.4	–		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 82.

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 82.

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.

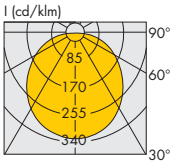
The modules can be safely operated with various constant-current drivers (350 mA, 500 mA or 700 mA). Sufficient cooling must be ensured.

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

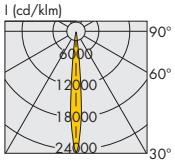
The modules are available without an optical attachment or with a fixed 10°, 20°, 30° or 40° optical attachment to enable the creation of different lighting scenes.

Typical applications

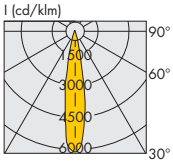
- Integration in luminaires
- Architectural lighting
- Marking paths, stairs, etc.
- Furniture lighting
- Light advertising
- Entertainment, retail lighting



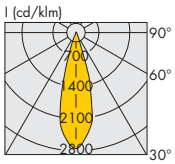
Without optics



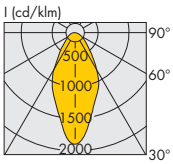
10°



20°



30°



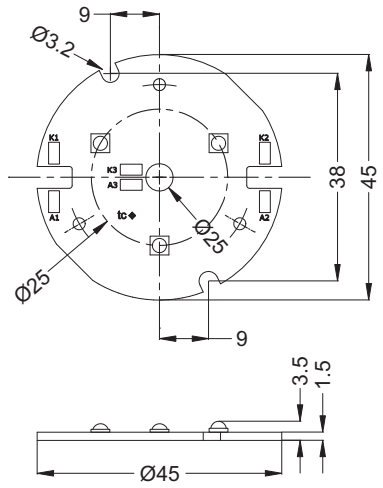
40°

Technical notes

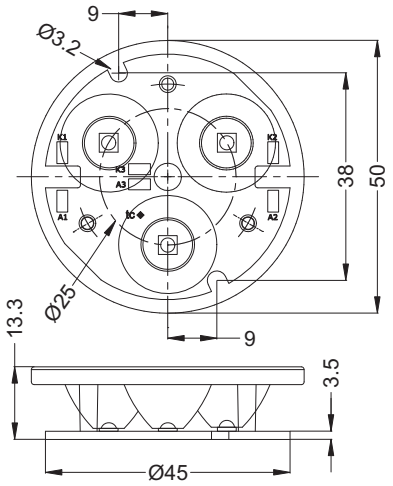
PCB diameter: 45 mm
Allowed operating temperature at t_c point:
-20 to 65 °C
Use of external LED constant current driver
Aluminium PCB for optimum thermal management
Efficiency up to 109 lm/W
Colour rendering index:
white R_a = 75, warm white R_a = 80
ESD protection class 2
Minimum order quantity: 120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

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 82.

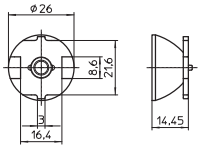
PowerOptics3 for XP/XT Modules

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%.

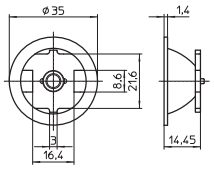
To guarantee easy mounting on PowerEmitter module, the PowerOptics3 are backed with self-adhesive tape. However, depending on the type of application and ambient conditions, the Power-Optics3 module may require additional fixing to ensure secure mounting.

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

A



B



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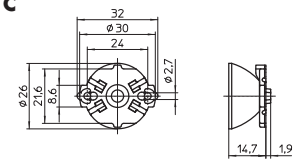

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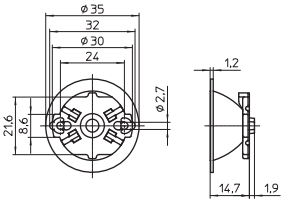
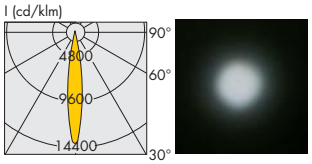


PowerOptics3 – Ø 26 mm

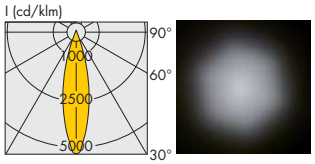
PowerOptics3 – Ø 35 mm

PowerOptics3 – Star

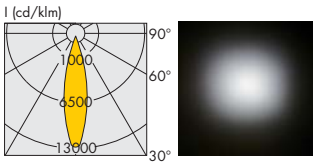
Light distribution curves PowerOptics3



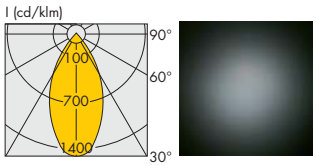
8°



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

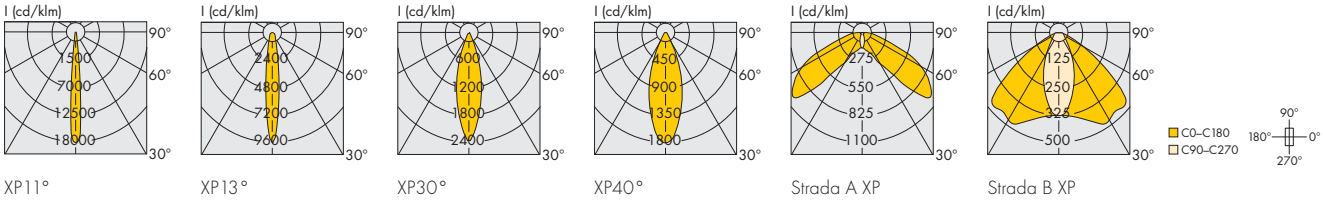
Various attachable optics are available for XP modules to enable different beam characteristics and illumination levels.

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

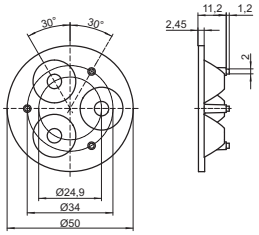
Type	Ref. No.	Beam angle* °	Dimensions* (mm) diameter x height / width x depth x height
Optics for LED modules of XP series			
PowerOptics XP 11°	**543422**	11	16.1 x 10.1
PowerOptics XP 13° diff	**543423**	12	16.1 x 10.1
PowerOptics XP 30°	**543424**	30	16.1 x 10.1
PowerOptics XP 40°	**543425**	40	16.1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

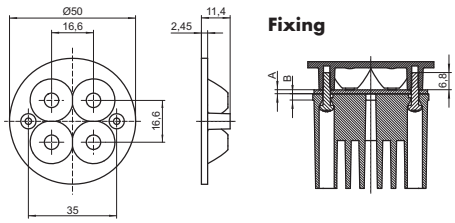
For TriplePowerEmitter and Spot modules
Various attachable optics are available for TriplePowerEmitter and the Spot modules of the XP series to enable different beam characteristics and illumination levels.

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



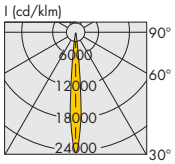

PowerOptics 3XP

Fixing
PowerOptics 3 XP: with glue
PowerOptics 4 XP: by self tapping screw 2.9 mm x H (H = 6.8 mm + A + B)

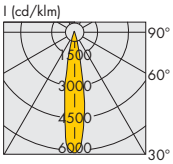



PowerOptics 4XP

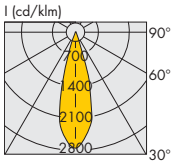
Light distribution curves PowerOptics 3XP



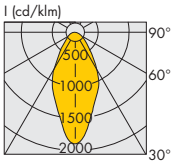
3XP 10°



3XP 20°

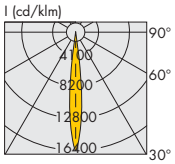


3XP 30°

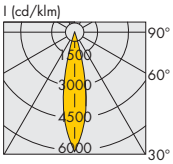


3XP 40°

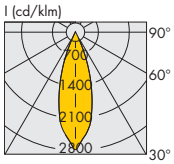
Light distribution curves PowerOptics 4XP



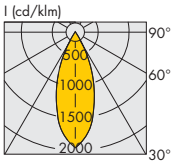
4XP 10°



4XP 20°



4XP 30°

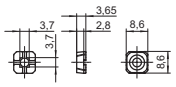


4XP 40°

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 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°

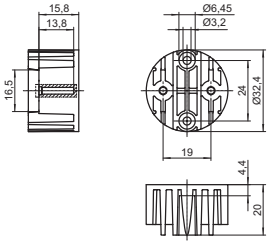


Heat Sinks for LED Modules XP and XML

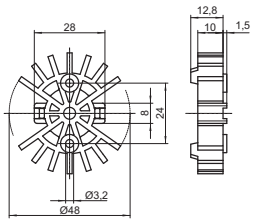
Under no circumstances may heat sinks ever be covered by insulation material or similar.
Air ventilation must be ensured.

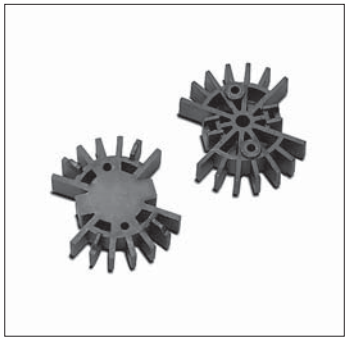
Heat sinks for PowerEmitter XP and XML modules
For LED modules with one XP LED up to 700 mA
For LED modules with one XML LED up to 350 mA
Material: thermoconductive resin
Dimensions: (Ø x depth):
32.4x20 mm / 48x12.8 mm
Fixing: with screws
Weight: 16.4 g
Packaging unit: 250 pcs.
Ref. No.: 548739 Drawing/photo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

A

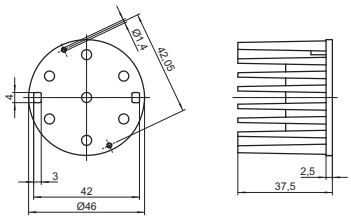


B



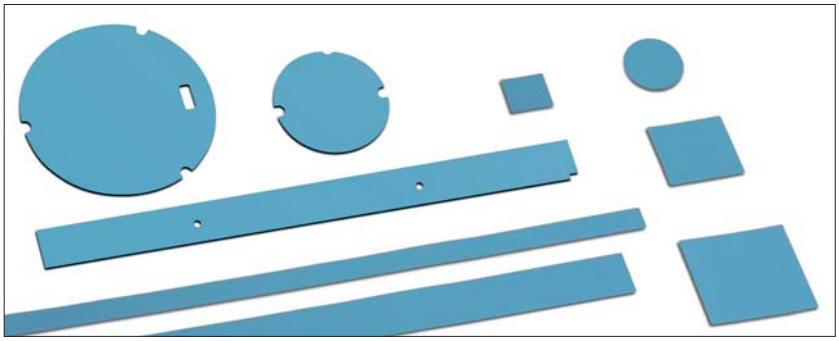


Heat sink for TriplePowerEmitter XP
For LED modules up to 700 mA
Material: thermoconductive resin
Dimensions (Ø x depth): 46x37.5 mm
Fixing: with screws
Weight: 51 g
Packaging unit: 225 pcs.
Ref. No.: 544805



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 specialised 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 specialised 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
Round							
Adhesive pad Ø28	**536248**	Ø 28	0.25	37.5 - 30	1.0	PowerEmitter	75-76
Adhesive pad Ø43	**536977**	Ø 43	0.20	76	0.5	TriplePowerEmitter Ø 45 mm, Ø 50 mm	76-77
Square							
Adhesive pad 49x49	**529157**	49x49	0.25	37.5-50	0.3	TriplePowerEmitter Ø 50 mm	76-77
Linear							
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	–

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.

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	61, 63, 70, 72, 74

LED MODULES FOR MAINS VOLTAGE

DRIVER-ON-BOARD TECHNOLOGY

READYLINE MODULES

LED modules for direct connection to mains voltage

With so-called Driver-on-Board technology (DoB), the control gear unit is directly integrated into the LED module, which permits direct connection to mains voltage (220–240 V, 50–60 Hz).

The built-in LED modules of the ReadyLine series are suitable for residential and furniture lighting, as a replacement for compact fluorescent downlights and for installation in reflector luminaires.

The range includes both COB as well as SMD modules in various colour temperatures from 2700 K to 5000 K, in square or round designs (of varying diameters), with or without a heat sink as well as with pre-attached leads with and without connectors. Many products are available with cover for protection against electrical contact. Built-in spots and MR16 built-in modules are also available.

Advantages at a glance:

- Direct connection to mains voltage
- More flexible space-saving luminaire designs due to absence of driver
- Direct replacement for conventional lamps in existing luminaires
- High power factor: > 0.9
- Long service life: up to 50,000 hours

LED Modules ReadyLine COB

Built-in LED modules with integrated driver for mains voltage

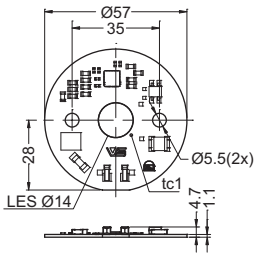
Technical Notes

Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.95
Dimensions (ØxH): 57x4.7 mm
Light emitting surface (LES)
Ø 14 mm: 10 W, 15 W, 20 W
Ø 21 mm: 30 W, 40 W
Aluminium PCB for optimum thermal management
Beam angle: 120°
On-board push-in terminals
Packaging unit: 100 pcs.

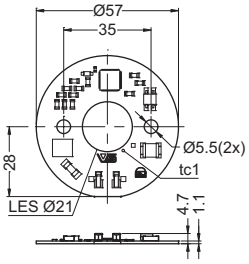
Typical Applications

- Residential lighting
- Replacement for CFL downlights
- Integration in reflector luminaires
- Furniture lighting

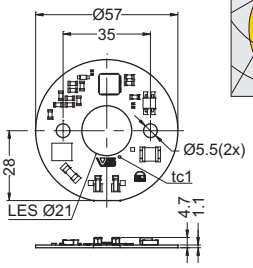
10 W, 15 W, 20 W

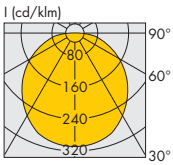


30 W



40 W



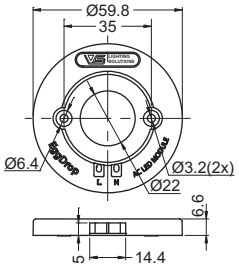


Typ. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Colour	Correlated colour temperature* K	Luminous flux (lm) and typ. efficieny** (lm/W) min. lm	typ. lm	typ. lm/W	Typ. beam angle °	Typ. CRI R_a	Energy efficiency
10	EDC57C_10W827_230A	**559771**	220–240	warm white	2700	780	850	85	120	80	A+
	EDC57C_10W830_230A	**559772**	220–240	warm white	3000	830	900	90	120	80	A+
	EDC57C_10W835_230A	**559773**	220–240	warm white	3500	880	930	93	120	80	A+
	EDC57C_10W840_230A	**559774**	220–240	neutral white	4000	910	950	95	120	80	A+
	EDC57C_10W850_230A	**559775**	220–240	cool white	5000	930	1000	100	120	80	A+
15	EDC57C_15W827_230A	**559776**	220–240	warm white	2700	1170	1275	85	120	80	A+
	EDC57C_15W830_230A	**559777**	220–240	warm white	3000	1245	1350	90	120	80	A+
	EDC57C_15W835_230A	**559778**	220–240	warm white	3500	1290	1395	93	120	80	A+
	EDC57C_15W840_230A	**559779**	220–240	neutral white	4000	1320	1425	95	120	80	A+
	EDC57C_15W850_230A	**559780**	220–240	cool white	5000	1395	1500	100	120	80	A+
20	EDC57C_20W827_230A	**559781**	220–240	warm white	2700	1560	1700	85	120	80	A+
	EDC57C_20W830_230A	**559782**	220–240	warm white	3000	1660	1800	90	120	80	A+
	EDC57C_20W835_230A	**559783**	220–240	warm white	3500	1720	1860	93	120	80	A+
	EDC57C_20W840_230A	**559784**	220–240	neutral white	4000	1760	1900	95	120	80	A+
	EDC57C_20W850_230A	**559785**	220–240	cool white	5000	1860	2000	100	120	80	A+
30	EDC57C_30W827_230A	**560985**	220–240	warm white	2700	2340	2550	85	120	80	A+
	EDC57C_30W830_230A	**560986**	220–240	warm white	3000	2490	2700	90	120	80	A+
	EDC57C_30W835_230A	**560987**	220–240	warm white	3500	2571	2781	93	120	80	A+
	EDC57C_30W840_230A	**560988**	220–240	neutral white	4000	2625	2835	95	120	80	A+
	EDC57C_30W850_230A	**560989**	220–240	cool white	5000	2747	2957	99	120	80	A+
40	EDC57C_40W827_230A	**560990**	220–240	warm white	2700	3120	3400	85	120	80	A+
	EDC57C_40W830_230A	**560991**	220–240	warm white	3000	3320	3600	90	120	80	A+
	EDC57C_40W835_230A	**560992**	220–240	warm white	3500	3428	3708	93	120	80	A+
	EDC57C_40W840_230A	**560993**	220–240	neutral white	4000	3500	3780	95	120	80	A+
	EDC57C_40W850_230A	**560994**	220–240	cool white	5000	3662	3942	99	120	80	A+

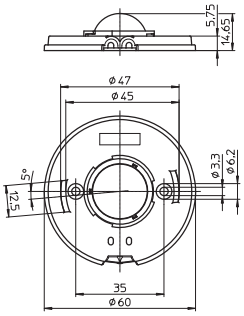
* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ±10% | CRI: ±3

LED Modules ReadyLine COB – Accessories

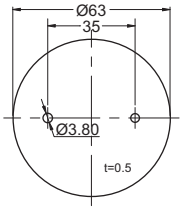
Holder
Dimensions (ØxH): 59.8x6.6 mm
Material: plastic, white
Ref. No.: 559786



Holder for EVO reflectors
For COB Type EDC57C
For reflectors see page 119
Cover for LES: PC, transparent
Dimensions (ØxH): 60x14.65 mm
Material: PC, inner ring: metallized
Packaging unit: 72 pcs.
Ref. No.: 561847



Thermal pad
Dimensions (ØxH): 63x0.5 mm
Thermal conductivity R_{th}: 2 W/mK
Ref. No.: 559883

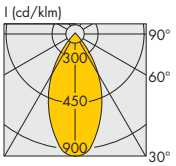


LEDSpot ReadyLine IP

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

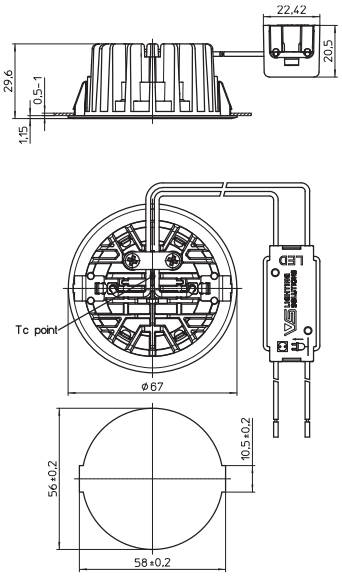
Technical notes

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
Packaging unit: 45 pcs.

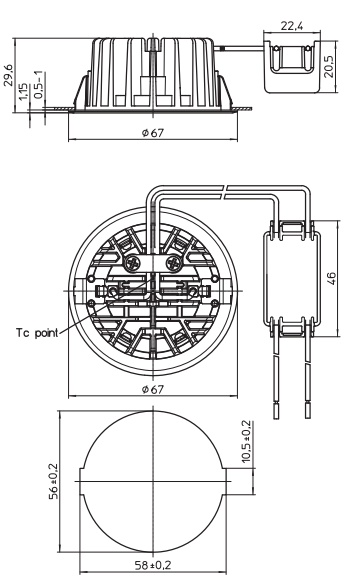


50°

IP20



IP54



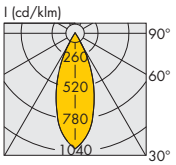
Max. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Luminous flux lm min.	typ.	Light intensity Candela	Beam angle °	CRI R_a	Frame colour	Energy efficiency
Degree of protection: IP54													
4.3	LCH024	**554956**	220–240	12	warm white	2900...3200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

LEDSpot ReadyLine MR16

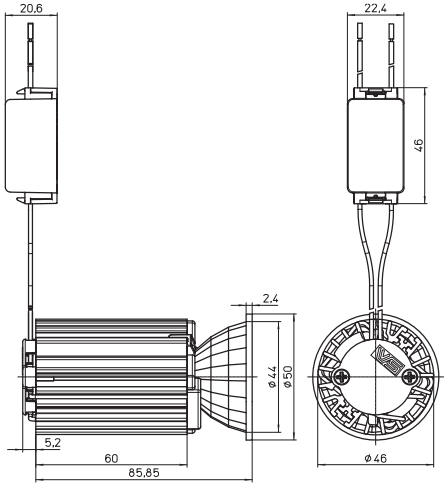
Complete LEDSpot equipped with optics, heat sink and leads

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
Packaging 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.	typ.	Light intensity Candela	Beam angle °	CRI R_a	Energy efficiency
8.7	LR8W	**554960**	220–240	8	warm white	2900...3200	515	600	636	42	> 80	A+
	LR8W	**554961**			neutral white	3700...4200	580	670	680			A+

LED Modules ReadyLine S

Built-in LED modules with integrated driver for direct connection to mains voltage

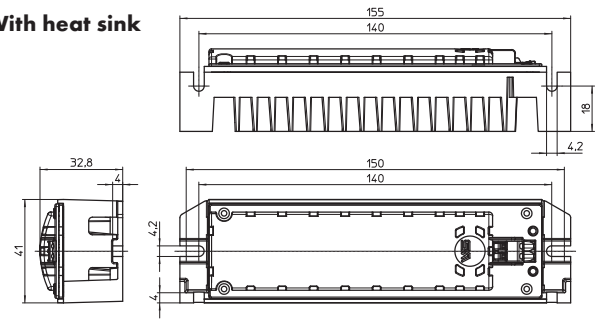
Technical notes

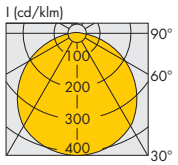
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.97
Dimensions:
with heat sink 155x41x32.8 mm
without heat sink 132x37.4x9.25 mm
Aluminium PCB for optimum thermal management
Heat sink made of thermoconductive resin
Protection cover: PC, UV-glued
or rivetted (module with heat sink)
Push-in terminals 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
(More information see page 229)
RFI suppressed
Weight: 35/140 g (without/with heat sink)
Packaging unit: 80/40 pcs. (without/with heat sink)

Typical applications

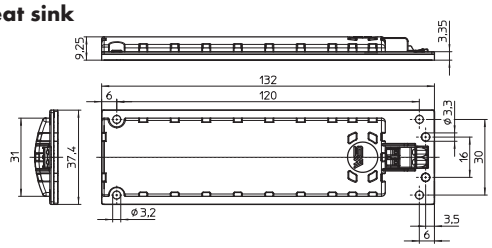
- Replacement for compact fluorescent lamps
- Integration in luminaires
- Residential lighting
- Architectural lighting
- Retail lighting
- Furniture lighting
-

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)

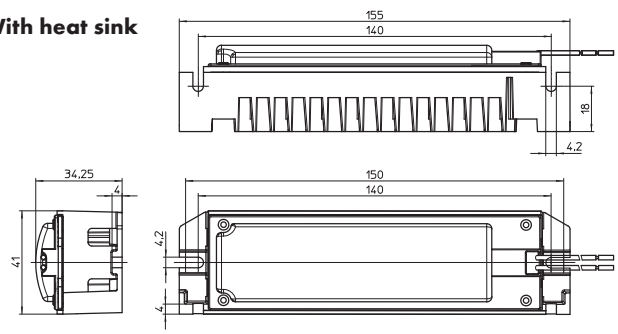
LED Modules ReadyLine S IP54

Built-in LED modules with integrated driver for direct connection to mains voltage

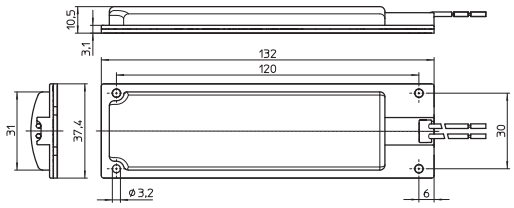
Technical notes

Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.97
Dimensions:
with heat sink 155x41x34.25 mm
without heat sink 132x37.4x10.5 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
(More information see page 229)
Degree of protection: IP54
RFI suppressed
Weight: 35/140 g (without/with heat sink)
Packaging unit: 80/40 pcs. (without/with heat sink)

With heat sink



Without heat sink



Typical applications

- Replacement for compact fluorescent lamps
- 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

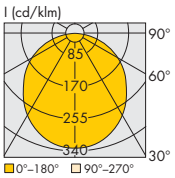
* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

LED Modules ReadyLine DL 160

Built-in LED modules with integrated driver for direct connection to mains voltage

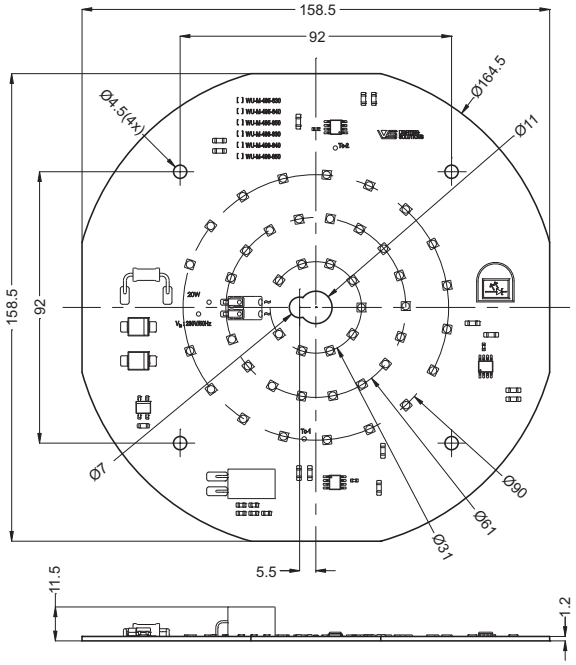
Technical notes

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
Packaging unit: 36 pcs.



Typical applications

- Downlights
- Replacement for compact fluorescent lamps

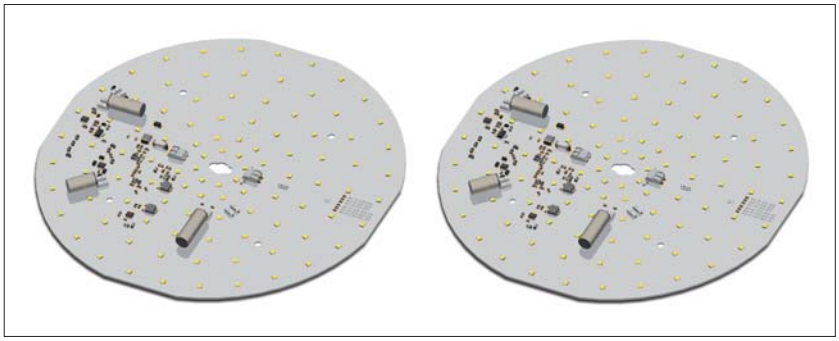


Typ. output W	Type	Ref. No.	Voltage AC 50–60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature (K)	Typ. luminous flux and efficiency* at 230 V lm	lm/W	Typ. beam angle (°)	Typ. CRI R_a	Energy efficiency
20	WU-M-498-830	**557252**	220–240	44	warm white	3000	2000	100	120	80	A+
	WU-M-498-840	**557253**	220–240	44	neutral white	4000	2200	110	120	80	A++
	WU-M-498-850	**557254**	220–240	44	cool white	5000	2500	125	120	80	A++

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

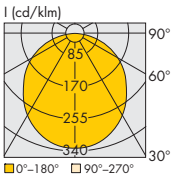
LED Modules ReadyLine DL 250

Built-in LED modules with integrated driver for direct connection to mains voltage



Technical notes

Mains voltage: 220–240 V, 50–60 Hz
Power factor: > 0.9
Dimensions: Ø 250 mm
Lumen maintenance L70/B50:
55,000 hrs. at t_p 80 °C

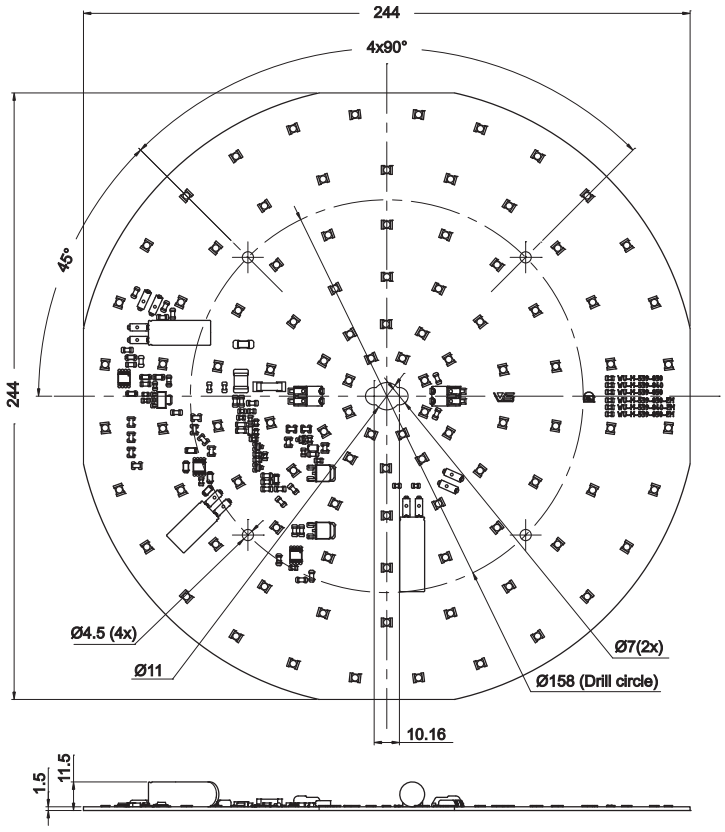


Version for emergency lighting

Separate LED circuit of 8 LEDs for operation with local emergency lighting driver.

Typical applications

- Downlights
- Replacement for compact fluorescent lamps



Products under development; preliminary technical datas

Typ. output W	Type	Ref. No.	Voltage AC 50–60 Hz V	Number of LEDs pcs.	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
32	WU-M-539-830	**562163**	220–240	90	warm white	3000	3300	104	120	80	A+
	WU-M-539-840	**562164**	220–240	90	neutral white	4000	3430	108	120	80	A+
	WU-M-539-850	**562165**	220–240	90	cool white	5000	3690	116	120	80	A+
ReadyLine DL – For emergency lighting											
32	WU-M-539-830-EM	**561882**	220–240	90+8	warm white	3000	3300	104	120	80	A+
	WU-M-539-840-EM	**561883**	220–240	90+8	neutral white	4000	3430	108	120	80	A+
	WU-M-539-850-EM	**562166**	220–240	90+8	cool white	5000	3690	116	120	80	A+

* Production tolerance of luminous flux and efficiency: ±10%

LED Modules ReadyLine C

Built-in LED modules with integrated driver for direct connection to 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
(More information see page 229)
RFI suppressed

ReadyLine	Heat sink	Weight g	Packaging unit pcs.
C 10	with	210	28
	without	55	36
C 08	with	190	28
	without	40	36
C 07	with	190	48
	without	40	48
C 06	without	25	48
C 05	without	40	45
C 03	without	30	45

Typical applications

- Replacement for compact fluorescent lamps
- Integration in luminaires
- Residential lighting
- Architectural lighting
- Retail lighting
- Furniture lighting

ReadyLine C 10

Technical notes

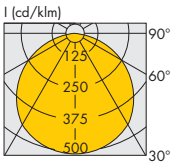
Power factor: > 0.97

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

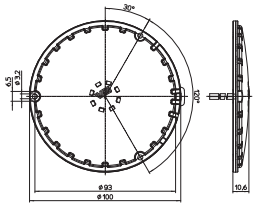
Screw terminals for LED module with heat sink:
2.5 mm²

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

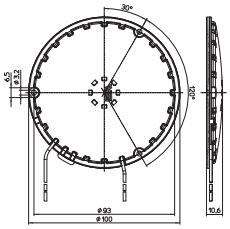
Fixing holes for screws M3 or self-tapping screws 2.9



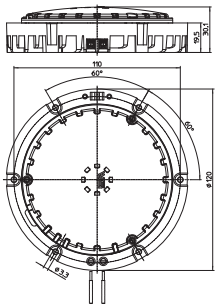
With central lead exit



With lateral lead exit



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



Max. output W	Type	Ref. No. 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	Lead exit	Energy efficiency
10	LR54	**559537**	**559539**	220–240	54	warm white	2600...2900	clear	1010	1120	> 80	central	A++
	LR54	**on request**	**559540**									lateral	A++
	LR54	**559538**	**559541**	220–240	54	warm white	2600...2900	diffuse	890	950	> 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	1330	> 80	central	A+
	LR42	**on request**	**559546**									lateral	A+
	LR42	**559544**	**559547**	220–240	42	warm white	2600...2900	diffuse	930	1100	> 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	1340	> 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	1370	> 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

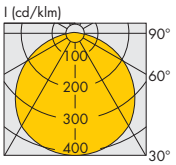
Power factor: > 0.97

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

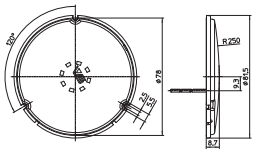
Screw terminals for LED module with heat sink:
2.5 mm²

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

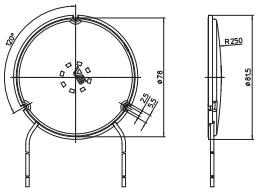
Fixing holes for screws M3 or self-tapping screws 2.9



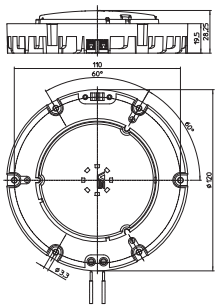
With central lead exit



With lateral lead exit



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



Max. output W	Type	Ref. No. 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	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	neutral white	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+

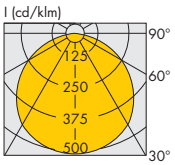
Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**557692**	Thermally conductive transfer tape Ø 76 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**558229**	Thermally conductive non-adhesive transfer tape Ø 76 mm	0.25 mm	2 W/mK	3 kV
–	–	**557691****	Thermally conductive transfer 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)

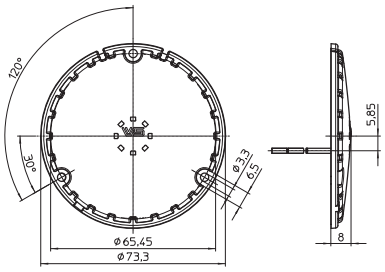
ReadyLine C 07

Technical notes

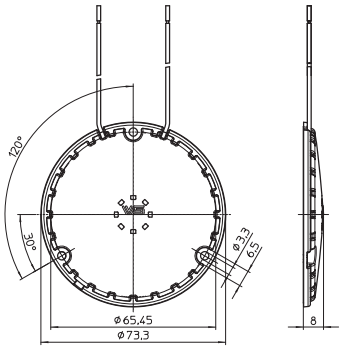
Power factor: > 0.95
Dimensions: Ø 73.3 mm;
Ø 120 mm with heat sink
Screw terminals for LED module with heat sink:
2.5 mm²
Welded leads for LED module without heat sink:
double FEP/FEP-insulation, length: 300 mm,
central or lateral lead exit
Fixing holes for screws M3 or self-tapping screws 2.9
Versions for the US market on request



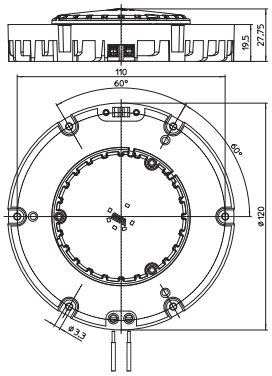
With central lead exit



With lateral lead exit



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



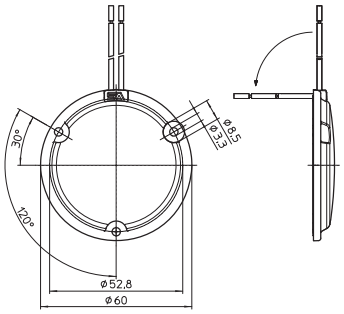
Max. output W	Type	Ref. No. with heat sink	Ref. No. without heat sink	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.	Luminous flux lm typ.	CRI R_a	Lead exit	Energy efficiency
17.5	LR42	**558025**	**556640**	220–240	42	warm white	2600...2900	clear	1140	1330	> 80	central	A+
	LR42	**on request**	**559559**									lateral	A+
	LR42	**559560**	**559563**	220–240	42	warm white	2600...2900	diffuse	930	1100	> 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	1340	> 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	1370	> 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: double FEP/FEP-insulation,
length: 300 mm, lateral lead exit
Fixing holes for screws M3

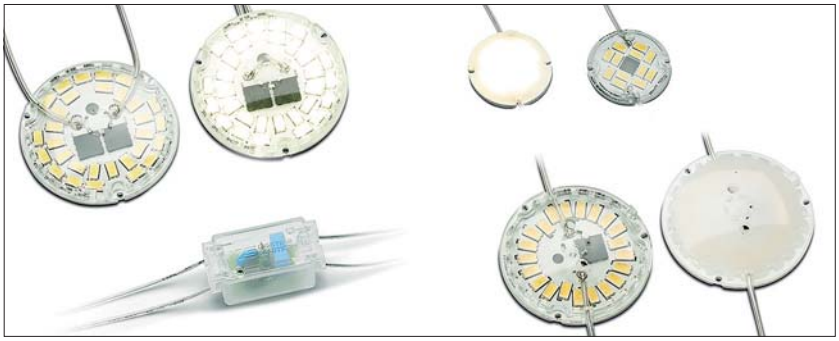


Max. output W	Type	Ref. No.	Voltage AC 50/60 Hz V	Number of LEDs pcs.	Colour	Correlated colour temperature K	Cover	Luminous flux lm min.	Luminous flux lm typ.	CRI R_a	Lead exit	Energy efficiency
8.7	LR12W	**559565**	220-240	12	warm white	2600...2900	clear	590	650	> 80	lateral	A+
	LR12W	**559566**					diffuse	480	530	> 80		A
	LR12W	**559567**	220-240	12	warm white	2900...3200	clear	720	780	> 80	lateral	A+
	LR12W	**559568**					diffuse	610	660	> 80		A+
	LR12W	**559569**	220-240	12	neutral white	3700...4200	clear	740	800	> 80	lateral	A+
	LR12W	**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:

C 05: Ø 46/50 mm (8.7/13 W)

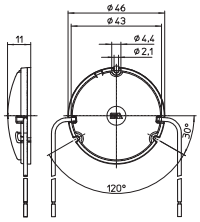
C 03: Ø 33 mm

Welded leads: double FEP/FEP-insulation, length: 300 mm, central or lateral lead exit

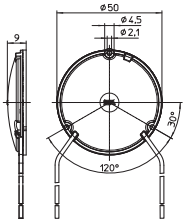
MOV – metal-oxide varistor, enclosed unassembled

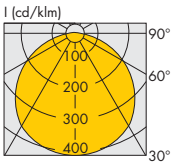
Fixing holes for screws M2

8.7 W – With lateral lead exit

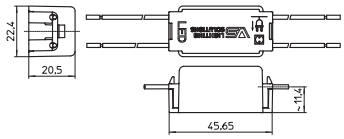


13 W – With lateral lead exit

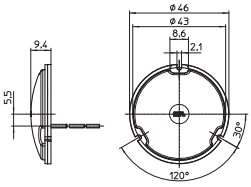




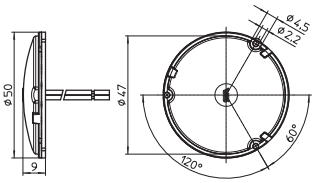
MOV



8.7 W – With central lead exit



13 W – With central lead exit



ReadyLine C05

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.	Luminous flux lm typ.	CRI R_a	Lead exit	Energy efficiency
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	neutral white	3700...4200	clear	740	800	> 80	central	A+
	LR21W	**554388**									lateral	A+
	LR21W	**559582**					diffuse	630	680	> 80	central	A+
	LR21W	**554389**									lateral	A+

Versions for the US market on request

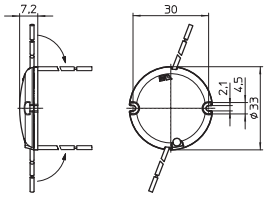
ReadyLine C 05

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.	Luminous flux lm typ.	CRI R_a	Lead exit	Energy efficiency
13	LR30W	**559583**	220–240	30	warm white	2600...2900	clear	910	940	> 80	central	A+
	LR30W	**559584**									lateral	A+
	LR30W	**559585**					diffuse	780	800	> 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+

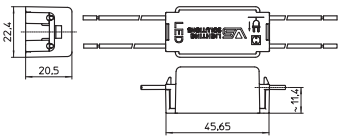
Accessories			Description	Tape thickness	Thermal conductivity	Breakdown voltage*
–	–	**555014**	Thermally conductive adhesive transfer tape Ø 54 mm	0.25 mm	0.8 W/mK	5.5 kV
–	–	**554419**	Thermally conductive transfer tape, non-adhesive Ø 49 mm	0.25 mm	2 W/mK	3 kV
–	–	**555013****	Thermally conductive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

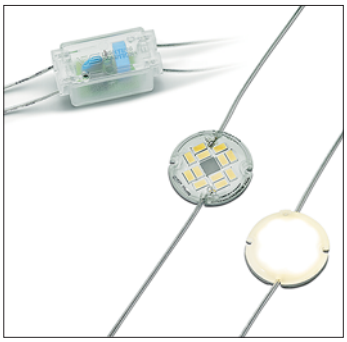
* Average value (not for specification purpose) | ** For use in luminaires of protection class I (has to be tested in luminaire)

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.	Luminous flux lm typ.	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	**563935**	220–240	12	warm white	2900...3200	clear	350	370	> 80	lateral	A++
	LR12W	**563936**					diffuse	312	330	> 80	lateral	A+
	LR12W	**563937**	220–240	12	neutral white	3700...4200	clear	380	400	> 80	lateral	A++
	LR12W	**563938**					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)

LED DOWNLIGHTS AND DECOLEDS

ADVANTAGES OF VS LED DOWNLIGHTS

LED Recessed Mounted Downlight and DecoLEDs
The integration of solid state lighting technology into conventional down lights provides optimal light distribution and extended life time, 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

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

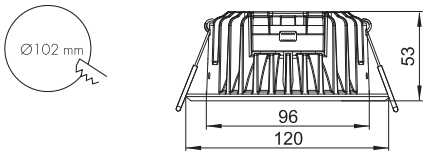
DECOLED
- Slim design for easy installation in low false ceiling
- Integrated driver, direct connection to mains
- Dimmable with regular phase-cut dimmer
- Swiveling LED module (± 30°)

Pro Series

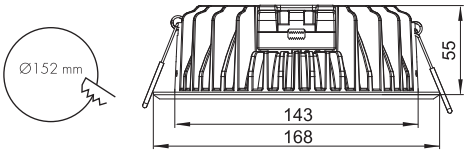
12 W / 18 W

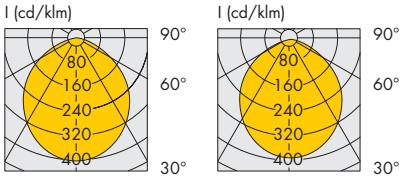
Voltage supply: 220–240 V AC
Integrated dimmable driver for direct connection to mains voltage
Allowed operating temperature: –10 to 50 °C
Allowed storage temperature: –10 to 50 °C
Screw terminals: 2.5 mm²
Quantity of screw terminals: 1x2-poles primary
Protection class II
SELV
Degree of protection: IP20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

Pro 12 W



Pro 18 W





Pro 12 W Pro 18 W

Type	Ref. No.	Colour	Colour temperature K	Luminous flux lm	Efficiency lm/W	Beam angle °	CRI R_a	Dimming	Power factor	System power W	Energy efficiency
Pro – 12 W											
DL-PRO-12-3000-110	**550880**	warm white	3000	850	71	110	≥ 80	yes	> 0.9	12	A+
DL-PRO-12-4000-110	**550882**	neutral white	4000	880	73	110	≥ 80	yes	> 0.9	12	A+
Pro – 18 W											
DL-PRO-18-3000-110	**550885**	warm white	3000	1350	75	110	≥ 80	yes	> 0.9	18	A
DL-PRO-18-4000-110	**550886**	neutral white	4000	1450	80	110	≥ 80	yes	> 0.9	18	A+

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

Typical Luminance

At 1, 2 and 3 meters

Pro

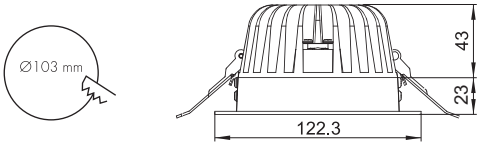
Light intensity (Lux)						
Colour temperature	**Pro 12 W**			**Pro 18 W**		
K	1 m	2 m	3 m	1 m	2 m	3 m
Warm white 3000 K	335	84	37	510	128	56
Neutral white 4000 K	380	95	42	620	155	68

Prime L Series

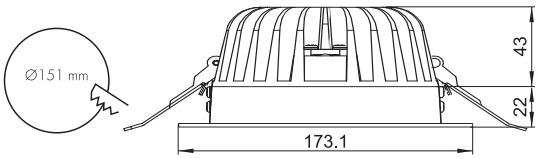
12 W / 26 W

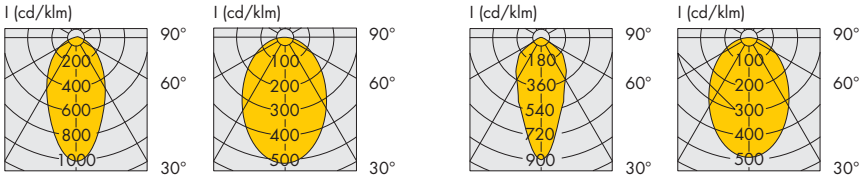
Current supply
for 12 W downlight: 350 mA DC
for 26 W downlight: 700 mA DC
Forward voltage: 37 V
Allowed operating temperature: -40 to 45 °C
Allowed storage temperature: -40 to 60 °C
Dimmable (dimmable LED drivers see from page 168 on)
Primary lead: PVC-insulation, length: 200 mm
Protection class III
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% diffuse

Prime L 26 W
87% diffuse

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

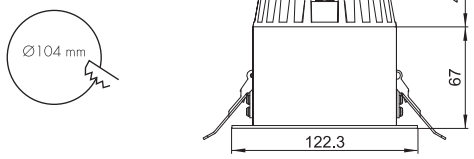
Test standards: IEC/EN 60598-1, IEC/EN 60598-2-2, IEC/EN 62031, IEC/EN 62471, IEC/EN 55015, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61547

Prime H Series

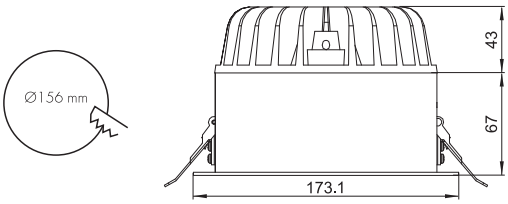
12 W / 26 W / 38 W and 40 W

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 168 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)

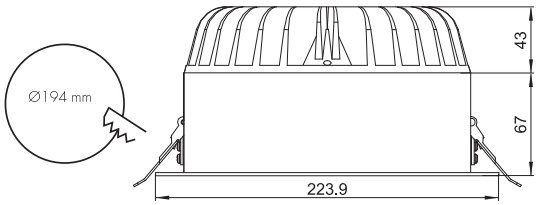
Prime H 12 W

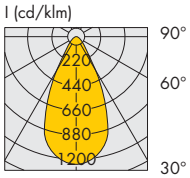


Prime H 26 W

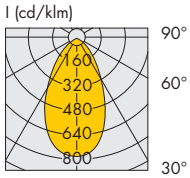


Prime H 38 W and 40 W

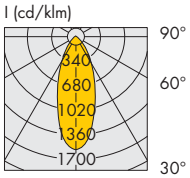




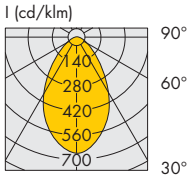
Prime H 12 W
99% clear



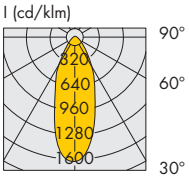
Prime H 12 W
87% diffuse



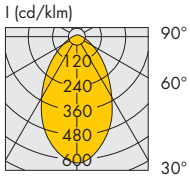
Prime H 26 W
99% clear



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	Luminous flux lm	Efficiency lm/W	Beam angle °	CRI R_a	Front plate transparency	Power W	Energy efficiency
Prime H – 12 W										
DL-PRIME-H-12-3000-50-C	**550898**	warm white	3000	895	75	50	≥ 90	99% clear	12	A
DL-PRIME-H12-3000-60-D	**550899**	warm white	3000	765	65	60	≥ 90	87% diffuse	12	A
DL-PRIME-H-12-4000-50-C	**550900**	neutral white	4000	1010	85	50	≥ 90	99% clear	12	A+
DL-PRIME-H-12-4000-60-D	**550901**	neutral white	4000	840	70	60	≥ 90	87% diffuse	12	A
Prime H – 26 W										
DL-PRIME-H-26-3000-40-C	**550902**	warm white	3000	2140	85	40	≥ 90	99% clear	26	A
DL-PRIME-H-26-3000-70-D	**550903**	warm white	3000	1820	70	70	≥ 90	87% diffuse	26	A
DL-PRIME-H-26-4000-40-C	**550904**	neutral white	4000	2170	85	40	≥ 90	99% clear	26	A+
DL-PRIME-H-26-4000-70-D	**550905**	neutral white	4000	1915	70	70	≥ 90	87% diffuse	26	A
Prime H – 38 W / 40 W										
DL-PRIME-H-383000-40-C	**550906**	warm white	3000	3240	85	40	≥ 90	99% clear	38	A+
DL-PRIME-H-38-3000-75-D	**550907**	warm white	3000	3000	80	75	≥ 90	87% diffuse	38	A
DL-PRIME-H-40-4000-40-C	**550908**	neutral white	4000	3240	85	40	≥ 90	99% clear	40	A+
DL-PRIME-H-40-4000-75-D	**550909**	neutral white	4000	2930	75	75	≥ 90	87% diffuse	40	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

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	318	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

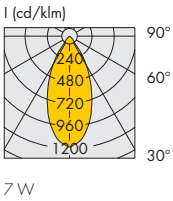
Light intensity (Lux)									
Colour temperature	**Prime H 12 W**			**Prime H 26 W**			**Prime H 38 W / 40 W**		
K	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm white 3000 K – 99% clear	1120	280	125	3600	900	400	5200	1300	578
Warm white 3000 K – 87% diffuse	600	150	68	1210	302	135	1870	468	208
Neutral white 4000 K – 99% clear	1260	315	140	3600	900	400	5125	1280	570
Neutral white 4000 K – 87% diffuse	660	165	74	1290	323	144	1830	458	204

VS DecoLED

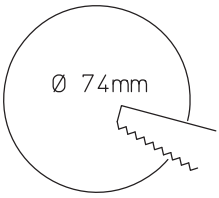
Complete LEDSpot equipped with optics, heatsink, leads and metal frame

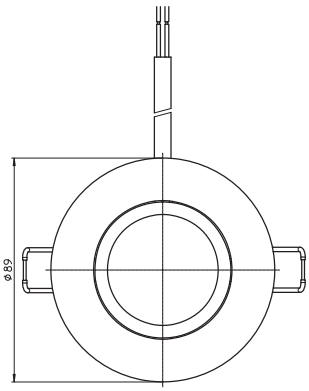
Technical notes

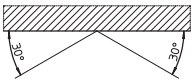
For direct connection to mains voltage
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.9
Metal frame, round
For cut-out: 74 mm
Swiveling LED module (± 30°)
Beam angle: 38°
Allowed operating temperature: –10 to 40 °C
Phase-cut dimmable (trailing-edge dimmers are preferred)
Leads: Cu tinned, stranded conductors 0.5 mm²
Si-insulation and sleeve
With integrated dimmable driver
Degree of protection: IP20
Weight: 160 g

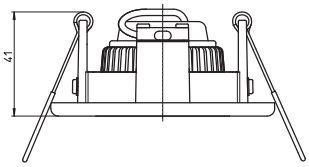


7 W









Type	**Ref. No.**	Colour	Colour temperature K	Luminous flux lm min.	typ.	Light intensity at 230 V Candela	Beam angle °	CRI R_a	Max. output W	Energy efficiency
DecoLED-7-3000-38	**562282**	warm white	3000	495	560	690	38	80	7	A+

FOR RETAIL, RESIDENTIAL AND FURNITURE LIGHTING

CONVENIENT LED TECHNOLOGY

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

These LEDSpots are available with high-power LEDs or with COB technology featuring a capacity range of 3–30 W. These modules are equipped with optics or reflectors depending on the field of application and heat sinks for a proper thermal management of the LED.
Some versions also have fixing frames for easy installation.

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

Typical applications for LEDSpots

- Replacement of more residential 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.

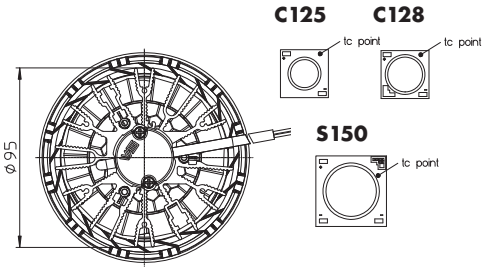
ShopLine series
- Replacement for HID lamps 20–150 W
- Built-in spot with heat sink based on LUGA modules
- Reflector for homogeneous light distribution

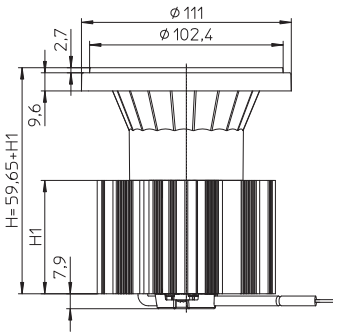
ActiveLine series
- Replacement for Halogen lamps up to 75 W and HID lamps 20–35 W (MR16)
- Built-in spot with heat sink based on LUGA or other COB modules
- Reflector or optics for homogeneous light distribution

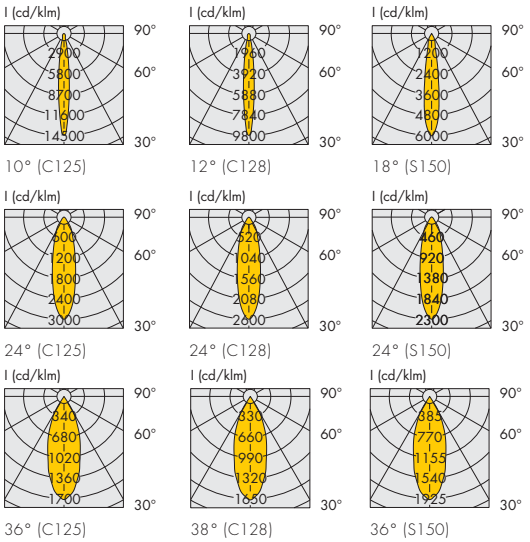
Complete LEDSpots with frame
- Replacement for Halogen lamps 20–35 W
- Flat LED spot with heat sink and frame based on COB or SMD modules
- For built-in into ceilings or metal sheets

ShopLine 111

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







Technical notes

Reflector: Ø 111 mm
Heat sink material: aluminium
Max. operating temperature at t_p point:
- 99 °C: Type C125/C128
- 80 °C: Type S150

Lumen maintenance: L90/B10; 50,000 hrs.
- 60 °C: Type C125/C128
- 70 °C: Type S150

Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers
The ceramic PCB ensures optimum thermal management
Plastic clear cover to protect reflector (opaque cover on request)
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

Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 300 mm
With integrated cord grip
Packaging unit: 6 pcs.

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

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	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
H1 = 40 mm (heat sink height)				P_{el} = 12 W $U_{typ.}$ = 34.2 V	P_{el} = 17.6 W $U_{typ.}$ = 35.1 V					
ShopLine 111 C125	**561664**	warm white	3000	1435	1930	–	28000	10	85	A+
ShopLine 111 C125	**561665**	neutral white	4000	1480	1985	–	29000	10	85	A+
ShopLine 111 C125	**561666**	warm white	3000	1435	1930	–	5800	24	85	A+
ShopLine 111 C125	**566134**	neutral white	4000	1480	1985	–	6100	24	85	A+
ShopLine 111 C125	**566135**	warm white	3000	1400	1885	–	3200	36	85	A+
ShopLine 111 C125	**566136**	neutral white	4000	1445	1940	–	3300	36	85	A+

Versions with other colour temperature, CRI 95 or pearl white on request | Versions with white reflector for extra wide beam angle on request
* 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	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
H1 = 60 mm (heat sink height)				P_{el} = 11.6 W $U_{typ.}$ = 33.2 V	P_{el} = 16.9 W $U_{typ.}$ = 33.9 V	P_{el} = 24.3 W $U_{typ.}$ = 34.7 V				
ShopLine 111 C128	**566137**	warm white	3000	1550	2115	2810	27500	12	85	A++
ShopLine 111 C128	**566138**	neutral white	4000	1600	2175	2880	28300	12	85	A++
ShopLine 111 C128	**566139**	warm white	3000	1550	2115	2810	7300	24	85	A++
ShopLine 111 C128	**566140**	neutral white	4000	1600	2175	2880	7550	24	85	A++
ShopLine 111 C128	**566141**	warm white	3000	1510	2070	2730	4150	38	85	A+
ShopLine 111 C128	**566142**	neutral white	4000	1560	2125	2820	4350	38	85	A++
H1 = 80 mm (heat sink height)				P_{el} = 14.4 W $U_{typ.}$ = 41.4 V	P_{el} = 20.9 W $U_{typ.}$ = 41.8 V	P_{el} = 29.9 W $U_{typ.}$ = 42.7 V				
ShopLine 111 S150	**560835**	warm white	3000	1875	2600	3500	21000	18	85	A++
ShopLine 111 S150	**560840**	neutral white	4000	1945	2700	3650	22000	18	85	A++
ShopLine 111 S150	**560836**	warm white	3000	1895	2630	3540	8100	24	85	A++
ShopLine 111 S150	**560841**	neutral white	4000	1970	2735	3690	8500	24	85	A++
ShopLine 111 S150	**560771**	warm white	3000	1895	2630	3540	6800	36	85	A++
ShopLine 111 S150	**560772**	neutral white	4000	1970	2735	3690	7200	36	85	A++

Versions with other colour temperature, CRI 95 or pearl white on request | Versions with white reflector for extra wide beam angle on request
* Production tolerance of luminous flux, voltage and power consumption: ±10%

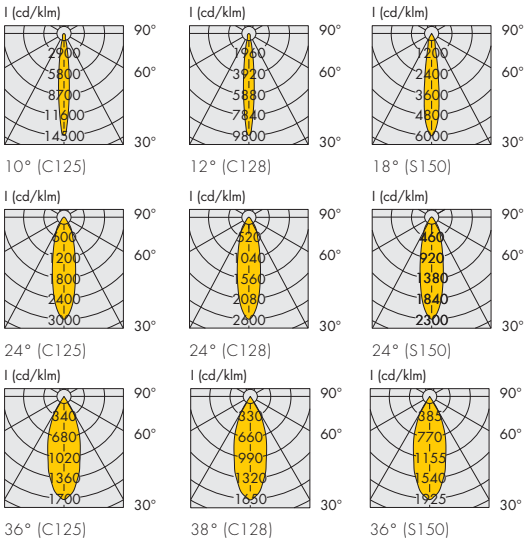
NEXT 111

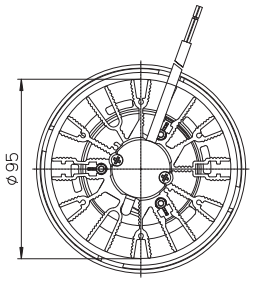
Built-in LEDSpot equipped with an interchangeable reflector, heat sink and leads – Replacement for AR111

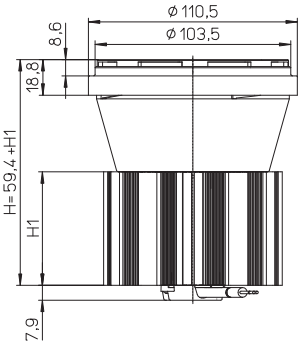
Technical notes

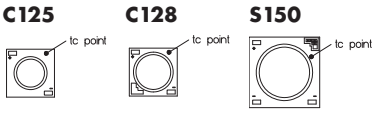
Reflector: Ø 111 mm, interchangeable
Heat sink material: aluminium
Max operating temperature at t_p point:
99 °C: Type C125/C128
80 °C: Type S150
Lumen maintenance: L90/B10; 50.000 hrs.
60 °C: Type C125/C128
70 °C: Type S150
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers
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 self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and neoprene sleeve, length: 300 mm
With integrated cord grip
Packaging 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









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	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
H1 = 40 mm (heat sink height)					P_{el} = 12 W $U_{typ.}$ = 34.2 V	P_{el} = 17.6 W $U_{typ.}$ = 35.1 V					
Next 111 C125	**561701**	**561707**	warm white	3000	1435	1930	–	28000	10	85	A+
Next 111 C125	**561702**	**561708**	neutral white	4000	1480	1985	–	29000	10	85	A+
Next 111 C125	**561703**	**561709**	warm white	3000	1435	1930	–	5800	24	85	A+
Next 111 C125	**561704**	**561710**	neutral white	4000	1480	1985	–	6100	24	85	A+
Next 111 C125	**561705**	**561711**	warm white	3000	1400	1885	–	3200	36	85	A+
Next 111 C125	**561706**	**561712**	neutral white	4000	1445	1940	–	3300	36	85	A+
H1 = 60 mm (heat sink height)					P_{el} = 11.6 W $U_{typ.}$ = 33.2 V	P_{el} = 16.9 W $U_{typ.}$ = 33.9 V	P_{el} = 24.3 W $U_{typ.}$ = 34.7 V				
Next 111 C128	**561810**	**561816**	warm white	3000	1550	2115	2810	27500	12	85	A++
Next 111 C128	**561811**	**561817**	neutral white	4000	1600	2175	2880	28300	12	85	A++
Next 111 C128	**561812**	**561818**	warm white	3000	1550	2115	2810	7300	24	85	A++
Next 111 C128	**561813**	**561819**	neutral white	4000	1600	2175	2880	7550	24	85	A++
Next 111 C128	**561814**	**561820**	warm white	3000	1510	2070	2730	4150	38	85	A+
Next 111 C128	**561815**	**561821**	neutral white	4000	1560	2125	2820	4350	38	85	A++
H1 = 80 mm (heat sink height)					P_{el} = 14.4 W $U_{typ.}$ = 41.4 V	P_{el} = 20.9 W $U_{typ.}$ = 41.8 V	P_{el} = 29.9 W $U_{typ.}$ = 42.7 V				
Next 111 S150	**560866**	**560887**	warm white	3000	1875	2600	3500	21000	18	85	A++
Next 111 S150	**560873**	**560892**	neutral white	4000	1945	2700	3650	22000	18	85	A++
Next 111 S150	**560867**	**560888**	warm white	3000	1895	2630	3540	8100	24	85	A++
Next 111 S150	**560874**	**560893**	neutral white	4000	1970	2735	3690	8500	24	85	A++
Next 111 S150	**560868**	**560889**	warm white	3000	1895	2630	3540	6800	36	85	A++
Next 111 S150	**560876**	**560894**	neutral white	4000	1970	2735	3690	7200	36	85	A++

Versions with other colour temperature, CRI 95 or pearl white on request | Versions with white reflector for extra wide beam angle on request
* Production tolerance of luminous flux, voltage and power consumption: ±10%

With Zhaga adaptor for aluminium reflectors

Reflector size
- top: Ø 94 mm
- bottom: Ø 40 mm
- height: 50 mm

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	Beam angle °	CRI R_a	Energy efficiency at max. current
H1 = 40 mm (heat sink height)				P_{el} = 12 W $U_{typ.}$ = 34.2 V	P_{el} = 17.6 W $U_{typ.}$ = 35.1 V				
Next 111 C125	**561822**	warm white	3000	1650	2215	–	120	85	A++
H1 = 60 mm (heat sink height)				P_{el} = 11.6 W $U_{typ.}$ = 33.2 V	P_{el} = 16.9 W $U_{typ.}$ = 33.9 V	P_{el} = 24.3 W $U_{typ.}$ = 34.7 V			
Next 111 128	**561823**	warm white	3000	1775	2430	3210	120	85	A++
H1 = 80 mm (heat sink height)				P_{el} = 14.4 W $U_{typ.}$ = 41.4 V	P_{el} = 20.9 W $U_{typ.}$ = 41.8 V	P_{el} = 29.9 W $U_{typ.}$ = 42.7 V			
Next 111 S150	**561824**	warm white	3000	2170	2955	3940	120	85	A++

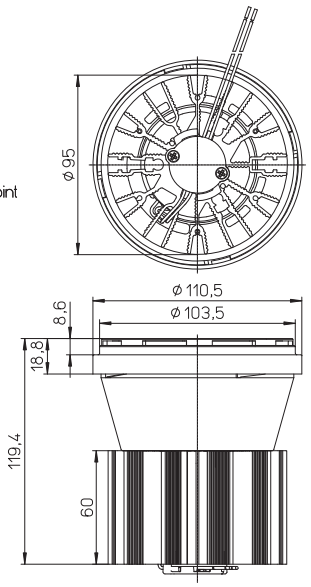
Versions with other colour temperature, CRI 95 or pearl white on request | Versions with white reflector for extra wide beam angle on request
* Production tolerance of luminous flux, voltage and power consumption: ±10%

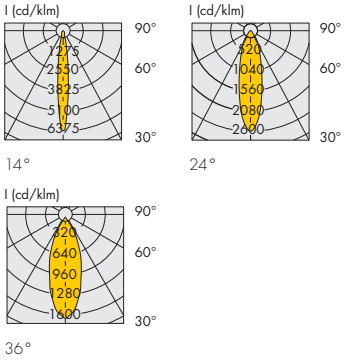
NEXT 111 R

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

Technical notes

For direct connection to mains voltage
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.95
Reflector: Ø 111 mm (with flange), aluminium, bayonet fixing
Heat sink material: aluminium
Max operating temperature at t_p point: 85 °C
Lumen maintenance:
L70/B50; 50,000 hrs. at 70 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM
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 self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP/FEP-insulation, length: 300 mm
With integrated cord grip
Weight: 430 g
Packaging unit: 6 pcs.





Type	Ref. No. for black LEDSpots	Ref. No. for white LEDSpots	Mains voltage AC 50/60 Hz V	Colour	Correlated colour temperature K	Typ. luminous flux* lm	Light intensity at 230 V Candela	Beam angle °	CRI R_a	Power consumption at 230 V W	Energy efficiency at 230 V
Next 111 R 20	**561713**	**561719**	220–240	warm white	3000	1440	8600	14	80	20	A
Next 111 R 20	**561714**	**561720**	220–240	neutral white	4000	1520	8790	14	80	20	A+
Next 111 R 20	**561715**	**561721**	220–240	warm white	3000	1440	3450	24	80	20	A
Next 111 R 20	**561716**	**561722**	220–240	neutral white	4000	1520	4100	24	80	20	A+
Next 111 R 20	**561717**	**561723**	220–240	warm white	3000	1455	2350	36	80	20	A
Next 111 R 20	**561718**	**561724**	220–240	neutral white	4000	1540	2480	36	80	20	A+

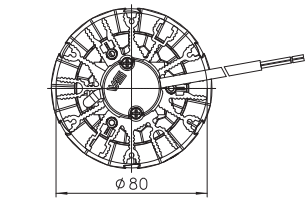
* Production tolerance of luminous flux: ±10%

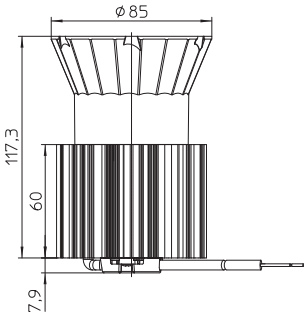
ShopLine 85

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

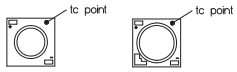
Technical notes

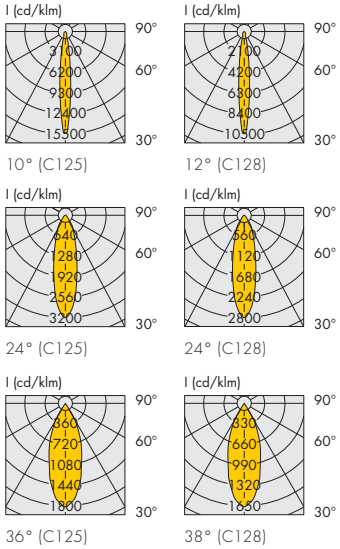
Reflector: Ø 85 mm
Heat sink material: aluminium
Max operating temperature at t_p point: 99 °C
Lumen maintenance:
L90/B10; 50,000 hrs. at 60 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers
The ceramic PCB ensures optimum thermal management
Fixation
heat sink: lateral fixation with M5 screws and nuts
or rear side fixation with self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and PVC sleeve, length: 300 mm
With integrated cord grip
Weight: 360 g
Packaging unit: 6 pcs.





C125 **C128**





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	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
ShopLine 85 C125				P_{el} = 12 W $U_{typ.}$ = 34.2 V	P_{el} = 17.6 W $U_{typ.}$ = 35.1 V					
ShopLine 85 C125	**561679**	warm white	3000	1470	1970	–	30500	10	85	A+
ShopLine 85 C125	**561680**	neutral white	4000	1515	2030	–	31600	10	85	A++
ShopLine 85 C125	**561681**	warm white	3000	1470	1970	–	6300	24	85	A+
ShopLine 85 C125	**561682**	neutral white	4000	1515	2030	–	6600	24	85	A++
ShopLine 85 C125	**561683**	warm white	3000	1435	1930	–	3450	36	85	A+
ShopLine 85 C125	**561684**	neutral white	4000	1480	1985	–	3600	36	85	A++
ShopLine 85 C128				P_{el} = 11.6 W $U_{typ.}$ = 33.2 V	P_{el} = 16.9 W $U_{typ.}$ = 33.9 V	P_{el} = 24.3 W $U_{typ.}$ = 34.7 V				
ShopLine 85 C128	**561826**	warm white	3000	1580	2165	2860	30200	12	85	A++
ShopLine 85 C128	**561827**	neutral white	4000	1630	2225	2950	31100	12	85	A++
ShopLine 85 C128	**561828**	warm white	3000	1580	2165	2860	8000	24	85	A++
ShopLine 85 C128	**561829**	neutral white	4000	1630	2225	2950	8300	24	85	A++
ShopLine 85 C128	**561830**	warm white	3000	1545	2115	2795	4600	38	85	A+
ShopLine 85 C128	**561832**	neutral white	4000	1600	2175	2880	4800	38	85	A++

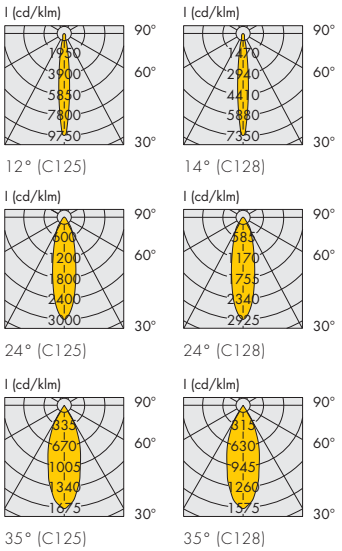
Versions with other colour temperature, CRI 95 or pearl white on request | Versions with white reflector for extra wide beam angle on request
* Production tolerance of luminous flux, voltage and power consumption: ±10%

EVO90

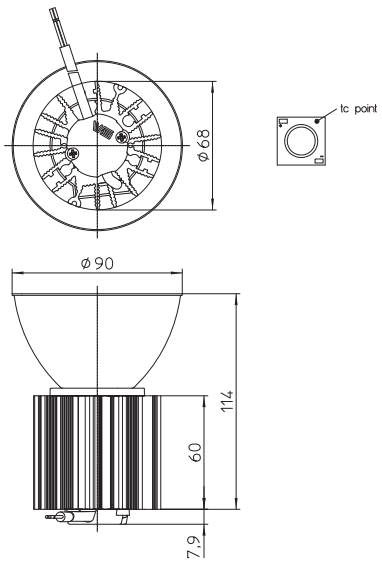
Built-in LEDSpot equipped with an interchangeable aluminium reflector, heat sink and leads

Technical notes

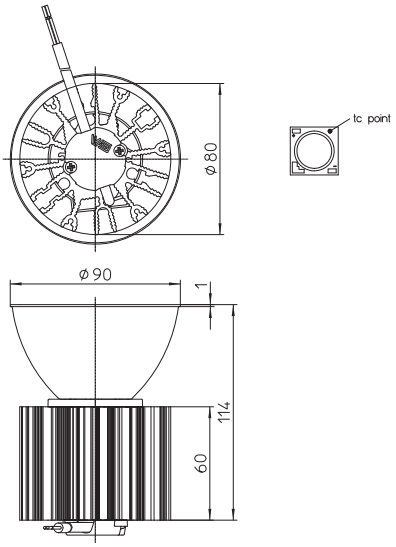
Reflector: Ø 90 mm, aluminium, bayonet fixing
Holder: PC, inner ring: metallized
Heat sink material: aluminium
Max operating temperature at t_p point: 99 °C
Lumen maintenance:
L90/B10; 50,000 hrs. at 60 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers
The ceramic PCB ensures optimum thermal management
Fixation
heat sink: lateral fixation with M5 screws and nuts
or rear side fixation with self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and PVC sleeve, length: 300 mm
With integrated cord grip
Weight: 280/360 g (C125/C128)
Packaging unit: 6 pcs.



EVO90 C125



EVO90 C128



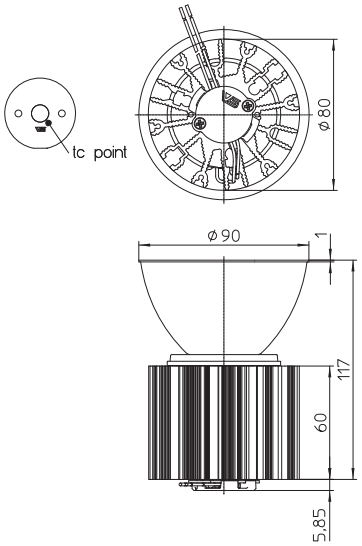
EVO90

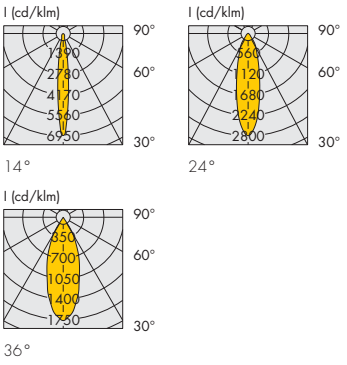
Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	700 mA lm	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
EVO90 C125				P_{el} = 12 W $U_{typ.}$ = 34.2 V	P_{el} = 17.6 W $U_{typ.}$ = 35.1 V					
EVO90 C125	**561745**	warm white	3000	1470	1970	–	19200	12	85	A+
EVO90 C125	**561746**	neutral white	4000	1515	2030	–	20000	12	85	A++
EVO90 C125	**561747**	warm white	3000	1485	1995	–	5900	24	85	A+
EVO90 C125	**561748**	neutral white	4000	1530	2050	–	6200	24	85	A++
EVO90 C125	**561749**	warm white	3000	1470	1970	–	3300	35	85	A+
EVO90 C125	**561750**	neutral white	4000	1515	2030	–	3400	35	85	A++
EVO90 C128				P_{el} = 11.6 W $U_{typ.}$ = 33.2 V	P_{el} = 16.9 W $U_{typ.}$ = 33.9 V	P_{el} = 24.3 W $U_{typ.}$ = 34.7 V				
EVO90 C128	**561837**	warm white	3000	1580	2165	2860	21000	14	85	A++
EVO90 C128	**561838**	neutral white	4000	1630	2225	2945	21900	14	85	A++
EVO90 C128	**561839**	warm white	3000	1600	2190	2890	8400	24	85	A++
EVO90 C128	**561840**	neutral white	4000	1650	2250	2980	8700	24	85	A++
EVO90 C128	**561841**	warm white	3000	1580	2165	2860	4500	35	85	A++
EVO90 C128	**561843**	neutral white	4000	1630	2225	2945	4600	35	85	A++

Versions with other colour temperature, CRI 95 or pearl white on request
* Production tolerance of luminous flux, voltage and power consumption: ±10%

EVO90 R

Built-in LEDSpot equipped with an interchangeable aluminium reflector, heat sink and leads





Technical notes

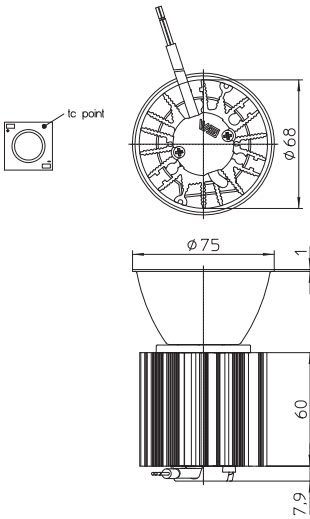
For direct connection to mains voltage
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.95
Reflector: Ø 90 mm, aluminium, bayonet fixing
Holder: PC, inner ring: metallized
Heat sink material: aluminium
Max. operating temperature at t_p point: 85 °C
Lumen maintenance:
L70/B50; 50,000 hrs. at 70 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM
Fixation
heat sink: lateral fixation with M5 screws and nuts
or rear side fixation with self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP/FEP-insulation, length: 350 mm
With integrated cord grip
Weight: 360 g
Packaging unit: 6 pcs.

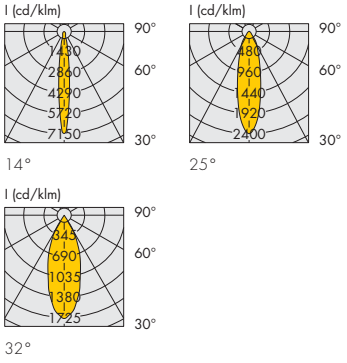
Type	**Ref. No.**	Mains voltage AC 50/60 Hz V	Colour	Correlated colour temperature K	Typ. luminous flux* lm	Light intensity at 230 V Candela	Beam angle °	CRI R_a	Power consumption at 230 V W	Energy efficiency at 230 V
EVO90 R 20	**561757**	220-240	warm white	3000	1515	9200	14	80	20	A
EVO90 R 20	**561758**	220-240	neutral white	4000	1600	9900	14	80	20	A+
EVO90 R 20	**561759**	220-240	warm white	3000	1515	4400	24	80	20	A
EVO90 R 20	**561760**	220-240	neutral white	4000	1600	4580	24	80	20	A+
EVO90 R 20	**561761**	220-240	warm white	3000	1495	2450	36	80	20	A
EVO90 R 20	**561762**	220-240	neutral white	4000	1580	2690	36	80	20	A+

* Production tolerance of luminous flux: ±10%

EVO75

Built-in LEDSpot equipped with an interchangeable aluminium reflector, heat sink and leads





Technical notes

Reflector: Ø 75 mm, aluminium, bayonet fixing
Holder: PC, inner ring: metallized
Heat sink material: aluminium
Max operating temperature at t_p point: 99 °C
Lumen maintenance:
L90/B10; 50,000 hrs. at 60 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Use of external LED constant-current drivers
The ceramic PCB ensures optimum thermal management
Fixation
heat sink: lateral fixation with M5 screws and nuts
or rear side fixation with self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP-insulation and PVC sleeve, length: 300 mm
With integrated cord grip
Weight: 280 g
Packaging unit: 6 pcs.

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	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
				P_{el} = 12 W $U_{typ.}$ = 34.2 V	P_{el} = 17.6 W $U_{typ.}$ = 35.1 V				
EVO75 C125	**561739**	warm white	3000	1470	1970	14100	14	85	A+
EVO75 C125	**561740**	neutral white	4000	1515	2030	15000	14	85	A++
EVO75 C125	**561741**	warm white	3000	1485	1995	4800	25	85	A+
EVO75 C125	**561742**	neutral white	4000	1530	2055	5000	25	85	A++
EVO75 C125	**561743**	warm white	3000	1470	1970	3400	32	85	A+
EVO75 C125	**561744**	neutral white	4000	1515	2030	3480	32	85	A++

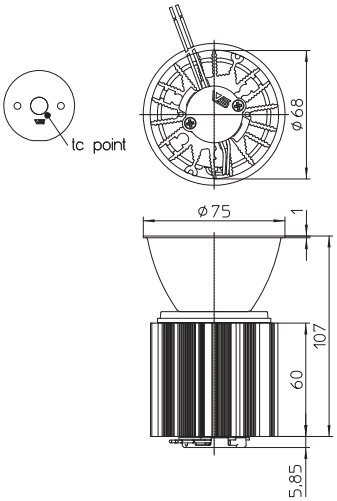
Versions with other colour temperature, CRI 95 or pearl white on request
* Production tolerance of luminous flux, voltage and power consumption: ±10%

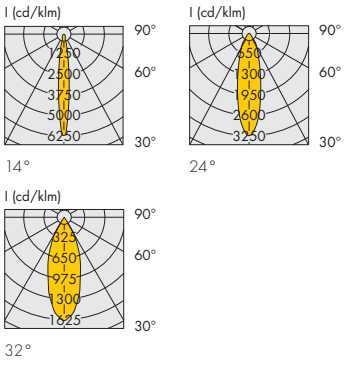
EVO75 R

Built-in LEDSpot equipped with an interchangeable aluminium reflector, heat sink and leads

Technical notes

For direct connection to mains voltage
Mains voltage: 220–240 V, 50/60 Hz
Power factor: > 0.95
Reflector: Ø 75 mm, aluminium, bayonet fixing
Holder: PC, inner ring: metallized
Heat sink material: aluminium
Max operating temperature at t_p point: 85 °C
Lumen maintenance:
L70/B50; 50,000 hrs. at 70 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM
The aluminium PCB ensures optimum thermal management
Fixation heat sink: lateral fixation with M5 screws and nuts
or rear side fixation with self-tapping screws ST2.9
Leads: Cu tinned, stranded conductors 0.5 mm², FEP/FEP-insulation and neoprene sleeve, length: 300 mm
With integrated cord grip
Weight: 280 g
Packaging unit: 6 pcs.

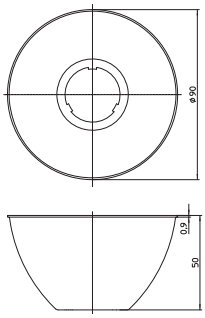


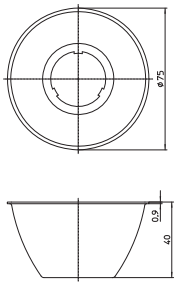


Type	**Ref. No.**	Mains voltage AC 50/60 Hz V	Colour	Correlated colour temperature K	Typ. luminous flux* lm	Light intensity at 230 V Candela	Beam angle °	CRI R_a	Power consumption at 230 V W	Energy efficiency at 230 V
EVO75 R 10	**561751**	220–240	warm white	3000	760	5000	14	80	10	A+
EVO75 R 10	**561752**	220–240	neutral white	4000	780	5180	14	80	10	A+
EVO75 R 10	**561753**	220–240	warm white	3000	760	3600	24	80	10	A+
EVO75 R 10	**561754**	220–240	neutral white	4000	780	3700	24	80	10	A+
EVO75 R 10	**561755**	220–240	warm white	3000	760	1370	32	80	10	A+
EVO75 R 10	**561756**	220–240	neutral white	4000	780	1430	32	80	10	A+

* Production tolerance of luminous flux: ±10%

Reflectors and Holders for EVO and NEXT 111





Exchangeable aluminum reflectors
Technical notes
Reflectors made of aluminium with bayonet fixation
Surface: anodised
Weight: 27/17 g (D90/D75)
Packaging unit: 18 pcs.

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.

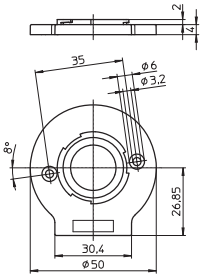
Ref. No.	Beam characteristic	Beam angle (°) EVO 90, EVO 75 DMC125	EVO 90 DMC128	EVO 75 R 10	NEXT 111, EVO 90 R 20
Reflector D90 – H = 50					
557359	narrow	12	14	14*	14
557360	medium	24	24	24*	24
557361	wide	35	35	36*	36
563446	extra wide	48	48	48*	48
Reflector D75 – H = 40					
557152	narrow	14	16	14	14**
557153	medium	25	26	24	24**
557154	wide	32	34	32	32**
562157	extra wide	60	60	60	60**

It's possible to use all the reflectors on the same holder.
* On request | ** Only for EVO 90 on request

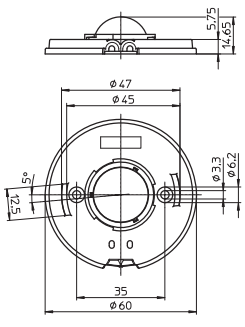
Holders
Material: PC, inner ring: metallized
Packaging unit: 72 pcs.

Ref. No.	For COB Type	Protection on LES
561161	DMC125 / DMC128	–
561847	R10 / R20	yes

561161



561847



ActiveLine LUGA

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

Technical notes
Reflector: Ø 50 mm
Heat sink material: aluminium
The ceramic PCB ensures optimum thermal management
Plastic clear cover to protect reflector (opaque cover on request)
Use of external LED constant-current drivers
Version with plug on request

ActiveLine 9.1 / 7.1 / 6.1 / HALO / 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)
Aluminium PCB for optimum thermal management
Plastic clear cover to protect reflector
Use of external LED constant-current drivers
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

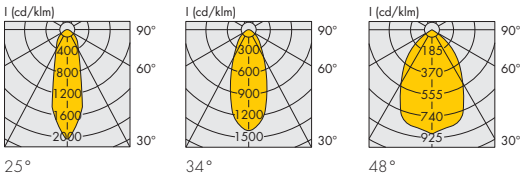
ActiveLine LUGA C


ActiveLine (A) – max. 350 mA


ActiveLine (B) – max. 500 mA

Technical notes

Reflector: Ø 50 mm
Max operating temperature at t_p point: 85 °C
Lumen maintenance: L90/B10; 50,000 hrs.
65 °C (350 mA)
60 °C (500 mA)
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Leads: Cu tinned, stranded
conductors 0.5 mm², FEP-insulation
and neoprene sleeve, length: 200 mm
With integrated cord grip
Weight: 145/260 g (A/B)
Packaging unit: 45/24 pcs. (A/B)



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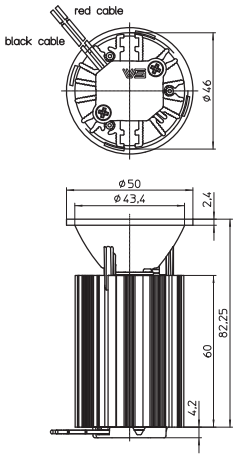
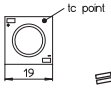
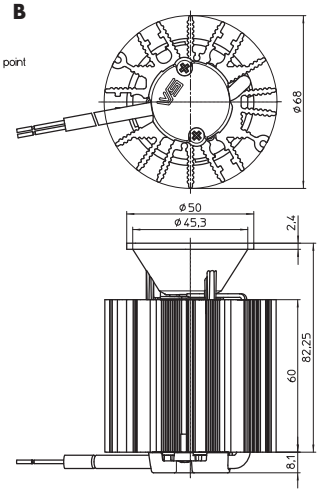




B



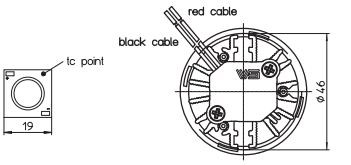
Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	Light intensity at max. current Candela	Beam angle °	CRI R_a	Drawing	Energy efficiency at max. current
Narrow beam angle: 25°				P_{el} = 11 W,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

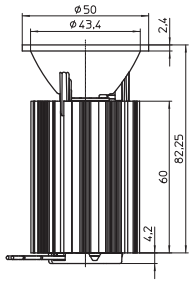
Versions with white reflector for extra wide beam angle on request | * Production tolerance of luminous flux, voltage and power consumption: ±10%

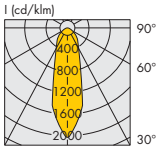
ActiveLine LUGA C

Technical notes

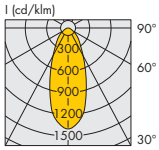
Reflector: Ø 50 mm
Max operating temperature at t_p point: 85 °C
Lumen maintenance:
L90/B10; 50,000 hrs. at 65 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM;
after 50,000 hrs. operating time: 4 SDCM
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 200 mm
With integrated cord grip
Weight: 145 g
Packaging unit: 45 pcs.



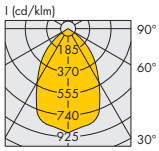




25°



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	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
Narrow beam angle: 25°				P_{el} = 10.2 W, $U_{typ.}$ = 29.2 V				
Luga C 104 27K	**559379**	warm white	2700	1020	2050	25	82	A+
Luga C 104 30K	**559382**	warm white	3000	1080	2170	25	85	A+
Luga C 104 40K	**559385**	neutral white	4000	1160	2330	25	85	A++
Luga C 104 30K	**559406**	warm white	3000	914	1850	25	95	A+
Medium beam angle: 34°								
Luga C 104 27K	**559380**	warm white	2700	1005	1410	34	82	A+
Luga C 104 30K	**559383**	warm white	3000	1065	1495	34	85	A+
Luga C 104 40K	**559386**	neutral white	4000	1145	1610	34	85	A++
Luga C 104 30K	**559407**	warm white	3000	905	1270	34	95	A+
Wide beam angle: 48°								
Luga C 104 27K	**559381**	warm white	2700	1045	955	48	82	A+
Luga C 104 30K	**559384**	warm white	3000	1105	1010	48	85	A+
Luga C 104 40K	**559387**	neutral white	4000	1190	1090	48	85	A++
Luga C 104 30K	**559408**	warm white	3000	940	860	48	95	A+

Versions with white reflector for extra wide beam angle on request | * Production tolerance of luminous flux, voltage and power consumption: ±10%

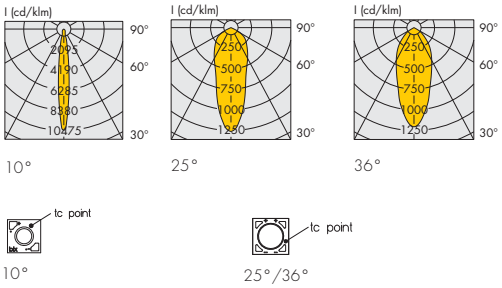
ActiveLine 9.1 & 7.1


ActiveLine 9.1

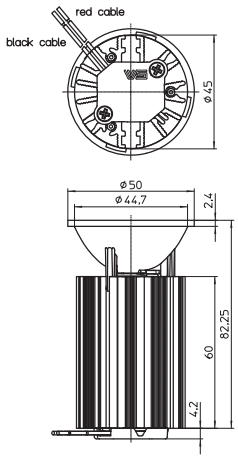

ActiveLine 7.1

Technical notes

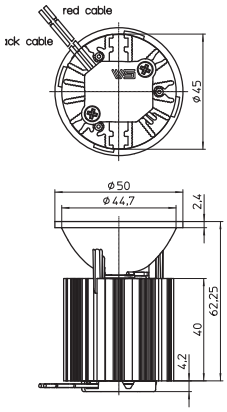
Reflector: Ø 50 mm
Max. operating temperature at t_p point: 85 °C
Lumen maintenance: L90/B30; 50,000 hrs. at 70 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM
Heat sink material: aluminium
Leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 200 mm
With integrated cord grip
Weight: 145/95 g (9.1/7.1)
Packaging unit: 45 pcs.



ActiveLine 9.1



ActiveLine 7.1



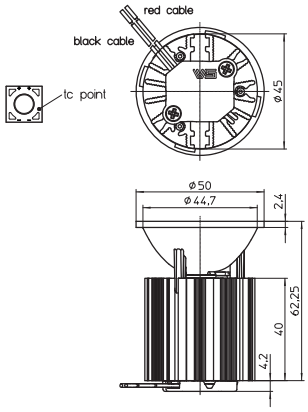
Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA lm	500 mA lm	Light intensity at max. current Candela	Beam angle °	CRI R_a	Energy efficiency at max. current
Extra narrow beam angle: 10°				P_{el} = 5.9 W, $U_{typ.}$ = 16 V	P_{el} = 8.6 W, $U_{typ.}$ = 17 V				
ActiveLine 9.1 27K	**561856**	warm white	2700	525	710	7000	10	80	A+
ActiveLine 7.1 27K	**561763**			525	–	5500			
ActiveLine 9.1 30K	**561857**	warm white	3000	565	750	8000	10	80	A+
ActiveLine 7.1 30K	**561764**			565	–	6100			
ActiveLine 9.1 40K	**561858**	neutral white	4000	600	795	8800	10	80	A+
ActiveLine 7.1 40K	**561765**			600	–	6500			
Narrow beam angle: 25°				P_{el} = 6.2 W, $U_{typ.}$ = 17.8 V	P_{el} = 9.3 W, $U_{typ.}$ = 18.5 V				
ActiveLine 9.1 27K	**559442**	warm white	2700	580	780	1400	25	80	A+
ActiveLine 7.1 27K	**559436**			580	–	1000			
ActiveLine 9.1 30K	**559444**	warm white	3000	615	825	1430	25	80	A+
ActiveLine 7.1 30K	**559438**			615	–	1075			
ActiveLine 9.1 40K	**559446**	neutral white	4000	645	865	1540	25	80	A++
ActiveLine 7.1 40K	**559440**			645	–	1150			
Medium beam angle: 36°				P_{el} = 6.2 W, $U_{typ.}$ = 17.8 V	P_{el} = 9.3 W, $U_{typ.}$ = 18.5 V				
ActiveLine 9.1 27K	**559443**	warm white	2700	580	780	1150	36	80	A+
ActiveLine 7.1 27K	**559437**			580	–	865			
ActiveLine 9.1 30K	**559445**	warm white	3000	615	825	1220	36	80	A+
ActiveLine 7.1 30K	**559439**			615	–	925			
ActiveLine 9.1 40K	**559447**	neutral white	4000	645	865	1350	36	80	A++
ActiveLine 7.1 40K	**559441**			645	–	1010			

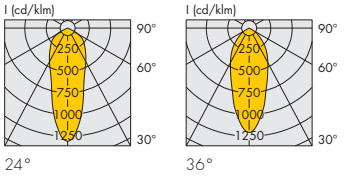
Versions with white reflector for extra wide beam angle on request | * Production tolerance of luminous flux, voltage and power consumption: ±10%

ActiveLine 6.1

Technical notes

Reflector: Ø 50 mm
Max. operating temperature at t_p point: 85 °C
Lumen maintenance:
L90/B30; 50,000 hrs. at 70 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM
Heat sink material: aluminium
Leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 200 mm
With integrated cord grip
Weight: 95 g
Packaging unit: 45 pcs.





24°

36°

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

Versions with white reflector for extra wide beam angle on request | * Production tolerance of luminous flux, voltage and power consumption: ±10%

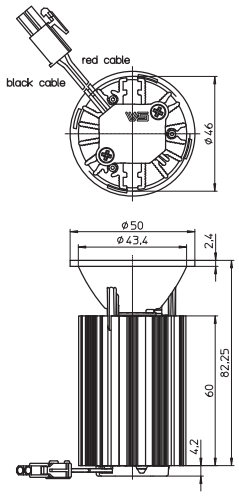
LEDSpot
ActiveLine HALO (3000–2000 K)

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

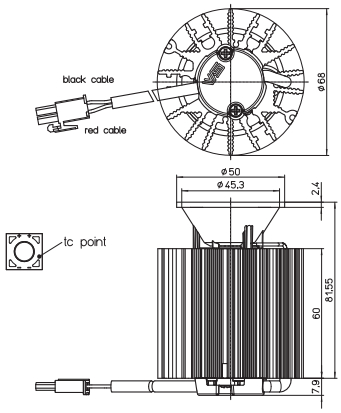
Technical Notes

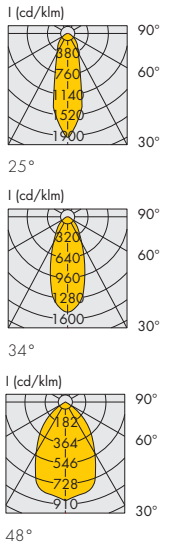
Reflector: Ø 50 mm
Heat sink material: aluminium
Allowed operating temperature at t_c point: -40 to 85 °C
Lumen maintenance:
L90/B50; 50,000 hrs. at 70 °C
Temperature depends on installation situation and has to be checked by the luminaire manufacturer.
Colour accuracy initially: 3 SDCM
Use of external LED constant-current drivers
With analogue dimming function (no PWM)
Plastic opaque cover to protect reflector (clear cover on request)
Leads: Cu tinned, stranded conductors AWG22, PVC-insulation, length: 200 mm, with plug
With integrated cord grip
Weight: 145/260 g (A/B)
Packaging unit: 45/24 pcs. (A/B)

A



B





Electrical characteristics

at t_j = 25 °C

Type	Ref. No.	Voltage DC* (V)						Power consumption* (W)					
		50 mA			350 mA			50 mA			350 mA		
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
ActiveLine HALO 6.6 W	**all**	12	14.3	15.6	17.5	18.8	20.5	0.6	0.72	0.78	6.2	6.6	7.2
ActiveLine HALO 12.8 W	**all**	26.4	31	34.1	31	36.5	40.2	1.3	1.6	1.7	10.9	12.8	14.1

Optical characteristics

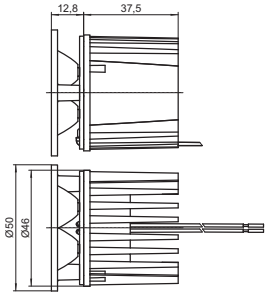
Type	Ref. No.	Colour	Typ. luminous flux* (lm) and correlated colour temperature (K)		Light intensity at max. current	Beam angle	CRI	Drawing	Energy efficiency at max. current
			50 mA lm/K	350 mA lm/K	Candela	°	R_a		
ActiveLine HALO 6.6 W			P_{el} = 0.7 W; V_f = 14.3 V	P_{el} = 6.6 W; V_f = 18.8 V					
ActiveLine HALO 6.6 W	**561865**	warm white	46lm/2000K	525lm/2800K	1000	25	90	A	A+
ActiveLine HALO 6.6 W	**561866**	warm white	45lm/2000K	515lm/2800K	775	34	90	A	A+
ActiveLine HALO 6.6 W	**561867**	warm white	47lm/2000K	530lm/2800K	480	48	90	A	A+
ActiveLine HALO 12.8 W			P_{el} = 1.6 W; V_f = 31 V	P_{el} = 12.8 W; V_f = 36.5 V					
ActiveLine HALO 12.8 W	**559962**	warm white	93lm/2000K	890lm/3000K	1800	25	90	B	A
ActiveLine HALO 12.8 W	**559963**	warm white	91lm/2000K	870lm/3000K	1300	34	90	B	A
ActiveLine HALO 12.8 W	**559645**	warm white	95lm/2000K	900lm/3000K	835	48	90	B	A

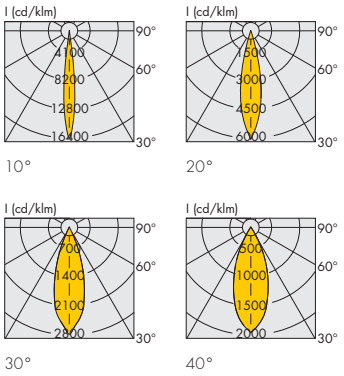
Versions with white reflector for extra wide beam angle on request | * Production tolerance of luminous flux, voltage and power consumption: ±10%

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
Packaging 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
LEDSpot ActiveLine Quad 10°						P_{el} = 3.99 W $U_{typ.}$ = 11.4 V		P_{el} = 5.8 W $U_{typ.}$ = 11.6 V		P_{el} = 8.5 W $U_{typ.}$ = 12.1 V				
LR4W	Quad XTE 3000K bin Q3	**547794**	**547790**	warm white	2870...3200	338	373	450	496	601	663	10000	10	A
LR4W	Quad XTE 4000K bin Q4	**549917**	**548864**	neutral white	3700...4260	360	398	479	529	640	707	10600	10	A+
LR4W	Quad XPE 6300K bin Q4	**547802**	**547798**	cool white	5650...6950	360	398	468	517	612	676	10200	10	A+
LEDSpot ActiveLine Quad 20°														
LR4W	Quad XTE 3000K bin Q3	**547793**	**547789**	warm white	2870...3200	338	373	450	496	601	663	3100	20	A
LR4W	Quad XTE 4000K bin Q4	**549916**	**547940**	neutral white	3700...4260	360	398	479	529	640	707	3300	20	A+
LR4W	Quad XPE 6300K bin Q4	**547801**	**547797**	cool white	5650...6950	360	398	468	517	612	676	3150	20	A+
LEDSpot ActiveLine Quad 30°														
LR4W	Quad XTE 3000K bin Q3	**547792**	**547788**	warm white	2870...3200	338	373	450	496	601	663	1600	30	A
LR4W	Quad XTE 4000K bin Q4	**549915**	**548863**	neutral white	3700...4260	360	398	479	529	640	707	1700	30	A+
LR4W	Quad XPE 6300K bin Q4	**547800**	**547796**	cool white	5650...6950	360	398	468	517	612	676	1630	30	A+
LEDSpot ActiveLine Quad 40°														
LR4W	Quad XTE 3000K bin Q3	**547791**	**547726**	warm white	2870...3200	338	373	450	496	601	663	1100	40	A
LR4W	Quad XTE 4000K bin Q4	**549914**	**547837**	neutral white	3700...4260	360	398	479	529	640	707	1180	40	A+
LR4W	Quad 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

As the perfect replacement for halogen lamps, these LED modules 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, matt silver or gold finish. Furthermore, flexible snap-in fasteners make it extremely easy and quick to exchange halogen spots, which are still in wide-spread use.

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

LEDSpot IPLine
Metal frame, round
For cut-out: Ø 56 mm
Colour accuracy initially: 3 SDCM
Degree of protection: IP54
CRI: 80

LEDSpot SmartLine
Metal frame, round or square
For cut-out: Ø 56 mm
Colour accuracy initially: 3 SDCM
Degree of protection: IP40
CRI: 80

LEDSpot StartLine
Resin or steel frame, round
For cut-out: Ø 56 mm
Colour accuracy initially: 3 SDCM
Degree of protection: IP20
CRI: 80

LEDSpot FlatLine
Metal frame, round
For cut-out: Ø 56 mm
Degree of protection: IP20 (front part IP67)
CRI: 80

Surface Kit with mounted LEDSpot
Metal frame to use IPLine, SmartLine, StartLine or FlatLine 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
Colour accuracy initially: 3 SDCM
Degree of protection: IP40
CRI: 80

LEDSpot EffectLine
Metal frame, round or square
For cut-out: Ø 37 mm
Colour accuracy initially: 3 SDCM
Degree of protection: IP20
CRI: 80

LEDSpot sets
You will receive complete sets that contain the desired number of LEDSpots, a respective number of cable sets and the required LED drivers

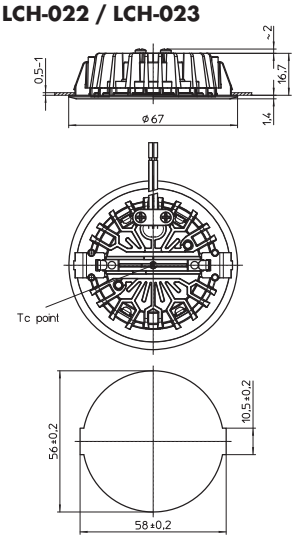
Lead sets for LEDSpots
Lead sets with connector for easy and fast connection

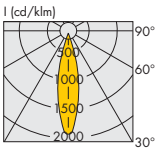
LEDSpot IPLine

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

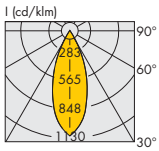
Technical notes
Metal frame, round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Reflector with clear glass (opaque glass on request)
Beam angle: 30° or 50° (LCH-022), 40° (LCH-023)
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers
Snap-in clips for easy installation
Degree of protection: IP54
Weight: 50 g
Packaging unit: 45 pcs.

LCH-022 / LCH-023

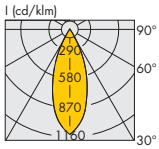




30° (LCH-022)



50° (LCH-022)



40° (LCH-023)

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		Beam angle °	Energy efficiency at max. current
					P_{el} = 1.02 W		P_{el} = 1.5 W		P_{el} = 2.16 W					
LEDSpot IPLine (LCH-022)					$U_{typ.}$ = 2.9 V		$U_{typ.}$ = 3 V		$U_{typ.}$ = 3.09 V		30°	50°		
LCH-022	IPLine 219 3000K	**A**	warm white	2870...3200	90	100	130	140	170	180	320	190	30/50	A++
LCH-022	IPLine 219 4500K	**B**	neutral white	4250...4750	100	110	140	150	180	190	390	210	30/50	A++
					P_{el} = 3.5 W									
LEDSpot IPLine COB (LCH-023)					$U_{typ.}$ = 10 V						40°			
LCH-023	IPLine COB 3000K	**C**	warm white	2920...3070	250	285	–	–	–	–	330	–	40	A+
LCH-023	IPLine COB 4200K	**D**	neutral white	3850...4650	263	300	–	–	–	–	380	–	40	A++

Emission data at t_j = 85 °C (LCH-022) / 25 °C (LCH-023) | Further colour temperatures on request
* Production tolerance of luminous flux, voltage and power consumption: ±7 % (LCH-022) / ±5 % (LCH-023)

	LCH-022				**LCH-023**	
Frame colour	**Ref. No.** **A** (warm white)		**Ref. No.** **B** (neutral white)		**Ref. No.** **C** (warm white)	**Ref. No.** **D** (neutral white)
	30°	50°	30°	50°	40°	40°
silver	**561770**	**561772**	**561774**	**561776**	**552089**	**552091**
white	**561771**	**561773**	**561775**	**561777**	**552088**	**552090**

Silver brushed or further colours on request

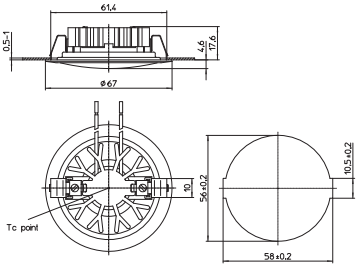
LEDSpot SmartLine COB

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

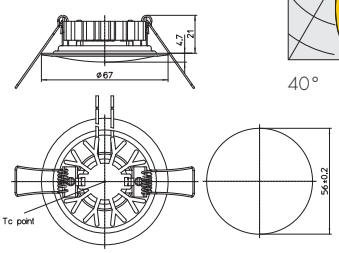
Technical notes

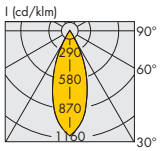
Metal frame, round or square
For cut-out: Ø 56 mm
LEDSpot with one LED and with an aluminium heat sink
Beam angle: 40°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers
Snap-in clips for easy installation
for luminaire sheets (type LCH-017 and -020)
for ceilings (type LCH-019 and -021)
Degree of protection: IP40
Weight: 60 g
Packaging unit:
45 pcs. (type LCH-017 and -020)
40 pcs. (type LCH-019 and -021)

LCH-017



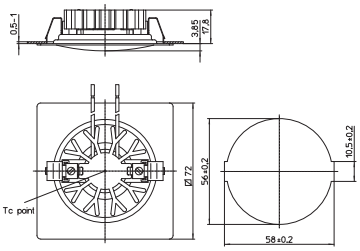
LCH-019



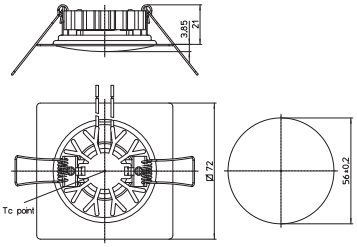


40°

LCH-020



LCH-021



Type	Description	LEDSpot Version for luminaire sheets	LEDSpot Version for ceilings	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA min.	typ.	Light intensity at max. current Candela	Frame shape round	Frame shape square	Energy efficiency at max. current
						P_{el} = 3.5 W, $U_{typ.}$ = 10 V					
All types	Smart COB 3000K 40°	**A**	**C**	warm white	2920...3070	250	285	330	round	square	A+
All types	Smart 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: ±5% | Further colour temperatures on request

	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**	**—**
white	**548915**	**548931**	**548919**	**548935**	**548923**	**548939**	**548927**	**548943**

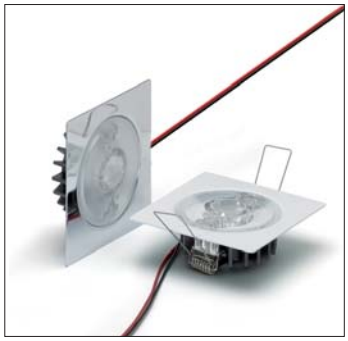
Silver brushed or further colours on request

LEDSpot SmartLine

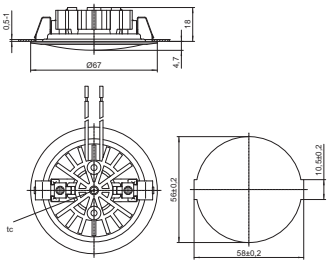
Complete LEDSpot equipped with optics, heat sink, leads and metal frame

Technical notes

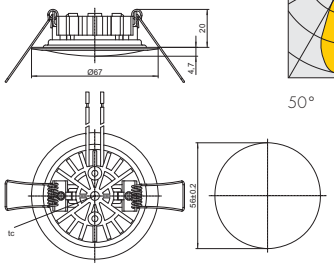
Metal frame, round or square
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Optics beam angle: 50°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers
Snap-in clips for easy installation
for luminaire sheets (type LCH-002 and -008)
for ceilings (type LCH-004 and -009)
Degree of protection: IP40
Weight: 55 g
Packaging unit:
45 pcs. (Type LCH-002 and -008)
40 pcs. (Type LCH-004 and -009)

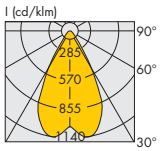


LCH-002



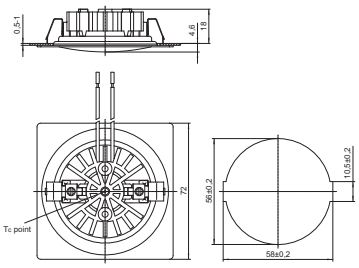
LCH-004



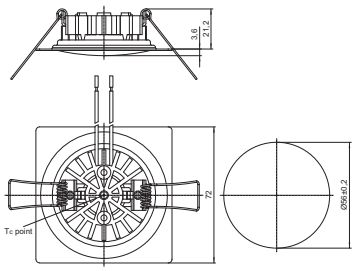


50°

LCH-008



LCH-009



Type	Description	**LEDSpot version** for luminaire sheets	ceilings	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA min.	typ.	500 mA min.	typ.	700 mA min.	typ.	Light intensity at max. current Candela	Frame shape round	square	Energy efficiency at max. current
						P_{el} = 1.02 W $U_{typ.}$ = 2.9 V		P_{el} = 1.5 W $U_{typ.}$ = 3 V		P_{el} = 2.16 W $U_{typ.}$ = 3.09 V					
All	Smart 219 3000K 40°	**A**	**C**	warm white	2870...3200	90	100	130	140	170	180	230	round	square	A++
All	Smart 219 4200K 40°	**B**	**D**	neutral white	4250...4750	100	110	140	150	180	190	270	round	square	A++

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

	For luminaire sheets (LCH-002 and LCH-008)				**For ceilings** (LCH-004 and LCH-009)			
Frame colour	**Ref. No.** **A** (warm white)		**Ref. No.** **B** (neutral white)		**Ref. No.** **C** (warm white)		**Ref. No.** **D** (neutral white)	
	round	square	round	square	round	square	round	square
silver	**561778**	**561781**	**561783**	**561786**	**561788**	**561791**	**561794**	**561797**
silver mat	**561779**	**—**	**561809**	**—**	**561789**	**—**	**561795**	**—**
white	**561780**	**561782**	**561785**	**561787**	**561790**	**561792**	**561796**	**561798**

Silver brushed or further colours on request

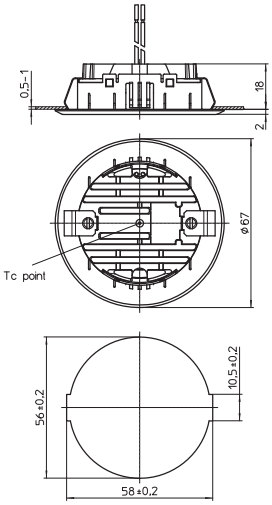
LEDSpot StartLine

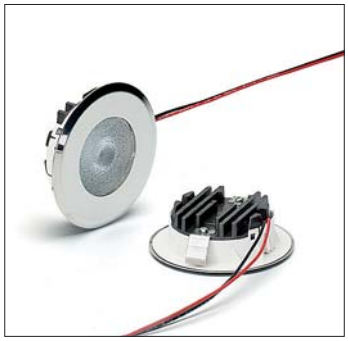
Complete LEDSpot equipped with optics, heat sink, leads and frame

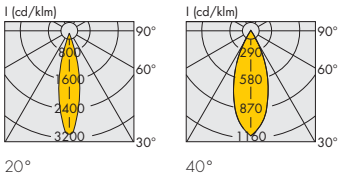
Technical notes

Steel frame: round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Optics 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
Snap-in clips for easy installation
Degree of protection: IP20
Weight: 40 g
Packaging unit: 45 pcs.

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} = 1.5 W $U_{typ.}$ = 3 V		P_{el} = 2.16 W $U_{typ.}$ = 3.09 V				
LCH-016	Start 219 3000K	**A**	warm white	3000	90	100	130	140	170	180	550	190	A++
LCH-016	Start 219 4500K	**B**	neutral white	4500	100	110	140	150	180	190	580	250	A++

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

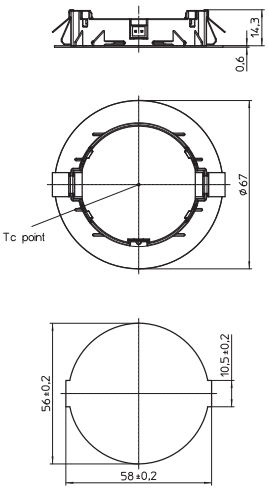
Frame colour	**Ref. No.** **A** (warm white) 20°	40°	**Ref. No.** **B** (neutral white) 20°	40°
silver	**561799**	**561801**	**561803**	**561805**
white	**561800**	**561802**	**561804**	**561807**

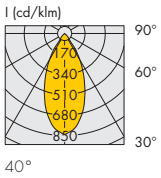
Silver brushed or further colours on request

LEDSpot FlatLine

Complete LEDSpot equipped with optics, leads and frame

Technical notes
Metal frame: silver, round
For cut-out: Ø 56 mm
LEDSpot with 5 LEDs (LCH027) or 6 LEDs (LCH028)
Beam angle: 40°
With connector
Snap-in clips for easy installation
Degree of protection: IP20 (Front part: IP67)
Weight: 40 g
Packaging unit: 45 pcs.





Constant current

Type	Description	Ref. No.	Colour	Correlated colour temperature K	Luminous flux (lm) and typical voltage ($U_{typ.}$) and power consumption (P_{el})* 350 mA typ.	500 mA typ.	700 mA typ.	Light intensity at max. current Candela 40°	Energy efficiency at max. current
LCH-027 – 5 LEDs					P_{el} = 1 W $U_{typ.}$ = 2.88 V	P_{el} = 1.5 W $U_{typ.}$ = 3 V	P_{el} = 2.2 W $U_{typ.}$ = 3.1 V		
LCH027	Flat 757D 3000K bin min P9	**561580**	warm white	2870...3200	101	135	190	160	A++
LCH027	Flat 757D 4000K bin min P9	**561582**	neutral white	3850...4250	105	140	195	220	A++

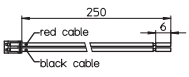
Emission data at t_j = 85 °C | * Production tolerance of luminous flux, voltage and power consumption: ±7% | Further colour temperatures on request

Constant voltage 12 V

Type	Description	Ref. No.	Colour	Correlated colour temperature K	Typ luminous flux* lm	Light intensity Candela	Max. power consumption W	Energy efficiency
LCH-028 – 6 LEDs								
LCH028	Flat 2835 3000K bin min P9	**561588**	warm white	2870...3200	100	90	1.7	A+
LCH028	Flat 2835 4000K bin min P9	**561590**	neutral white	3850...4250	100	100	1.7	A+

Emission data at t_j = 85 °C | * Production tolerance of luminous flux: ±7% | Further colour temperatures on request

Cable set
Length: 250 mm
Ref. No.: 561868

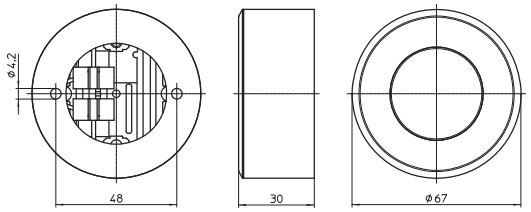


Surface Kit with Mounted LEDSpot

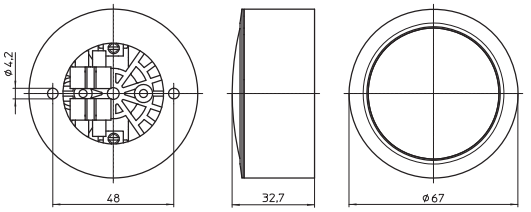
Metal frame to use IPLine, SmartLine, StartLine or FlatLine as surface mounting spots
Two single pole terminals for electrical connection inside the kit (frame + spot)
Fixation by self tapping screws
Packaging unit: 90 pcs.
Ref. No.: 554845 Frame colour: white
Ref. No.: 554843 Frame colour: silver

Frame

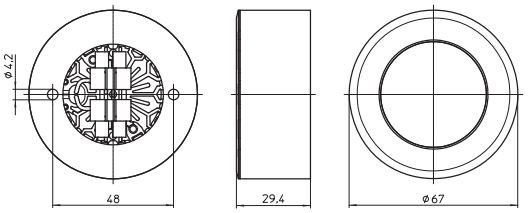
Surface Kit with LEDSpot StartLine
Colour temperature: 3000 K
Beam angle: 40°
Packaging unit: 1 pcs.
Type: StartLine SFK LCH016
Ref. No.: 559621 Frame colour: white
Ref. No.: 557157 Frame colour: silver
Technical details LEDSpots see page 131



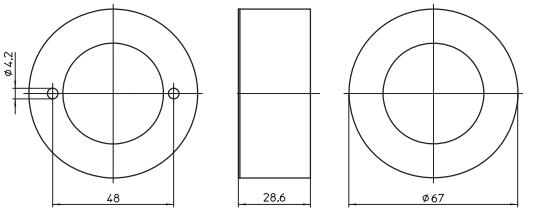
Surface Kit with LEDSpot SmartLine
Colour temperature: 3000 K
Beam angle: 50°
Packaging unit: 1 pcs.
Type: SmartLine SFK LCH002
Ref. No.: 557158 Frame colour: white
Ref. No.: 559622 Frame colour: silver
Technical details LEDSpots see page 130



Surface Kit with LEDSpot IPLine
Colour temperature: 4500 K
Beam angle: 30°
Packaging unit: 1 pcs.
Type: IPLine SFK LCH022
Ref. No.: 559624 Frame colour: white
Ref. No.: 559623 Frame colour: silver
Technical details LEDSpots see page 128



Surface Kit with LEDSpot FlatLine
Colour temperature: 3000 K
Beam angle: 40°
Packaging unit: 1 pcs.
Type: FlatLine SFK LCH027 (700 mA)
Ref. No.: 561870 Frame colour: white
Ref. No.: 561871 Frame colour: silver
Technical details LEDSpots see page 132



Surface Kit with Mounted LEDSpot

Description	**Ref. No.** Frame colour		Colour	Correlated colour temp. (K)	Luminous flux* (lm)			Light intensity at max. current (Cd)	Beam angle °	Energy efficiency at max. current
	silver	white			350 mA typ.	500 mA typ.	700 mA typ.			
					P_{el} = 1.02 W	P_{el} = 1.5 W	P_{el} = 2.16 W			
StartLine SFK LCH016					$U_{typ.}$ = 2,9 V	$U_{typ.}$ = 3 V	$U_{typ.}$ = 3.09 V			
StartLine 219 3000K Bin	**557157**	**559621**	warm white	2870...3200	100	140	180	190	40	A++
SmartLine SFK LCH002										
SmartLine 219 3000K Bin	**559622**	**557158**	warm white	2870...3200	100	140	180	230	50	A++
IPLine SFK LCH002										
IPLine 219 4500K Bin	**559623**	**559624**	neutral white	4250...4750	110	150	190	390	30	A++
					P_{el} = 1 W	P_{el} = 1.5 W	P_{el} = 2.2 W			
FlatLine SFK LCH027					$U_{typ.}$ = 2.88 V	$U_{typ.}$ = 3 V	$U_{typ.}$ = 3.1 V			
FlatLine 757D 4000K bin min P9	**561871**	**561870**	neutral white	3850...4250	105	140	195	220	40	A++

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

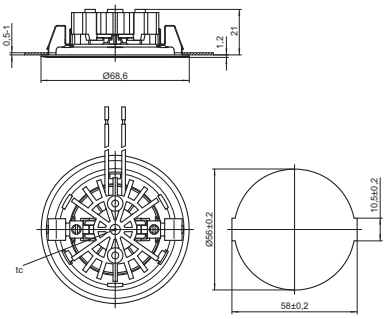
LEDSpot DiscLine

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

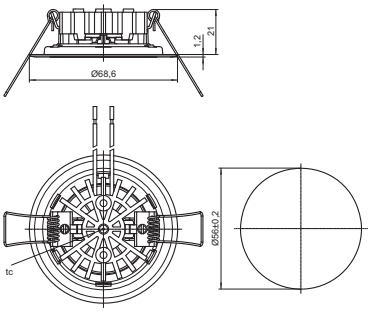
Technical notes

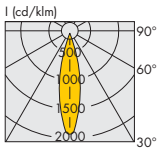
Metal frame, round
For cut-out: Ø 56 mm
LEDSpot with one LED and with thermoplastic heat sink
Reflector with clear glass (opaque glass on request)
Beam angle: 30° or 50°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers
Snap-in clips for easy installation
for luminaires sheets (type LCH-006)
for ceilings (type LCH-007)
Degree of protection: IP40
Weight: 50 g
Packaging unit: 45 pcs. (type LCH-006)
40 pcs. (type LCH-007)

LCH-006

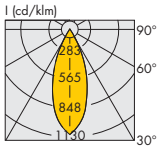


LCH-007





30°



50°

Type	Description	LEDSpot version for luminaire sheet	LEDSpot version for ceilings	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°	Energy efficiency at max. current
						P_{el} = 1.02 W $U_{typ.}$ = 2.9 V		P_{el} = 1.5 W $U_{typ.}$ = 3 V		P_{el} = 2.16 W $U_{typ.}$ = 3.09 V				
All types	Disc 219 3000K	**A**	**C**	warm white	3000	90	100	130	140	170	180	320	190	A++
All types	Disc 219 4500K	**B**	**D**	neutral white	4500	100	110	140	150	180	190	390	210	A++

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

Frame colour	**For luminaire sheets** (LCH-006) **Ref. No.** **A** (warm white) 30°	50°	**Ref. No.** **B** (neutral white) 30°	50°	**For ceilings** (LCH-007) **Ref. No.** **C** (warm white) 30°	50°	**Ref. No.** **D** (neutral white) 30°	50°
silver	**561836**	**561844**	**561846**	**561849**	**561851**	**561854**	**561861**	**561863**
white	**561842**	**561845**	**561848**	**561850**	**561853**	**561855**	**561862**	**561864**

Silver brushed or further colours on request

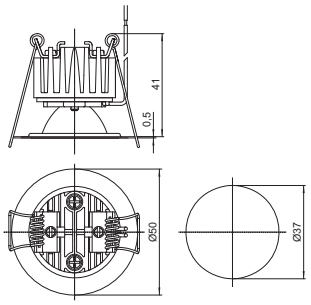
LEDSpot EffectLine

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

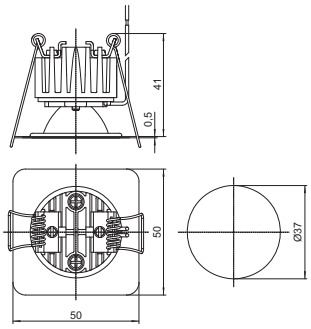
Technical notes

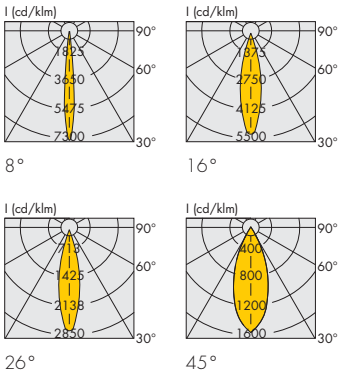
Metal frame, round or square
For cut-out: Ø 37 mm
LEDSpot with one LED and with thermoplastic heat sink
Beam angle: 8°, 16°, 26° or 45°
Leads: Cu tinned, stranded conductors AWG22,
PVC-insulation, length: 250 mm
Use of external LED constant-current drivers
Snap-in clips for easy installation
Degree of protection: IP20
Weight: 40 g
Packaging 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 intensity at 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} = 1.02 W $U_{typ.}$ = 2.9 V		P_{el} = 1.5 W $U_{typ.}$ = 3 V		P_{el} = 2.16 W $U_{typ.}$ = 3.09 V						
All types	Effect 219 3000K	**A**	warm white	3000	90	100	130	140	170	180	1200	450	500	300	A++
All types	Effect 219 4500K	**B**	neutral white	4500	100	110	140	150	180	190	1250	1100	560	330	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	**566143**	**561808**	**566146**	**566148**	**566150**	**566152**	**556154**	**566156**	**566158**	**566160**	**566162**	**566164**	**566166**	**566168**	**561831**	**561834**
white	**566144**	**566145**	**566147**	**566149**	**566151**	**566153**	**566155**	**566157**	**566159**	**566161**	**566163**	**566165**	**566167**	**566169**	**561833**	**561835**

Silver brushed or further colours on request

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.


Set 1


Set 2


Set 3

Set 4

Set 5

Set 6


Set 7


Set 8

Set No.	Ref. No.	Sets includes LEDSpot	Frame*		Driver	Lead set
ActiveLine Pro Kit						
1	**561726**	1 piece ActiveLine 9.1 3000 K 36°	round	silver brushed	186349	inclusive
2	**561728**	1 piece ActiveLine 6.1 3000 K 36°			186341	
3	**561729**	2 pieces ActiveLine 6.1 3000 K 36°			186431	
ActiveLine Pro Kit – dimmable						
4	**561734**	1 piece ActiveLine 9.1 3000 K 36°	round	silver brushed	186448	inclusive
5	**561731**	2 pieces ActiveLine 6.1 3000 K 36°			186415	
GU10 Kit – dimmable						
6	**561732**	6 W GU10 LED lamp, dimmable + frame + lampholder with connection box (3 poles terminal block)	round	silver brushed	–	inclusive
StartLine						
7	**554535**	2 pieces StartLine 3000 K 40°	round	white	186348	inclusive
FlatLine						
8	**561733**	2 pieces FlatLine 700 mA, 3000 K 40°	round	silver	186348	inclusive

* Square shape or other colours on request

Lead Sets

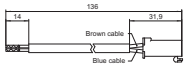
For LEDSpots with connectors

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: 18/36/58/72/90 g
Packaging 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



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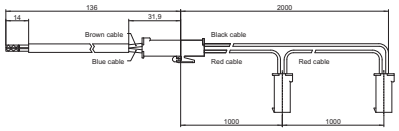

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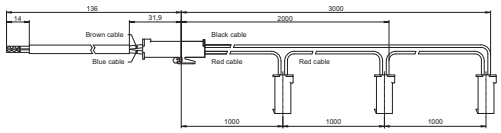

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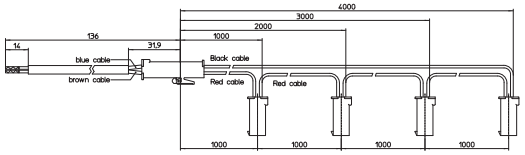

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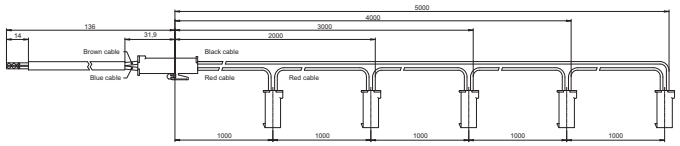

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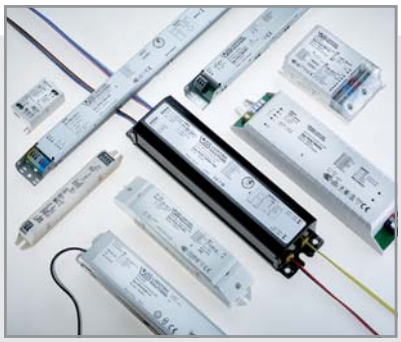
LEDLINE ECX

ELECTRONIC CONSTANT CURRENT DRIVERS



LED CONSTANT CURRENT DRIVERS

Electronic converters for LED modules operated with constant current

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

PrimeLine
Programmability
Intelligent functions
Maximum flexibility
Up to 100,000 hrs. expected service life time

ComfortLine
Convenient
Intelligent functions
Up to 100,000 hrs. expected service life time

EasyLine
Focus on core functions
Cost-efficient
Up to 50,000 hrs. expected service life time

Product overview by main application fields

Main application field	Capacity range W	Output current DC mA	Output voltage DC V	Ref. No.	Version	Current setting	Dimming	Max. service life time (hrs.)	Page
Office	6/10/14	150/250/350	17-40	186530	EasyLine	Push-in terminal	–	50,000	153
	15	350	2-40	186229	ComfortLine	–	–	100,000	151
	15/18/21	500/600/700	17-30	186529	EasyLine	Push-in terminal	–	50,000	153
	27.5/33/38.5	125/150/175	110-220*	186486	ComfortLine	Push-in terminal	–	100,000	147
	28.5	500	19-57	186554	ComfortLine	–	–	100,000	152
	4x9	4x60	55-150	186384	ComfortLine	–	DALI, PUSH	100,000	145
			110-150	186305	ComfortLine	–	–	100,000	150
	40	350/500/700	28-114*	186444	ComfortLine	Push-in terminal	–	100,000	148
	2x20	2x350	17-57	186407	ComfortLine	–	1-10 V	100,000	146
				186406	ComfortLine	–	–	100,000	149
	42	350-700	34-120*	186446, 186575, 186576	PrimeLine	Programmable	DALI, PUSH	100,000	142
			28-114*	186565	ComfortLine	Resistor	–	100,000	143
		350	80-120	186414	EasyLine	–	–	50,000	154
	44/47/47	200/225/250	94-220*	186487	ComfortLine	Push-in terminal	–	100,000	147
	46.8	275/300/325	72-170*	186488	ComfortLine	Push-in terminal	–	100,000	147
	2x28,5/2x40	2x500/2x700	17-57	186410	ComfortLine	Dip switch	1-10 V	100,000	146
				186409	ComfortLine	Dip switch	–	100,000	149
	60	700	46-86	186429	EasyLine	–	–	50,000	154
	77/84	350-700	60-220*	186445, 186577, 186578	PrimeLine	Programmable	DALI, PUSH	100,000	142
				186564	ComfortLine	Resistor	–	100,000	143
	79/85/85	350/500/700	60-225*	186443	ComfortLine	Push-in terminal	–	100,000	148
	82.5/84.8/85	375/400/425	100-220*	186491	ComfortLine	Push-in terminal	–	100,000	147
	84.7/84.6/85.1	550/600/650	65-154*	186492	ComfortLine	Push-in terminal	–	100,000	147
	107	500	90-215	186460	ComfortLine	–	DALI, PUSH	100,000	145
				186315	ComfortLine	–	–	100,000	150
	2x70	2x700	42-100	186356	ComfortLine	–	DALI, PUSH	100,000	144
				186355	ComfortLine	–	1-10 V	100,000	146
				186354	ComfortLine	–	–	100,000	149
Retail	10/14/20	250/350/500	17-40	186463	EasyLine	Push-in terminal	–	50,000	163
	15/18/21	500/600/700	17-30	186464	EasyLine	Push-in terminal	–	50,000	163
	24	350-700	14-34	186465, 186573, 186574	PrimeLine	Programmable	DALI, PUSH	100,000	155
		700	14-34	186280	ComfortLine	–	DALI, PUSH	100,000	156
				186279	ComfortLine	–	1-10 V	100,000	159
				186278	ComfortLine	–	–	100,000	160
	28.5/34.2/40	500/600/700	25-57	186531	EasyLine	Push-in terminal	–	50,000	162
	34	700	9-48	186177, 186195	ComfortLine	–	DALI, PUSH	100,000	157
	34.4/38.7/45	800/900/1050	25-43	186532	EasyLine	Push-in terminal	–	50,000	162
	37	350-700	30-53	186503, 186571, 186572	PrimeLine	Programmable	DALI, PUSH	100,000	155
		700	30-53	186308	ComfortLine	–	DALI, PUSH	100,000	156
				186306	ComfortLine	–	–	100,000	160
				186556	ComfortLine	–	–	100,000	158
	40	700	20-57	186221, 186222	ComfortLine	–	DALI, PUSH	100,000	157
				186266, 186267	ComfortLine	–	–	100,000	161
	60	1050	20-57	186196, 186197	ComfortLine	–	DALI, PUSH	100,000	157
				186268, 186269	ComfortLine	–	–	100,000	161

Product overview by main application fields

Main application field	Capacity range W	Output current DC mA	Output voltage DC V	Ref. No.	Version	Current setting	Dimming	Max. service life time (hrs.)	Page
Residential	5.6	700	2.8-8	186348	EasyLine	–	–	50,000	169
	6	150	27-41	186447	EasyLine	–	C	50,000	168
	7	350	8.4-20	186342	EasyLine	–	–	50,000	169
	8	350	2-24	186180	ComfortLine	–	–	100,000	165
	8.75	350	2-25	186519	ComfortLine	–	–	100,000	166
	10	500	13-20	186448	EasyLine	–	C	50,000	168
	11	350	2-32	186424	ComfortLine	–	–	100,000	165
	12	250	27-48	186449	EasyLine	–	C	50,000	168
		500	8-24	186508	EasyLine	–	–	50,000	170
	12.6	350	8.4-36	186341	EasyLine	–	–	50,000	171
	15	500	8-30	186349	EasyLine	–	–	50,000	171
	16	500	2-32	186425	ComfortLine	–	–	100,000	165
	17	700	2-25	186426	ComfortLine	–	–	100,000	165
	18	350	32-52	186415	EasyLine	–	C	50,000	168
		700	16-26	186450	EasyLine	–	C	50,000	168
	20	350	16-57	186431	EasyLine	–	–	50,000	171
			40-57	186507	EasyLine	–	–	50,000	170
		1050	2-19	186427	ComfortLine	–	–	100,000	165
	20.3	700	8-29	186350	EasyLine	–	–	50,000	171
	25	700	22-36	186416	EasyLine	–	C	50,000	168
	25.2	700	22-36	186353	EasyLine	–	–	50,000	171
	30	350	57-86	186430	EasyLine	–	–	50,000	172
		700	17-42	186393	ComfortLine	–	–	100,000	164
	31.5	1050	20-30	186351	EasyLine	–	–	50,000	172
	36	700	32-52	186451	EasyLine	–	C	50,000	168
		1050	18-36	186394, 186395	ComfortLine	–	C	100,000	164
	40	350	78-114	186550	ComfortLine	–	–	100,000	181
	60	700	43-86	186548	EasyLine	–	–	50,000	172
		1050	40-58	186522	EasyLine	–	–	50,000	172
Street	40	350	78-114	186550	ComfortLine	–	–	100,000	181
		700	32-55	186490	ComfortLine	–	1-10 V	100,000	177
				186489	ComfortLine	–	–	100,000	179
			39-57	186551	ComfortLine	–	–	100,000	181
		1050	26-38	186552	ComfortLine	–	–	100,000	181
	42	350	40-115	186175	ComfortLine	–	–	100,000	182
	60	1050	28-57	186316	ComfortLine	–	1-10 V	100,000	176
	75	700	57-107	186400	ComfortLine	–	1-10 V	100,000	175
		700/400	54-107	186397	ComfortLine	–	Power reduction	100,000	178
	82/90/90	700/1000/1400	22-117*	186367	PrimeLine	Dip switch/DALI	DALI,PUSH,MidNight	100,000	174
	100	700	70-143	186401	ComfortLine	–	1-10 V	100,000	175
		700/400	70-143	186398	ComfortLine	–	Power reduction	100,000	178
	150	350-1050	85-260*	186442	PrimeLine	Programmable	1-10 V	100,000	173
		700	107-210	186402	ComfortLine	–	1-10 V	100,000	175
		700/400	107-210	186509	ComfortLine	–	Power reduction	100,000	178
		700	107-210	186399	ComfortLine	–	–	100,000	180
Industry	19.95/28.5/34.2/39.9	350/500/ 600/700	20-57	186326, 186327	ComfortLine	Rotary switch	1-10 V	100,000	185
	38.7/45.1/51.6/60.2	900/1050/1200/1400	20-43	186208	ComfortLine	Rotary switch	1-10 V	100,000	184
	50	700	35-72	186452	EasyLine	–	–	50,000	187
	75	1050	35-72	186453	EasyLine	–	–	50,000	187
	100	1400	30-72	186454	EasyLine	–	–	50,000	187
	112	700	85-160	186299, 186300	ComfortLine	–	DALI, PUSH	100,000	183
				186297, 186298	ComfortLine	–	–	100,000	186
	125	1700	30-72	186455	EasyLine	–	–	50,000	187
	126	1050	85-120	186303, 186304	ComfortLine	–	DALI, PUSH	100,000	183
				186301, 186302	ComfortLine	–	–	100,000	186
	150	2100	45-72	186456	EasyLine	–	–	50,000	187
	175	2400	45-72	186510	EasyLine	–	–	50,000	187
	200	2800	45-72	186477	EasyLine	–	–	50,000	187
	230	3200	45-72	186478	EasyLine	–	–	50,000	187

Accessories

iProgrammer	Ref. No. 186428	The iProgrammer is designed to configure LED drivers using the 3C function.	182

* Depends on the adjusted current output

PrimeLine LED Drivers – Dimmable with Programmable 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:
0.95 (ECXd 700.149)
0.97 (ECXd 700.150)
Standby 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: see table).
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)
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
Product guarantee: 5 years

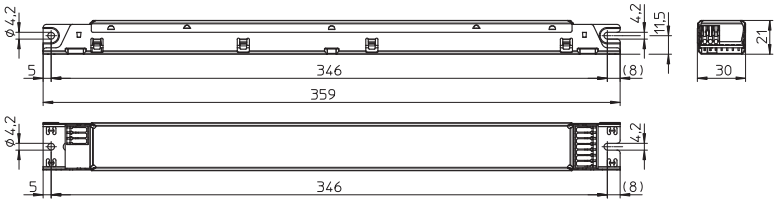
DALI
PUSH
LiCS INDOOR

See page 235–242

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186446		186445	
all	60 °C	50 °C	70 °C	65 °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 programmable mA	Factory setting 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	ECXd 700.150	**186446**	220–240	215–200	350–700 -5/+10 %	350	34–120	< 250	> 92	-25 to 50	60	235
		186575				500			> 91			
		186576				700			> 91			
84	ECXd 700.149	**186445**	220–240	410–380	350–700 -5/+7 %	350	60–220	< 250	> 94	-25 to 50	75	265
		186577				500			> 94			
		186578				700			> 93			

* Depends on the adjusted current output

ComfortLine LED Drivers – Dimmable 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: 0.95
Standby losses: < 0.4 W

Dimming
Dimming function is realised by hybrid dimming.
Analogue dimming: ≥ 275 mA
PWM dimming: < 275 mA
Dimming range: 3 to 100%
If no dimming interface is connected, brightness will stay at 100%.

Adjustable
The output current can be freely adjusted in 25 mA steps between 350 mA and 700 mA by using a resistor (according to LEDset standard).

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
Product guarantee: 5 years
Product guarantee: 5 years

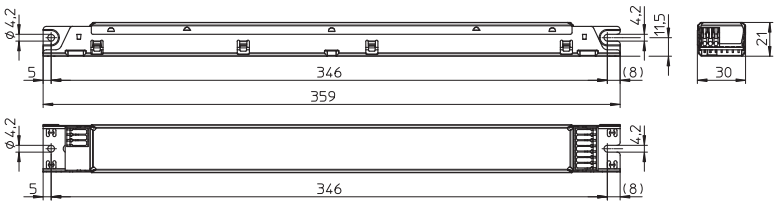
DALI
PUSH
LED⊳set 1
LiCS INDOOR

See page 235–242

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186565		186564	
all	60 °C	50 °C	70 °C	60 °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 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	ECXd 700.214	**186565**	220–240	210–190	350–700 ±5%	34–120	< 250	> 90	-25 to 50	60	235
77	ECXd 700.213	**186564**	220–240	410–380	350–700 ±5%	60–220	< 250	> 93	-25 to 50	70	265
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
Standby 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

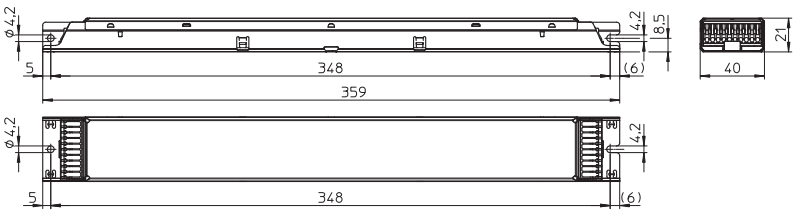
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186356	
2x700 mA	85 °C	75 °C
hrs.	50,000	100,000

DALI
PUSH
LiCS INDOOR
See page 235–242

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	85	400
			220–240	750–688							

ComfortLine LED Drivers – Dimmable

4x60 mA / max. 4x9 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
Standby 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

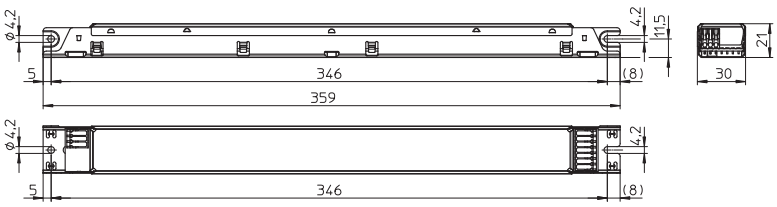
Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
Product guarantee: 5 years

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
LiCS INDOOR
See page 235–242

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%	110–150	< 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

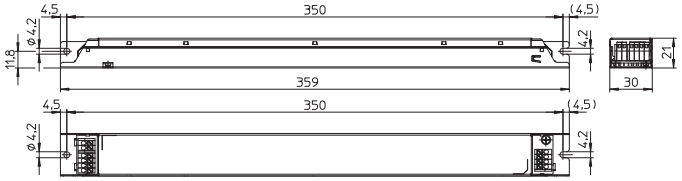
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV
Product guarantee: 5 years

Expected service life time

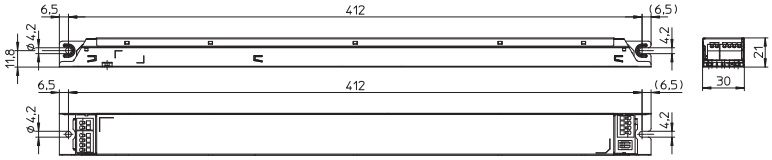
at operation temperatures at t_c point

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	85 °C	75 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000

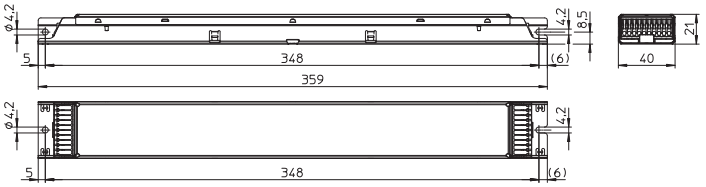
M10.1



M11.1



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
M10.1 – 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							
M11.1 – Dimensions: 425x30x21 mm											
2x28.5/ 2x40	ECXd 2700.127	**186410**	198-264	490-385	2x500 ±5%/ 2x700 ±5%	17-57	60	> 88	-20 to 50	75	310
			220-240	480-400							
M12 – Dimensions: 359x40x21 mm											
2x70	ECXd 2700.088	**186355**	198-264	834-625	2x700 ±5%	42-100	120	> 90	-20 to 50	85	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.

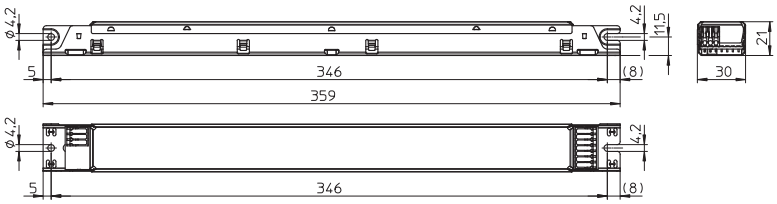
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186486		186487, 186488		186491, 186492	
125–175 mA	55 °C	45 °C	–	–	–	–
200–325 mA	–	–	60 °C	50 °C	–	–
375–550 mA	–	–	–	–	65 °C	55 °C
600–650 mA	–	–	–	–	70 °C	60 °C
hrs.	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: 359×30×21 mm											
27.5	ECXe 175.173	**186486**	220–240	150–140	125 ±5%	155–220	< 250	> 90	-20 to 60	70	220
33				175–165	150 ±5%	130–220		> 91			
38.5				200–190	175 ±5%	110–220		> 92			
44	ECXe 250.174	**186487**	220–240	220–205	200 ±5%	112–220	< 250	> 93	-20 to 60	70	220
47				230–220	225 ±5%	104–208		> 92			
47				235–220	250 ±5%	94–188		> 92			
46.8	ECXe 325.175	**186488**	220–240	235–220	275 ±5%	85–170	< 250	> 91	-20 to 60	75	220
46.8				235–220	300 ±5%	78–156		> 91			
46.8				235–220	325 ±5%	72–144		> 91			
82.5	ECXe 425.178	**186491**	220–240	410–375	375 ±5%	113–220	< 250	> 93	-20 to 50	65	243
84.8				420–385	400 ±5%	105–212		> 94			
85				420–390	425 ±5%	100–200		> 94			
84.7	ECXe 650.179	**186492**	220–240	420–390	550 ±5%	77–154	< 250	> 93	-20 to 50	65	244
84.6				420–390	600 ±5%	71–141		> 93		70	
85.1				420–390	650 ±5%	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.

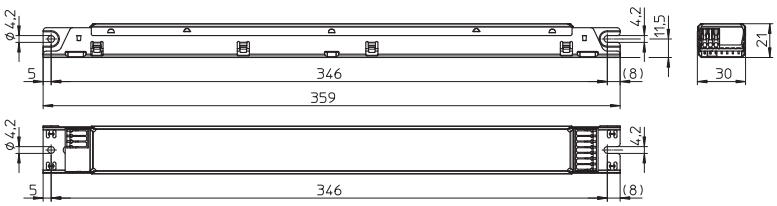
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
Product guarantee: 5 years

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	200–190	350 ±5%	57–114	< 250	> 90	-20 to 50	60	227
				205–190	500 ±5%	40–80		> 89		65	
				210–195	700 ±5%	28–57		> 88		70	
79	ECXe 700.147	**186443**	220–240	400–370	350 ±5%	120–225	< 250	> 94	-20 to 60	70	250
85				420–390	500 ±5%	80–170		> 93		75	
				420–390	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: > 0.9 C

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

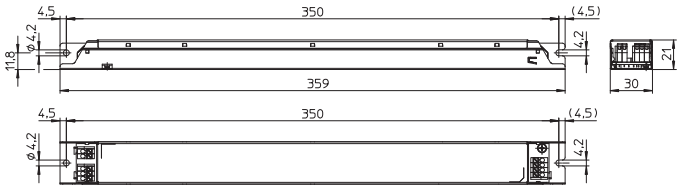
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV
Product guarantee: 5 years

Expected service life time

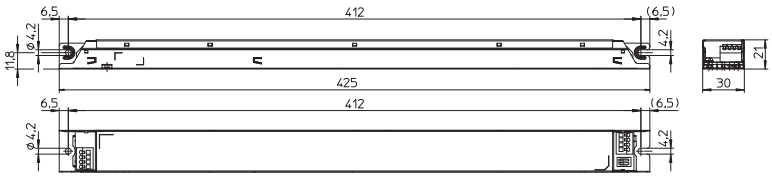
at operation temperatures at t_c point

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	85 °C	75 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000

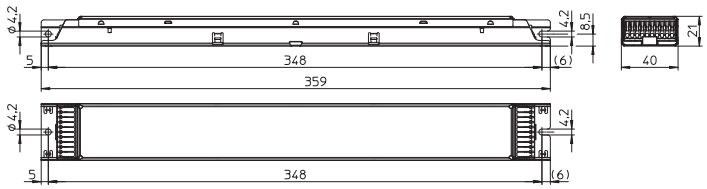
M10.1



M11.1



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
M10.1 – 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							
M11.1 – 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	85	400
			220-240	750-688							

ComfortLine LED Drivers

4x60 mA / max. 4x9 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: 0.96

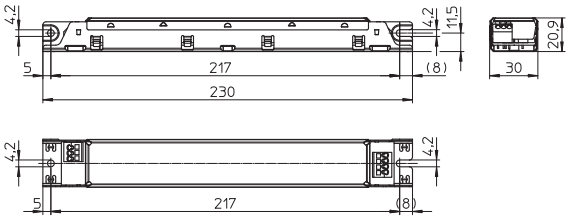
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
DC operation (except 186305):
198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
Product guarantee: 5 years

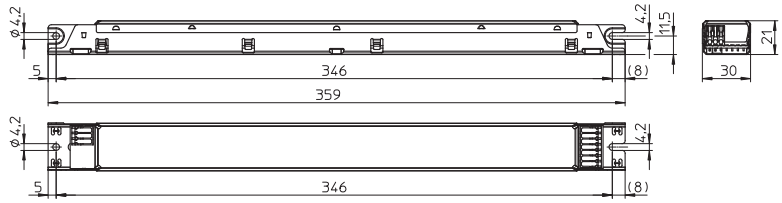
Expected service life time
at operation temperatures at t_c point

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							

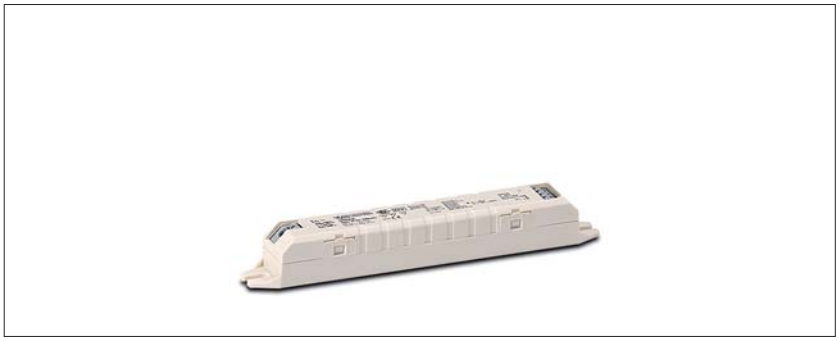
ComfortLine LED Drivers

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: 0.55 C

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

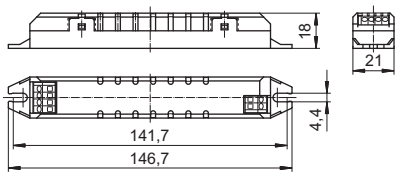
Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years



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 DC 220–240 AC	140–90 81–75	350 +5/–10%	2–40	42	> 81	–20 to 50	80	49

ComfortLine LED Drivers

500 mA / max. 28.5 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

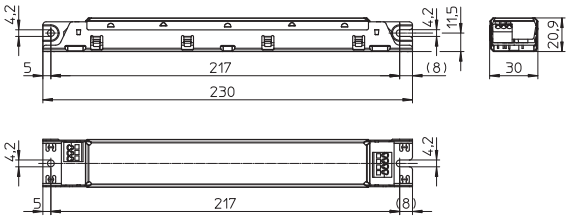
Connection details
Mains voltage: 120–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186554	
500 mA	70 °C	60 °C
hrs.	50,000	100,000

M6.1



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
M6.1 – Dimensions: 230 x 30 x 20.9 mm											
28.5	ECXe 500.210	**186554**	120–240	280–140	500$^{\pm 5\%}$	19–57	< 250	> 83	-25 to 50	70	152

EasyLine LED Drivers – with Selectable Current

150/250/350 mA / max. 14 W
500/600/700 mA / max. 21 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: > 0.94

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

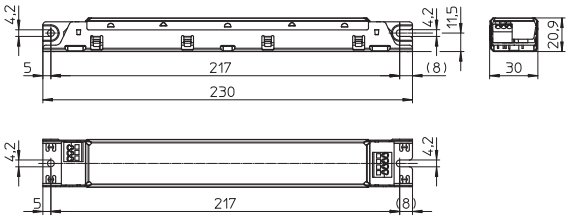
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV
Product guarantee: 3 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186530		186529	
150–350 mA	65 °C	55 °C	–	–
500–700 mA	–	–	70 °C	60 °C
hrs.	30,000	50,000	30,000	50,000

M6.1



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
M6.1 – Dimensions: 230 x 30 x 20.9 mm											
6	ECXe 350.198	**186530**	220–240	32–29	150 ±7.5%	17–40	< 60	> 84	-20 to 50	65	146
10				53–49	250 ±7.5%						
14				74–68	350 ±7.5%						
15	ECXe 700.197	**186529**	220–240	80–73	500 ±7.5%	17–30	< 60	> 84	-20 to 50	70	146
18				96–88	600 ±7.5%						
21				112–102	700 ±7.5%						

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 C

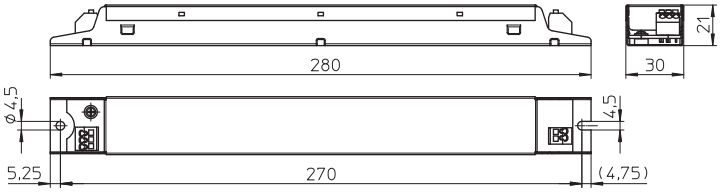
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV (186429)
Product guarantee: 3 years

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

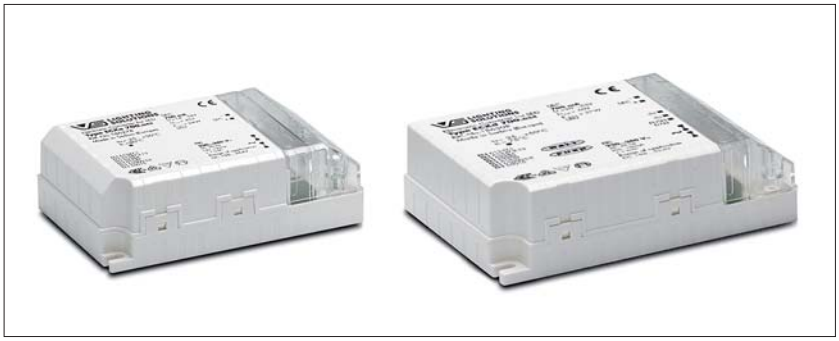
M7.1



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 Programmable 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: > 0.95
Standby 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: see table).
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

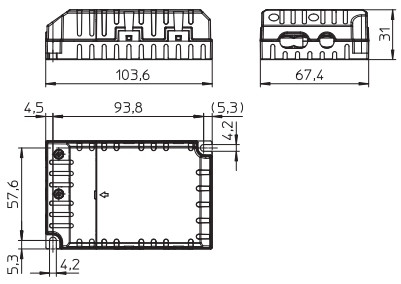
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years

DALI
PUSH
LiCS INDOOR
See page 235–242

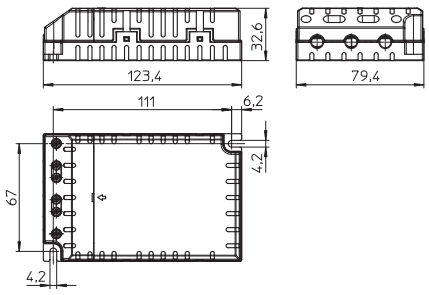
Expected service life time
at operation temperatures at t_c point

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 50–60 Hz V	Mains current mA	Current output DC programmable mA	Factory setting 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 67,4 x 31 mm												
24	ECXd 700.166	**186465**	198–264	160–100	350–700 ±5 %	350	14–34	< 45	> 84	-25 to 50	75	145
			220–240	130–120								
		186573				500						
		186574				700						
K3.2 – Abmessungen: 123,4 x 79,4 x 32,6 mm												
37	ECXd 700.184	**186503**	198–264	235–155	350–700 ±5 %	350	30–53	< 60	> 87	-25 to 50	75	190
			220–240	200–180								
		186571				500						
		186572				700						

ComfortLine LED Drivers – Dimmable

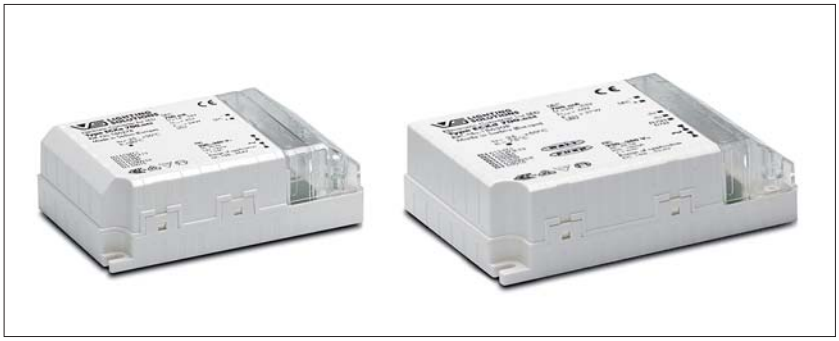
700 mA / max. 24 W and max. 37 W
Compact casing shape with integrated cord grip optional for built-in or independent operation.

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

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
Product guarantee: 5 years



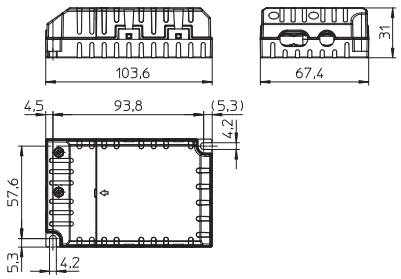
Expected service life time
at operation temperatures at t_c point

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

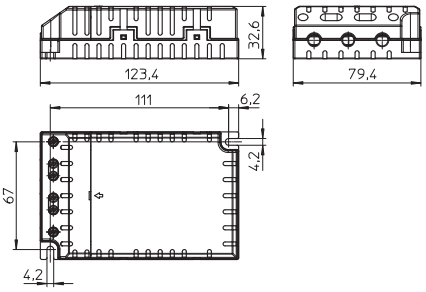
DALI
PUSH
LiCS INDOOR

See page 235–242

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 67.4 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
Standby 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
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

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

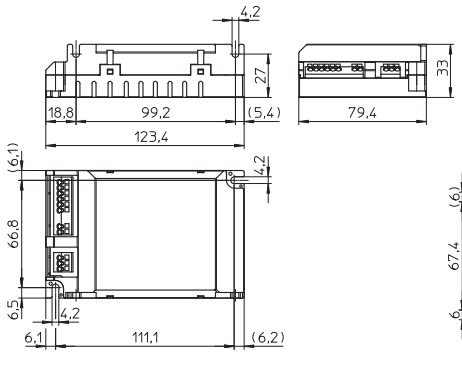
DALI

PUSH

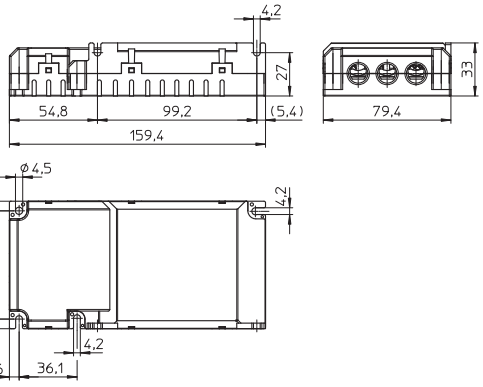
LiCS INDOOR

See page 235–242

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: 123.4x79.4x33 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: 159.4x79.4x33 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

700 mA / max. 37 W

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

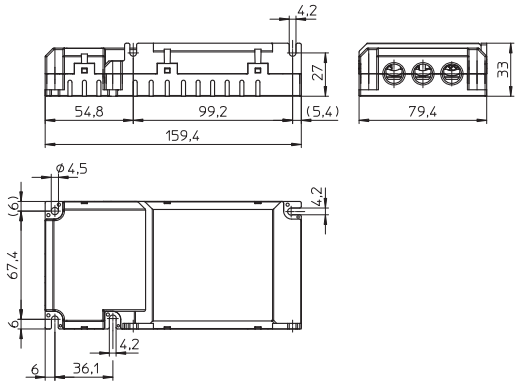
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
DC operation: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
With integrated through-wiring for L/N/PE
Push-in terminals: 0.25–2.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186556	
700 mA	75 °C	65 °C
hrs.	50,000	100,000

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)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K3 with cord grip – Dimensions: 159.4x79.4x33 mm											
37	ECXe 700.211	**186556**	198–264	235–155	700 ±5%	30–53	< 60	> 87	-25 to 50	75	230
			220–240	200–180							

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

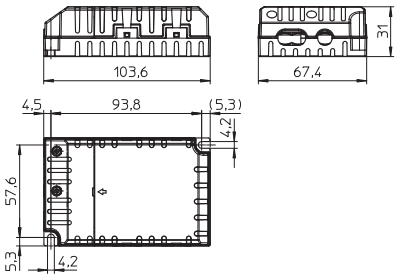
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years

1–10V

Expected service life time
at operation temperatures at t_c point

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

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: 103.6x67.4x31 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							

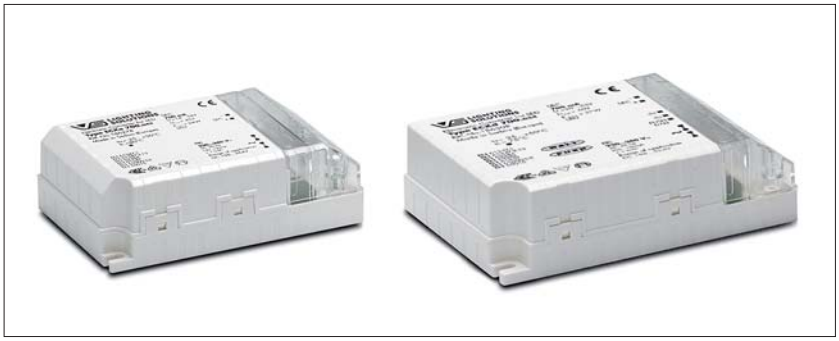
ComfortLine LED Drivers

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

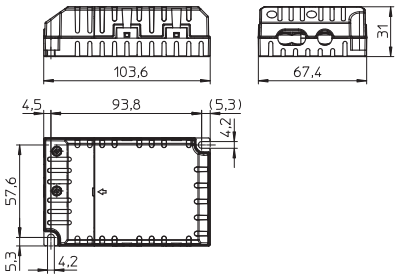
Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years



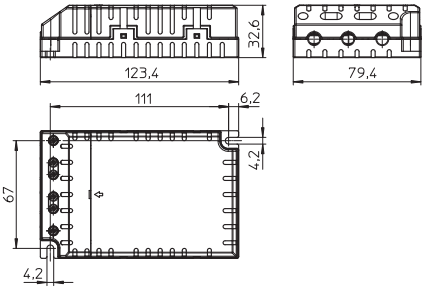
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. all types	
700 mA	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 67.4 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

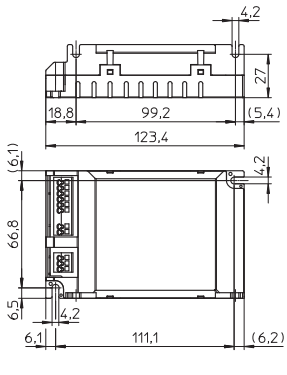
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
SELV equivalent
Product guarantee: 5 years

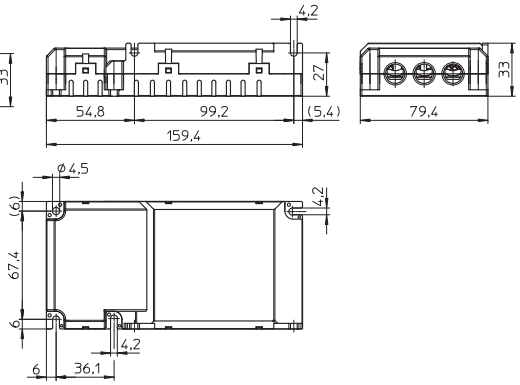
Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186266, 186267		186268, 186269	
700 mA	75 °C	65 °C	–	–
1050 mA	–	–	80 °C	70 °C
hrs.	50,000	100,000	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: 123.4x79.4x33 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: 159.4x79.4x33 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								

EasyLine LED Drivers – with Selectable Current

500/600/700 mA / max. 40 W
800/925/1050 mA / max. 45 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: > 0.93

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

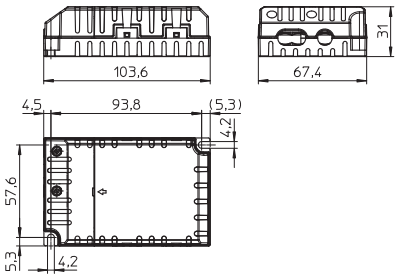
Selectable current output
The required current output can be chosen by selecting the respective pin at the output terminal.

Safety features
Temporary electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

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: 103.6x67.4x31 mm											
28.5	ECXe 700.199	**186531**	220–240	145–130	500 ±7.5%	25–57	< 60	> 89	-20 to 50	80	135
34.2				175–160	600 ±7.5%			> 90			
40				200–185	700 ±7.5%			> 90			
34.4	ECXe 1050.200	**186532**	220–240	185–160	800 ±7.5%	25–43	< 60	> 89	-20 to 50	80	155
39.8				210–185	925 ±7.5%			> 89			
45				245–210	1050 ±7.5%			> 89			

EasyLine LED Drivers – with Selectable Current

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: > 0.93

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

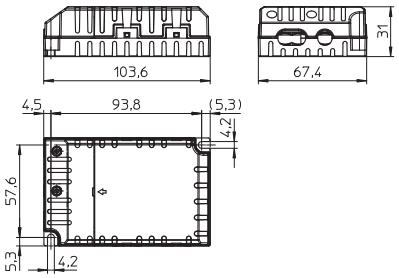
Selectable current output
The required current output can be chosen by selecting the respective pin at the output terminal.

Safety features
Temporary electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

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: 103.6x67.4x31 mm											
10	ECXe 500.164	**186463**	220–240	53–48	250 ±7.5%	17–40	< 60	> 83	-20 to 50	75	145
14				73–67	350 ±7.5%			> 84			
20				104–95	500 ±7.5%			> 85			
15	ECXe 700.165	**186464**	220–240	80–71	500 ±7.5%	17–30	< 60	> 85	-20 to 40	75	145
18				94–86	600 ±7.5%			> 85			
21				110–100	700 ±7.5%			> 85			

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 (except 186393)
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.

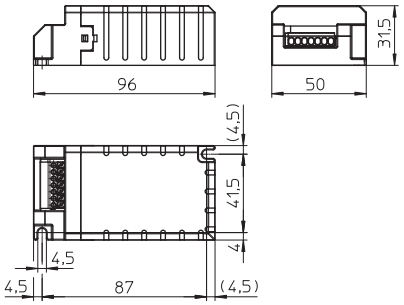
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.2–1.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years

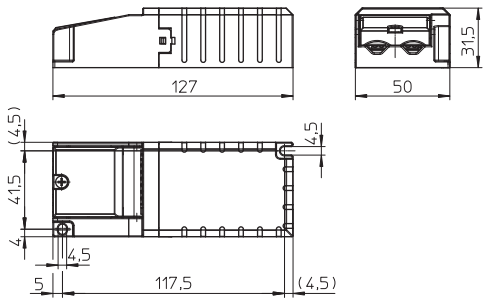
Expected service life time
at operation temperatures at t_c point

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

K35



K35 with cord grip

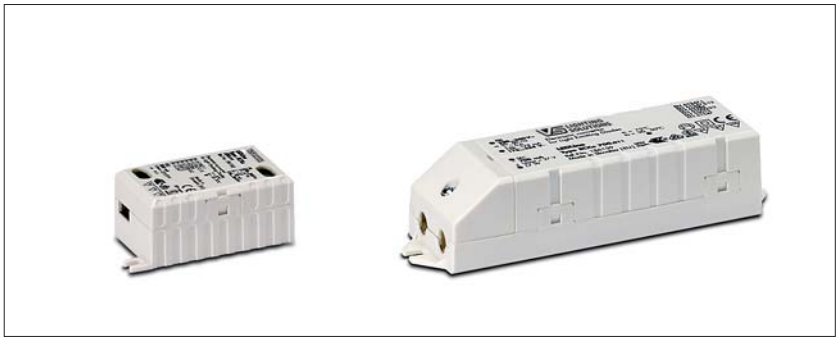


Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K35 – Dimensions: 96x50x31.5 mm											
30	ECXe 700.112	**186393***	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

* Phase-out products (available until October 2016)

ComfortLine LED Drivers

350 mA / max. 8 W and max. 11 W
500 mA / max. 16 W
700 mA / max. 17 W
1050 mA / max. 20 W



Electrical characteristics
Secondary side switching of LED modules is not allowed.
Power factor at full load: > 0.55 C (186180: > 0.6)

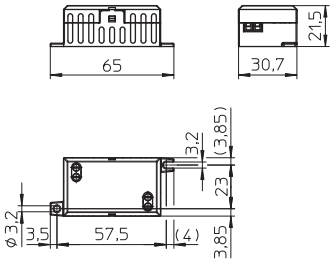
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Screw terminals: 2.5 mm²
With integrated cord grip (except 186180)

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV equivalent
Product guarantee: 5 years

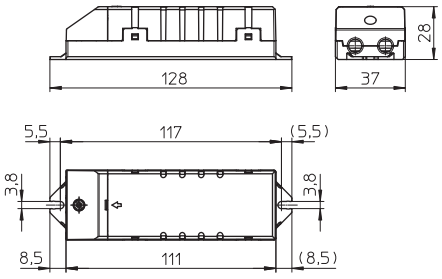
Expected service life time
at operation temperatures at t_c point

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	34	> 87	-20 to 50	75	71
			220–240	188–178							
20	ECXe 1050.012	**186427**	176–264	137–92	1050 ±5%	2–19	34	> 87	-20 to 45	75	71
			220–240	210–202							

* Phase-out products (available until October 2016)

ComfortLine LED Drivers

350 mA / max. 8.75 W

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: 198–264 V DC, 0 Hz
(can be reduced to 176 V with reduced service life time)
Screw terminals: 2.5 mm²

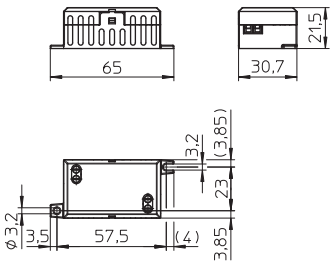
Safety features
Protection against transient main peaks up to 1 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186519	
350 mA	80 °C	70 °C
hrs.	50,000	100,000

Special Feature
Protection against transient main peaks up to 1 kV (between L and N)

K29



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											
8.75	ECXe 350.192	**186519**	176-264	60-39	350 ±5%	3-25	26	> 78	-20 to 50	80	35
			220-240	79-73							

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

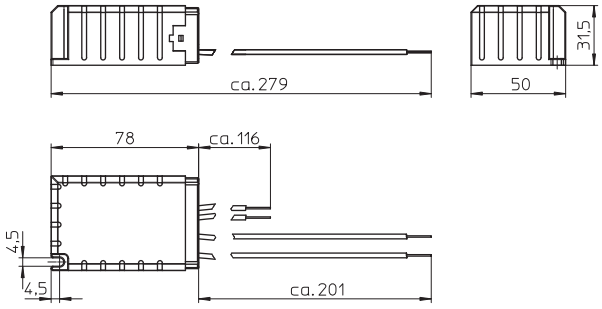
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary: 2x0.5 mm², length: approx. 201 mm
secondary: 2x0.5 mm², length: approx. 116 mm

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		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.

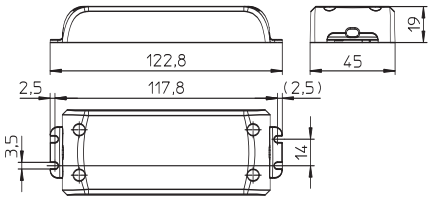
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

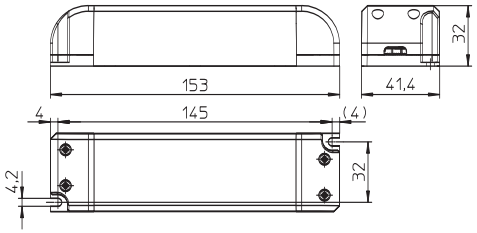
Expected service life time
at operation temperatures at t_c point

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



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: 122.8x45x19 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: 153x41.4x32 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

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

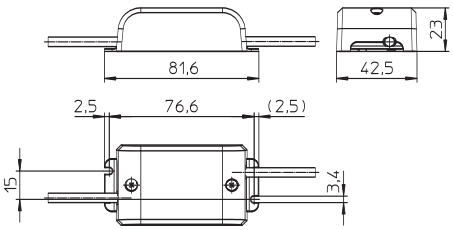
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary: 2x0.75 mm², length: 180 mm
secondary: 2x0.5–0.75 mm², length: 180 mm

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

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: 81.6x42.5x23 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. 20 W
500 mA / max. 12 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: > 0.9

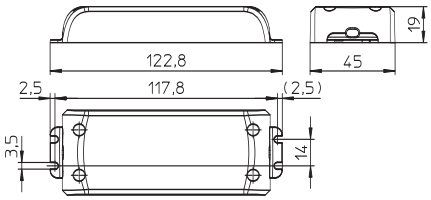
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186508		186507	
350 mA	–	–	75 °C	65 °C
500 mA	70 °C	60 °C	–	–
hrs.	30,000	50,000	30,000	50,000

K52



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: 122.8x45x19 mm											
12	ECXe 500.189	**186508**	220–240	64–58	500 ±5 %	8–24	< 60	> 85	-15 to 45	70	65
20	ECXe 350.188	**186507**	220–240	107–98	350 ±5 %	40–57	< 60	> 85	-15 to 45	75	70

EasyLine LED Drivers

350 mA / max. 12.6 W and 20 W
500 mA / max. 15 W
700 mA / max. 20.3 W and 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)

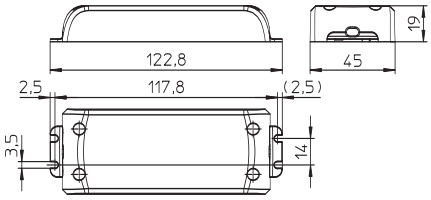
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

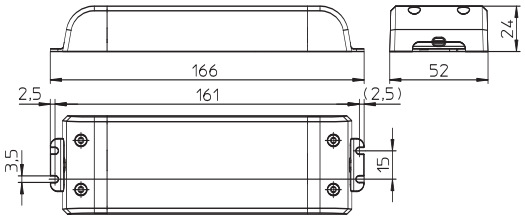
Expected service life time
at operation temperatures at t_c point

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: 122.8x45x19 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

350–1050 mA / max. 30–60 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: > 0.95

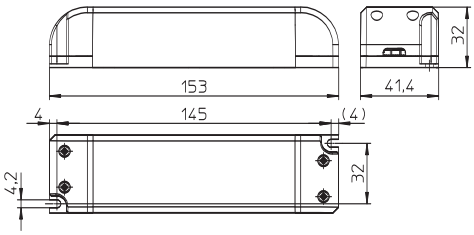
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Screw terminals: 0.5–2.5 mm²

Safety features
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
SELV
Product guarantee: 3 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186430		186351, 186522		186548	
350 mA	70 °C	60 °C	–	–	–	–
750 mA	–	–	–	–	75 °C	65 °C
1050 mA	–	–	75 °C	65 °C	–	–
hrs.	30,000	50,000	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: 153x41.4x32 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
60	ECXe 700.206	**186548***	220–240	320–294	700 ±8%	43–86	< 120	> 85	-15 to 45	75	180
60	ECXe 1050.183	**186522***	220–240	320–294	1050 ±8%	40–58	< 70	> 85	-15 to 45	75	180

* Products under development; preliminary technical datas

PrimeLine LED Drivers – Dimmable with Programmable Current

350–1050 mA / max. 75 W
350–1050 mA / max. 150 W

These electronic LED constant current drivers are especially designed for use in street lighting systems.

1–10V

Electrical characteristics

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

Dimming

The dimming function is achieved by applying a analogue dimming signal to the nominal current.
Dimming range: 10 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 1050 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
Mains frequency: 50–60 Hz
Pre-assembled connection leads:
primary: 0.75 mm², length: 300 mm
secondary: 0.75 mm², length: 300 mm

Safety features

Protection against transient main peaks up to 6 kV (between L and N)

Double isolated

Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP65

Potection class II

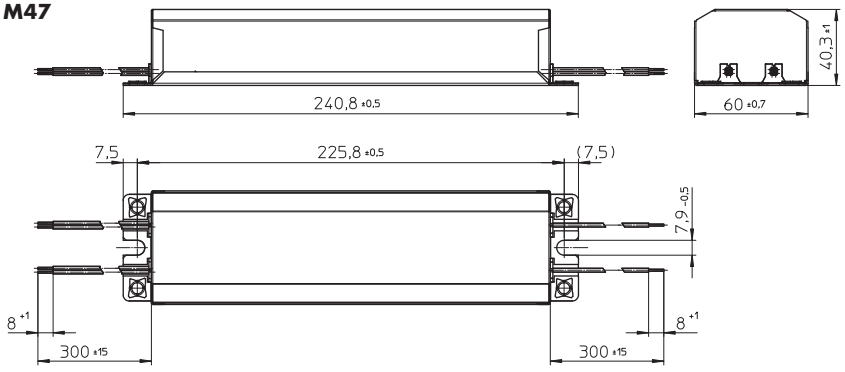
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached
Product guarantee: 5 years

Expected service life time

at operation temperatures at t_c point

Operation current	Ref. No. all types	
350–1050 mA	80 °C	70 °C
hrs.	50,000	100,000

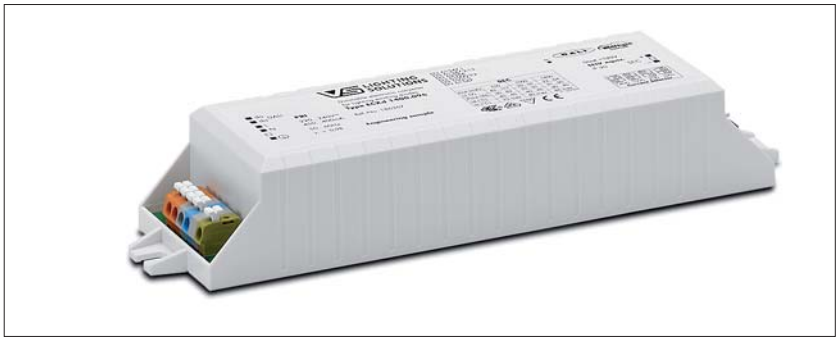
M47



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
Dimensions: 240.8x60x40.3 mm											
150	ECXd 1050G.146	**186442**	220–240	757–694	350–1050 ±5%	85–260	< 310	> 91	-40 to 60	80	1050

* Depends on the adjusted current output

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: IP20
Protection class I
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

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

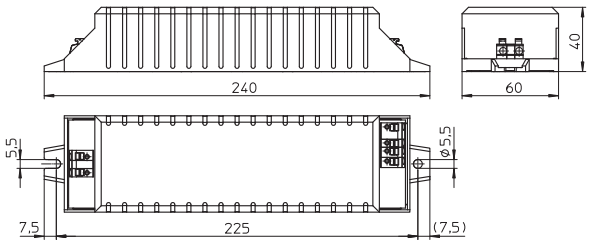
DALI

MidNight™ Multi-Step Dimming

LiCS INDOOR

See page 235–242

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
secondary: 4x0.75 mm²

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
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

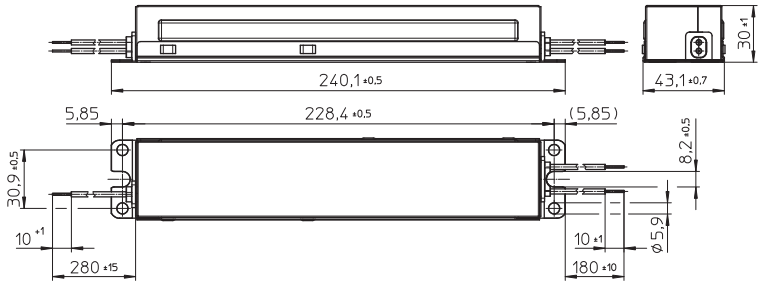
Operation current	Ref. No. 186400, 186402		186401	
700 mA	85 °C	75 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000

1–10V

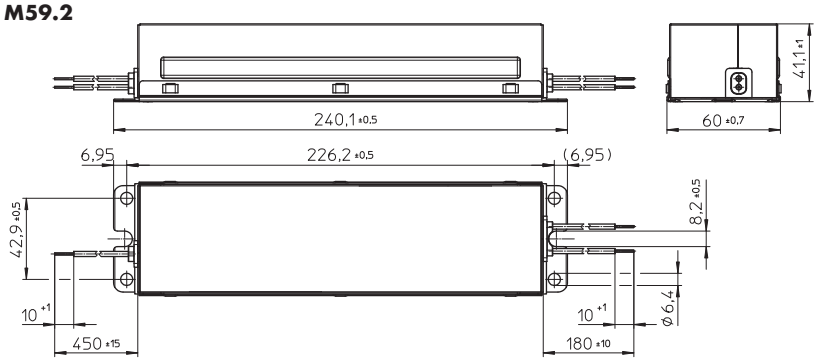
LiCS OUTDOOR

See page 264

M59.1



M59.2



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
M59.1 – Dimensions: 240.1x43.1x30 mm											
75	ECXd 700G.117	**186400**	120-277	700-304	700 ±5%	54-107	< 250	> 88	-40 to 55	85	625
M59.2 – Dimensions: 240.1x60x41.1 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
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

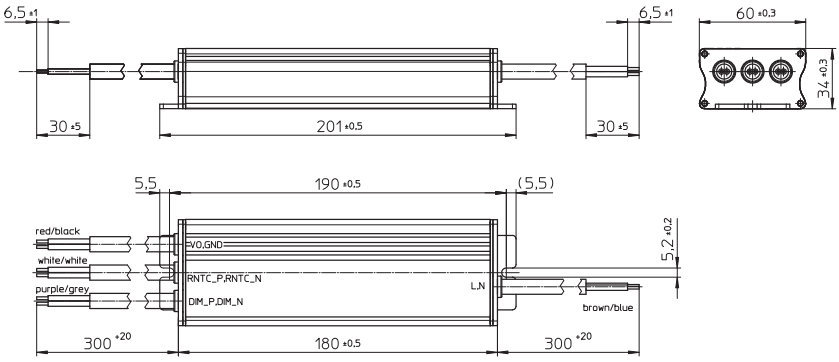
Operation current	Ref. No. 186316	
1050 mA	80 °C	70 °C
hrs.	50,000	100,000

1–10V

LiCS OUTDOOR

See page 264

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 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: 228 mm
secondary: 4x0.75 mm², length: 228 mm

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: IP54
Protection class II
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

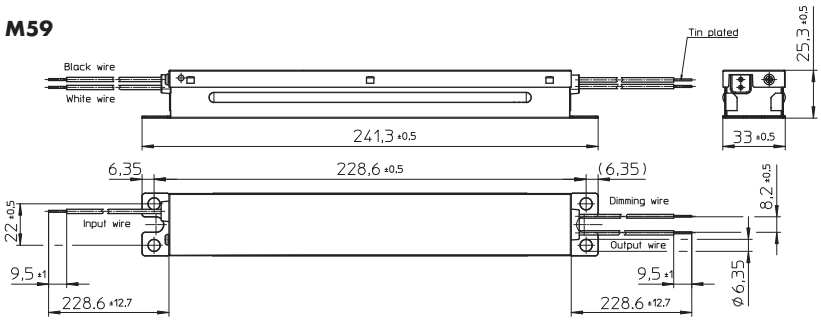
Operation current	Ref. No. 186490	
700 mA	80 °C	70 °C
hrs.	50,000	100,000

1–10V

LiCS OUTDOOR

See page 264

M59



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: 241.3x33x25.3 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. 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: 3x0.75 mm²
secondary: 2x0.75 mm²

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

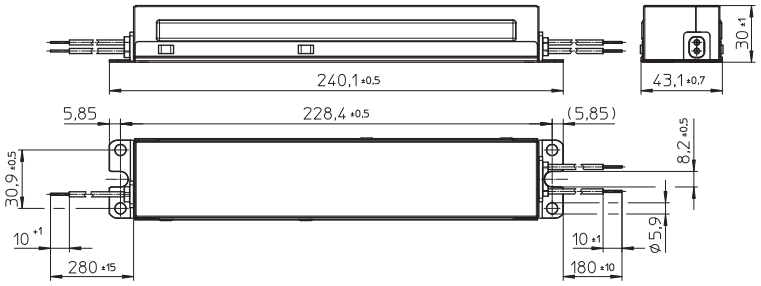
Protection against transient main peaks up to 6 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP65
Protection class II
Product guarantee: 5 years

Expected service life time

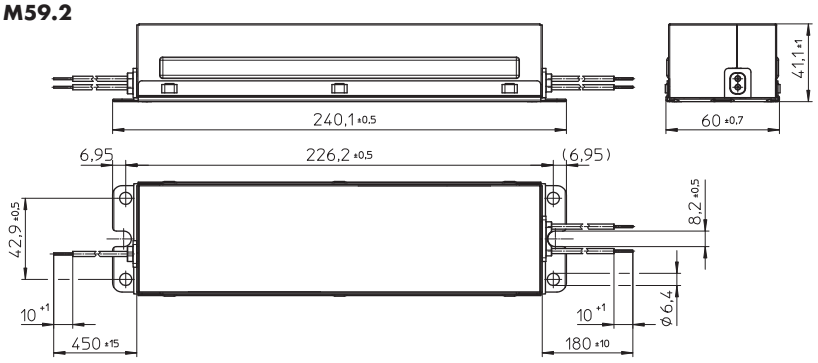
at operation temperatures at t_c point

Operation current	Ref. No. 186397, 186509		186398	
700 mA	85 °C	75 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000

M59.1



M59.2



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
M59.1 – Dimensions: 240.1 x 43.1 x 30 mm											
75	ECXe 700G.114	**186397**	120–277	700–304	700 ±5% 400 ±5%	54–107	< 250	> 88	-40 to 55	85	625
M59.2 – Dimensions: 240.1x60x41.1 mm											
100	ECXe 700G.115	**186398***	120–277	917–398	700 ±5% 400 ±5%	70–143	< 250	> 88	-40 to 55	80	1070
150	ECXe 700G.190	**186509***	120–277	1363–591	700 ±5% 400 ±5%	107–210	< 250	> 88	-40 to 55	85	1070

* Products under development; preliminary technical datas

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

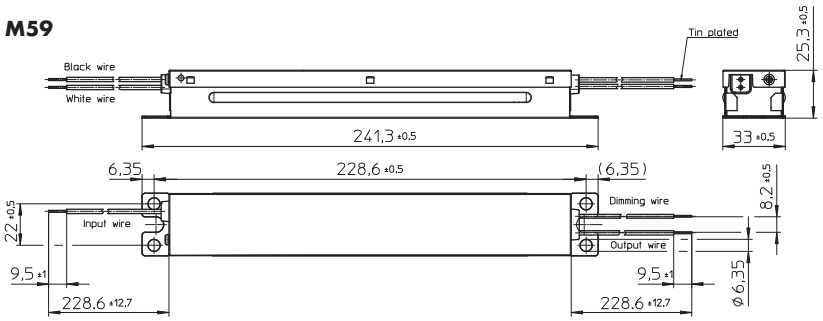
Connection details
Mains voltage: 120-277 V ±10%
Mains frequency: 50-60 Hz
Pre-assembled connection leads:
primary: 2x0.75 mm², length: 228 mm
secondary: 2x0.75 mm², length: 228 mm

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: IP54
Protection class II
Product guarantee: 5 years

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



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: 241.3x33x25.3 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

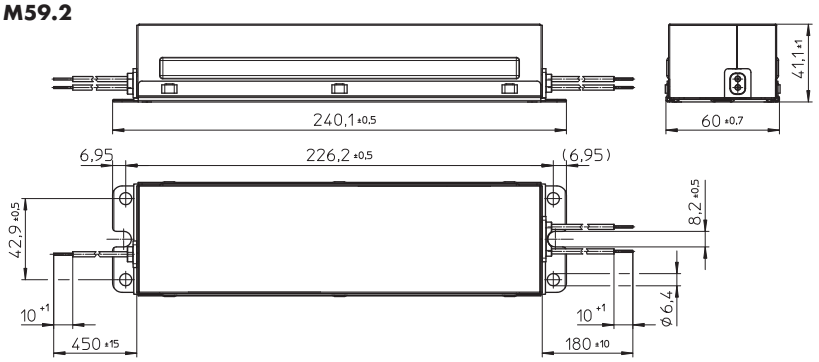
Connection details
Mains voltage: 120-277 V ±10%
Mains frequency: 50-60 Hz
Pre-assembled connection leads:
primary: 2x0.75 mm², length: 450 mm
secondary: 2x0.75 mm², length: 180 mm

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
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

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

M59.2



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
M59.2 – Dimensions: 240.1x60x41.1 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. 40 W
700 mA / max. 40 W
1050 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

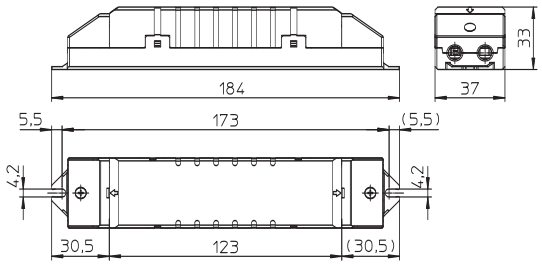
Connection details
Mains voltage: 120–277 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.75–2.5 mm²

Safety features
Protection against transient main peaks up to 4 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP20
Protection class II
Product guarantee: 5 years

Expected service life time
at operation temperatures at t_c point

Operation current	Ref. No. 186550		186551		186552	
350 mA	70 °C	60 °C	–	–	–	–
700 mA	–	–	70 °C	60 °C	–	–
1050 mA	–	–	–	–	75 °C	65 °C
hrs.	50,000	100,000	50,000	100,000	50,000	100,000

K39.2



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 V	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
Dimensions: 184 x 37 x 33 mm											
40	ECXe 350.207	**186550**	120–277	387–168	350 ±5%	78–114	< 120	> 86	-25 to 50	70	160
40	ECXe 700.208	**186551**	120–277	387–168	700 ±5%	39–57	< 60	> 86	-25 to 50	70	160
40	ECXe 1050.209	**186552**	120–277	387–168	1050 ±5%	26–38	< 60	> 86	-25 to 50	75	160

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

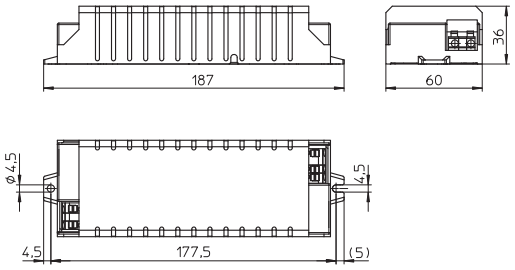
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Push-in terminals: 0.75–2.5 mm²

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
Product guarantee: 5 years

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

* Phase-out products (available until October 2016)

ComfortLine LED Drivers – Dimmable

700 mA / max. 112 W
1050 mA / max. 126 W
With 12 V interface

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
Standby 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%.

NTC at LED module 10 kΩ (Type Nurata NCP18XH103J03RB)	
R (kΩ)	Nominal current (%)
10	100
< 1.49	60
< 1.13	0 (off)

See page 235-242

See page 264

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

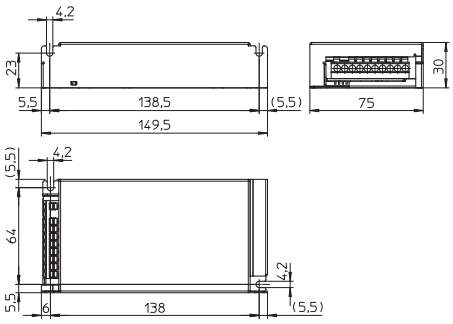
Electronic short-circuit protection
Overload and overtemperature protection
Protection against "no load" operation
Degree of protection: IP20
Protection class I
The LEDs are thermally protected by the driver's NTC interface, which ensures the current will be reduced when a critical temperature is reached.
Product guarantee: 5 years

Expected service life time

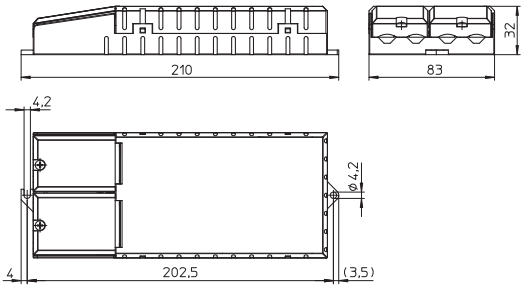
at operation temperatures at t_c point

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 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	ECXd 700.058	**186299**	198-264	595-445	700 ±5%	85-160	< 450	> 91	yes	-25 to 50	70	288
			220-240	550-510								
126	ECXd 1050.060	**186303**	198-264	660-495	1050 ±5%	85-120	< 450	> 91	yes	-25 to 50	75	288
			220-240	630-590								
K38 with cord grip – Dimensions: 210 x 83 x 32 mm												
112	ECXd 700.058	**186300**	198-264	595-445	700 ±5%	85-160	< 450	> 91	yes	-25 to 50	80	335
			220-240	550-510								
126	ECXd 1050.060	**186304**	198-264	660-495	1050 ±5%	85-120	< 450	> 91	yes	-25 to 50	90	335
			220-240	630-590								

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.
Product guarantee: 5 years

NTC at LED module 220 kΩ	
R (kΩ)	Nominal current (%)
34	100
27	60
16	0 (off)

1–10V

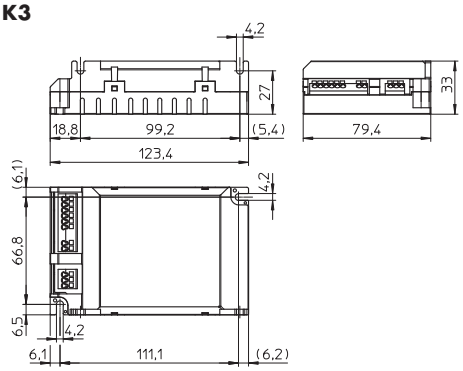
LiCS OUTDOOR

See page 264

Expected service life time
at operation temperatures at t_c point

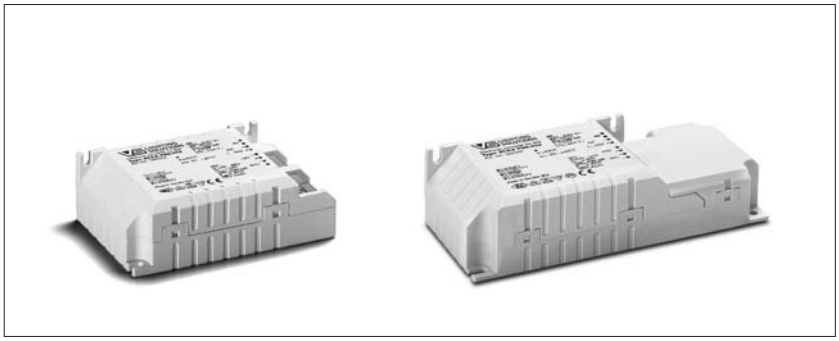
Operation current	Ref. No. 186208	
all	85 °C	75 °C
hrs.	50,000	100,000

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: 123.4x79.4x33 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.
Product guarantee: 5 years

NTC at LED module 220 kΩ	
R (kΩ)	Nominal current (%)
34	100
27	60
16	0 (off)

1–10V

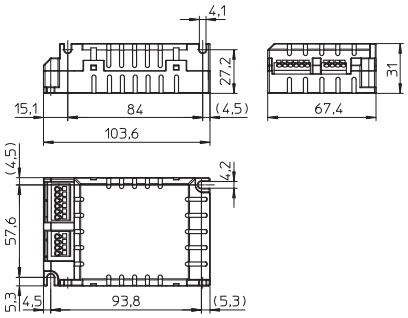
LiCS OUTDOOR

See page 264

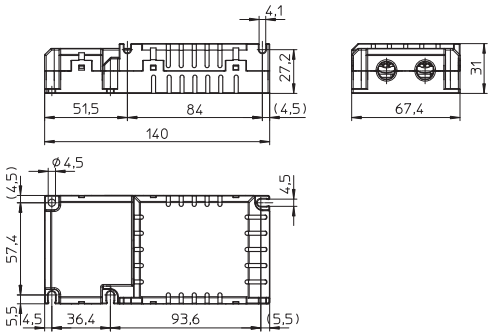
Expected service life time
at operation temperatures at t_c point

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

K2



K2 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
K2 – Dimensions: 103.6x67.4x31 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: 140x67.4x31 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
With 12 V interface

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.

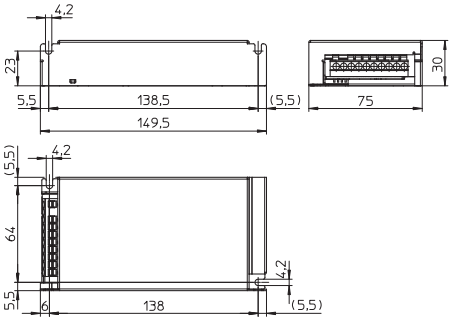
NTC at LED module 10 kΩ (Type Nurata NCP18XH103J03RB)	
R (kΩ)	Nominal current (%)
10	100
< 1.49	60
< 1.13	0 (off)

Expected service life time

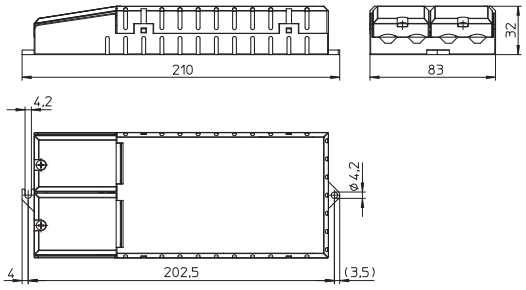
at operation temperatures at t_c point

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	595–445	700 ±5%	85–160	< 450	> 91	yes	–25 to 50	70	288
			220–240	550–510								
126	ECXe 1050.059	**186301**	198–264	660–495	1050 ±5%	85–120	< 450	> 91	yes	–25 to 50	75	288
			220–240	630–590								
K38 with cord grip – Dimensions: 210 x 83 x 32 mm												
112	ECXe 700.057	**186298**	198–264	595–445	700 ±5%	85–160	< 450	> 91	yes	–25 to 50	80	335
			220–240	550–510								
126	ECXe 1050.059	**186302**	198–264	660–495	1050 ±5%	85–120	< 450	> 91	yes	–25 to 50	90	335
			220–240	630–590								

EasyLine LED Drivers

700–3200 mA / max. 50–230 W

These electronic LED constant current drivers are especially designed for use in industrial hall lighting systems as well as 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

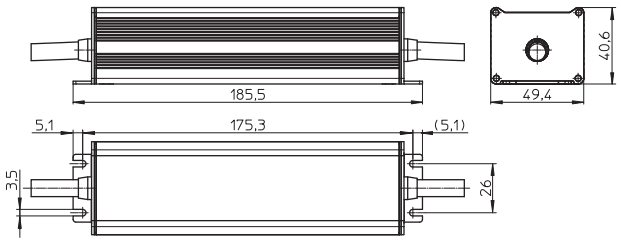
Protection against transient main peaks up to 1.5 kV (between L and N)
Electronic short-circuit protection
Overload protection
Protection against "no load" operation
Degree of protection: IP67
Protection class I

Expected service life time

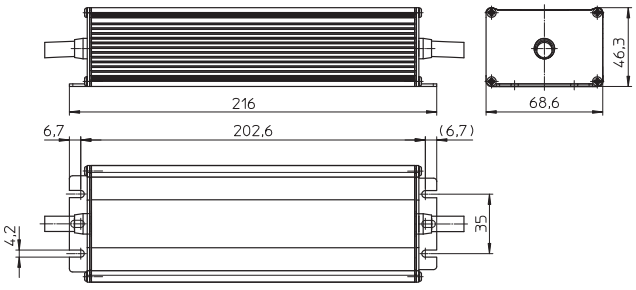
at operation temperatures at t_c point

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

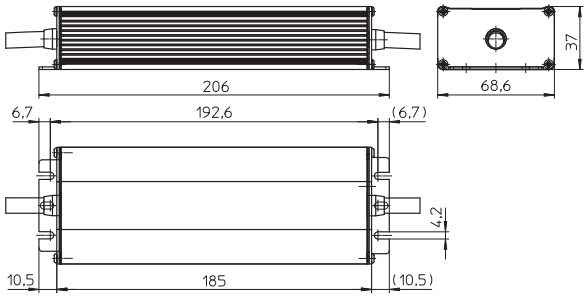
M56



M58



M58.1



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: 216x68.6x46.3 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

*Products under development

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 product page under www.vossloh-schwabe.com for detailed configuration procedures.

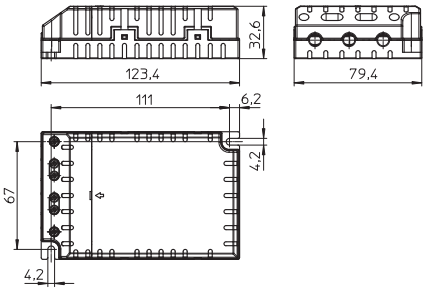
Technical notes
Configuration interface: DALI
Ambient temperature t_a: 5 to 50 °C
Push-in terminals: 0.2–1.5 mm²
Degree of protection: IP20

Connections
- Mains connection: 220–240 V AC/50–60 Hz
- Max. power consumption: 5 W
- USB 2.0

Software download
See product page under www.vossloh-schwabe.com

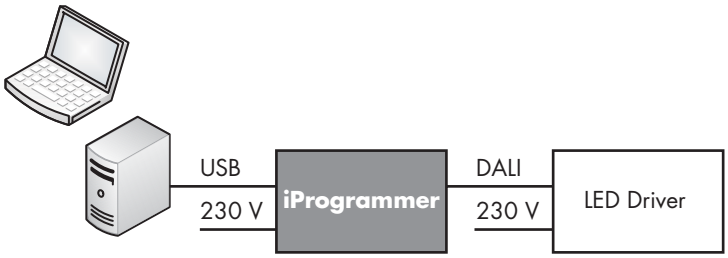
Functions
Configuring "3C" LED drivers

K3.2



3C convenient clever Communication

Connection



Type	**Ref. No.**	Connection to PC/Laptop	Functions	Dimensions (LxWxH) mm	Weight g
iProgrammer	**186428**	USB 2.0	Configuring "3C" LED drivers	123.4x79.4x32.6	135

LUMINAIRE PROTECTION AND POWER ADJUSTMENT

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.

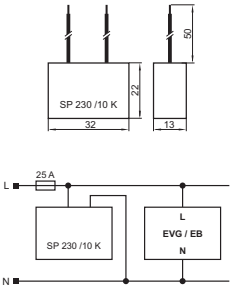
Luminaire Protection Device

For electronic devices
When electronic components form part of lighting systems, it is often necessary to protect such components against electric overloads (power surges).

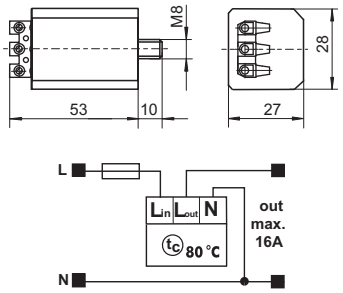
These can be caused by switching inductive loads or by atmospheric discharges such as lightning striking the mains or the ground. A further cause can be induced voltages from neighbouring cables when working with leading-edge phase-cutting controls.

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.

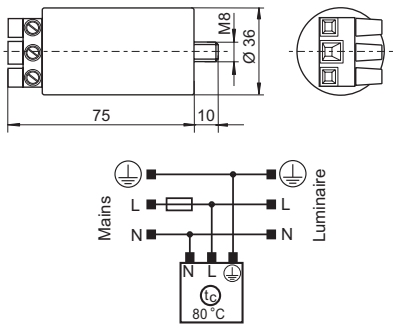
SP 230/10 K
Suitable for luminaires of protection class II
Dimensions (LxWxH): 32x22x13 mm
Weight: 20 g
Connecting: solid wire, length: 50 mm
Ref. No.: 147230



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 II
Type 3 product
Dimensions (LxWxH): 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 (ØxH): Ø 36x75 mm
Weight: 60 g
Screw terminals: 0.75–4 mm²
Ref. No.: 147233

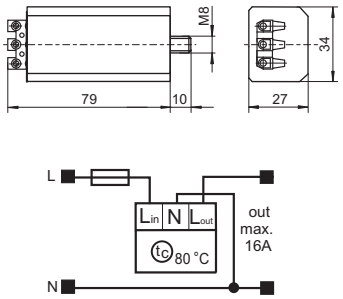


Type	Ref. No.	Voltage 50/60 Hz V ±10%	Max. load current A	Max. impulse voltage U_{OC} (V)	Discharge current (8/20 µs) I_N (A)	$I_{max.}$ (A)	Protection level at discharge current of 1000 A	Fuse max. A	Max. permitted casing temperature °C	Min. permitted ambient temperature °C	Fixation
SP 230/10 K	**147230**	220-240	–	10000	5000	10000	≤ 850 V	25	80	-30	–
SPC 230/10 K	**142736**	220-240	16	10000	5000	10000	≤ 850 V	16	80	-30	M8x10
SP 3/230/10 K	**147233**	100-277	–	10000	5000	10000	≤ 1000 V	25	80	-30	M8x10

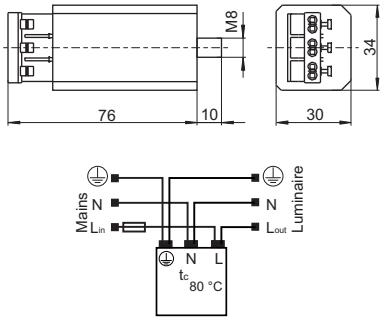
Luminaire Protection Device

For electronic devices
These protective components are fitted with an LED indicator. Once the end of the component's life has been reached, the green LED goes out or the red LED lights up and the protective component has to be replaced.

SPC 230/10 K/i
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 II
Type 3 product
These protective luminaire components feature a green indicator LED that goes out if the protective function fails.
With an integrated thermal fuse
Dimensions (LxWxH): 79x34x27 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
These protective luminaire components feature an indicator LED that lights up in red if the protective function fails.
With an integrated thermal fuse
Dimensions (LxWxH): 76x34x30 mm
Weight: 105 g
Screw terminals: 1–2.5 mm² for solid leads
Ref. No.: 147239



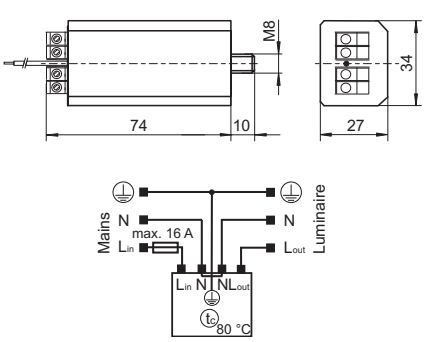
Type	Ref. No.	Voltage 50/60 Hz V ±10%	Max. load current A	Max. impulse voltage U_{OC} (V)	Discharge current (8/20 µs) I_N (A)	$I_{max.}$ (A)	Protection level at discharge current of 1000 A	Fuse max. A	Max. permitted casing temperature °C	Min. permitted ambient temperature °C	Fixation
SPC 230/10 K/i	**142737**	220–240	16	10000	5000	10000	≤ 1000 V	16	80	-30	M8x10
SP 3/230/10 K/i	**142739**	100–277	6	10000	5000*	10000*	≤ 1000 V	16	80	-30	M8x10

* Discharge current: at 5000 A up to 10 strikes; at 10000 A up to 1 strike

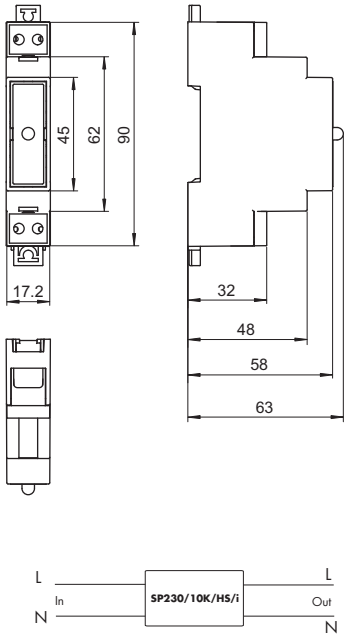
Luminaire Protection Device

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.
With an integrated thermal fuse

SPC 3/230/10 K/i
Suitable for luminaires of protection class I
Type 3 product
At the end of the service life time of a protective luminaire component, the voltage supply to the LED driver is permanently disrupted; this status is shown by the green indicator LED going out.
Dimensions (LxWxH): 74x34x27 mm, Weight: 100 g
Screw terminals: 0.75–2.5 mm²
Lead ground terminal: stranded conductor, 2.5 mm², silicone insulation, length: 150 mm
Ref. No.: 142738



SP230/10 K/HS/i
Type 3 product
The green LED light will go out if the protective function fails.
Dimensions (LxWxH): 90x17.2x63 mm, Weight: 45 g
Screw terminals: 0.5–2.5 mm²
Fixation on DIN installation rail
Ref. No.: 147240



Type	Ref. No.	Voltage 50/60 Hz V ±10%	Max. load current (A)	Protection level at discharge current of 1000 A L-N (V)	L-PE (V)	Max. impulse voltage U_{OC} (V)	Discharge current* (8/20 µs) I_N (A)	$I_{max.}$ (A)	Fuse max. A	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
SPC 3/230/10 K/i	**142738**	100–277	16	< 1100	1520	10000	5000	10000	16	80	-30	M8x10
SP230/10 K/HS/i	**147240**	220–240	16	< 1000	–	10000	5000	10000	16	80	-30	–

* Discharge current: at 5000 A up to 10 strikes; at 10000 A up to 1 strike

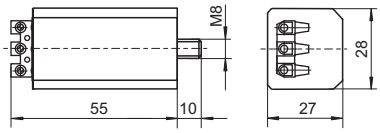
Inrush Current Limiter ESB-6K

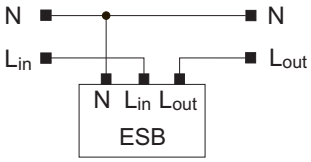
Limits capacitive inrush currents of electronic ballasts, LED driver and converters

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.

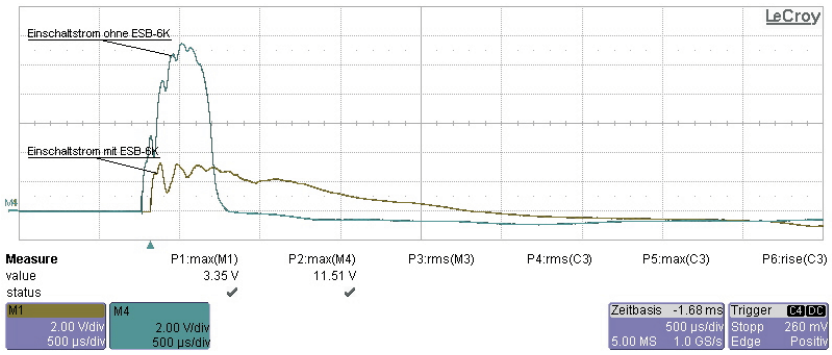




ESB-6K
Casing: PC
Dimensions (LxWxH): 55x28x27 mm
Weight: 61 g
Screw terminals: 0.5–1.5 mm²
Ref. No.: 149820

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 an 150 W LED driver
Brown: with ICL (ESB)
Blue: without ICL (ESB)
1 V = 1 A

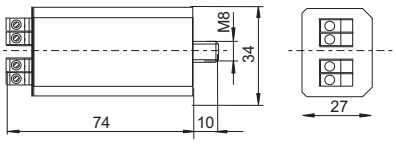


Power Switch PS 16 K

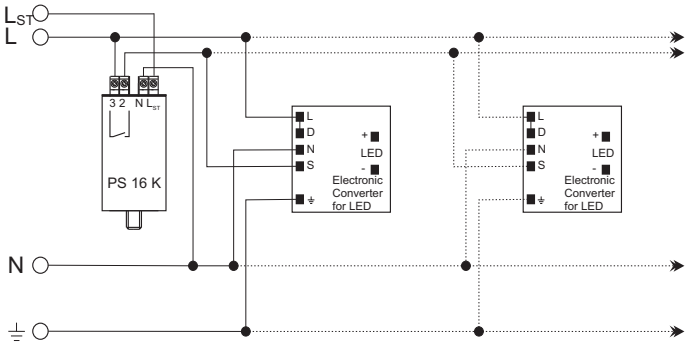
For electronic LED drivers
Given centralised control of an LED driver's L_{ST} control input, the existing cable capacities of the control line can lead to switching errors.
This can be prevented by installing a PS 16 K power switch, which features a potential-free and galvanically isolated switching 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 (LxWxH): 74x34x27 mm
Weight: 100 g
Screw terminals: 0.75–2.5 mm²
Ref. No.: 142185



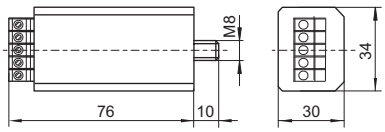
Type	Ref. No.	Control voltage V ±10%	Max. switching capacity (VA)	Max. switching voltage (V)	Max. contact current A λ = 1	λ = 0.6	Inherent heating K	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
PS 16 K	**142185**	230 V/50 Hz	4000	400	16	10	< 25	80	-30	M8x10
		220 V/60 Hz								

Automatical Power Switch for LED Drivers – PR 12 K LC

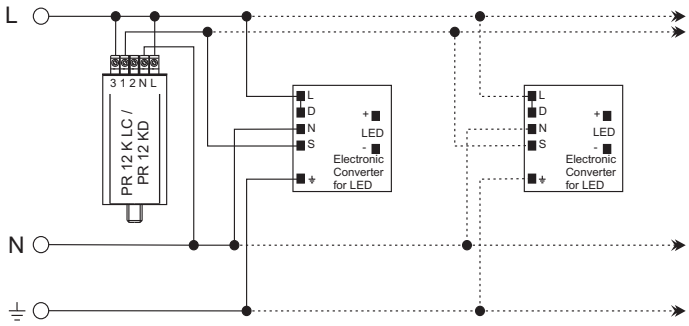
The PR 12 K LC can be used for power switching of LED drivers with LST control input.
A control phase is not needed.
Once it's connected to the mains supply voltage the power switch will switch automatically.

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 (LxWxH): 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. 186509)



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 K LC	**142170**	220–230 V/50 Hz 220 V/60 Hz*	3000	8	12	< 1	< 12	selectable	80	–30	M8x10

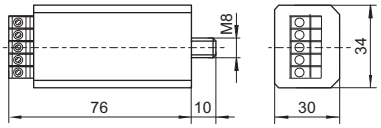
*120–240 V ±10% available on request

Programmable Power Switch for LED Drivers – PR 12 KD

The PR 12 KD can be used for power switching of LED drivers with LST control input.
A control phase is not needed.
The constant switching-time is selectable.

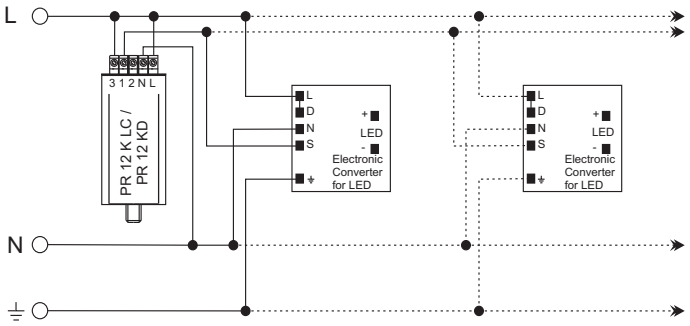
The left side of the rotary switch is used for reset to full power after eleven hours; the right side is for continuous power reduction after programmed time has been reached.

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 (LxWxH): 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. 186509)



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 V/50 Hz 220 V/60 Hz**	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
**120–240 V ±10% available on request

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.

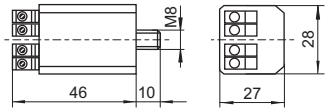
To this end, the switch units utilises the 1–10 V interface of the control gear unit. The switch unit is mainly intended for outdoor luminaires in systems with or without a control phase.

Dimensions (LxWxH): 56x28x27 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 M8x10 with pre-assembled washer and nut

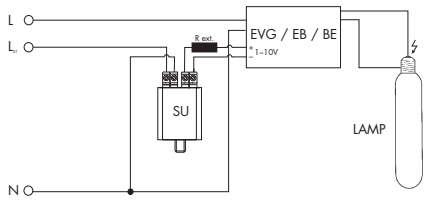
Power reduction SU 1–10 V K for lighting systems featuring an L_{ST} control phase
The switch unit employs a positive switching to reduce power, i.e. power is reduced when the control phase is switched off (L_{ST} = 0 V).
The 1–10 V interface of the electronic ballast is addressed at the moment that 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.

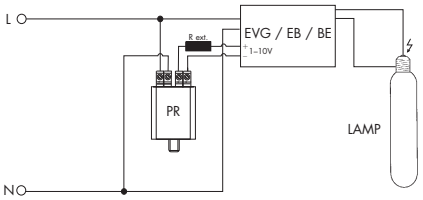
The 1–10 V interface is addressed on the basis of the fundamental operating principle used by Vossloh-Schwabe's PR 12 K LC power switch (details of which can be made available on request). This power switch is capable of determining the starting time of reduced-power operation over the measured operating 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

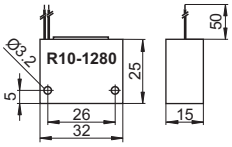


Type	Ref. No.	Control voltage L_{ST} V ±10%, 50/60 Hz	Externally (on site) connected resistor ($R_{ext.}$) kΩ (min. 0.1 W)	Inherent heating K	Weight g
For lighting systems with control phase					
SU 1–10 V K	**149992**	220–240	1–70	< 10	50
For lighting systems without control phase					
PR 1–10 V K LC	**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 K 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 (LxWxH): 32x25x15 mm
Weight: 20 g
Connection leads, solid: 0.5 mm²
Lead length: 50 mm
Ref. No.: 149800

R6,25K-70K
Resistor network for LEDset interfaces
Casing: PC
Dimensions (LxWxH): 32x25x15 mm
Weight: 20 g
Connection leads, solid: 0.5 mm²
Lead length: 50 mm
Ref. No.: 149802

Type	**Ref. No.**	Number of dip switch pcs.	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
R6,25K-70K	**149802**	8	0.25	200	80	-30

LED COMPONENTS FOR 24 V SYSTEMS

With its 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 converters and the constant-current control is effected on the LED circuit board.

Typical applications

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

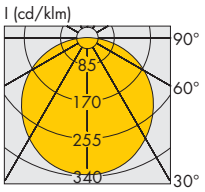
The specifications contained in this catalogue can change due to technical innovations. Any such changes will be made without separate notification.

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.**

LEDLine Flex SMD Professional Indoor White

Built-in PCB lighting modules

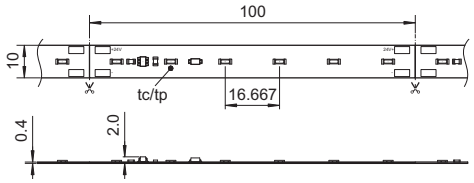
The LEDLine Flex SMD Professional Indoor is fitted with SMD LEDs on a flexible printed circuit board of only approx. 0.4 mm thickness. Even the most complex structures can be illuminated thanks to the use of an extremely pliable foil. LEDLine Flex SMD Professional Indoor can be separated into segments 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 75 °C
Wide beam angle: 120°
Voltage supply: 24 V
Power consumption per step (100 mm): 0.53 W

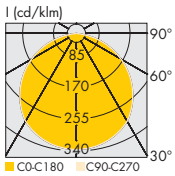
Typical applications

- 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

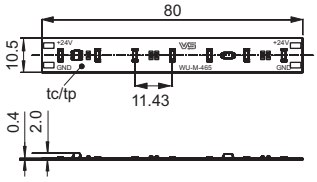
The LEDLine Flex SMD Professional Indoor High Brightness is fitted with SMD LEDs on a flexible printed circuit board of only approx. 0.4 mm thickness. Even the most complex structures can be illuminated thanks to the use of an extremely pliable foil. LEDLine Flex SMD Professional Indoor High Brightness 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

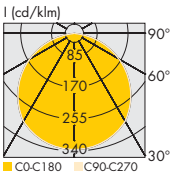
* The values mentioned above represent only statistical variables on account of the complex manufacturing process of light emitting diodes.
The values do not necessarily correspond exactly to the actual parameters of every single product which can vary from the typical specification.

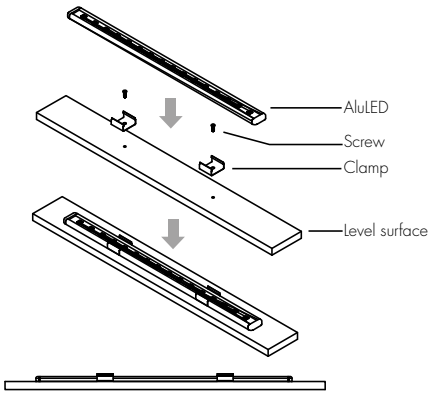
AluLED IP66/IP67

AluLED IP66/IP67 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.

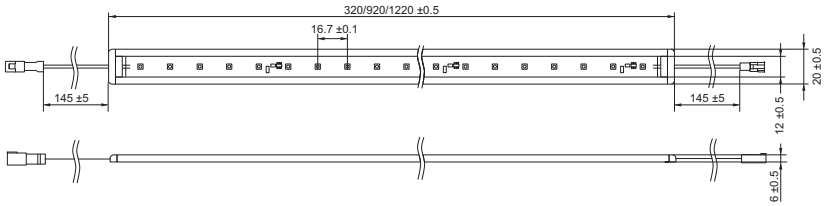
Technical notes

Voltage supply: 24 V DC
Beam angle: 120°
Allowed ambient temperature t_a: –30 to 85 °C
Allowed storage temperature: –40 to 85 °C
Degree of protection: IP66/IP67
Maximum bridging current load: 3 A
Lumen maintenance for white AluLED
L70/B20: > 50,000 hrs. at t_p/t_c = 50 °C

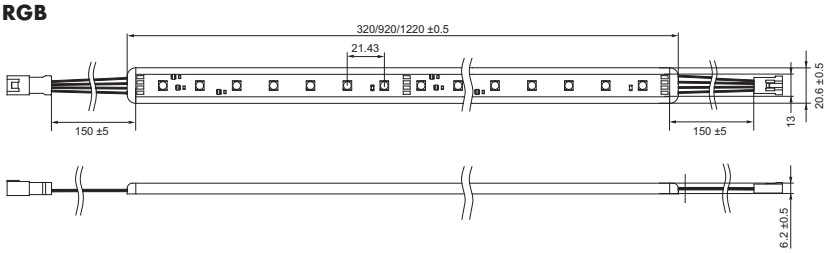




White



RGB



Optical characteristics

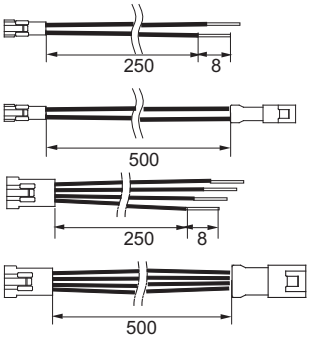
at t_p = 50 °C

White Modules										
Type	**Ref. No.**	Length mm	No. of LEDs	Current mA	Colour	Colour temperature (K)	Luminous flux lm	Beam angle °	Power W	Packaging unit pcs.
AluLED-320-2700-II Fully Coated	**571125**	320	18	140	warm white	2700 ±300	200	120	3.4	20
AluLED-920-2700-II Fully Coated	**571126**	920	54	420	warm white	2700 ±300	600	120	10.1	20
AluLED-1220-2700-II Fully Coated	**571127**	1220	72	560	warm white	2700 ±300	800	120	13.5	20
AluLED-320-3000-II Fully Coated	**561698**	320	18	140	warm white	3000 ±300	240	120	3.4	20
AluLED-920-3000-II Fully Coated	**561699**	920	54	420	warm white	3000 ±300	720	120	10.1	20
AluLED-1220-3000-II Fully Coated	**561700**	1220	72	560	warm white	3000 ±300	960	120	13.5	20
AluLED-320-6000-II Fully Coated	**571115**	320	18	140	cool white	6000 ±300	280	120	3.4	20
AluLED-920-6000-II Fully Coated	**571116**	920	54	420	cool white	6000 ±300	840	120	10.1	20
AluLED-1220-6000-II Fully Coated	**571117**	1220	72	560	cool white	6000 ±300	1120	120	13.5	20

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	Packaging unit pcs.
AluLED-320-RGB-II Fully Coated	**571130**	320	18	140	25	75	15	620-630	520-535	465-475	120	3.4	20
AluLED-920-RGB-II Fully Coated	**571131**	920	54	420	75	225	45	620-630	520-535	465-475	120	10.1	20
AluLED-1220-RGB-II Fully Coated	**571132**	1220	72	560	100	300	60	620-630	520-535	465-475	120	13.5	20

Further colours for AluLED are available upon request.

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, feed-in connector
Ref. No.: 543427 50 cm, PCB to PCB connector
For RGB modules with 4 strands
Ref. No.: 543428 25 cm, feed-in connector
Ref. No.: 543429 50 cm, PCB to PCB connector



Shrink caps
For sealing exposed connection wires
(Strand diameter: 0.35 mm²/22 AWG)
Adhesive coating on the inside
Ref. No.: 571150 transparent
Ref. No.: 571151 black

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.

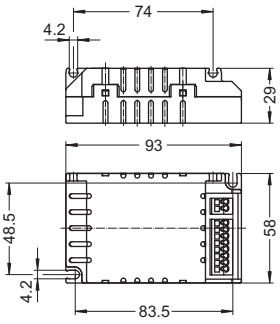
The CA series of VS colour control modules are available with both a manual operating pad and a DALI interface or "PUSH" or DMX variant.

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

All DigiLED not suitable for the US market.

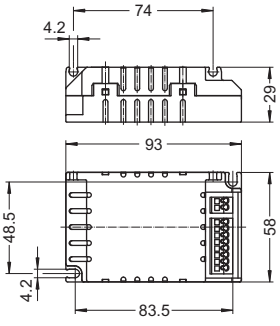
Technical notes
Dimensions (LxWxH): 93 x 58 x 29 mm
Ambient temperature t_a: 0 to 45 °C
Operating voltage: 24 V
Max. current on the supply line: 5 A
Push-in terminals: 0.25–1.5 mm²,
grid: 3.5 mm

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



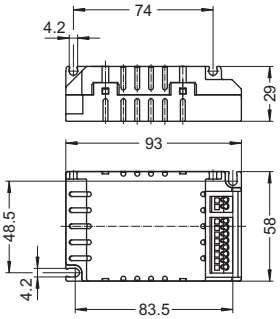

DigiLED Manual CA

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



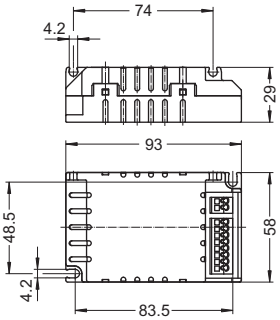

DigiLED DALI CA

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



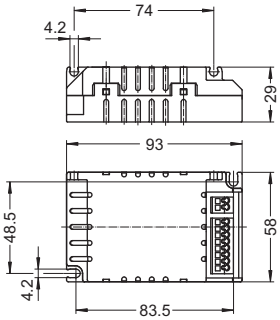

DigiLED DMX CA

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



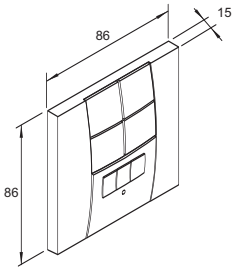

DigiLED IR CA

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.
Ambient temperature t_a: –20 to 45 °C
Max. current per control channel: 1.25 A
Type: WU-ST-012-DigiLED-RF CA
Ref. No.: 186181



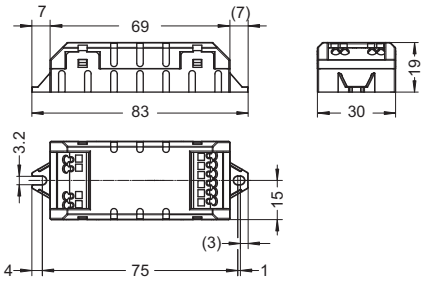

DigiLED RF CA

Walltransmitter
Required to activate the programs
in the DigiLED RF
Dimensions (LxWxH): 86x86x15 mm
Colour: white
Type: WU-ST-009-Walltransmitter
Ref. No.: 536843



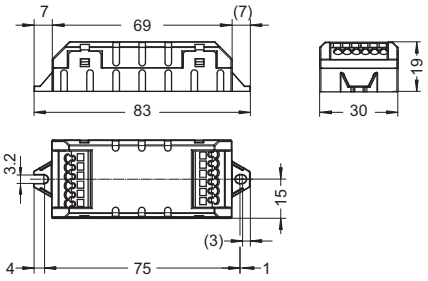

Walltransmitter

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



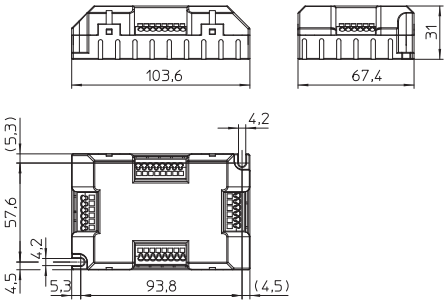

DigiLED Push CA

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



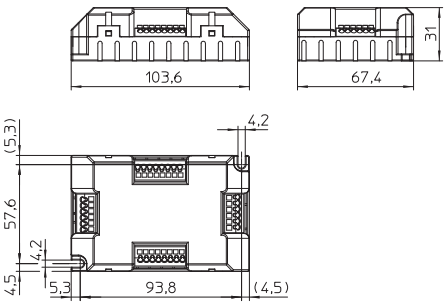

DigiLED Mono CA

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



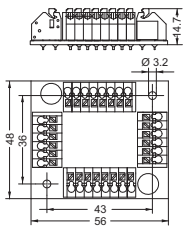

DigiLED Slave CA

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

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

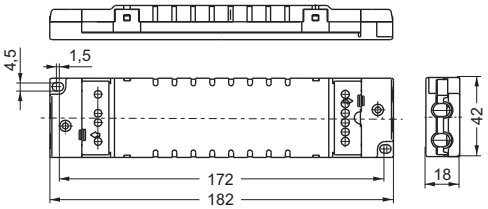
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
With connection lead on primary side

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 ±10%	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 ±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
DC operation: 176–264 V DC, 0 Hz
(only EDXe 150)

Safety features

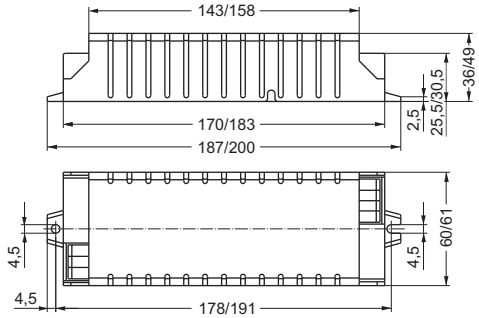
Electronic short-circuit protection
Overload and temperature protection: reversible
Protection against "no load" operation
Degree of proteciton: IP20
Protection class I
SELV

Expected service life time

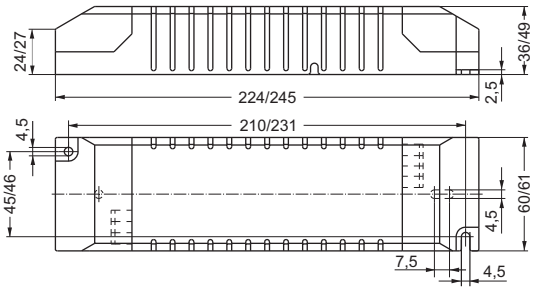
at operation temperatures at t_c point

	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 0 Hz 50-60 Hz V ±10%	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K30 – Dimensions: 187x60x36 mm									
50	EDXe 150/24.035	**186218**	176-264	24 ±0,72	325-218	0.0-2.1	-40 to 45	70	320
			220-240		260-240				
K30.1 – Dimensions: 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: 224x60x36 mm									
50	EDXe 150/24.035	**186219**	176-264	24 ±0,72	325-218	0.0-2.1	-40 to 45	70	370
			220-240		260-240				
K30.1 with cord grip – Dimensions: 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

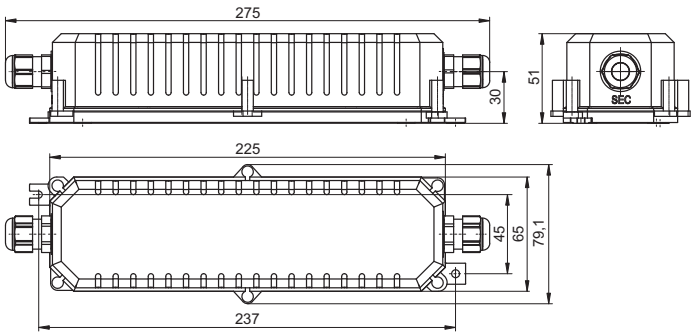
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary side: 5x1 mm², length: 200 mm
secondary side: 2x1 mm², length: 200 mm

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 ±10%	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: 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
Pre-assembled 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

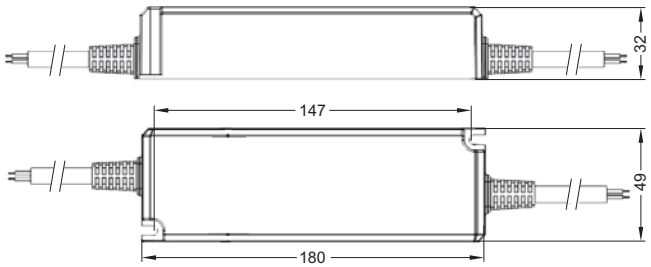
Short-circuit protection: electronic
Overload protection
Protection against "no load" operation
Degree of protection: IP67
Protection class I
Protection class II (186432)
SELV

Expected service life time

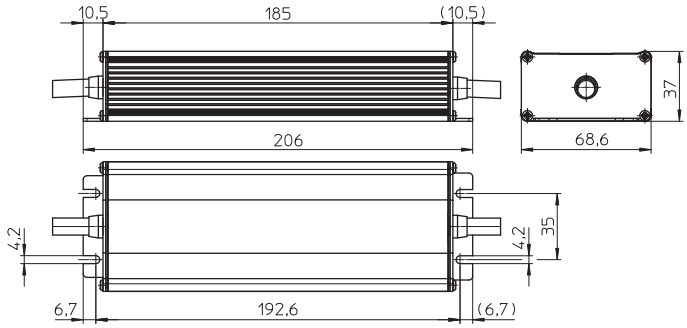
at operation temperatures at t_c point

	Ref. No. all types	
t_c temperature	80 °C	70 °C
hrs.	30,000	50,000

K30.2



M58.1



Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V ±10%	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
K30.2 – Dimensions: 180x49x32 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: 206x68.6x37 mm										
100	EDXe 1100/24.041	**186433**	220–240	24 ±0.5	505–465	0.0–4.2	-15 to 45	80	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

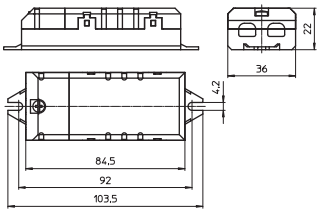
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz

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 ±10%	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K39.1 – Dimensions: 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. 6 W
This LED constant-voltage driver is designed for use in applications with capacity range of up to 6 W.

Electronic characteristics
Power factor at full load: > 0.55 C

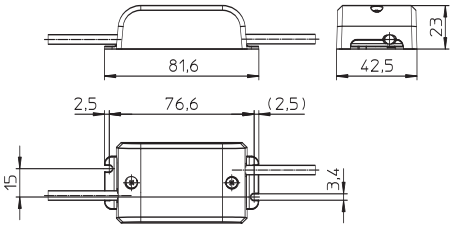
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary: 2x0.75 mm², length: 180 mm
secondary: 2x0.5–0.75 mm², length: 180 mm

Safety features
Short-circuit protection: electronic
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

	Ref. No. 186412	
t_c temperature	80 °C	70 °C
hrs.	30,000	50,000

K51



Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V ±10%	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
K51 – Dimensions: 81.6x42.5x23 mm										
6	EDXe 106/12.037	**186412**	220–240	12 ±0.5	70–60	0.0–0.5	-15 to 45	65	72	44

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

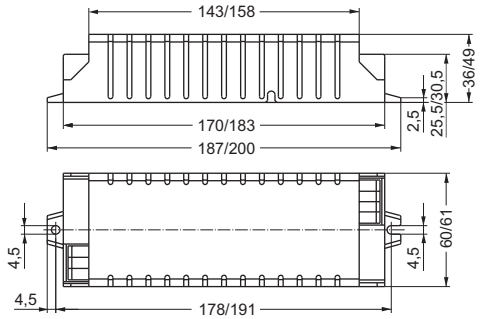
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
DC operation: 176–264 V DC, 0 Hz
(only EDXe 150)

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

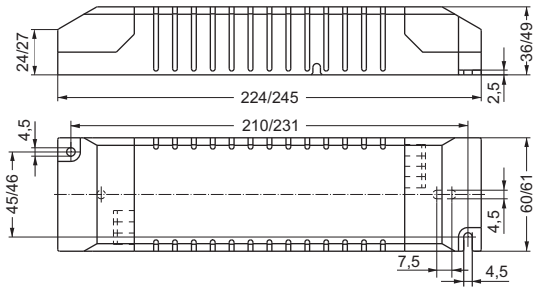
Expected service life time
at operation temperatures at t_c point

	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 0 Hz 50–60 Hz V ±10%	Output voltage V	Mains current mA	Current output A	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
K30 – Dimensions: 187x60x36 mm									
50	EDXe 150/12.034	**186216**	176–264	12.1 ±0.24	325–218	0.0–4.2	–40 to 45	70	375
			220–240		260–240				
K30.1 – Dimensions: 200x61x49 mm									
70	EDXe 170/12.011	**186112**	220–240	12.1 ±0.24	365–335	0.0–5.8	–20 to 45	70	340
K30 with cord grip – Dimensions: 224x60x36 mm									
50	EDXe 150/12.034	**186217**	176–264	12.1 ±0.24	325–218	0.0–4.2	–40 to 45	70	425
			220–240		260–240				
K30.1 with cord grip – Dimensions: 245x61x49 mm									
70	EDXe 170/12.012	**186113**	220–240	12.1 ±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

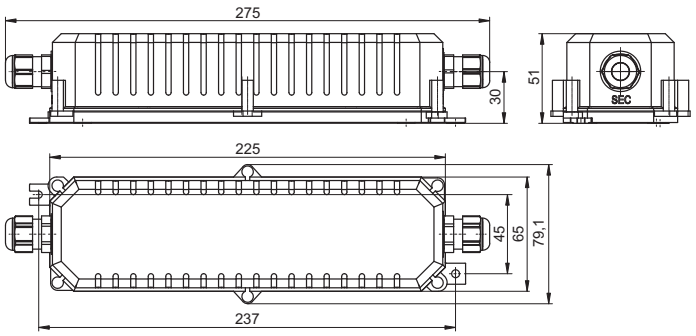
Connection details
Mains voltage: 220–240 V ±10%
Mains frequency: 50–60 Hz
Pre-assembled connection leads
primary side: 5x1 mm², length: 200 mm
secondary side: 2x1 mm², length: 200 mm

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 ±10%	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: 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.
Ambient temperature: 5 to 50 °C

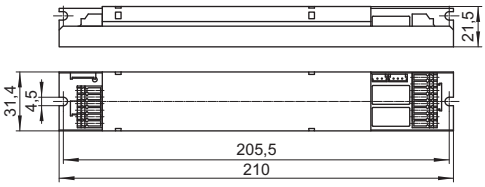
Electrical characteristics
Power consumption: 4 VA
Constant output: > 3 W
Weekly automatic self-diagnosis and daily testing of system status
Battery charge is checked during regular testing cycles.
Optical status display via two-colour LED

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.

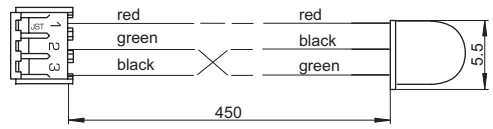
Technical notes – Rechargeable batteries
Choice of rechargeable battery depends on the operating device.
Charging time of rechargeable batteries: max. 24 hrs.
Rechargeable batteries: nickel-cadmium (NiCd)

Safety features
Protection class I
Degree of protection: IP20
SELV (186498)

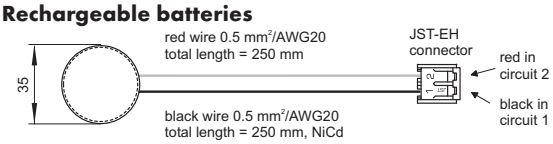
M5.1

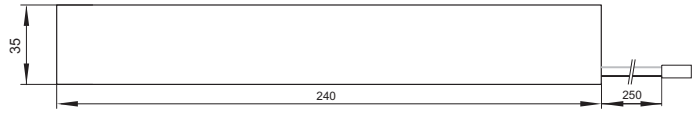


LED



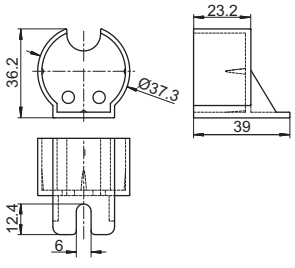
Rechargeable batteries





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 EL module: 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.
Ambient temperature: 5 to 50 °C

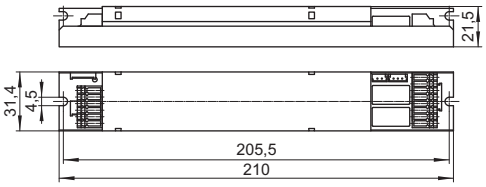
Electrical characteristics
Power consumption: 3.5 VA
Constant output: > 3 W
Weekly automatic self-diagnosis and daily testing of system status
Battery charge is checked during regular testing cycles.
Optical status display via two-colour LED

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.

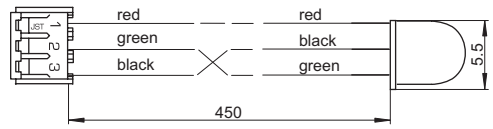
Technical notes – Rechargeable batteries
Choice of rechargeable battery depends on the operating device.
Charging time of rechargeable batteries: max. 24 hrs.
Rechargeable batteries: nickel-cadmium (NiCd)

Safety features
Protection class I
Degree of protection: IP20
SELV (186495)

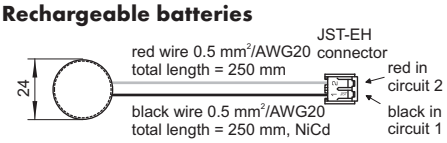
M5.1

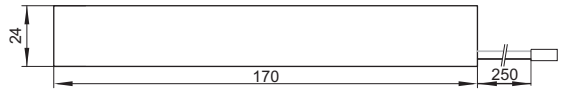


LED



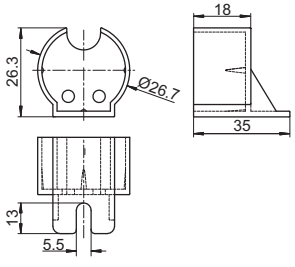
Rechargeable batteries





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 EL module: 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, GU10

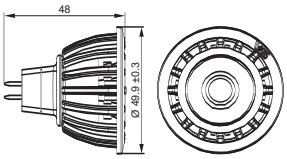
LED – THE GREEN FUTURE LIGHTING

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.

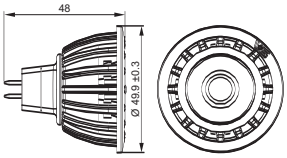
In addition to providing UV- and IR-free light, LEDs are vibration-proof and have a very long service life that further increases the overall efficiency of any lighting system. As LED lamps are now powerful enough to replace both incandescent and low-voltage halogen lamps, they are becoming increasingly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

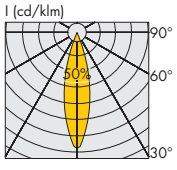
Type	**Ref. No.**	Colour	Colour temperature K	Typ. luminous flux (lm)	Light intensity cd	Beam angle (°)	Field angle (°)	CRI R_a	Power factor	Power W	Energy efficiency
MR16 – 5.5 W											
MR16-5-3000-24-III	**553212**	warm white	3000	350	1300	24	48	≥ 80	0.7	5.5	A
MR16-5-3000-36-III	**553213**	warm white	3000	350	700	36	72	≥ 80	0.7	5.5	A+
MR16 – 7 W											
MR16-7-3000-24-III	**553214**	warm white	3000	500	1280	24	48	≥ 80	0.9	7	A
MR16-7-3000-36-III	**553215**	warm white	3000	500	1000	36	72	≥ 80	0.9	7	A

Note: Further colour temperatures are available on request.

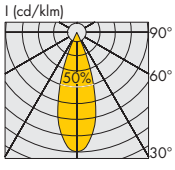
Typical luminance of MR16 at 1, 2 and 3 meters

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

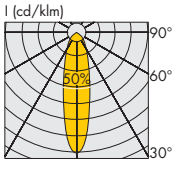
Typical light distribution curves



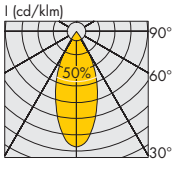
MR16 - 5.5 W 24°



MR16 - 5.5 W 36°



MR16 - 7 W 24°

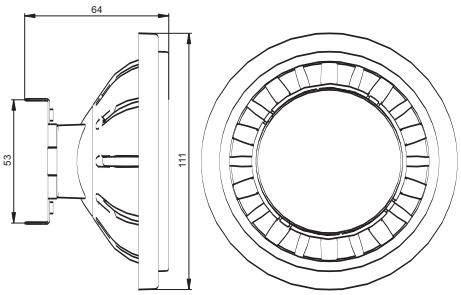


MR16 - 7 W 36°

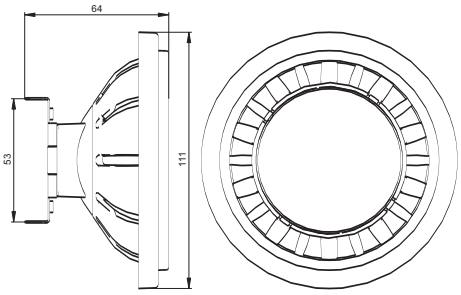
LED Lamps

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

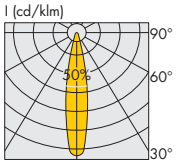
Type	**Ref. No.**	Colour	Colour temperature K	Typ. luminous flux (lm)	Light intensity cd	Beam angle °	Field angle °	CRI R_a	Power factor	Power W	Energy efficiency
AR111 – 16 W											
AR111-16-3000-24-III	**556794**	warm white	3000	1000	3200	24	48	≥ 80	> 0.9	16	A
AR111-16-3000-36-III	**556795**	warm white	3000	1000	1600	36	72	≥ 80	> 0.9	16	A
AR111 – 13 W											
AR111-13-3000-24-III	**556796**	warm white	3000	800	2600	24	48	≥ 80	> 0.9	13	A
AR111-13-3000-36-III	**556797**	warm white	3000	800	1400	36	72	≥ 80	> 0.9	13	A

Further colour temperatures are available on request.

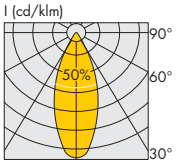
Typical luminance of AR111 at 1, 2 and 3 meters

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 210–213.

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

For replacement of mains voltage incandescent lamps

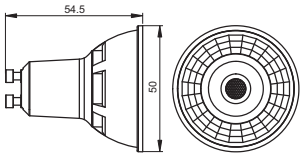
- Unsuitable for operation with an additional driver
- Integrated high-frequency driver
- Do not use in ambient temperatures of more than 40 °C
- Unsuitable for installation in enclosed or airtight luminaires
- For indoor use only
- Unsuitable for use outdoors or in high-moisture environments
- Dimmable with phase-cutting dimmers (designated 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!

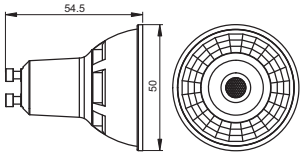
LED Lamps

With integrated driver for replacement of high-voltage halogen incandescent lamps

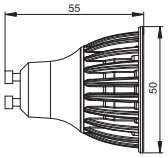
GU10 – 4 W
Design style: SMD reflector
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Non dimmable
Base: GU10



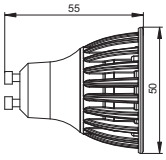
GU10 – 4.5 W and 6 W
Design style: SMD reflector
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Phase-cut dimmable (trailing-edge dimmers are preferred)
Base: GU10



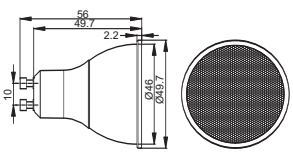
GU10 – 5.5 W
Design style: COB lens
Operating temperature: –20 to 40 °C
Storage temperature: –40 to 60 °C
Input voltage: 220–240 V AC
Non dimmable
Base: GU10



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



GU10 – 7 W
Design style: SMD lens
Operating temperature: 0 to 35 °C
Storage temperature: –20 to 85 °C
Input voltage: 220–240 V AC
Non dimmable
Base: GU10



LED Lamps

With integrated driver for replacement of high-voltage halogen incandescent lamps

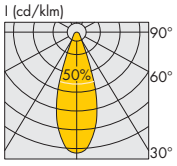
Type	Ref. No.	Colour	Colour temperature K	Typ. luminous flux (lm)	Light intensity cd	Beam angle °	Field angle °	CRI R_a	Power factor	Power W	Energy efficiency
4 W – SMD reflector											
GU10-4-3000-36-R	**556798**	warm white	3000	290	550	36	72	≥ 80	0.4	4	A+
4.5 W – SMD reflector											
GU10-4.5-2700-36-R	**554601**	warm white	2700	230	520	36	72	≥ 80	0.4	4.5	A+
5.5 W – COB lens											
GU10-5-3000-24-III	**553218**	warm white	3000	350	1300	24	48	≥ 80	0.5	5.5	A+
GU10-5-3000-36-III	**553219**	warm white	3000	350	700	36	72	≥ 80	0.5	5.5	A+
6 W – SMD reflector											
GU10-6-3000-36-R	**556799**	warm white	3000	380	680	36	72	≥ 80	0.6	6	A+
7 W – COB reflector											
GU10-7-3000-24-III	**553220**	warm white	3000	450	1000	24	48	≥ 80	0.9	7	A+
GU10-7-3000-36-III	**553221**	warm white	3000	450	800	36	72	≥ 80	0.9	7	A+
7 W – SMD lens											
GU10-7-2700-36-R	**550086**	warm white	2700	460	1250	36	72	≥ 80	0.5	7	A+
GU10-7-5000-36-R	**550087**	cool white	5000	520	1500	36	72	≥ 80	0.5	7	A+

Further colour temperatures are available on request.

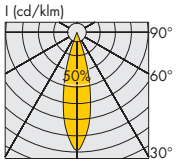
Typical luminance of GU10 at 1, 2 and 3 meters

Intensity (lux)																					
Colour temperature K	**GU10 – 4 W 36°**			**GU10 – 4.5 W 36°**			**GU10 – 5.5 W 24°**			**36°**			**GU10 – 6 W 36°**			**GU10 – 7 W 24°**			**36°**		
	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m	1 m	2 m	3 m
Warm white 2700 K	–	–	–	520	130	60	–	–	–	–	–	–	–	–	–	–	–	–	1250	313	139
Warm white 3000 K	550	140	60	–	–	–	1300	325	140	700	175	80	680	170	80	1000	250	120	–	–	–
Cool white 5000 K	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1500	375	167

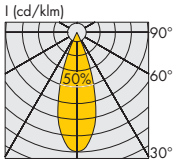
Typical light distribution curves



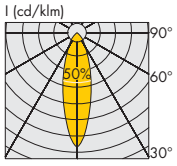
4 / 4.5 / 6 W – 36°



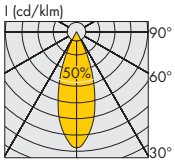
5.5 W – 24°



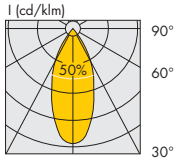
5.5 W – 36°



7 W – 24°, COB



7 W – 36°, COB



7 W – 36°, SMD

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.

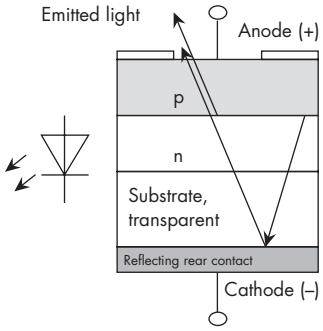
The key basis of modern optoelectronics is the availability of high-performance LEDs in the three primary colours red, green and blue as well as white and warm white. By assembling these on circuit boards and in combination with converters and control systems, lighting systems can be created for the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



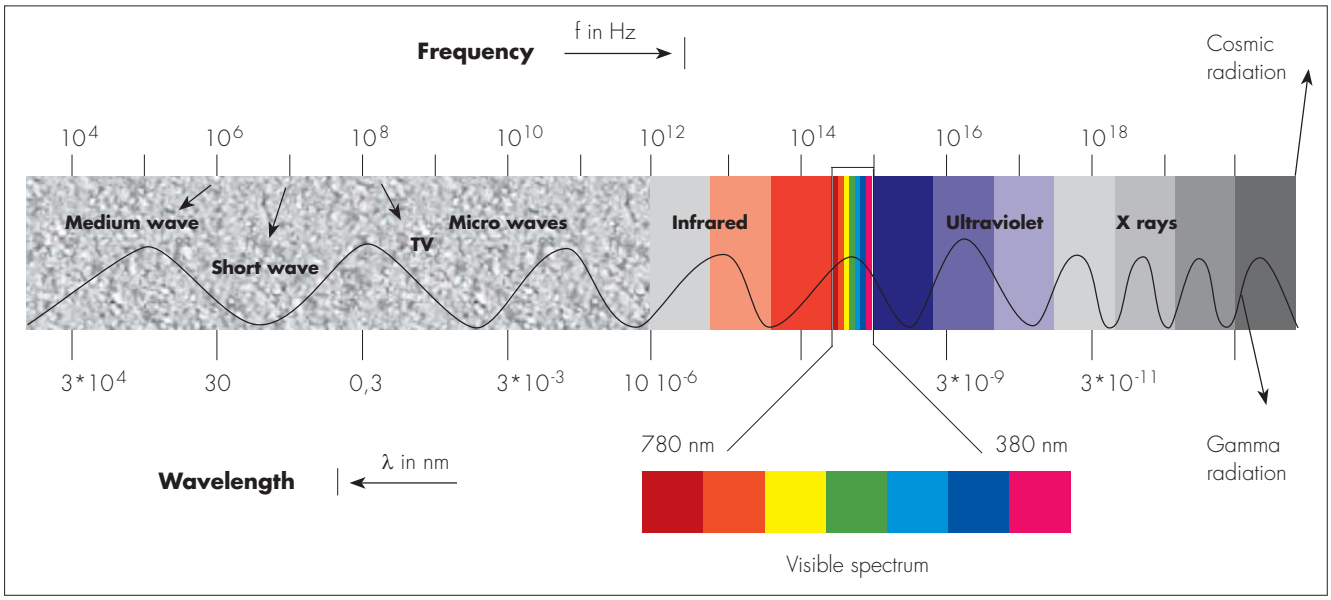
Cross-sectional detail
Cross-section of an LED semi-conductor chip
Light emission at the pn depletion layer

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

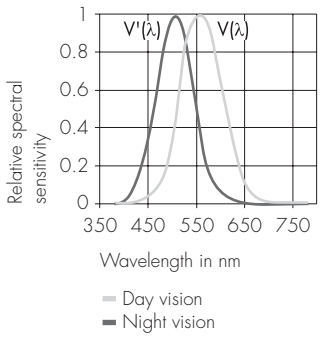
Visible light only accounts for a small part of the electromagnetic spectrum. The part of the electromagnetic spectrum that is visible for humans ranges from ultraviolet (λ = 380 nm) to dark red (λ = 780 nm).



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.

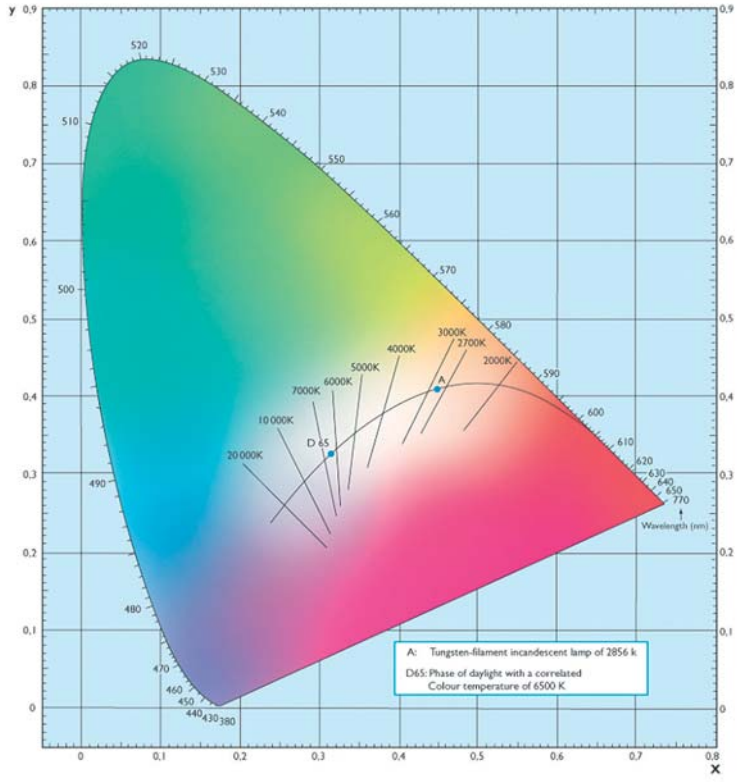
LED efficiency

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 modules
- LED optics
- 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.

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 required).

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

Safety, assembly and handling information for ReadyLine modules

The ReadyLine LED modules are designed for direct mains operation (230 V AC). Installation must be carried out under observation country specific relevant safety regulations and standards.

The LED module is a built-in lighting module to assemble into luminaires. Clearance and creepage distances of the LED module are designed for class II luminaires.

Additional insulating material could be required in order to reach the sufficient isolation acc. country specific standards (e.g. EN 60598 and EN61547 Tab. 10 for Europe).

DALI LIGHT CONTROL GEAR AND ACCESSORIES

INTELLIGENT INDOOR LIGHTING

With its new XSW Wireless Light Controllers, Vossloh-Schwabe has opened up a new chapter in light control. The Wireless Light Controller offers users particularly easy and flexible integration of light control options into a system or luminaire – with a special emphasis on simple, intuitive operation.

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 IEC 62386:2008 DALI standard. The Light Controllers of the LiCS System Network series automatically interconnect to form a centrally controllable TCP/IP network.

The entire lighting system was designed to permit easily comprehensible configuration. Any later modifications to the system can thus be carried out without any problems.

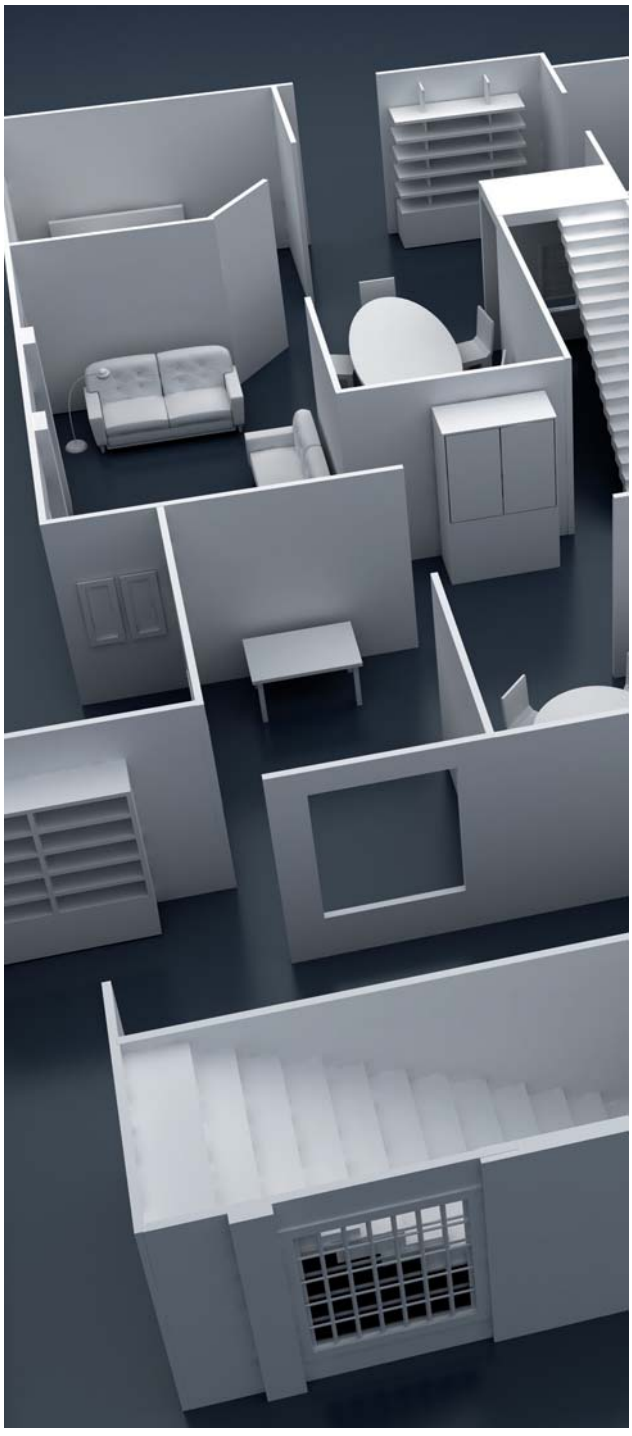
Light Controllers provide users with a convenient means of integrating numerous control options, from controlling individual luminaires via a smartphone right up to a light management system.

Typical applications

- Offices, industrial spaces and warehouses
- Shops, supermarkets and malls
- Hotels and gastronomy
- Public buildings (e.g. museums, schools and hospitals)
- Stairwells and hallways
- Sanitary facilities

Light Controller IP/DALI and LightBox

Light Controller XSW-E6 and XSW-E64



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

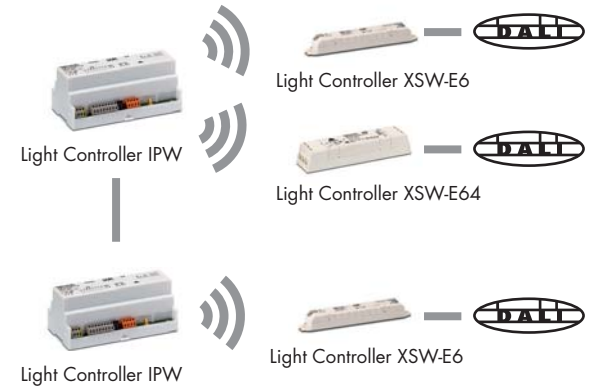
- Network-compliant:
  - Intelligent networking of DALI devices
- Lighting control:
  - 3 level motion detection (automatic and semi-automatic)
  - Constant light control
  - Intelligent day- and time-dependent switching functions
  - Astro function
  - Scene settings
  - Push function (on/off, up and down)
  - Chain command (push button-controlled sequence of commands)
  - Dimming (only up or only down)
  - ON function, OFF function
  - Light value
  - Stairway 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

Overview of the LiCS Indoor System Wireless

General Functions

- Selection of the operating mode via a dip switch (for the XSW-E6 Light Controller)
- Scalable systems – from standalone right up to interlinked network operation
- Maintenance-free EnOcean wireless communication
- Connection to standard-compliant DALI luminaires
- An independent version (XSW-E64 Light Controller) and a version for integration into a luminaire (XSW-E6 Light Controller) are available
- All the functions of a wired system plus the advantages of flexible installation

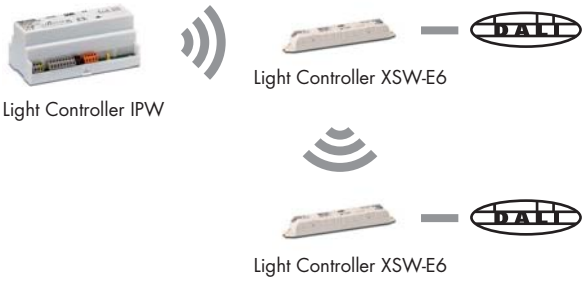
Operating Mode 1 – Network



Functions
- Wireless integration into a LiCS system network: commissioning, configuration and control
- Wireless integration of a further DALI universe per IPW Light Controller

Light Controller XSW-E64/XSW-E6

Operating Mode 2 – Mesh Network

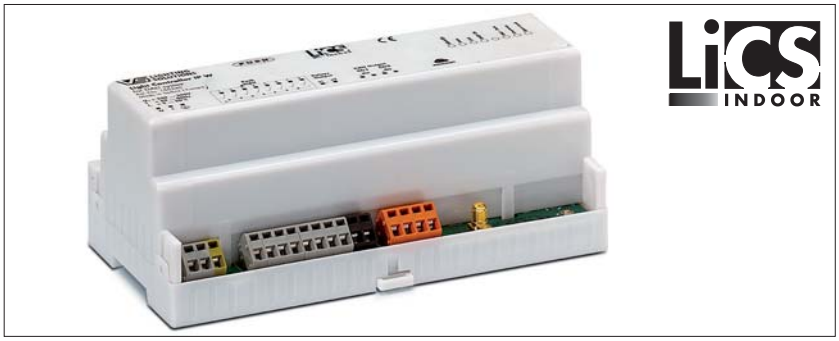


Functions
- Wireless integration into a LiCS system network: commissioning, configuration and control
- Larger range thanks to mesh functionality

Operating Mode 3 – Standalone

Functions
- Configuration via PC/Laptop
- Control via wireless push buttons (EnOcean)
- Definition of scenes and groups

Light Controller IP/DALI

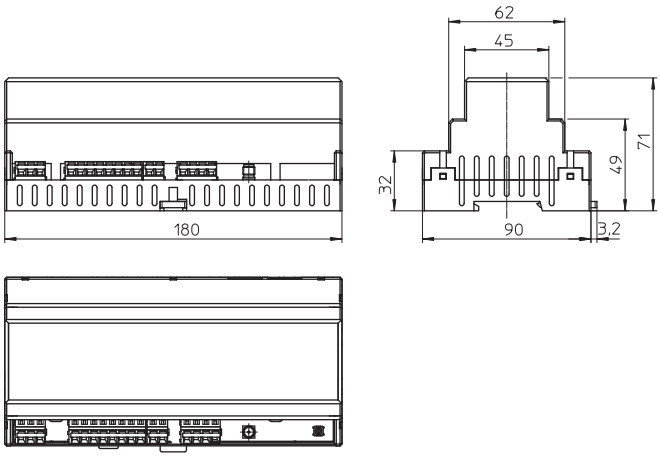


For installation in a distribution board
This light control gear (gateways) is designed for installation in a distribution board.

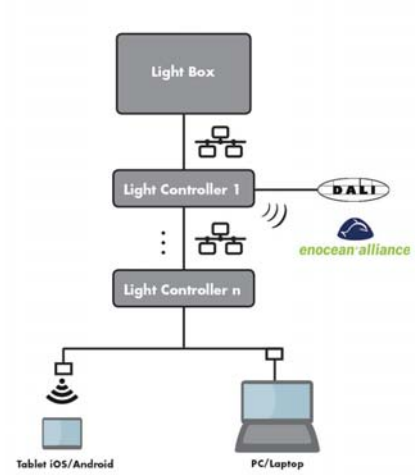
Technical notes
Configuration interface: via browser via tablet/PC
Ambient temperature t_a: 5 to 50 °C
(186484, 186485 t_a: 5 to 45 °C)
Push-in terminals with lever opener: 0.5–2.5 mm²
Degree of protection: IP20, Protection class I
RFI-suppressed
The MultiSensors and DALI push-button interfaces are connected 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

Software download
See product page under www.vossloh-schwabe.com



System architecture



Light Controller IP/DALI W 2CH / IP/DALI W
Suitable for wireless operation with EnOcean
No. of wireless modules: 16 pcs.
Radio signal with a frequency of 868 MHz
Antenna needed

enocean alliance
No Wires. No Batteries. No Limits.

Light Controller	**Ref. No.**	Max. No. of operating devices pcs./controller	No. of MultiSensors or DALI push-button interfaces (pcs./controller)	EnOcean	Dimensions (LxWxH) mm	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 of up to ten Light Controllers IP and is pre-configured for plug-and-play operation.

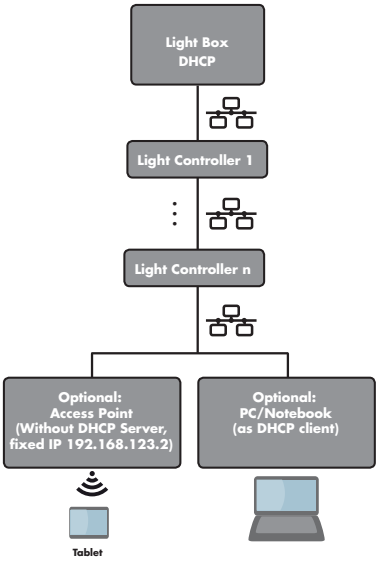
Technical notes

- 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 Mailserver, Internet remote access
- The Windows 8.1N operating system merely needs to be personalised and activated by telephone.

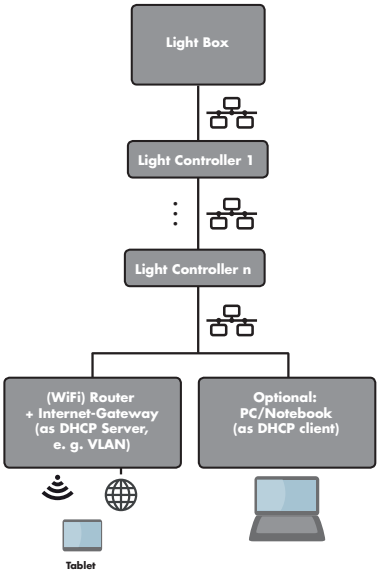
Connections

- 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

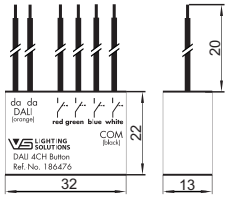


Type	Suitable for	**Ref. No.**	Max. No. of Light Controller per LightBox (pcs.)	Dimensions (LxWxH) mm	Weight g
LightBox	network- and internet-based operation (as a DHCP client)	**186512**	10	127x127x45	600
LightBox DHCP	stand-alone light management (as a DHCP server)	**186513**	10	127x127x45	600

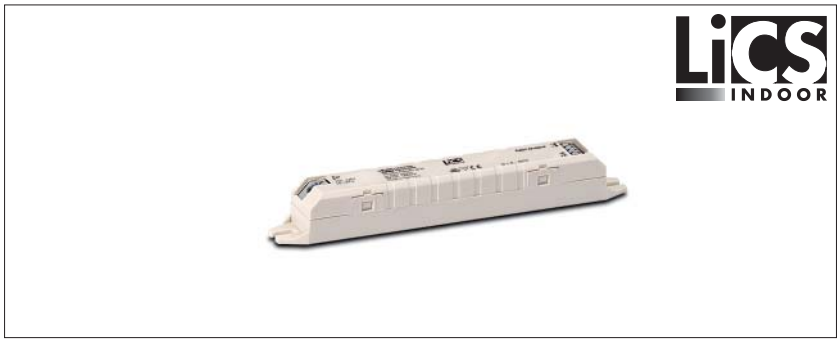
DALI Push-button Interface

For extension of up to 4 push buttons to a Light Controller IP/DALI

DALI push-button interfaces make it possible to install additional push-buttons at any point along the DALI bus without needing to connect an additional power supply source.
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 XSW-E6



Suitable for installation in luminaires/ on mounting rails
These light controllers are suitable for installation in luminaires or on mounting rails.

Technical notes
Configuration interface: wireless (EnOcean) and mode dip switch
Ambient temperature ta: 5 to 50 °C
Push-in terminals with lever opener: 0.5–1.5 mm²
Degree of protection: IP20
For luminaires of protection class II
RFI-suppressed
The MultiSensors are connected directly to the DALI bus.

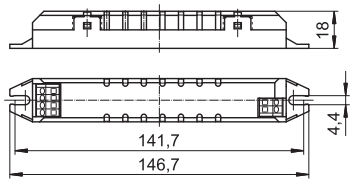
Connections
- Mains connection: 220–240 V AC, 50–60 Hz
- Max. power consumption 1 W
- 1 DALI bus: max. current on DALI bus = 20 mA (see the respective data sheet for current consumption of individual components)
- As a standard DALI bus is not SELV-compliant, the DALI cable must be rated for mains voltage.
- The DALI bus features reversible electronic overload and short-circuit protection.

Operating modes
1. Network
2. Mesh network
3. Standalone

Functions of the Network version
Wireless training and coupling of the system, integration into Light Controller IP network (Ref. No.: 186485 and 186340), centralised configuration

Functions of Standalone mode
Teach-in function of EnOcean modules, ON/OFF function, individual addressing option, group formation, scenes, light values
Software available for download:
see product page under www.vossloh-schwabe.com
Requirement for Standalone mode:
EnOcean USB drive (available on request)

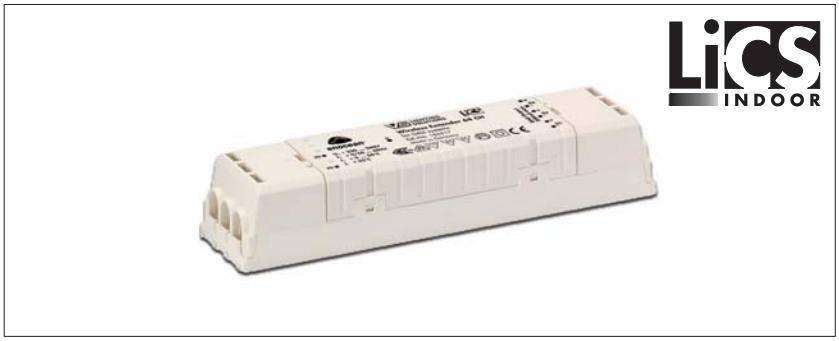
Additional notes
- Sensors and push buttons are only permissible in operating mode 1.
- Max. 4 XSW-E devices per IP DALI controller.
- Max. 58 DALI addresses per mesh network.

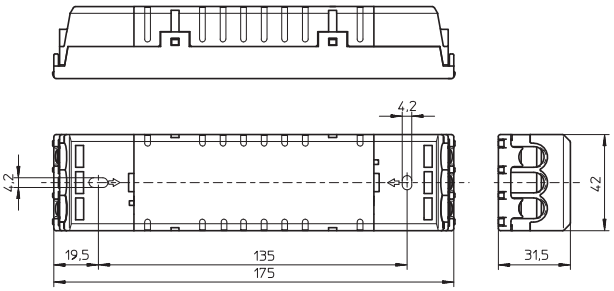


enocean alliance
No Wires. No Batteries. No Limits.

Light Controller	**Ref. No.**	Max. No. of operating devices pcs./controller	Max. No. of MultiSensors pcs./controller	EnOcean	Dimensions (LxWxH) mm	Weight g
XSW-E6	**186516**	6	1	yes	146.7x21x18	40

Light Controller XSW-E64





Wireless light controller
These light control devices are suitable for independent operation (e.g. in false ceilings).

Technical notes
Configuration interface: wireless (EnOcean)
Ambient temperature ta: 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/50–60 Hz
- Max. power consumption 6.7 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.

Operating modes
1. Network

Functions
Wireless training and coupling of the system, integration into Light Controller IP network (Ref. No.: 186485 and 186340), centralised configuration

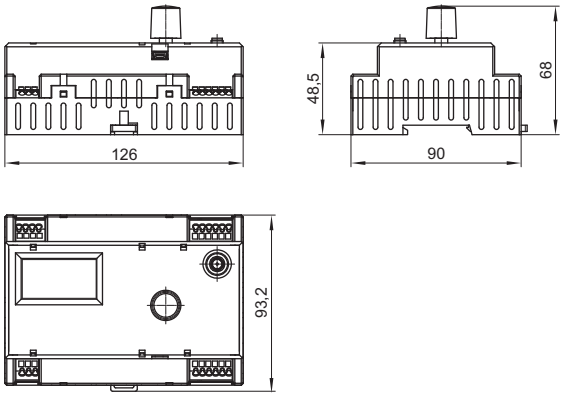
Addional notes
- 4 XSW-E64 devices (max.) per IP DALI controller.
- Full integration of sensors and DALI bush buttons.

Light Controller	**Ref. No.**	Max. No. of operating devices pcs./controller	Max. No. of MultiSensors pcs./controller	EnOcean	Dimensions (LxWxH) mm	Weight g
XSW-E64	**186517**	64	36	yes	175x42x31.5	127

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: display 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

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, Italian, Spanish

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.
Radio signal with a frequency of 868 MHz
Antenna needed

enocean alliance
No Wires. No Batteries. No Limits.

DALI Group Configuration Tool

FMH4-rw Ref. No.: 555534

Light Controller	**Ref. No.**	Max. No. of operating devices pcs./controller	Max. No. of MultiSensors pcs./controller	EnOcean	Dimensions (LxWxH) mm	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

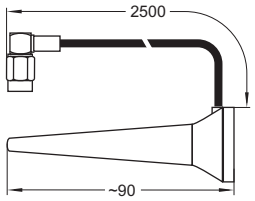
To supplement LiCS Indoor System

To ensure faultless wireless operation, an antenna must be connected that is set to the respective frequency.

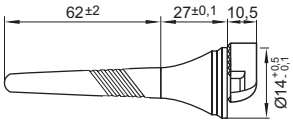
When fitting the antenna, care must be taken that it is not shielded by metal objects, e.g. steel cabinets, radiators, ventilation shafts etc., to ensure optimum signal reception.

The requisite antenna is provided 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

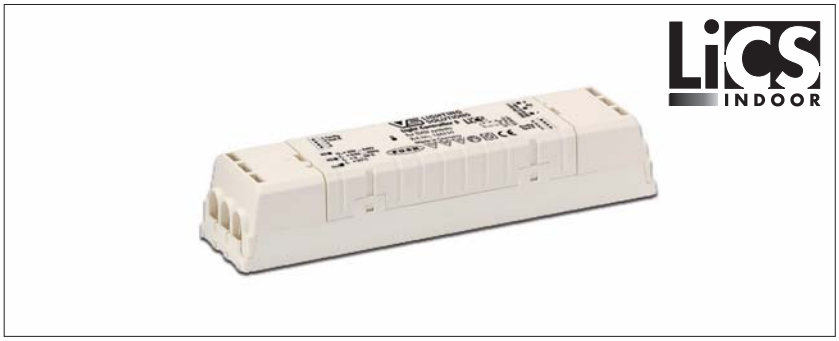


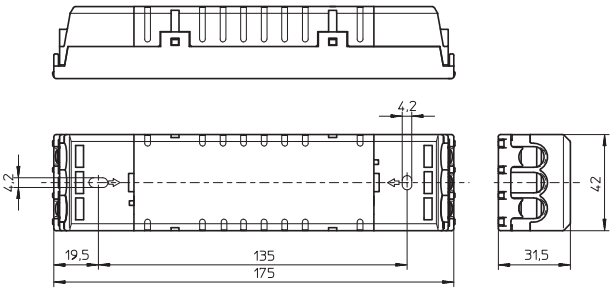
Screw-base antenna
Antenna dimensions (ØxH): 33x89 mm
Impedance: 50 Ω
Capacity: 8 W pulsed
Ambient temperature t_a: -40 to 70 °C
Storage temperature: -40 to 80 °C
Degree of protection: IP66
Weight: 41 g
Ref. No.: 186212



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).

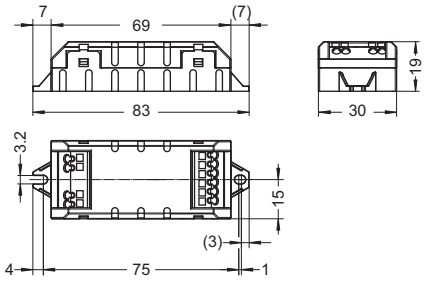
Technical notes
Configuration interface: dip switch (on the device)
Ambient temperature t_a: 0 to 50 °C
Max. casing temperature t_c: 65 °C
Screw terminals: 0.75–2.5 mm²
Degree of protection: IP20, Protection class II
RFI-suppressed
The MultiSensors are connected directly to the DALI bus.

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./controller	Max. No. of MultiSensors pcs./controller	EnOcean	Dimensions (LxWxH) mm	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.

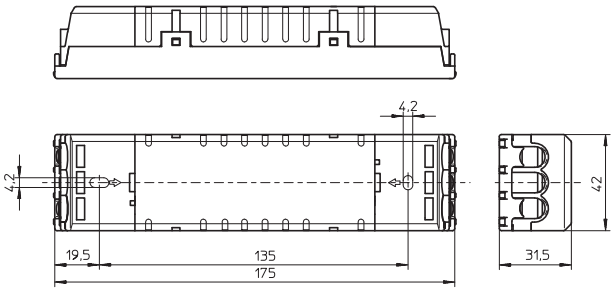
Technical notes
Configuration interface: dip switch (on the device)
Ambient temperature t_a: 5 to 50 °C
Max. casing temperature t_c: 60 °C
Service life time: 50,000 hrs.
Push-in terminals with lever opener: 0.5–1.5 mm²
Degree of protection: IP20
RFI-suppressed
For luminaires of protection class I and 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./controller	Max. No. of MultiSensors pcs./controller	EnOcean	Dimensions (LxWxH) mm	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./Extender	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

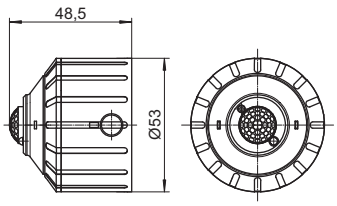
To supplement LiCS Indoor system
Daylight and motion sensors increase both energy savings and convenience.

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.

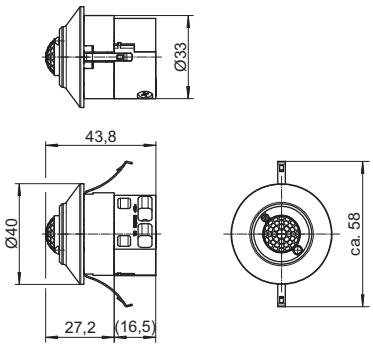
Technical notes
Configuration interface:
via the Light Controller
Ambient temperature t_a: 0 to 50 °C
Push-in terminals with lever opener: 0.5–1.5 mm²
DALI current consumption: 4 mA

Functions
Motion detection and monitoring of lighting levels. With built-in LED (red): the light flashes during configuration when the sensor is selected.

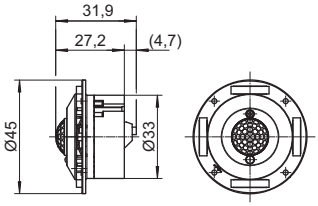
MultiSensor SM-E
For surface mounting
Dimensions (ØxH): 53x48.5 mm
Weight: 30 g
Ref. No.: 186320



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.

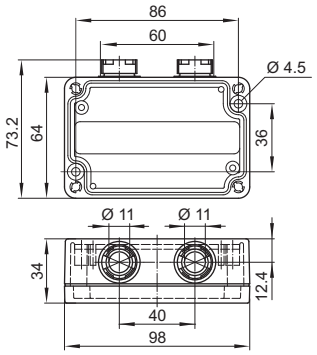
VS BrightnessSensors detect light levels in difficult environments that require an IP65 degree of protection. The Brightness systems do not require an external power supply as the DALI lead can simply be connected through.

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
Dimensions (LxWxH): 98x73.2x34 mm
Push-in terminals with lever opener: 0.5–1.5 mm²

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
DALI current consumption: 2 mA
Weight: 151 g
Ref. No.: 186311



BrightnessSensor IP65
For surface mounting
With cord grip
Degree of protection: IP65
Protection class II
DALI current consumption: 4 mA
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

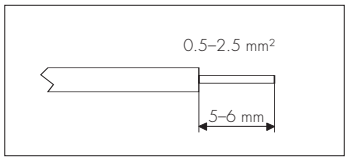
Installation

- 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:

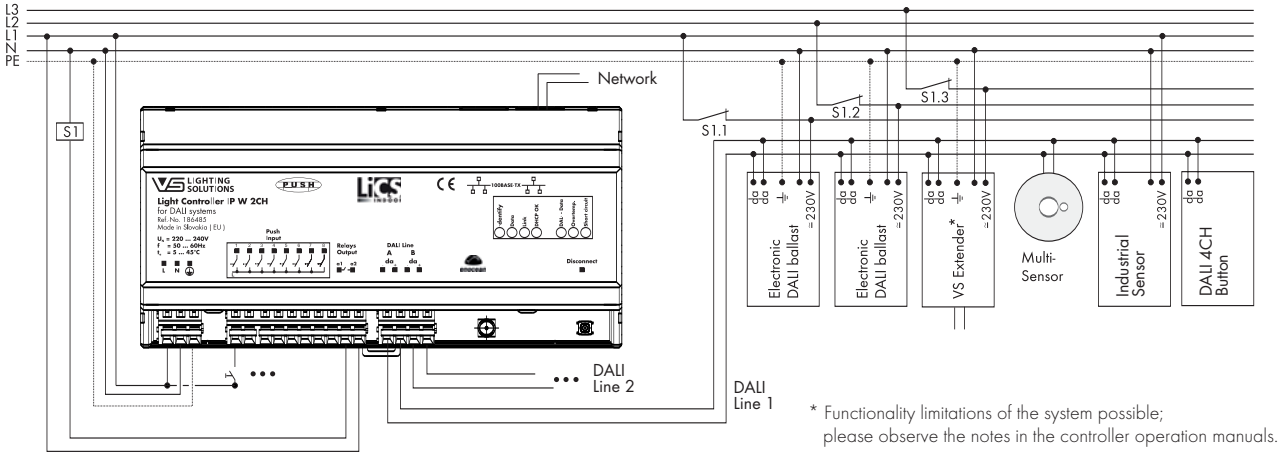
	2.5 mm²	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	300 m	180 m	130 m	80 m

- 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 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** 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 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

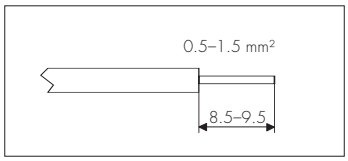
Installation

- 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:

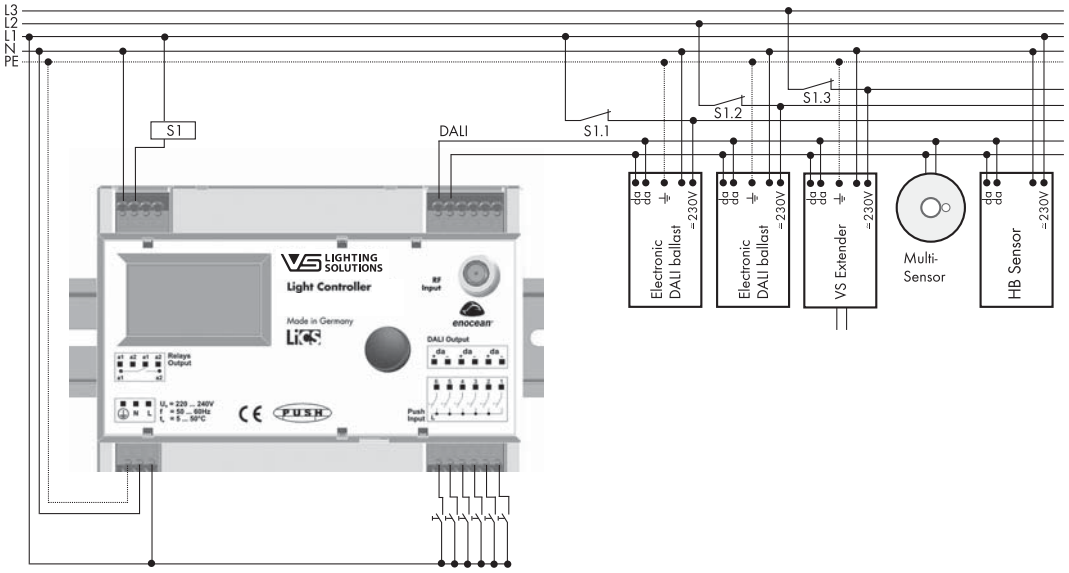
	1.5 mm²	**1 mm²**	**0.75 mm²**	**0.5 mm²**
6.2 Ω max.	300 m	180 m	130 m	80 m

- 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** 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.

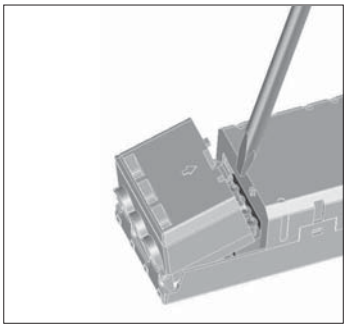
Circuit diagram of Light Controller L/LS and LW/LSW

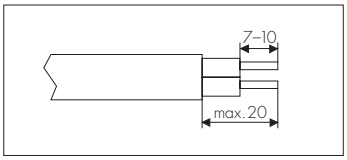


Technical details Light Controller L/LS and LW/LSW

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.

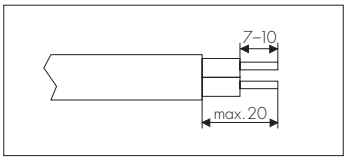
Light Controller XS

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.



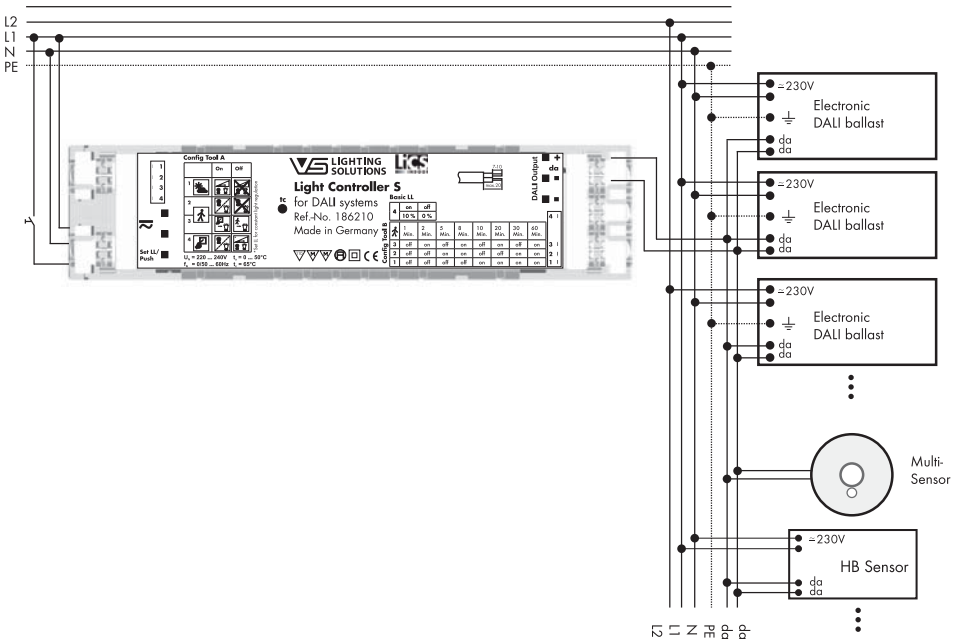
Installation instructions

- 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.

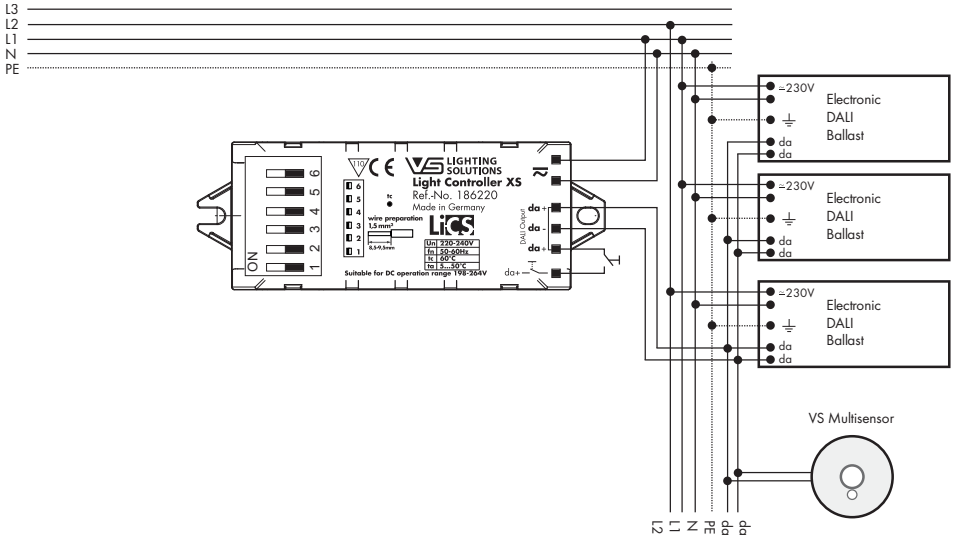
Additional information

- 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** for exact instructions on how to configure the system using the controller.

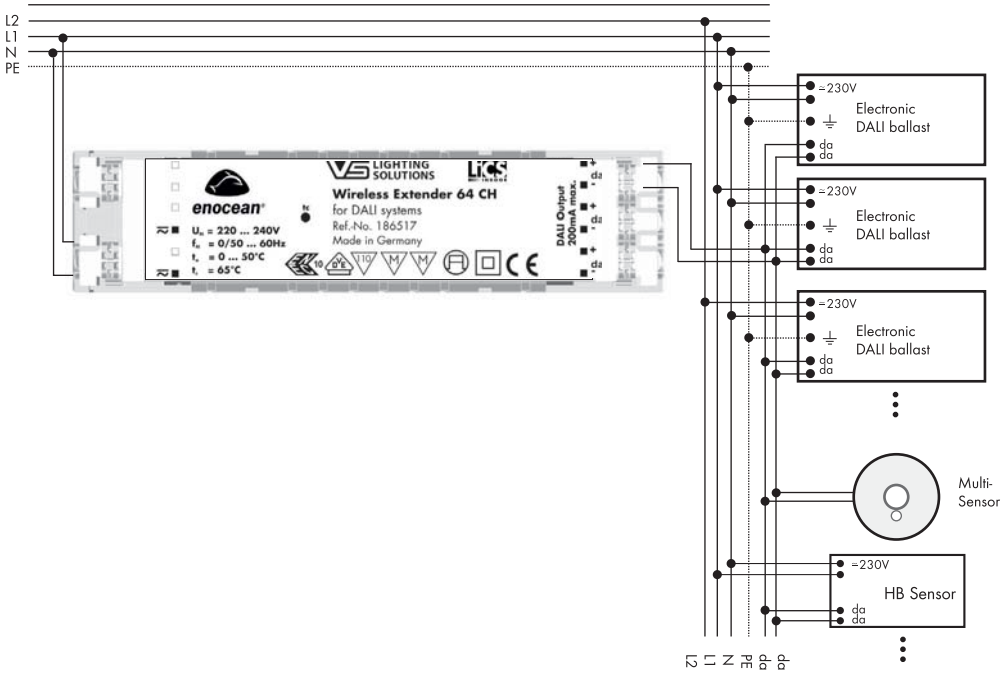
Circuit diagram of Light Controller S



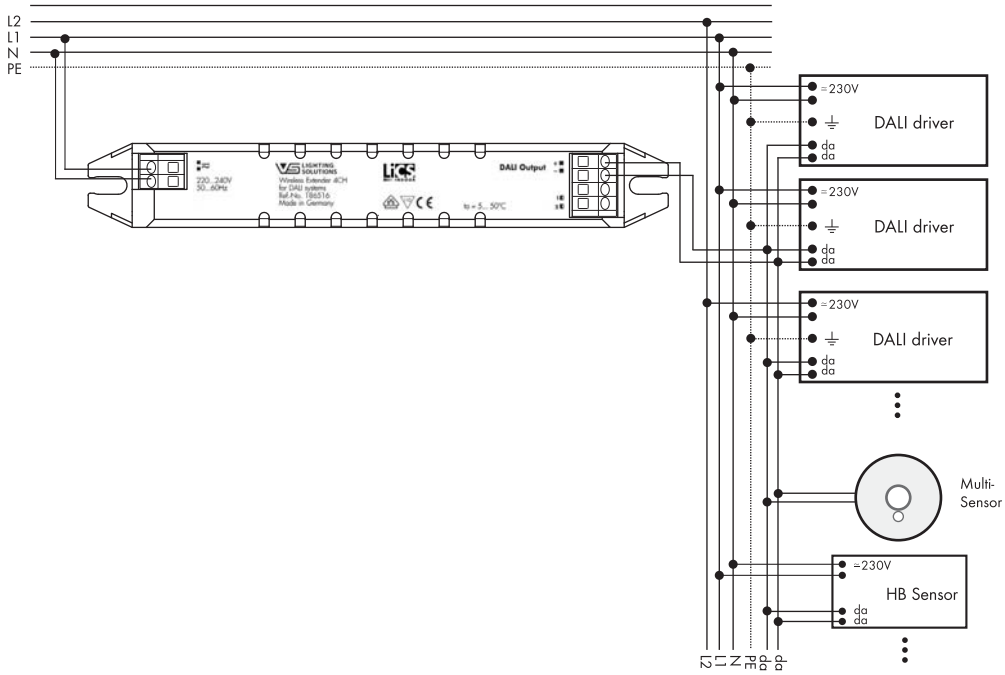
Circuit diagram of Light Controller XS



Circuit diagram of Light Controller XSW-E64



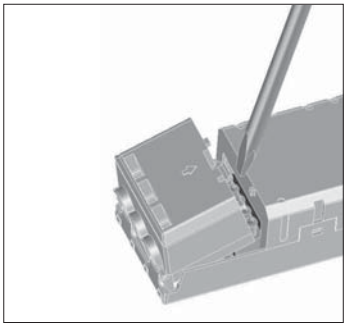
Circuit diagram of Light Controller XSW-E6



Technical details Light Controller S and XS

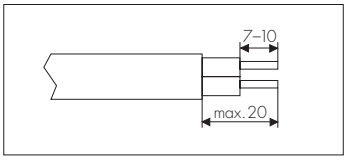
Light Controller	S	XS
Ref. No.	186210	186220
Supply voltage	220–240 V AC/DC, 0/50–60 Hz	
Power consumption	6.5 W	0.8 W
Ambient temperature t_a	0 to 50 °C	
DALI output (da+–)	max. 200 mA current drain	max. 20 mA current drain
No. of operating devices (DALI-EBs, LiCS-Extender, HB sensors)	max. 64 pcs. 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



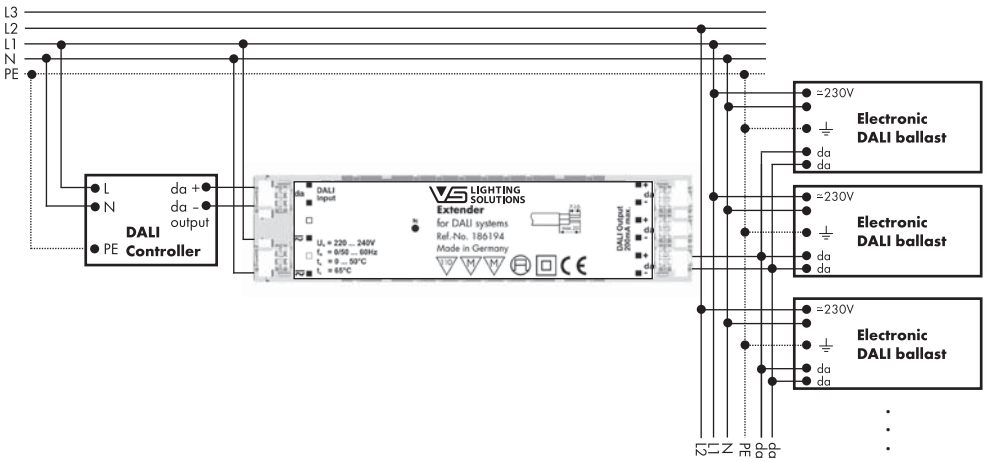
Installation instructions

- 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).

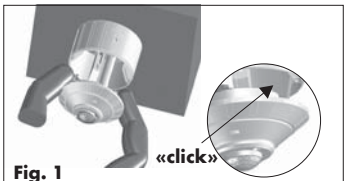


Fig. 1

Fig. 2

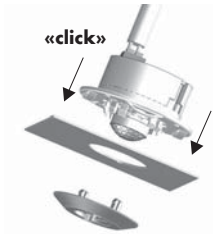
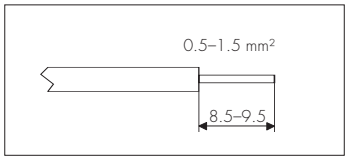


Fig. 3

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** 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.

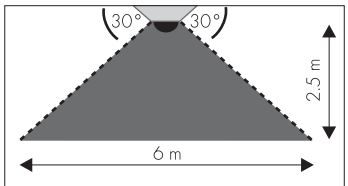
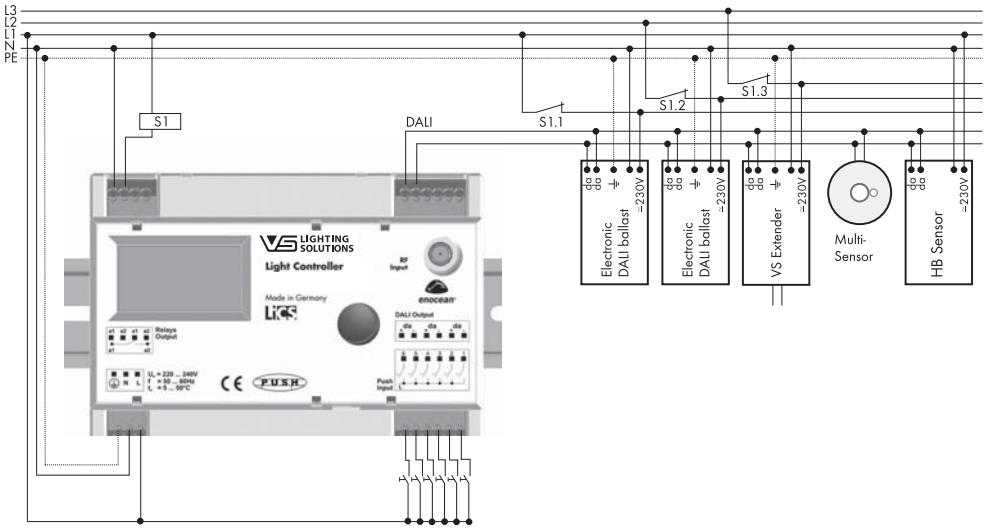


Fig. 4

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

Installation instructions

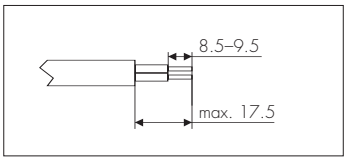
- To protect the device, please use a Type B circuit breaker (10 A or 16 A).
- Conductor cross-section of all terminals: 0.5–1.5 mm² for both rigid and flexible conductors
- Preparation of the sensor cables (see on the right)
- As a standard DALI bus is not SELV-compliant, cables must be rated for mains 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 MovementSensor
in meters (sensor leads on the left side)

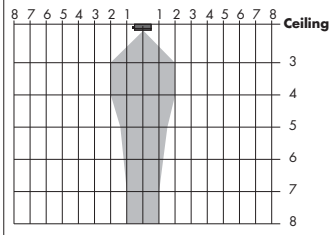


Fig. 1

Wall mounting:
Sensing range MovementSensor
in meters (sensor connections on bottom side)

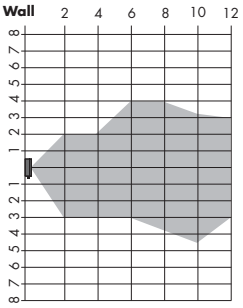


Fig. 2

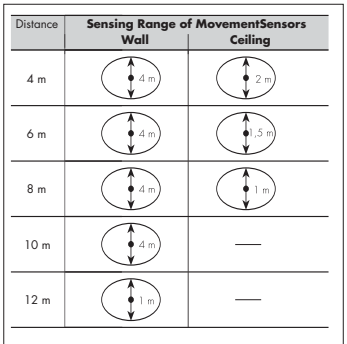
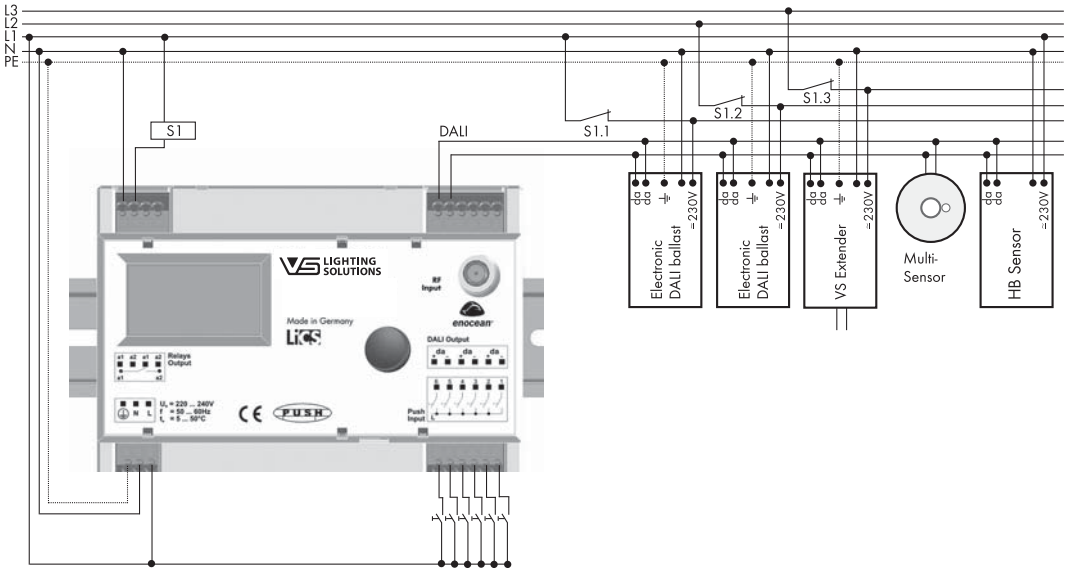


Fig. 3

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

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:

	1.5 mm²	1 mm²	0.75 mm²	0.5 mm²
6.2 Ω max.	300 m	180 m	130 m	80 m

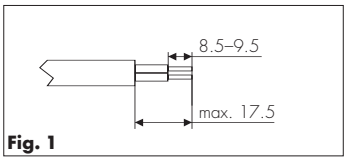
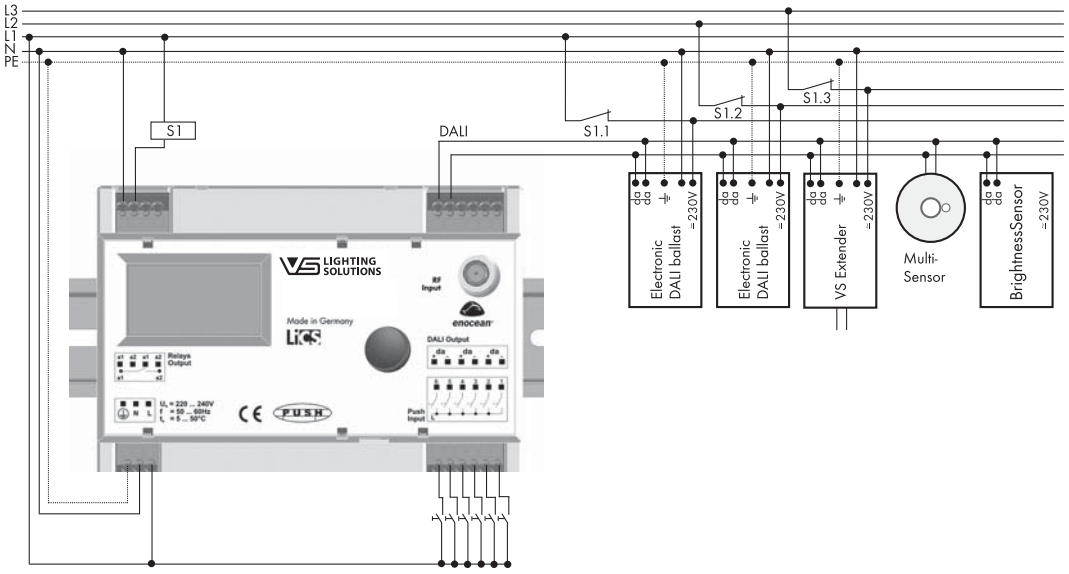


Fig. 1

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**
- 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

Targeted use of light and optimisation of maintenance processes

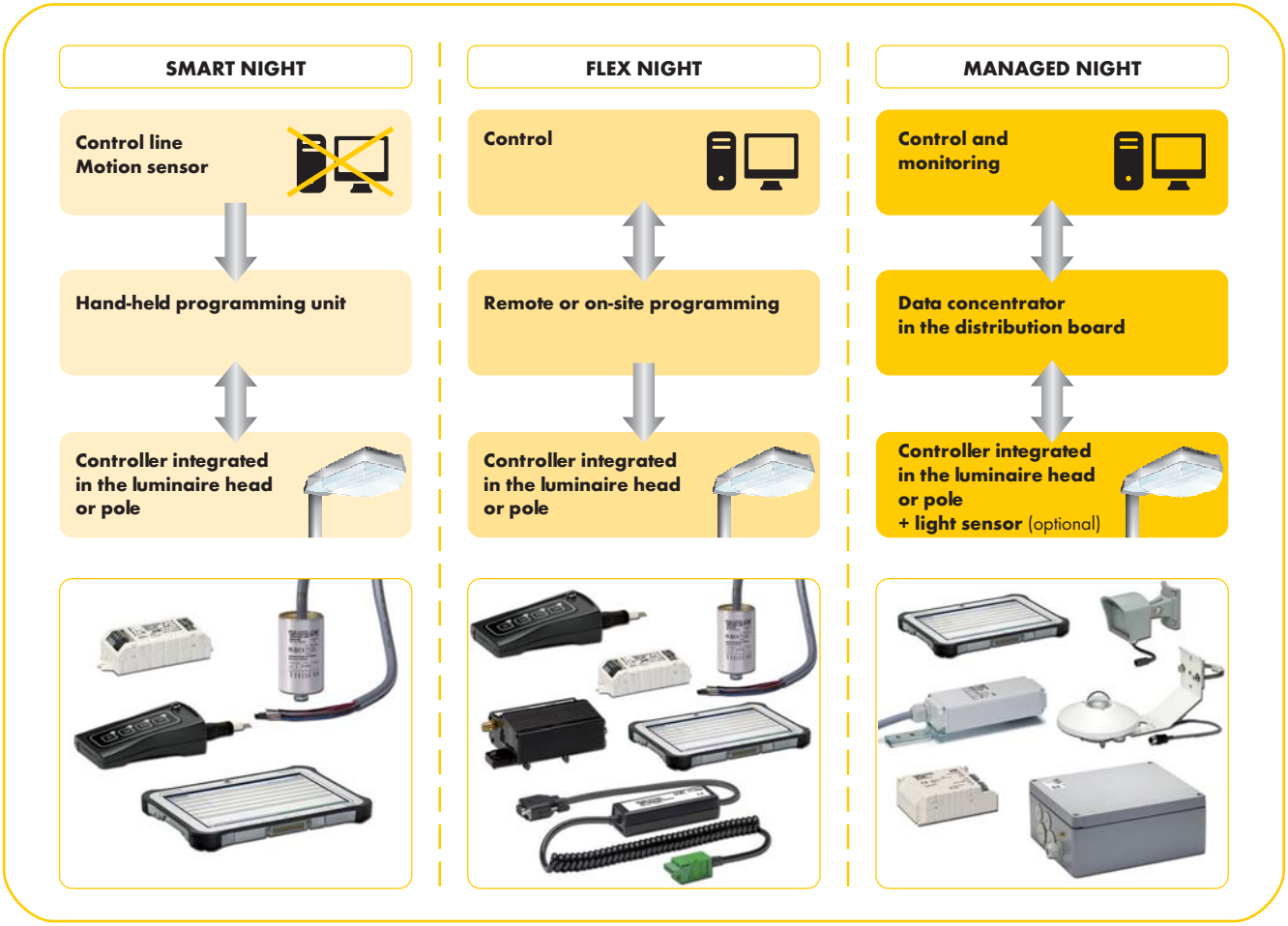
Vossloh-Schwabe's LiCS Outdoor system makes it possible to dim individual luminaires or entire luminaire groups. Depending on the requirements, the degree to which the lighting level is dimmed can be sensor-controlled or can comply with a preset level; the burn-in periods of discharge lamps can also 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.



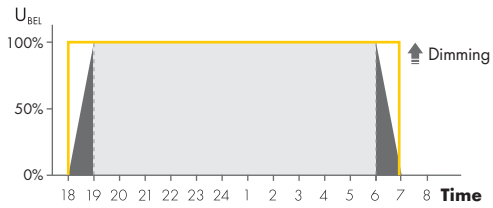
Vossloh-Schwabe's LiCS Outdoor System is based on mature system technology that has already proved itself in millions of applications around the world in the most diverse of areas.

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.

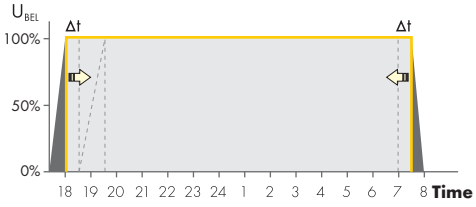
DOO (Dimmed ON/OFF)

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.

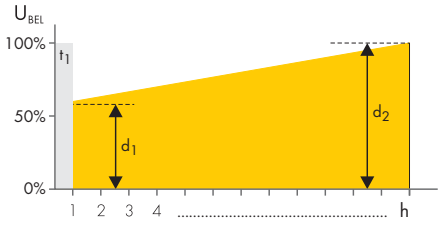


BBT (Burn-in Block Time)

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).

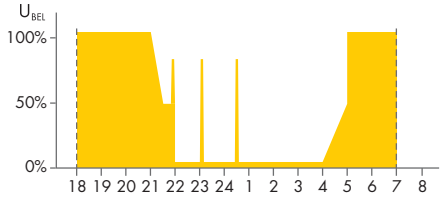
MFF (Maintenance Factor Function)

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

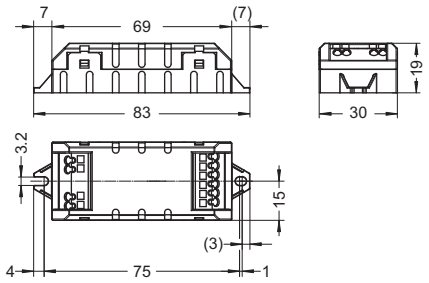
These light controllers were specifically designed for independent operation to enable control of street lighting or lighting close to buildings.

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.

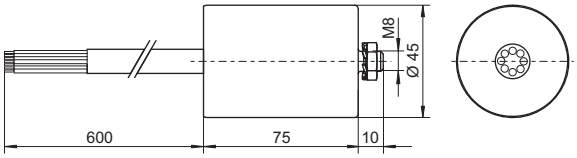
The control input LST can be used to connect a control phase, a motion detector, a key switch or a light sensor, but can also be used to receive simple data protocols.

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. 262)

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
iMCU IP20	**186558**	220–230, 60	< 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
iMCU IP67	**186559**	220–230, 60	< 500	230	4	9-core lead, 600 mm	250

iCTI – intelligent Hand-held Operating Device

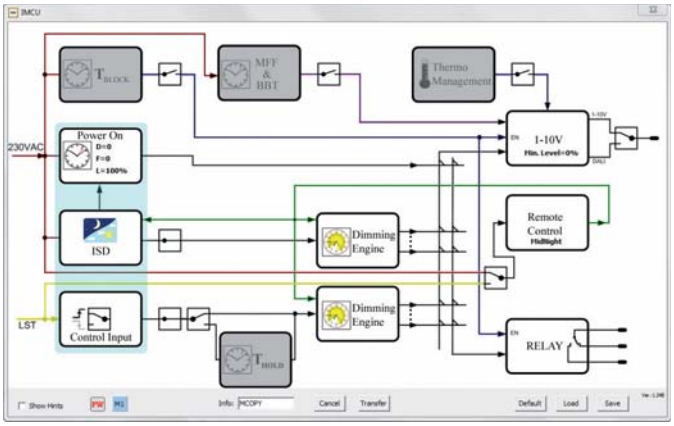
For subsequent controller configuration

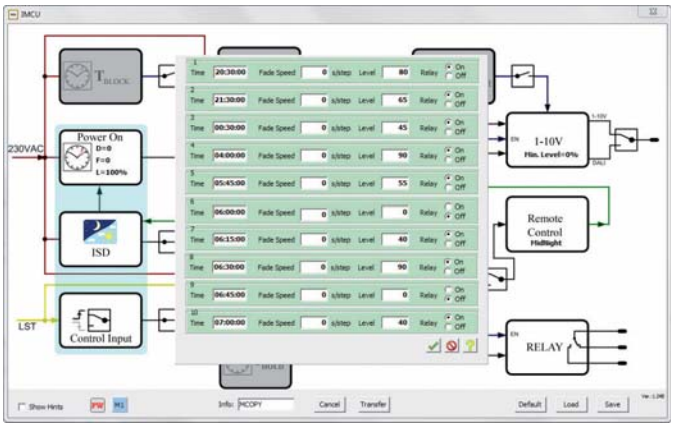
The iCTI features 4 memory cells for different lighting situations.

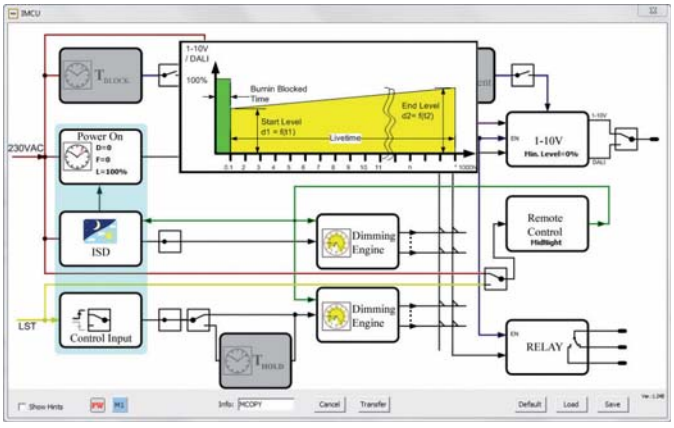
Standard connection: USB 2
OS: upgradeable firmware
The continually updated programming software can be downloaded at www.vossloh-schwabe.com
Dimensions (LxWxH): 180x65x40 mm
Weight: 0.2 kg
Ref. No.: 186246

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
Ref. No.: 186392 iCTI-USB

iCTI **iCTI-USB**







iCTT – intelligent Configuration Technician Tool

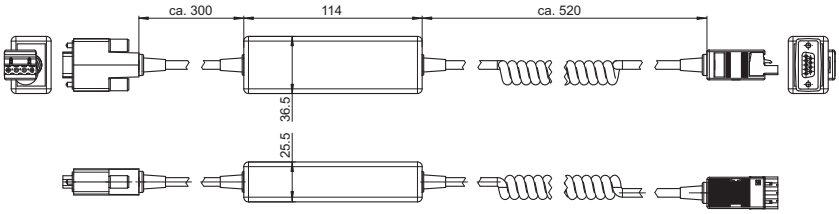

iCTT

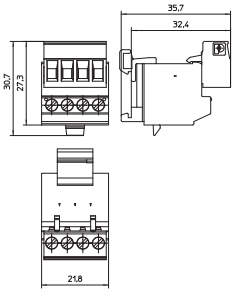
For subsequent configuration of lighting scenes

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): 114x36.5x25.5 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
Connection to a laptop/PC:
RS-232 One DB9 male (Standard EIA),
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.

Technical notes

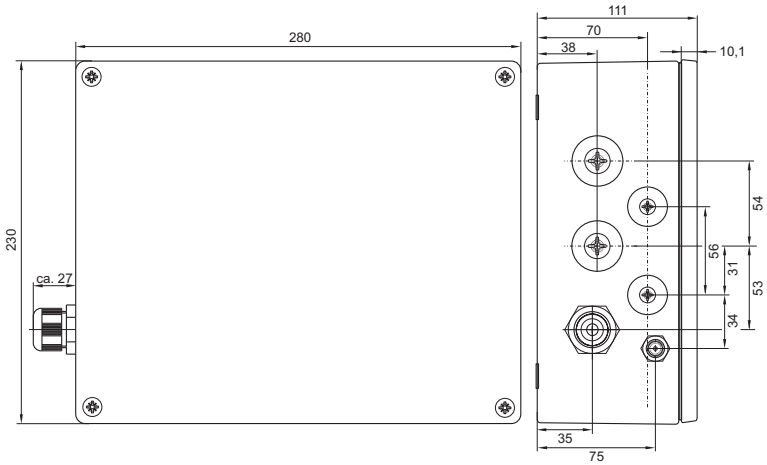
Operating temperature: –20 to 50 °C
Storage temperature: –25 to 75 °C
Humidity during operation: 5–75%
Protection class I
1 relay contact: potential-free (input, opener, closing contact)
Material: aluminium AlSi12 (Fe)
Drill holes for cables for iMICO-BI:
- 2 PG metric fittings (25x1.5 mm)
- 2 PG metric fittings (32x1.5 mm)
- 1 PG metric fittings (20x1.5 mm)
- 1 fixing hole for antenna connection

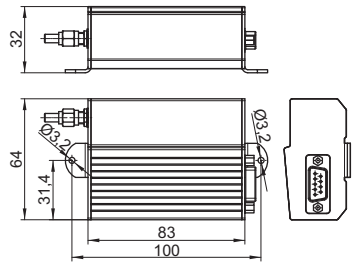
Interfaces

Transmission: mobile phone network, requires Quad band SIM card
Protocols: SMS, GPRS
Internal modem: Telit 862
Internal and external antenna: MMCX

iMICO BI – incl. transformer and relay, completely pre-wired

iMICO – single controller without transformer and relay





Type	Ref. No.	Voltage AC V, Hz	Max. switching output A/V	Overvoltage protection kV	Degree of protection	Dimensions (LxWxH) mm	Weight g
iMICO-BI	**186250**	220–230, 50	16/250	4	IP65	280x230x111	4400
iMICO	**186240**	220–230, 50	–	2	IP20	83x64x32	450

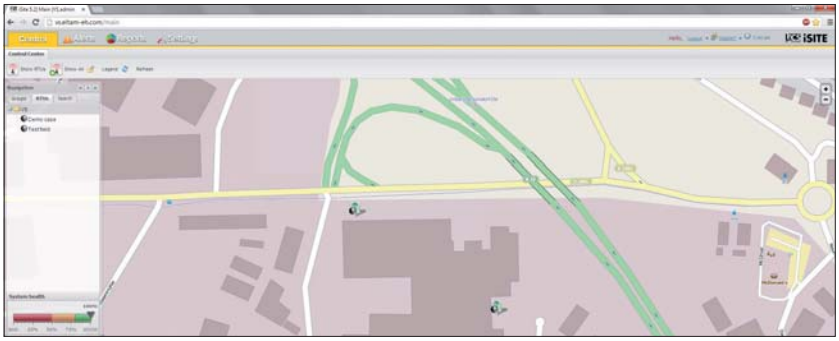
iSITE MidNight – intelligent Configuration Software

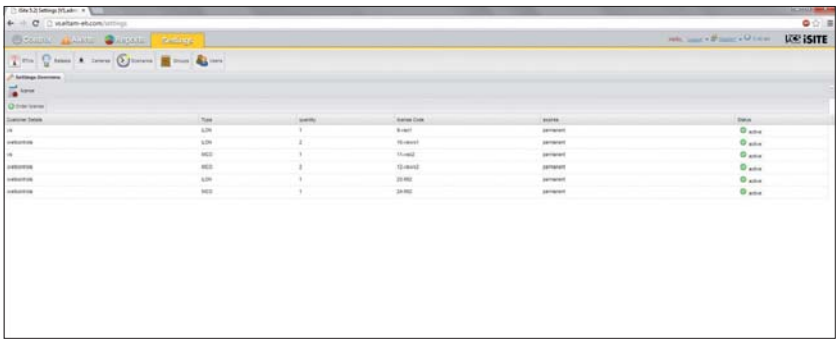
For programming lighting situations using iMICO

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 luminaires to be reprogrammed with new lighting profiles. The server-based supports Windows Server operating 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

LiCS OUTDOOR

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).

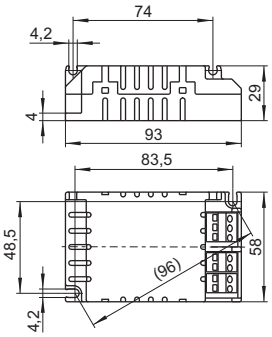
iLC can be used as independent control unit in a light management system. The controller is integrated into a LON power-line light management system that requires a network connection to a central module (iDC).

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): 93x58x29 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

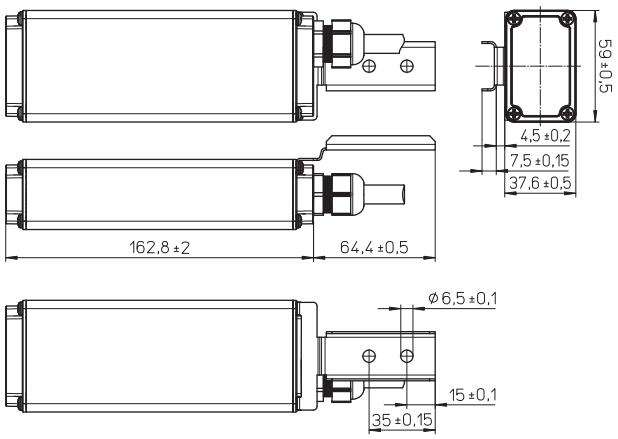
● DPC ● MFF ● ISD ● DOO
● BBT ● LST ○ RCR
(s. p. 262)

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	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 269.

iPC – intelligent Pole Controller



Technical notes

Dimensions (LxWxH): 227.2 x 59 x 37.6 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: IP65

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. 262)

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	Controller	**186234**	110–230	< 1	230	230	4	360
iPC-Lux	iLUX light sensors	**186235**	110–230	< 1	230	230	4	360
iPC-RC	ripple-control sound frequency**	**186236**	110–230	< 1	230	230	4	360
iPC-HFS	iHFS high frequency sensor	**186357**	110–230	< 1	230	230	4	360

** Protocols on request
* Optionally available with a second switching output 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): 280x230x111 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

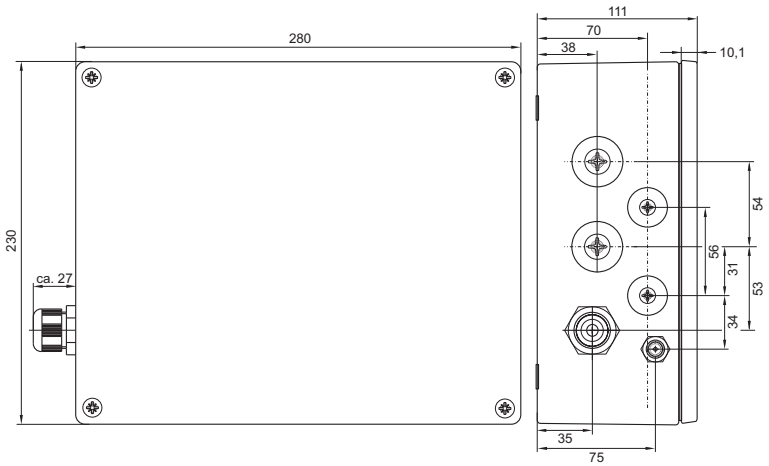
iDC – intelligent Data Concentrator

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-R	**186546**	230±10%, 50±1%	7	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 273)			

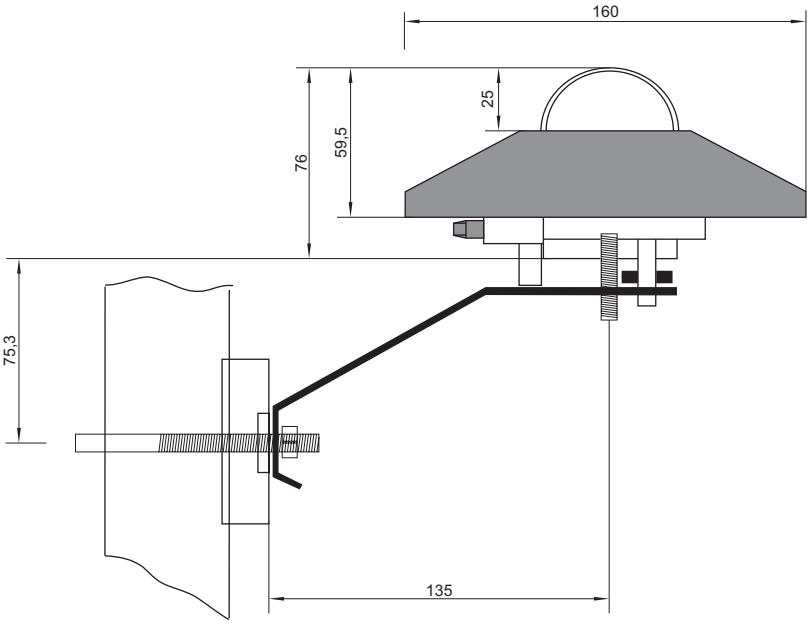
iLUX – intelligent Lux Meter with Power-line Interface

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

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 270

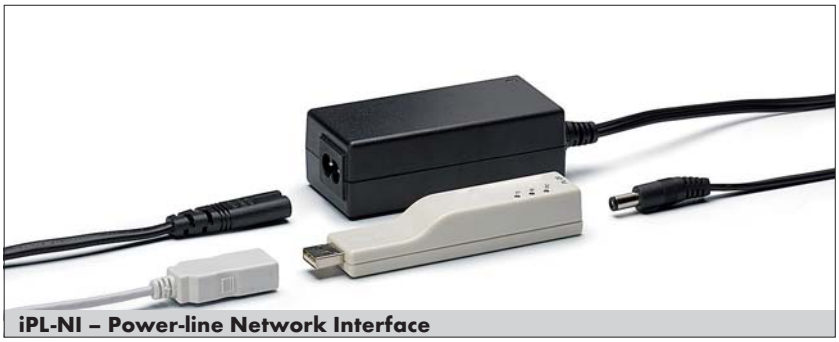
Typical applications

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 Power-line 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 – Power-line Network Interface

LiCS OUTDOOR

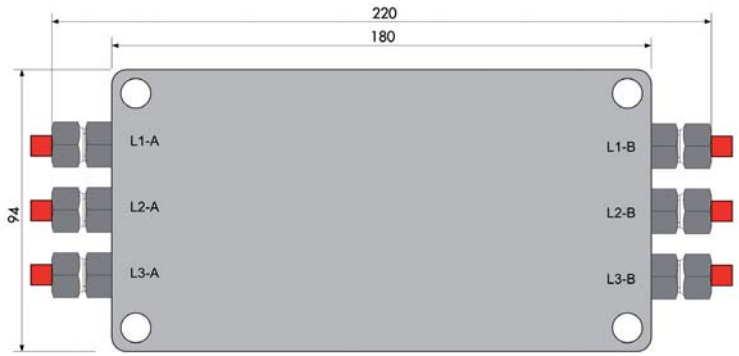
iCCU – intelligent, Capacitive Coupling Unit

Intelligent, capacitive coupling unit for power-line communication.
Power-line 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

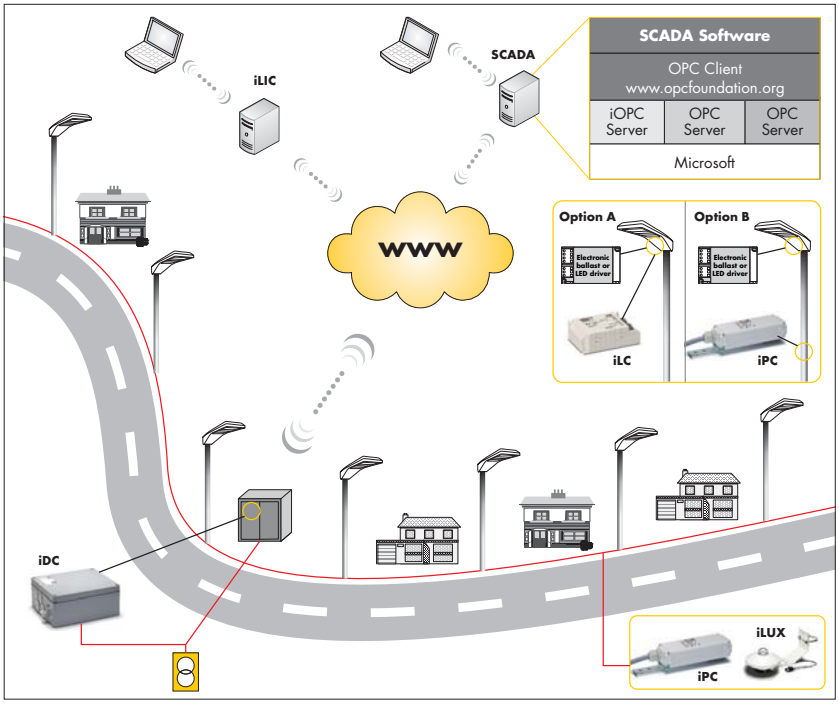
- Server: state-of-the-art
- Memory RAM: 4GB
  Memory HD: 2TB
- CPU: min. Dual Core, depending on the scope of the project
- Operating system: XP, Windows 7, Linux, Distribution, VM operation is possible
- Data security: min. RAID 1 recommended RAID 5

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. 270)
Dimensions (LxWxH): 83x75x67 mm
plus holder
Operating temperature: -20 to 70 °C
HF technology: 5.8 GHz
Cable length: 10 m

iHFS

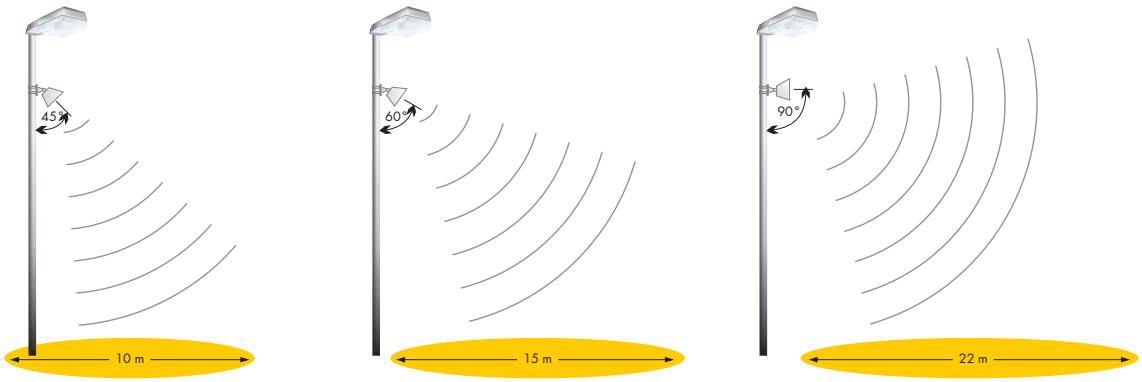
Installation

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 (LxWxH): 270x188x9 mm
Weight: approx. 1.1 kg
Ref. No.: 186251

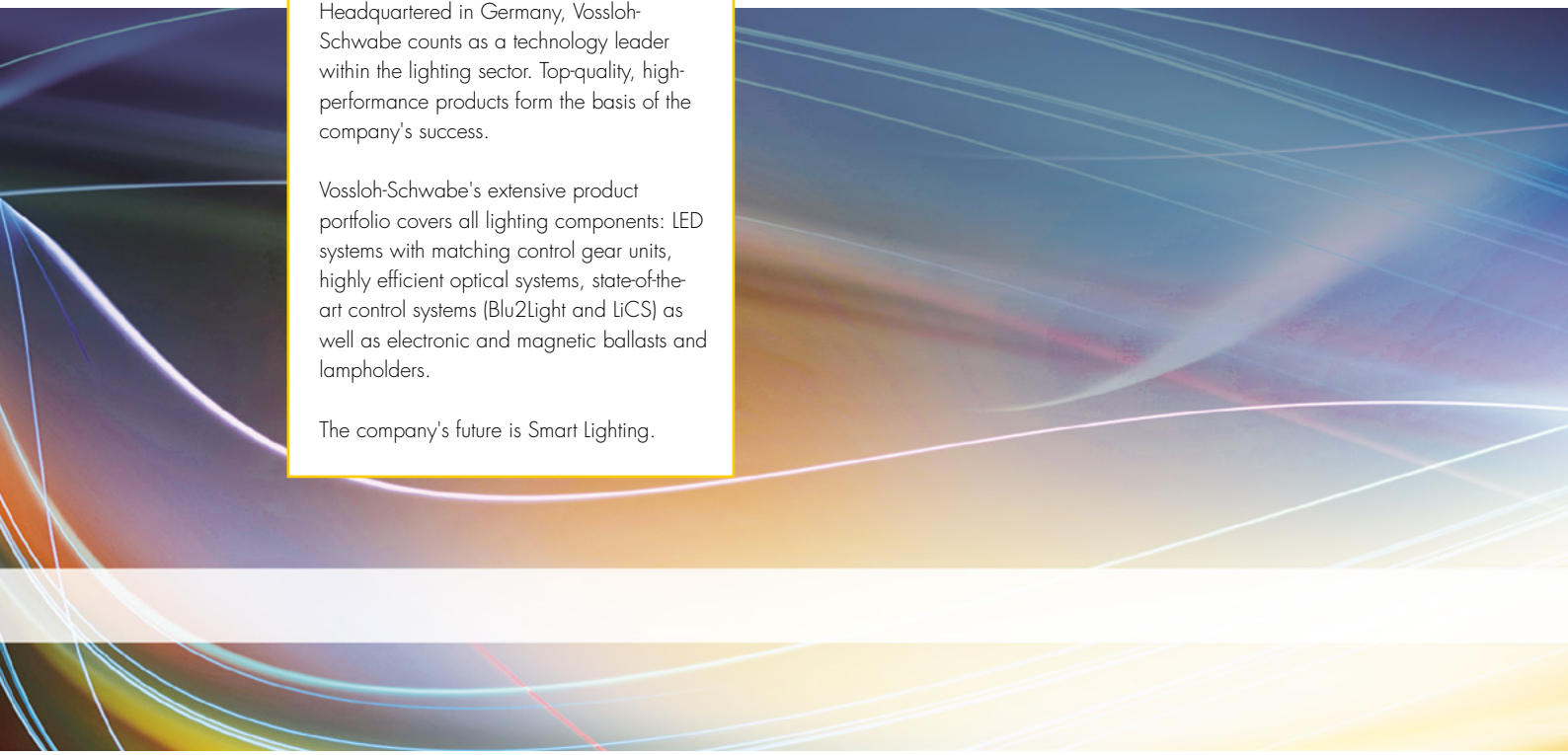
Further details can be found under:
business.panasonic.co.uk/computer-product/toughpad/fz-g1

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 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, highly efficient optical systems, state-of-the-art control systems (Blu2Light and LiCS) as well as electronic and magnetic ballasts and lampholders.

The company's future is Smart Lighting.



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