LED HORTICULTURE KIT

WU-M-600-HORTICULTURE

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WU-M-600-Horticulture

The greenhouse lighting version, derived from our successful Industry Kit platform, offers the same benefits as the standard version.

- 2 different power levels available (MP and HP)
- 6 different spectra available
- 4 different optics available (Extra Wide 110°, Wide 60°, Wide 90°, High Rack) with integrated IP65 protection
- Module with high LED density for a compact luminaire assembly
- Custom spectral designs on request

Typical fields of application

- Greenhouses
- Toplight
- Replacement for HPS/MH
- Vertical Farming
- Shelving systems

LED Horticulture Kit

- **HIGHLY EFFICIENT: UP TO 185 µmol/S OR 2,9 µmol/J**
- **FLEXIBLE LIGHT DISTRIBUTION THROUGH THREE DIFFERENT ATTACHMENT OPTICS**
- **MATCHING HEATSINKS AVAILABLE**

LIGHTING SOLUTIONS

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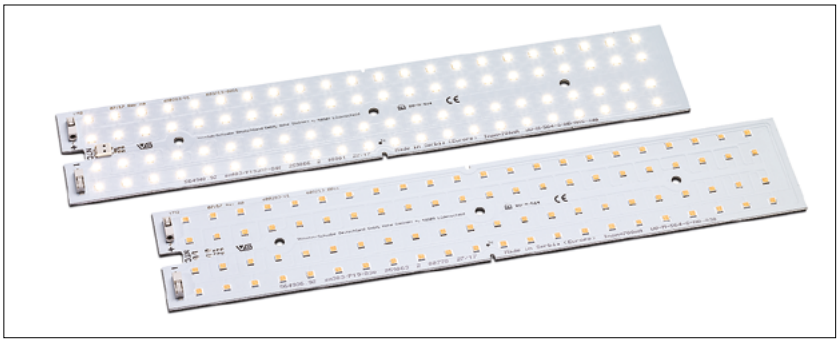
LED Horticulture Kit



Technical Notes

- LED built-in module for integration into luminaires
- 88 high-efficiency LEDs
- Matching optics (IP65) and heat sinks available
- Dimensions (without optics): 289x55x6 mm
- Operating current: up to 1400 mA (HP), 700 mA (MP)
- On-board plug-in terminals
- Beam angle (without optics): 120°

Spectra

Additional information

Electrical Characteristics

at t_p = 50 °C

MP Types	LEDs	Typ. voltage DC					Temperature	Typ. power consumption				
		350 mA	500 mA	700 mA	1050 mA	1400 mA	coefficient	350 mA	500 mA	700 mA	1050 mA	1400 mA
		V	V	V	V	V	mV/K	W	W	W	W	W
16B72R MP	88	45,6	47,2	49,0	N/A	N/A	–29,2	16,0	23,6	34,3	N/A	N/A
16B52R20FR MP	88	44,8	46,3	48,1	N/A	N/A	–28,0	15,7	23,1	33,6	N/A	N/A
72R16W850S2 MP	88	45,4	46,8	48,5	N/A	N/A	–29,1	15,9	23,4	34,0	N/A	N/A
60R12FR16W850S2 MP	88	44,9	46,3	48,0	N/A	N/A	–28,4	15,7	23,1	33,6	N/A	N/A
24R64W840S2 MP	88	55,9	57,4	59,3	N/A	N/A	–25,7	19,6	28,7	41,5	N/A	N/A
12R12FR64W850S2 MP	88	55,2	56,7	58,5	N/A	N/A	–25,0	19,3	28,4	41,0	N/A	N/A

HP Types	LEDs	Typ. voltage DC					Temperature	Typ. power consumption				
		350 mA	500 mA	700 mA	1050 mA	1400 mA	coefficient	350 mA	500 mA	700 mA	1050 mA	1400 mA
		V	V	V	V	V	mV/K	W	W	W	W	W
16B72R HP	88	43,8	45,0	46,4	48,6	50,7	–31,7	15,3	22,5	32,5	51,1	71,0
16B52R20FR HP	88	42,8	43,8	45,1	47,2	49,1	–30,1	15,0	21,9	31,6	49,6	68,7
72R16W850S2 HP	88	43,9	45,1	46,6	48,9	50,0	–30,4	15,4	22,6	32,6	51,4	70,0
60R12FR16W850S2 HP	88	43,2	44,4	45,8	48,1	50,1	–29,4	15,1	22,2	32,1	50,5	70,1
24R64W840S2 HP	88	55,3	56,7	58,5	61,4	64,0	–26,1	19,4	28,4	41,0	64,5	89,6
12R12FR64W850S2 HP	88	54,6	56,0	57,7	60,5	62,9	–29,4	19,1	28,0	40,4	63,5	88,1
12R12FR64W830S2 HP	88	54,6	55,9	57,5	60	62,4	–29,4	19,2	28	40,3	63	87,4

Voltage and power consumption tolerance: ± 10%

Use of external LED constant current driver required.

Maximum Ratings

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

Types	Operating current	Operation temperature range at t_c point		Storage temperature range		Max. allowed repetitive peak current
	mA	°C min.	°C max.	°C min.	°C max.	mA
MP-Typen	≤ 700 mA	–30	+85	–30	+85	1000
HP-Typen	≤ 1400 mA	–30	+85	–30	+85	1600

Operating Life

L70/B10: 50.000 hrs. at t_p/t_c = 85 °C with max. operating current

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Optical Characteristics at t_p = 50 °C; without secondary optics

MP Types	Ref. No.	Colour	Correlated colour temperature K	Operating current mA	Photon flux and typ. efficiency* µmol/s	µmol/J	Typ. luminous flux* (lm) and typ. efficiency (lm/W) lm	lm/W	CRI
16B72R MP	**569780**	pink	N/A	350	37	2,3	360	23	N/A
				500	52	2,2	505	21	
				700	71	2,1	685	20	
16B52R20FR MP	**569781**	pink	N/A	350	36	2,3	290	18	N/A
				500	50	2,2	400	17	
				700	69	2,0	545	16	
72R16W850S2 MP	**569782**	pinkish white	1.950	350	38	2,4	1025	65	50
				500	54	2,3	1435	61	
				700	75	2,2	1960	58	
60R12FR16W850S2 MP	**569783**	pinkish white	2.150	350	38	2,4	981	62	50
				500	53	2,3	1374	59	
				700	73	2,2	1879	56	
24R64W840S2 MP	**569784**	white	3.600	350	50	2,6	2980	152	90
				500	70	2,4	4165	145	
				700	95	2,3	5675	137	
12R12FR64W850S2 MP	**569785**	white	4.800	350	49	2,6	2980	154	85
				500	69	2,4	4170	147	
				700	95	2,3	5680	139	
HP Types	**Ref. No.**	Colour	Correlated colour temperature K	Operating current mA	Photon flux and typ. efficiency* µmol/s	µmol/J	Typ. luminous flux* (lm) and typ. efficiency (lm/W) lm	lm/W	CRI
16B72R HP	**569786**	pink	N/A	350	43	2,8	495	32	N/A
				500	61	2,7	700	31	
				700	85	2,6	965	30	
				1050	126	2,5	1410	28	
				1400	167	2,4	1865	26	
16B52R20FR HP	**569787**	pink	N/A	350	41	2,7	385	26	N/A
				500	59	2,7	545	25	
				700	81	2,6	755	24	
				1050	120	2,4	1100	22	
				1400	159	2,3	1420	21	
72R16W850S2 HP	**569788**	pinkish white	1.650	350	44	2,9	1150	75	40
				500	63	2,8	1620	72	
				700	87	2,7	2225	68	
				1050	129	2,5	3210	62	
				1400	170	2,4	4155	59	
60R12FR16W850S2 HP	**569789**	pinkish white	1.800	350	43	2,8	1075	71	45
				500	61	2,7	1515	68	
				700	85	2,7	2080	65	
				1050	125	2,5	3010	60	
				1400	165	2,4	3865	55	
24R64W840S2 HP	**570048**	white	3.500	350	52	2,7	3030	157	94
				500	73	2,6	4240	149	
				700	100	2,4	5775	141	
				1050	144	2,2	8270	128	
				1400	185	2,1	10605	118	
12R12FR64W850S2 HP	**570049**	white	4.700	350	52	2,7	3030	159	89
				500	73	2,6	4240	151	
				700	100	2,5	5770	143	
				1050	144	2,3	8290	130	
				1400	185	2,1	10565	120	
12R12FR64W830S2 HP	**607167**	weiß	2.875	350	49	2,5	2736	142,5	89
				500	69	2,5	3829	136,8	
				700	94	2,3	5216	129,4	
				1050	136	2,2	7482	118,8	
				1400	175	2,0	9563	109,4	

* Production tolerance of photon flux and luminous flux: ±10 %, calculated in the range 280-800 nm | Effectiveness values calculated from typical values

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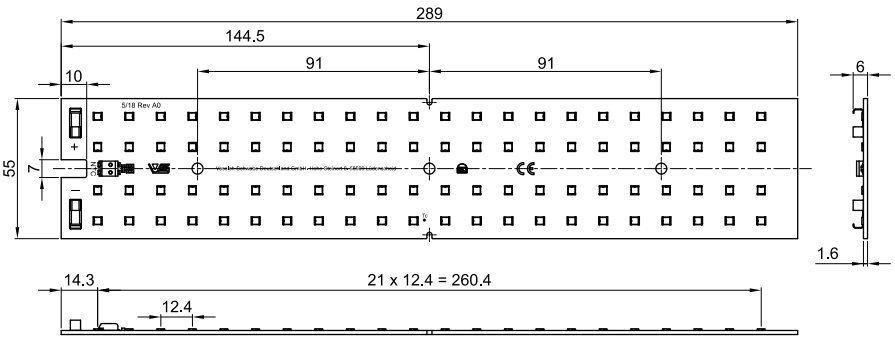
Spectral Characteristics at t_p = 50 °C

MP-Types	Spectral distribution related to µmol/s				Ratios		
	Blue 400–500 nm	Green 500–600 nm	Red 600–700 nm	Far red > 700 nm	Blue – Red	Blue – Green	Red – Far red
16B72R MP	24%	0%	76%	0%	1 : 3.2	N/A	N/A
16B52R20FR MP	24%	0%	58%	17%	1 : 2.4	N/A	1 : 0.3
72R16W850S2 MP	6%	13%	80%	1%	1 : 12.7	1 : 2	N/A
60R12FR16W850S2 MP	6%	13%	70%	10%	1 : 10.9	1 : 2	1 : 0.1
24R64W840S2 MP	15%	38%	45%	2%	1 : 3.1	1 : 2.6	N/A
12R12FR64W850S2 MP	20%	39%	33%	8%	1 : 1.7	1 : 2	1 : 0.2

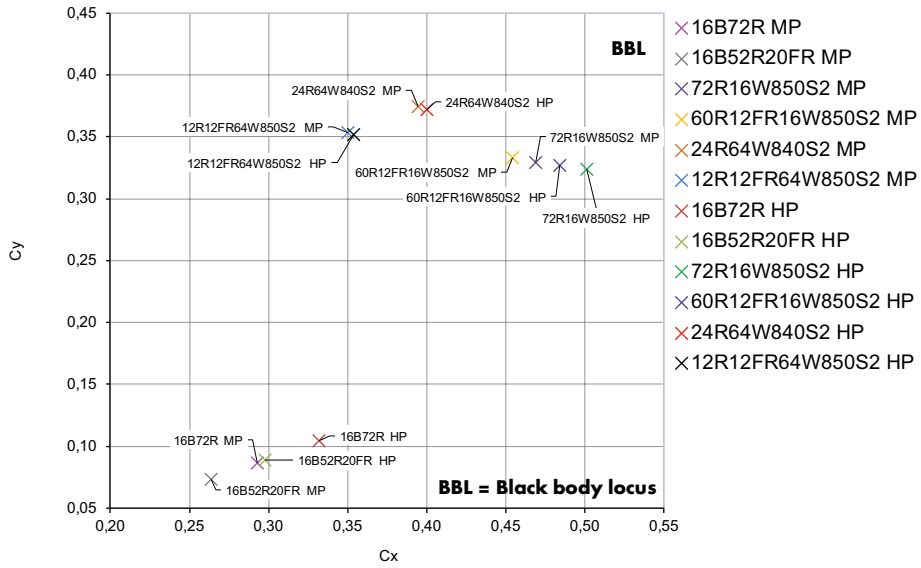
HP-Types	Spectral distribution related to µmol/s				Ratios		
	Blue 400–500 nm	Green 500–600 nm	Red 600–700 nm	Far red > 700 nm	Blue – Red	Blue – Green	Red – Far red
16B72R HP	21%	0%	79%	0%	1 : 3.8	N/A	N/A
16B52R20FR HP	22%	0%	61%	17%	1 : 2.8	N/A	1 : 0.3
72R16W850S2 HP	5%	11%	83%	1%	1 : 15.5	1 : 2	N/A
60R12FR16W850S2 HP	6%	11%	73%	10%	1 : 13.1	1 : 2	1 : 0.1
24R64W840S2 HP	14%	36%	48%	2%	1 : 3.4	1 : 2.6	N/A
12R12FR64W850S2 HP	19%	38%	33%	10%	1 : 1.8	1 : 2	1 : 0.3
12R12FR64W830S2 HP	12%	36%	42%	9%	1 : 3,5	1 : 3	1 : 0,2

* All charcteristics shown are for reference only and will not be guaranteed.

Dimensions SMD-Board



Bins



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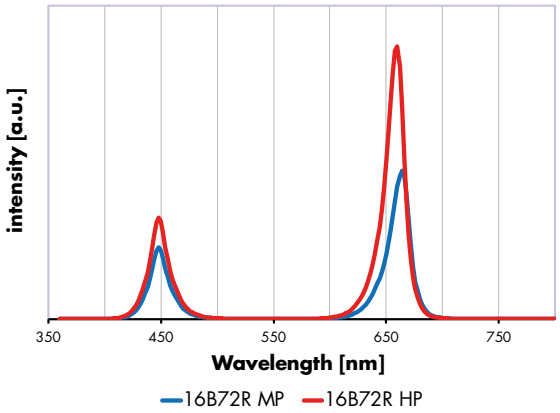
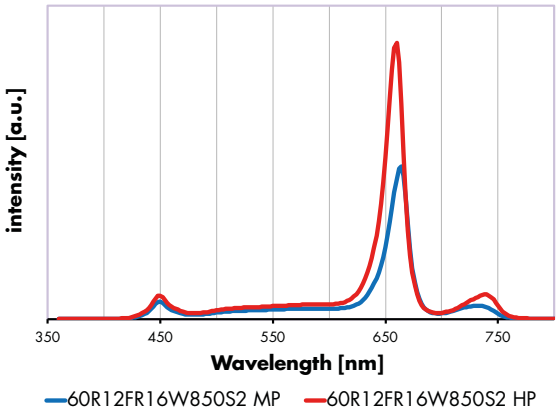
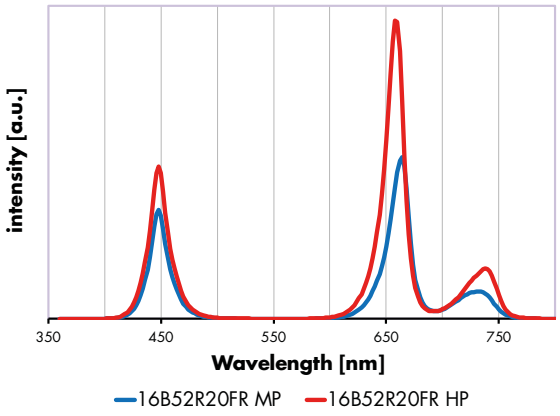
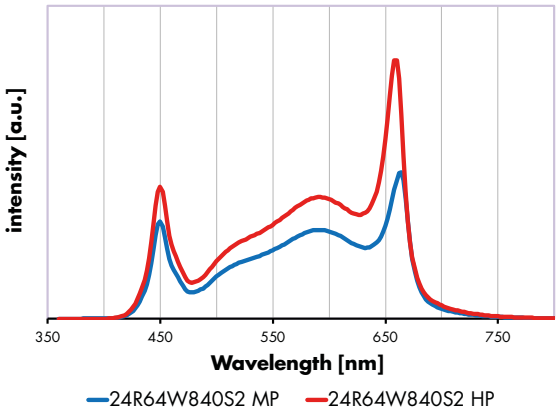
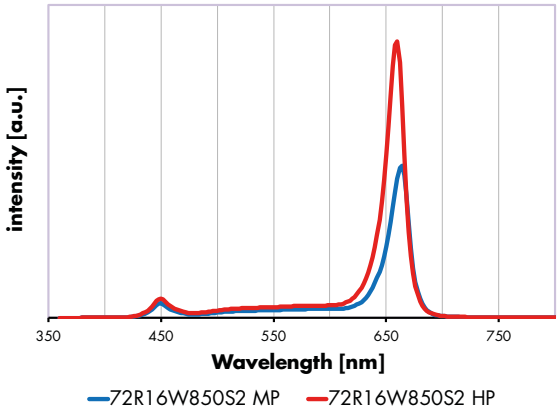
Typ. Light Distribution Curves

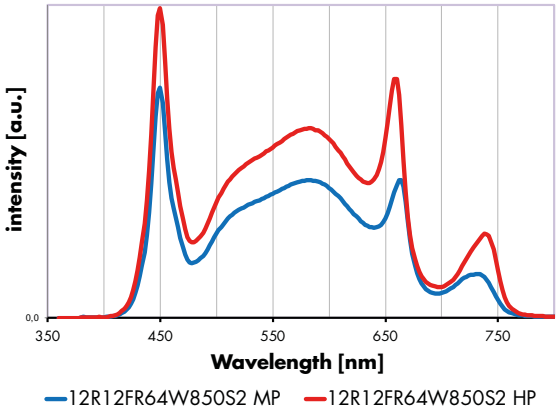


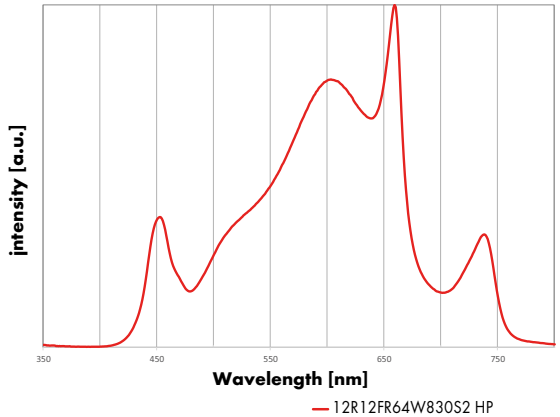












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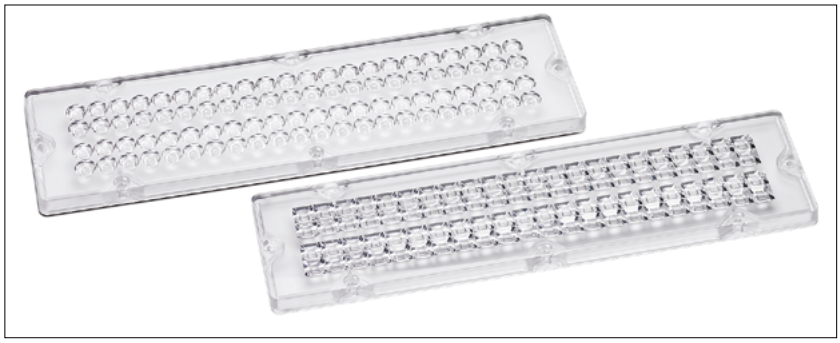
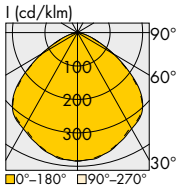
Linear optics 4R for SMD W5.5 Horticulture 88 single lenses 318mm IP65



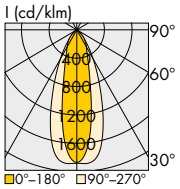
Technical Notes

- Brilliant light distribution and surfaces
- Highly efficient up to 92%
- Material: PC, transparent
- Suitable for luminaires with impact rating IK08/5J
- Degree of protection: IP65 (incl. silicone gasket)
- Dimensions (LxWxH): 318x84x11.75 mm
- Max. allowed temperature: 100 °C
- Fixing holes for M4 screws

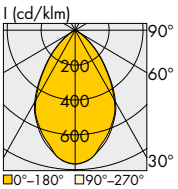
Light distribution	Optics type	**Ref. No.**	Efficiency %	Weight g
Wide 60°	97600	**565228**	92	190
Wide 90°	97601	**565229**	92	178
High Rack	97602	**565230**	92	173
Extra Wide 110°	97603	**571732**	92	178



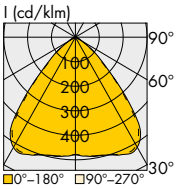
Extra Wide 110°



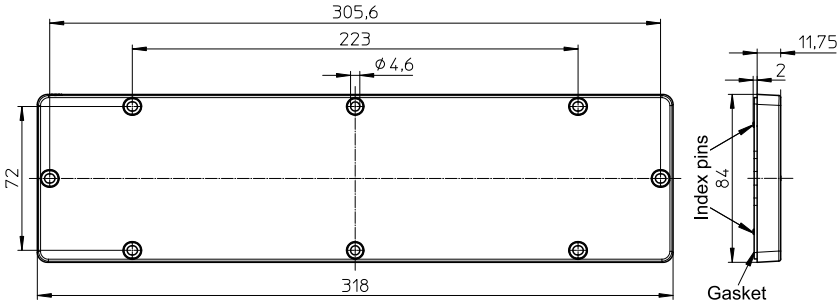
High Rack



Wide 60°



Wide 90°



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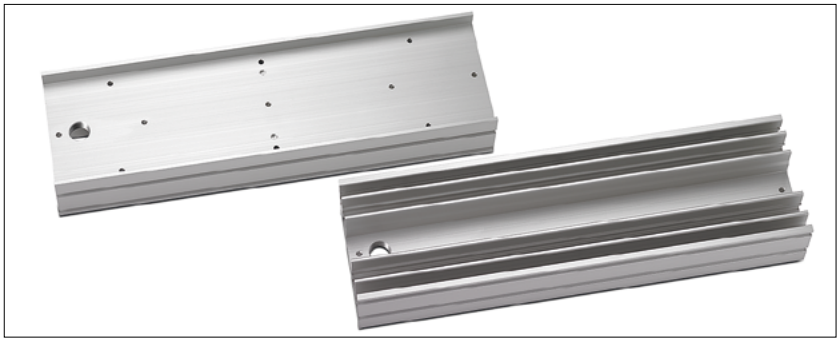
Heat Sink

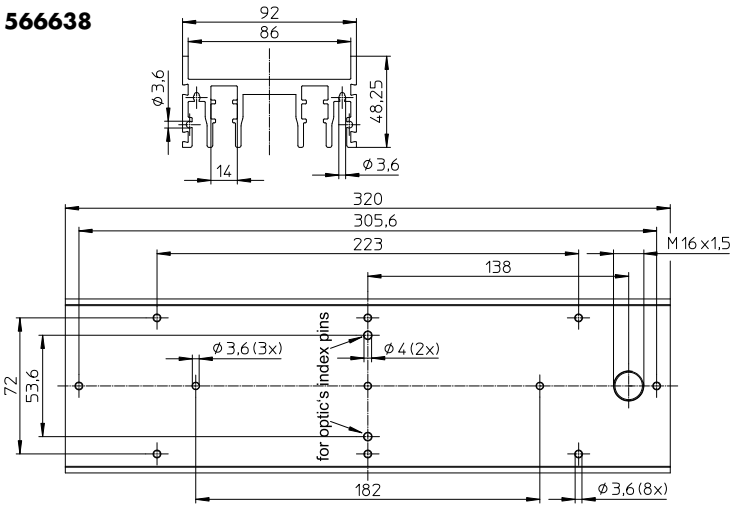
For LED Horticulture Kit
Under no circumstances may heat sinks ever be covered by insulation material or similar. Air ventilation must be ensured.

Technical Notes for Heat Sink
Material: aluminium EN AW-6060 (AlMgSi 0,5) T66 anodized
Fixing holes for PCB: for self-tapping screws M4, screw length: 6 mm
Fixing holes for optics: for self-tapping screws M4, screw length: 12 mm
2 additional blind holes for holding the index pins of the optics for easier positioning of the optics on the heat sink
Centrally located cable bushing with an M16x1,5 thread for an IP65 cable gland



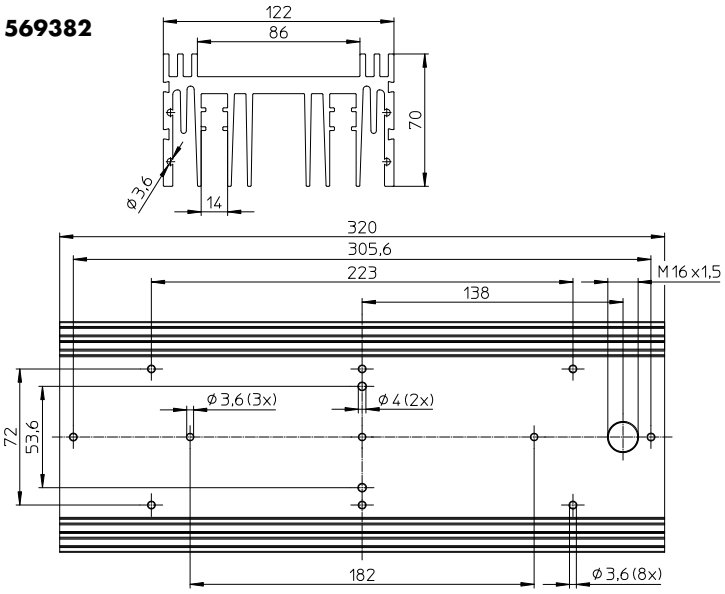
Heat sink optimized for operating currents
MP-Type
at max. ambient temperature t_a 50 °C
Dimensions (LxWxH): 320x92x48.25 mm
Weight: 1050 g, Packaging unit: 1 pcs.
Ref. No.: 566638

566638



Heat sink optimized for operating currents
HP-Type
at max. ambient temperature t_a 50 °C
Dimensions (LxWxH): 320x122x70 mm
Weight: 2260 g, Packaging unit: 1 pcs.
Ref. No.: 569382

569382



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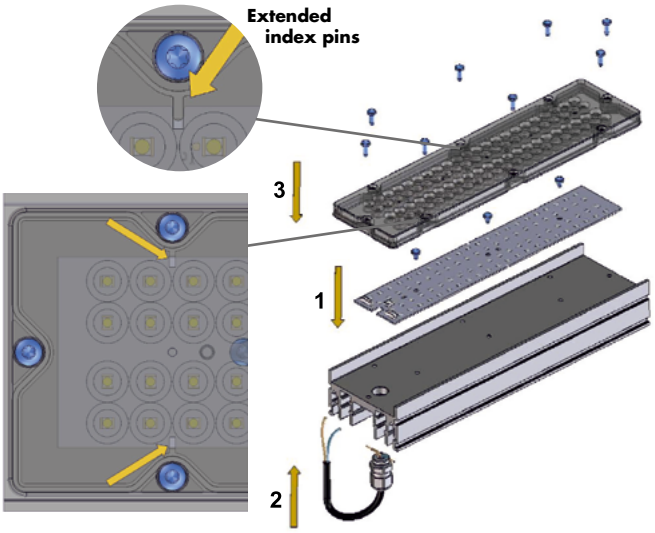
Installation Instructions for Industry Kit



Step 1
The LED PCB must be placed on and fixed to the heat sink. Please only ever use flat-headed M4x6 screws.
Maximum torque on screws: 1.4 Nm

Step 2
Establish electrical contact by feeding the stripped leads through the screw hole of the PG port and inserting them into the push-in terminals of the LED PCB. Correct polarity must be ensured when establishing a connection to the LED driver.

Step 3
Now place the optics on the PCB and apply pressure to the middle of the optics to that all the ribs in the middle and the end of the optics align with the spaces in the LED PCB. After first tightening the two M4x12 screws in the middle of the optics, attach the optics itself to the heat sink using six M4x12 screws.
Torque on screws: 0.8–1 Nm for M4x12 self-cutting screws in accordance with DIN 7500. With regard to the heat sink, the permissible torque may differ depending on the screw used and the the kind of borehole.

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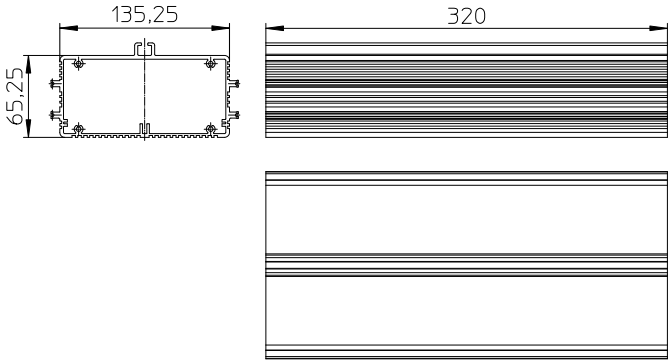
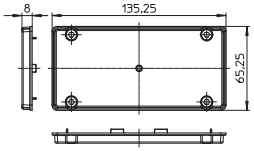
Accessories for LED Horticulture Kit

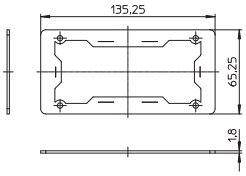
Driver Box
Casing for a driver and fixing the installed Industry Kit Assembly Unit
Material: aluminium EN AW-6060 T66
Dimensions: 320x149.25x65.25 mm
(other casing lengths on request)
Weight: 1080 g
Packaging unit: 1 pcs.
Ref. No.: 567836



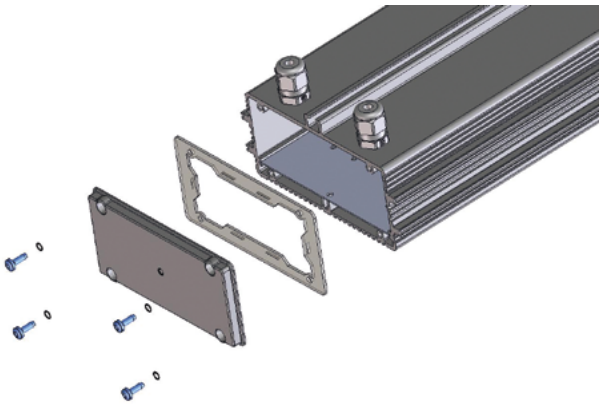
End Cap
For lateral closure of the driver box
Material: PC
Dimensions: 135.25x65.25x8 mm
Fixation: 4 fixing holes for screws M4
Weight: 30 g
Packaging unit: 100 pcs.
Ref. No.: 566640



Gasket for End Cap
O-ring for degree of protection IP65
Material: silicone
Dimensions: 135.25x62.25x1.8 mm
Weight: 10 g
Packaging unit: 100 pcs.
Ref. No.: 566850



Mounting of end caps with gasket to the driver box



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

LIGHTING SOLUTIONS
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Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. The LED modules are designed for operation within a casing or luminaire. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains). The following advice must be observed; non-observance can result in the destruction of the LED assembly modules, fire and/or other hazards.

- Consider safety regulations acc. EN 60598 in the luminaire design, especially when the operating LED driver is not galvanic isolated.
  - In mode of operation regard to sufficient isolation.
  - Live parts must not be touched in operation mode. Danger in life!!!

- ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED modules. See VS's application notes on ESD protection.
- Adequate anti-static electricity measures, including the use of conductive shoes, ionizers, work bench grounding, wrist straps, flooring and stools should be used.
- LED assembly modules must not be subjected to any undue mechanical stress, e. g.:
  - do not treat as bulk cargo
  - avoid shear and compressive forces during handling and installation
  - do not damage circuit paths
  - avoid any pressure on the light emitting surface
- Safe operation only possible by the use of external constant current sources ($I_{max.}$ see table "Electrical Characteristics").
- Operation only with power supply units that feature the following protection:
  - Short-circuit protection
  - Overload protection
  - Overheating protection
- The module can be fixed with M4 screws. Fixation only with flat or cylinder head screws (M4) (no countersank screws)
  Max. torque: 1.2 Nm (M4)
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- Measurement tolerances:
  - luminous flux: ± 7%
  - voltage: ± 3%
  - CRI: ± 1
- The following points must be observed when connecting LED modules in parallel:
  - All LED strings that are wired in parallel must contain the same number of LEDs (symmetrical loading).
  - Owing to differing forward biases, there can be a difference of up to 10% in brightness between modules connected in parallel.
- Compliance with the maximum limit values must be ensured for each parallel strand.
- To ensure problem-free operation, the specified maximum temperature at the t_p point (see "Operating Life") must be observed (and measured in accordance with EN 60598-1). To satisfy this point, it may be necessary to put measures in place to ensure any heat is dissipated from the PCB to the environment.
- In the event of outdoor applications or applications in damp locations, care must be taken to protect LED assembly modules against humidity, splashes and jets of water. Any corrosion damage resulting from humidity or contact with condensation will not be recognised as a defect or manufacturing fault. LED assembly modules are not specially protected against foreign bodies or dust. Depending on the type of application, further protection must be ensured to prevent dust and foreign bodies from entering.
- Due to the manufacturing process, the PCBs of the LED assembly modules can have sharp edges and corners. Care must therefore be taken during handling and installation to avoid injury.
- For optimal load of used constant current driver the modules can only be connected in series. The quantity of LED modules is limited by the sum of forward voltage and the capacity of used constant current driver. Safety regulations acc. to EN 60598 has to be observed if the sum of forward voltage exceed the permitted touchable value.
- Operating LED modules in the presence of certain chemical substances or in chemically enriched (aggressive) environments can impair module functionality or even cause total module failure. Detailed information can be found in our "Chemical Incompatibility" PDF on our website www.vossloh-schwabe.com
- The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471
  Rating in accordance with IEC / TR 62778: risk group 2
  Note: Risk of eye injury! Avoid staring directly into the LED lights or wear suitable eye protection.

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

EN 62471
Photobiological safety of lamps and lamp systems

Product Guarantee

- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage (www.vossloh-schwabe.com). We will be happy to send you these conditions upon request.

Die Werte in diesem Datenblatt können sich aufgrund technischer Innovationen verändern und werden ohne gesonderte Benachrichtigung vorgenommen.

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