

REPLACEMENT KIT

BRAVE
WITH PROTECTION GLASS
SINGLE (12 LEDs) AND
DOUBLE (24 LEDs) VERSIONS
POWERED BY 5050 LED



BRAVE

**Modular built-in light engines with glass
for outdoor applications**

Very flexible solutions due to a combination of five different colour temperatures, a wide range of lenses and two power units.

Typical applications

Integration in luminaires

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

Replacement Kit – BRAVE

- **DEGREE OF PROTECTION: IP66**
- **IMPACT RESISTANCE: IK09**
- **COLOUR TEMPERATURES:
2200K / 2700K / 3000K / 4000K / 5000K**
- **LUMEN MAINTENANCE L80/B10: >102,000 hrs**
- **ESD PROTECTION CLASS 3 (up to 8kV)**
- **WIDE RANGE OF
LIGHT DISTRIBUTIONS**
- **MADE IN ITALY**



BRAVE

Replacement kit for street lighting

Technical notes

LED built-in engines with glass for integration into luminaires



Equipped with SMD PCB WU-M-630-SA, optics, silicone gasket, heat sink and connection leads

Lens material: PMMA (PC on request)

Light distribution: IESNA Type M3M, Type P2M, Type A5 (further LDCs on request)

Degree of protection: IP66 (acc. to IEC 60529), IK09

ESD protection class 3 (up to 8kV)

Max. operating temperature at t_c point: 75 °C

Lumen maintenance: L80/B10; > 102,000 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.

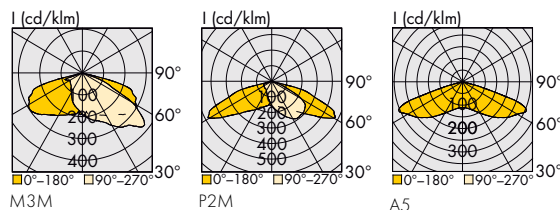
Initial colour accuracy: 5 SDCM

Heat sink material: thermoconductive resin

Leads: bi-polar cable, double insulation FEP/PVC,

AWG22, lead length: 400 mm,

with PG-7 cable gland



Electrical Characteristics

at $t_p = 60$ °C

Type	No. of LEDs	Voltage DC (V)														
		500 mA			600 mA			700 mA			800 mA			900 mA		
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
BRV-12-630SA-XXX-YY	12	30.0	33.3	36.6	30.3	33.7	37.1	30.6	34.0	37.4	30.9	34.3	37.7	31.1	34.6	38.1
BRV-24-630SA-XXX-YY	24	60.0	66.4	73.2	60.7	67.4	74.1	61.2	68.0	74.8	-	-	-	-	-	-

Type	No. of LEDs	Power consumption (W)														
		500 mA			600 mA			700 mA			800 mA			900 mA		
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
BRV-12-630SA-XXX-YY	12	14.9	16.6	18.2	18.2	20.2	22.2	21.4	23.8	26.2	24.7	27.4	30.2	28.0	31.1	34.3
BRV-24-630SA-XXX-YY	24	29.8	33.1	36.4	36.4	40.4	44.5	42.8	47.6	52.4	-	-	-	-	-	-

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		Storage temperature range		Max. allowed repetitive peak current mA
		°C min.	°C max.	°C min.	°C max.	
BRV-12-630SA-XXX-YY	900	-30	75	-40	80	2000
BRV-24-630SA-XXX-YY	700	-30	75	-40	80	2000

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

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Optical characteristics

at $t_p = 60\text{ }^\circ\text{C}$

Type	Ref.No.	Colour	Correlated colour temperature K	Typ. luminous flux* (lm) and typ. Efficiency (lm/W)						Light distribution	CRI**
				700mA		800mA		900mA			
				lm	lm/W	lm	lm/W	lm	lm/W		
12 LEDs											
BRV-12-630SA-722-M3M	573224	warm white	2200	2900	122	3265	119	3625	117	Type M3M	≥ 70
BRV-12-630SA-727-M3M	573227	warm white	2700	3180	134	3580	131	3980	128	Type M3M	≥ 70
BRV-12-630SA-730-M3M	573268	warm white	3000	3275	138	3685	134	4095	132	Type M3M	≥ 70
BRV-12-630SA-740-M3M	573271	neutral white	4000	3415	143	3840	140	4270	137	Type M3M	≥ 70
BRV-12-630SA-750-M3M	on request	cool white	5000	3365	141	3790	138	4210	135	Type M3M	≥ 70
BRV-12-630SA-722-P2M	573225	warm white	2200	2980	125	3350	122	3725	120	Type P2M	≥ 70
BRV-12-630SA-727-P2M	573228	warm white	2700	3265	137	3675	134	4085	131	Type P2M	≥ 70
BRV-12-630SA-730-P2M	573269	warm white	3000	3365	141	3785	138	4205	135	Type P2M	≥ 70
BRV-12-630SA-740-P2M	573272	neutral white	4000	3505	147	3945	144	4385	141	Type P2M	≥ 70
BRV-12-630SA-750-P2M	on request	cool white	5000	3460	145	3890	142	4325	139	Type P2M	≥ 70
BRV-12-630SA-722-A5	573226	warm white	2200	3020	127	3395	124	3775	121	Type A5	≥ 70
BRV-12-630SA-727-A5	573229	warm white	2700	3305	139	3725	136	4140	133	Type A5	≥ 70
BRV-12-630SA-730-A5	573270	warm white	3000	3405	143	3835	140	4260	137	Type A5	≥ 70
BRV-12-630SA-740-A5	573273	neutral white	4000	3555	149	3995	146	4445	143	Type A5	≥ 70
BRV-12-630SA-750-A5	on request	cool white	5000	3505	147	3940	144	4380	141	Type A5	≥ 70

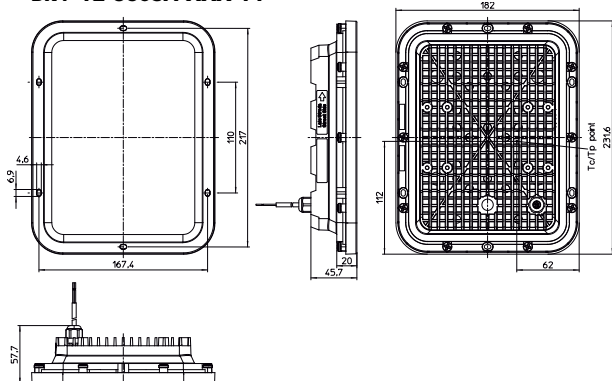
* Measurement tolerance of luminous flux and efficiency: ± 10% | ** Measurement tolerance CRI: ± 2

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux* (lm) and efficiency* (lm/W) at						Light distribution	CRI** R _a
				500 mA		600 mA		700 mA			
				lm	lm/W	lm	lm/W	lm	lm/W		
24 LEDs											
BRV-24-630SA-722-M3M	573230	warm white	2200	4150	125	4900	121	5640	118	Type M3M	≥ 70
BRV-24-630SA-727-M3M	573233	warm white	2700	4540	137	5380	133	6180	130	Type M3M	≥ 70
BRV-24-630SA-730-M3M	573274	warm white	3000	4680	141	5540	137	6370	134	Type M3M	≥ 70
BRV-24-630SA-740-M3M	573277	neutral white	4000	4880	147	5770	143	6650	140	Type M3M	≥ 70
BRV-24-630SA-750-M3M	on request	cool white	5000	4820	146	5540	137	6550	138	Type M3M	≥ 70
BRV-12-630SA-722-P2M	573231	warm white	2200	4200	127	4970	123	5720	120	Type P2M	≥ 70
BRV-12-630SA-727-P2M	573234	warm white	2700	4610	139	5450	135	6270	132	Type P2M	≥ 70
BRV-24-630SA-730-P2M	573275	warm white	3000	4750	144	5610	139	6460	136	Type P2M	≥ 70
BRV-24-630SA-740-P2M	573278	neutral white	4000	4950	150	5850	145	6740	142	Type P2M	≥ 70
BRV-24-630SA-750-P2M	on request	cool white	5000	4880	147	5610	139	6640	139	Type P2M	≥ 70
BRV-24-630SA-722-A5	573232	warm white	2200	4260	129	5040	125	5800	122	Type A5	≥ 70
BRV-24-630SA-727-A5	573235	warm white	2700	4670	141	5530	137	6360	134	Type A5	≥ 70
BRV-24-630SA-730-A5	573276	warm white	3000	4810	145	5690	141	6550	138	Type A5	≥ 70
BRV-24-630SA-740-A5	573279	neutral white	4000	5020	152	5930	147	6830	143	Type A5	≥ 70
BRV-24-630SA-750-A5	on request	cool white	5000	4950	150	5690	141	6730	141	Type A5	≥ 70

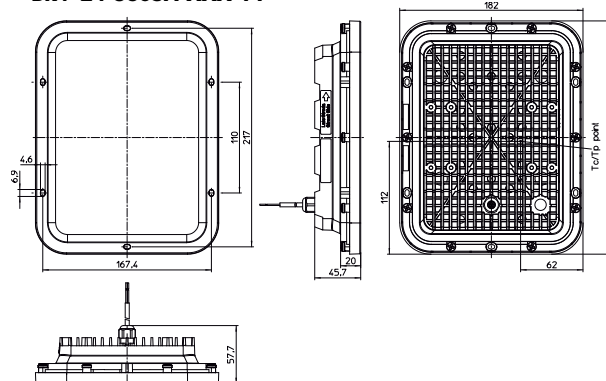
* Measurement tolerance of luminous flux and efficiency: ± 10% | ** Measurement tolerance CRI: ± 2

Mechanical measurement

BRV-12-630SA-XXX-YY



BRV-24-630SA-XXX-YY



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General information

Performance acc. to IEC 62717: L70/B50 $t_p = 60\text{ °C} - > 100,000\text{ hrs.}$

Packaging unit

Type	Packaging unit pcs.	Box dimensions (LxWxH) mm	Weight single (g)	Gross weight packaging unit (g)
BRV-12-ZZZ-XXX-YY	6	416x271x180	980	6620
BRV-24-ZZZ-XXX-YY	6	416x271x180	1060	7100

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.

EPREL information

Containing product	Light Source		
Types	Type	EPREL Reg.No.	EE Class
BRV-12-630SA-722	WU-M-630-SA-12-722	2000079	C
BRV-24-630SA-722			
BRV-12-630SA-727	WU-M-630-SA-12-727	2000084	C
BRV-24-630SA-727			
BRV-12-630SA-730	WU-M-630-SA-12-730	2000103	C
BRV-24-630SA-730			
BRV-12-630SA-740	WU-M-630-SA-12-740	2000106	B
BRV-24-630SA-740			
BRV-12-630SA-750	WU-M-630-SA-12-750	2000119	B
BRV-24-630SA-750			

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 engines 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 BRAVE 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 in accordance with EN 62471: 2008
 - general lighting
 - exempt group: WU-M-630-SA/xx-X
 - other applications
 - risk group 2: WU-M-630-SA/xx-X
- Assessment in acc. with IEC/TR 62778:
- Given a clearance of more than d_{min} , within which the lighting intensity limit of $E_{thr} = 900 \text{ lx}$ is attained, the classification goes down to 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.

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