REPLACEMENT KIT

BRAVE

BRAVE

Modular built-in light engines for outdoor applications

Very flexible solutions due to a combination of four different colour temperatures and a wide range of lenses.

Typical applications
Integration in luminaires

- Street lighting, urban street lighting
- Tunnel lighting
- Flood and area lighting
- Industrial lighting for production halls & warehouses
- Indoor lighting
- Lighting for sports facilities

Replacement Kit – BRAVE

- **DEGREE OF PROTECTION: IP67**
- **COLOUR TEMPERATURES: 2200K / 3000K / 4000K / 5000K**
- **HIGHLY EFFICIENCY: UP TO 147 LM/W**
- **SURGE PROTECTION UP TO 4 KV**
- **WIDE RANGE OF LIGHT DISTRIBUTIONS**
- **MADE IN ITALY**

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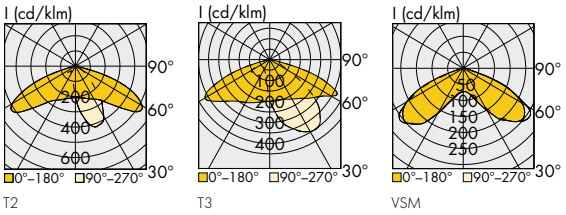
LIGHTING SOLUTIONS

Vossloh-Schwabe Deutschland GmbH · Stuttgarter Straße 61/1 · 73614 Schorndorf · Germany · Phone +49 7181/8002-0 · Fax +49 7181/8002-122 · www.vossloh-schwabe.com

BRAVE

Replacement kit for street lighting



Technical notes

LED built-in engines for integration into luminaires

Equipped with SMD PCB WU-M-631-S, optics, silicone gasket, heat sink and connection leads

Lens material: PMMA (PC on request)

Light distribution: IESNA T2, T3, VSM (further LDCs on request)

Degree of protection: IP67 (acc. to IEC 60529)

ESD protection class 2

Surge protection: up to 4 kV

Max. operating temperature at t_c point: 70 °C

Lumen maintenance: L80/B10; > 54,000 hrs. at max. allowed operation current and 60 °C at t_p point

Temperature depends on installation situation and has to be checked by the luminaire manufacturer.

Initial colour accuracy: 5 SDCM

Heat sink material: thermocunductive resin

Leads: bi-polar cable, double insulation FEP/PVC, AWG22, lead length: 400 mm, with PG-7 cable gland

Weight: 650 g

Packaging unit: 6 pcs. (12 LEDs)

Note: for a longer service lifetime it's available on request versions powered by WU-M-688-SQ5

Electrical Characteristics

at t_p = 60 °C

Type	No. of LEDs	Voltage DC (V) 500 mA min.	500 mA typ.	500 mA max.	600 mA min.	600 mA typ.	600 mA max.	700 mA min.	700 mA typ.	700 mA max.	800 mA min.	800 mA typ.	800 mA max.	Temperature coefficient mV/K
BRA-12-631S-XXX-YY	12	31.0	32.6	34.3	31.4	33.1	34.7	31.8	33.5	35.2	32.2	33.9	35.6	- 10.3

Type	No. of LEDs	Power consumption (W) 500 mA min.	500 mA typ.	500 mA max.	600 mA min.	600 mA typ.	600 mA max.	700 mA min.	700 mA typ.	700 mA max.	800 mA min.	800 mA typ.	800 mA max.
BRA-12-631S-XXX-YY	12	15.5	16.3	17.1	18.9	19.8	20.8	22.3	23.4	24.6	25.8	27.1	28.5

Use of external LED constant current driver required. | * Two separate LED modules: values are calculated for series connection.

Maximum Ratings

Exceeding the maximum ratings can lead to destruction of the module.

Type	Operation current mA	Operation temperature range at t_c point °C min.	°C max.	Storage temperature range °C min.	°C max.	Max. allowed repetitive peak current mA
BRA-12-631S-XXX-YY	<=800	–30	+70	–40	+80	1800

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Optical characteristics

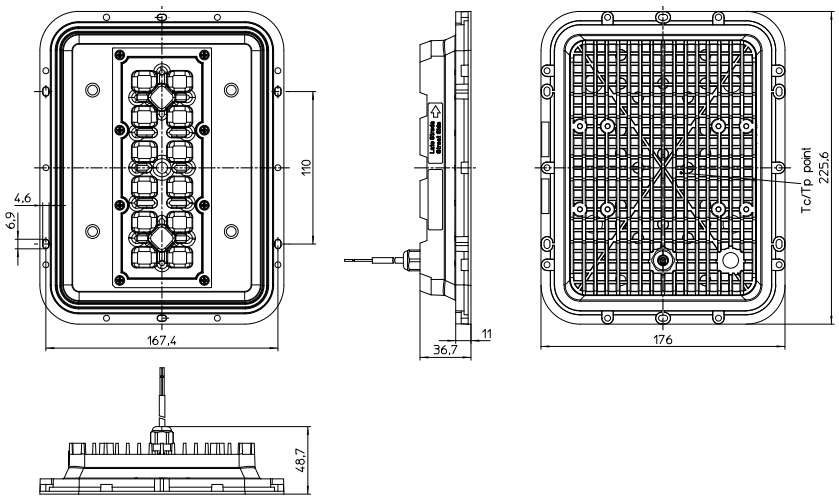
at t_p = 60 °C

Type	Ref. No.	No. of SMDs	Colour	Correlated colour temperature K	Typ. luminous flux* (lm) and efficiency* (lm/W) at 500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	800 mA lm	800 mA lm/W	Light distribution	CRI** R_a
BRA-12-631S-722-T2	**on request**	12	warm white	2200	2350	144	3135	134	3525	130	T2	≥ 70
BRA-12-631S-730-T2	**572569**	12	warm white	3000	2720	167	3690	157	4160	154	T2	≥ 70
BRA-12-631S-740-T2	**572571**	12	neutral white	4000	2935	180	3975	169	4490	166	T2	≥ 70
BRA-12-631S-750-T2	**on request**	12	cool white	5000	2895	178	3920	167	4420	163	T2	≥ 70
BRA-12-631S-722-T3	**on request**	12	warm white	2200	2400	147	3200	137	3600	133	T3	≥ 70
BRA-12-631S-730-T3	**572570**	12	warm white	3000	2780	171	3770	160	4160	154	T3	≥ 70
BRA-12-631S-740-T3	**572572**	12	neutral white	4000	2995	184	4060	173	4490	166	T3	≥ 70
BRA-12-631S-750-T3	**on request**	12	cool white	5000	2955	181	4000	170	4420	163	T3	≥ 70
BRA-12-631S-722-T VSM	**on request**	12	warm white	2200	2375	146	3170	135	3560	131	VSM	≥ 70
BRA-12-631S-730--T VSM	**572432**	12	warm white	3000	2750	169	3730	159	4160	154	VSM	≥ 70
BRA-12-631S-740--T VSM	**572573**	12	neutral white	4000	2965	182	4020	171	4490	166	VSM	≥ 70
BRA-12-631S-750--T VSM	**on request**	12	cool white	5000	2925	179	3960	169	4420	163	VSM	≥ 70

* Measurement tolerance of luminous flux and efficiency: ± 10% | ** Measurement tolerance CRI: ± 2

Mechanical measurement

BRA-12-631S-XXX-YY



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General information

Performance acc. to IEC 62717: L70/B50 t_p = 60 °C – > 100,000 hrs.

Packaging unit

Type	Packaging unit pcs.	Box dimensions (LxWxH) mm	Weight single (g)	Gross weight packaging unit (g)
BRA-12-631S-XXX-YY	6	330x275x220	595	4330

General safety and installation instructions

- These instructions must be carefully read before installing and commissioning the system, as this is the only way to ensure safe and correct handling.
- VS product may only be installed and commissioned by authorised and fully qualified staff.
- No object can be placed in contact with heat sink: thermal management might be compromised.
- An external constant-current driver is required.
- 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. Repairs may only be undertaken by the manufacturer.

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.

EPREL information

Containing product Types	Light Source Type	EPREL Reg.No.	EE Class
BRA-12-631S-722-YY	WU-M-631-S-722	1226080	D
BRA-12-631S-730-YY	WU-M-631-S-730	920433	C
BRA-12-631S-740-YY	WU-M-631-S-740	920434	C
BRA-12-631S-750-YY	WU-M-631-S-750	920435	C

LED Constant Current Drivers

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

Surge Protection

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

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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. Safety regulations acc. to EN 60598 has to be observed. Installation must be carried out in a voltage-free state (i.e.disconnection from the mains).

- Mains frequency: 0 Hz
- LED built-in modules must not be subjected to any undue mechanical stress, e. g.:
  - handle LED modules carefully
  - avoid shear and compressive forces onto the optics during handling and installation
  - avoid vibrations of more than 2 kHz, 40 G
  - do not carry or move the LED engines by using the wires
- When installing/screwing the module into a luminaire, please ensure that the cables are not squeezed between luminaire and LED engine.
- The LED engine must not be used in hermetically sealed casings.
- Safe operation only possible by the use of external constant current sources ($I_{max.}$ see table "Electrical Characteristics").
- Operation is dependent on constant current drivers that should provide the following protective measures:
  - short-circuit protection
  - overload protection
  - overheating protection
- 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 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.
- A parallel connection of the LED engines is not allowed.
- The clearance and creepage distances of LED enginges are designed for working voltages up to 450 V DC (basic insulation) acc. to EN 62031/EN 60598. This value is designed between live parts and accessible metal parts.
- For insulation class II a LED driver with double or reinforced insulation between LV supply and secondary circuit shall be used when the LED module is integrated in a containing product where accessible metal parts are connected to an equipotential bond (acc. to EN 60598-1, Annex X).
- If a system consists of multiple LED engines BREK connected to a single driver, only one module will be monitored by the NTC. That means that one module is in "master" mode operated and the rest are operated in "slave" mode.
- Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.
- To ensure problem-free operation, the specified maximum temperature at the t_c and t_p point (see "Operating Life") must be observed (measured in accordance with EN 60598-1). To satisfy this point, it is necessary to put measures in place to ensure any heat is dissipated from the LED engine to the environment.
- To ensure good thermal behaviour take care about "general safety and installation instructions".
- 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.

  Assessment in acc. with IEC/TR 62471-2:
  - BRA-12-631S-XXX-YY general lighting exempt group (dRG0 = 2.62 m)

  Assessment in acc. with IEC/TR 62778:
  - BRA-12-631S-XXX-YY general lighting

  Given a clearance of more than d_{thr} > 2.85 m, within which the lighting intensity limit of E_{thr} = 911 lx is attained, the classification goes down to Risk Group 1.

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

EN 62471-2
Photobiological safety of lamps and lamp systems

EN 62778

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