LUGA LINE COB HB HORTICULTURE

BLOOM & LEAF

LUGA LINE COB HORTICULTURE
HIGH BRIGHTNESS
LED MODULES FOR LINEAR PLANT LIGHTING

DML12B*HC-V**

Typical Applications

- Greenhouses
- Linear top lighting
- Research facilities
- Replacement for HS/MH

LUGA Line COB HB Greenhouse

- **HIGH-EFFICIENT COB TECHNOLOGY**
- **SPECTRA OPTIMIZED FOR VEGETATIVE (LEAF) & GENERATIVE (BLOOM) GROWTH**
- **VERY LONG SERVICE LIFETIME**
- **HIGH PHOTON FLUX: UP TO 141 µmol/s**
- **HIGH PHOTON EFFICACY: UP TO 2.4 µmol/J**

LIGHTING SOLUTIONS

A member of the Panasonic group Panasonic

Vossloh-Schwabe Deutschland GmbH · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

LUGA Line COB HB Horticulture

Technical Notes

- LED built-in module for integration into luminaires
- Dimensions: 280x15 mm
- Typ. driving current: 700 mA, 1050 mA, 1400 mA, 1700 mA, 2100 mA (max.)
- Beam angle: 120°

Spektrum "Leaf"

Recommendation for plants and vegetables which should have an optimized vegetative growth. Due increased spectral emission in the infrared (> 700 nm), as well as in the green (500–560 nm) spectral range, the growth of the plants or the vegetables can be positively influenced. The slightly pink-coloured full spectrum light (white light with a colour rendering > 80) also shows an improved compatibility for the employees in the vicinity of the illumination solution.

Spektrum "Bloom"

"Bloom" shows an optimized effect on ornamental plants and young seedlings, which need support in the flowering or in the initial growth stage. The spectrum is characterized by its focus on the blue and red spectral range, which provides maximum efficiency in photosynthesis.

Electrical Characteristics

at t_p = 65 °C

Type	Typ. voltage DC* (V)					Typ. power consumption* (W)				
	700 mA	1050 mA	1400 mA	1700 mA	2100 mA	700 mA	1050 mA	1400 mA	1700 mA	2100 mA
	V	V	V	V	V	W	W	W	W	W
DML12B***HC-V	33.4	34.5	35.6	36.5	37.5	23.4	36.3	49.9	62.0	79.0

*Voltage and power tolerance: ±10 %

Maximum Ratings

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

Type	Operating current	Operation temperature range at t_c-point		Ambient temperature range		Storage temperature range		Max. allowed repetitive
	mA	°C min.	°C max.	°C min.	°C max.	°C min.	°C max.	peak current (mA)
DML12B***HC-V	700	–40	+105	–40	+40	–40	+105	2400
	1050		+105					
	1400		+100					
	1700		+90					
	2100		+80					

Optical Characteristics

at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temp.*	PPF range**	Typ. photon flux*** and efficiency at										Typ. CRI	Photo-metric
					700mA		1050mA		1400mA		1700mA		2100mA			
			K		µmol/s	µmol/J	µmol/s	µmol/J	µmol/s	µmol/J	µmol/s	µmol/J	µmol/s	µmol/J	R_a	code
DML12B_Bloom_HC-V	**566379**	pink	1835	PAR	53.1	2.3	76.1	2.1	97.2	1.9	113.6	1.8	134.2	1.7	57	518
				PBAR	56.0	2.4	80.0	2.2	102.0	2.0	120.0	1.9	141.0	1.8		
DML12B_Leaf_HC-V	**566380**	pinkish white	2665	PAR	48.2	2.1	69.5	1.9	89.2	1.8	105.3	1.7	124.9	1.6	88	826
				PBAR	55.0	2.4	79.0	2.2	101.0	2.0	119.0	1.9	141.0	1.8		

* Colour tolerance: 3 MacAdam | ** PAR: 400–700 nm; PBAR: 280–800 nm | *** Production tolerance of photon flux and efficiency: ± 10 %

Minimum order quantity: 60 pcs.

LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
Vossloh-Schwabe Deutschland GmbH · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

LUGA Line COB HB Horticulture

Spectral Characteristics

at t_p = 65 °C

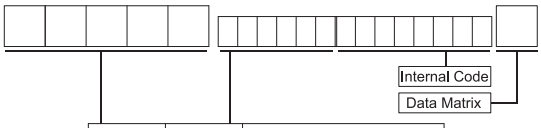
Type	Spectral distribution related to µmol/s				Ratios		
	400–500 nm (blue)	500–600 nm (green)	600–700 nm (red)	> 700 nm (far red)	blue – red	blue – green	red – far red
DML12B_Bloom_HC-V	17.2%	23.6%	54.3%	4.9%	1 – 3.2	1 – 1.4	1 – 0.1
DML12B_Leaf_HC-V	10.7%	24.4%	53.2%	11.7%	1 – 5.0	1 – 2.3	1 – 0.2

Operating Life

at t_p = 65 °C

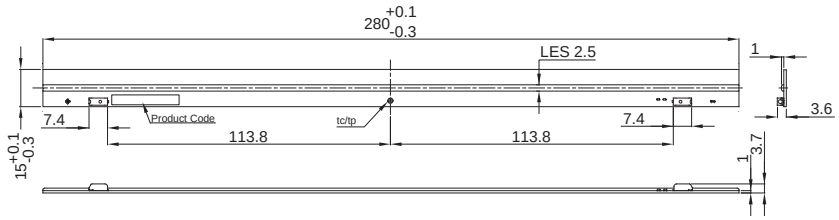
Lumen maintenance	DML12B***HC-V				
	I_f 700 mA	I_f 1050 mA	I_f 1400 mA	I_f 1700 mA	I_f 2100 mA
L90/B10	63,000 hrs.	59,000 hrs.	54,000 hrs.	48,000 hrs.	40,000 hrs.
L80/B10	88,000 hrs.	84,000 hrs.	79,000 hrs.	73,000 hrs.	65,000 hrs.
L70/B10	98,000 hrs.	94,000 hrs.	89,000 hrs.	83,000 hrs.	75,000 hrs.

Product Code

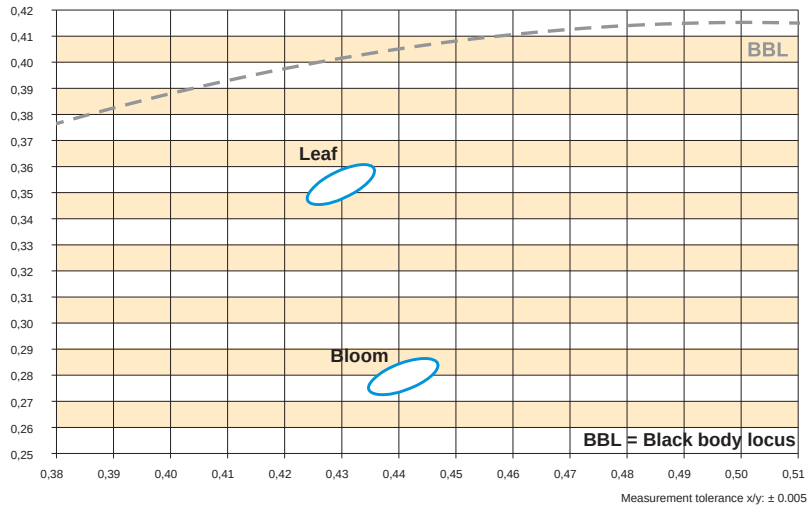


Code 1	Code 2	Product Name
AIHCH	2BAAIH	DML12B_Bloom_HC-V
AJHCH	2BCAJH	DML12B_Leaf_HC-V

Mechanical Dimensions



Bins

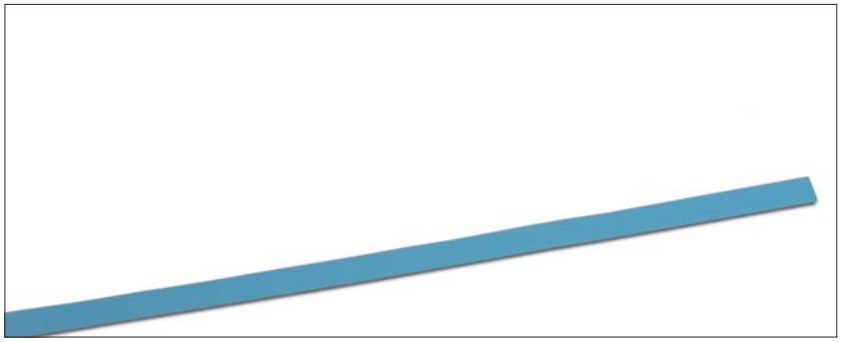


Measurement tolerance x/y: ± 0.005

LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
Vossloh-Schwabe Deutschland GmbH · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

Accessories for LUGA Line COB HB Horticulture

Thermally Conductive Adhesive Transfer Tapes
Dimension: 278x13 mm
Ref. No.: 548179



Linear LED Constant Current Drivers

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

LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
Vossloh-Schwabe Deutschland GmbH · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

LUGA Line COB HB Horticulture

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.

- 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 sould 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
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- For interconnection of the LED modules:
  - Single solid conductor connection only, with size 0.14 mm² - 0.34 mm² (26 – 22 AWG sol.). If 0.5 mm² (20 AWG sol.) is used, no smaller size can be applied afterwards.
  - Strip length 6 ... 7.5mm (0.24...0.3 inch)
  - For more information (Tooling, etc.), please refer to Wago 2059 datasheets.
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- Max. number of modules connected in series: 4
- A parallel connection of the LED modules is not allowed.
- To ensure problem-free operation, the specified maximum temperature at the t_c point (see "Operating Life") must be observed (and measured in accordance with EN 60598-1). To satisfy this point, it may be necessary to put measures in place to ensure any heat is dissipated from the PCB to the environment.
- Measurement tolerances (in addition to production tolerance):
  - luminous flux: ± 7 %
  - voltage: ± 3 %
  - CRI: ± 1 %
- LED modules must be attached in such a way as to ensure that any temperature-related material tension between the (ceramic) LED module and the substrate of the luminaire (e.g. aluminium) can be balanced out. VS recommends using (non-adhesive) thermally conductive paste in combination with mechanical fixing clips, which must allow the module to expand in a lateral direction on the substrate surface. In addition, Vossloh-Schwabe provides a thermally conductive adhesive transfer pad (Ref. No. 548179) that can also balance out any material stresses. Care must be taken to check whether the luminaire/application is suitable for use with adhesive transfer pads given the respective material and ambient conditions. A space of at least 0.5 mm must be left between any two modules.
- Products equipped with adhesive transfer tape must only be applied to dry and clean surfaces that are free from grease, oil, silicone or other soiling. It is therefore recommended to clean the substrate with isopropyl alcohol (IPA). Please ensure a full-surface bond over the entire contact area when sticking the module to the substrate.
  The following substances are regarded as critical for creating an adhesive bond:
  – Polyefins (polyethylene, polypropylene)
  – Rubber
  – Powder-coated materials
  – Silicone rubber
  – Teflon
  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. Prior to sticking a VS product care must be taken to check whether the material in question is actually suitable for the intended purpose under consideration of all possible application-relevant influences. Supplementary holders must be used if necessary.
- 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.

LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
Vossloh-Schwabe Deutschland GmbH · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com

LUGA Line COB HB Horticulture

Assembly and Safety Information

- Due to the manufacturing process, the PCBs of the LED assembly modules can have sharp edges and corners. Care must therefore be taken during handling and installation to avoid injury.
- For optimal load of used constant current driver the modules can be connected in series. The quantity of LED modules is limited by the sum of forward voltage and the capacity of used constant current driver. Safety regulations acc. to EN 60598 has to be observed if the sum of forward voltage exceed the permitted touchable value.
- 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 62471:2008:
  Rating in accordance with IEC / TR 62778: risk group 1

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.

LIGHTING SOLUTIONS
A member of the Panasonic group Panasonic
Vossloh-Schwabe Deutschland GmbH · Hohe Steinert 8 · 58509 Lüdenscheid · Germany · Phone +49 23 51/10 10 · Fax +49 23 51/10 12 17 · www.vossloh-schwabe.com