

REPLACEMENT KIT

BRAVE

WITH PROTECTION GLASS

SINGLE (12 LEDs) AND

DOUBLE (24 LEDs) VERSIONS

POWERED BY 3535 LED



BRAVE

Modular built-in light engines with glass for outdoor applications

Very flexible solutions due to a combination of four 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 / 3000K / 4000K / 5000K**
- **LUMEN MAINTENANCE L80/B10: >150.000hrs.**
- **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-541-SQ5, optics, silicone gasket, heat sink and connection leads

Lens material: PMMA (PC on request)

Light distribution: IESNA T2, T3, VSM,

(on request with DWC, ME, T4, SCL and SCL2)

Degree of protection: IP67 (acc. to IEC 60529), IK09

ESD protection class 3 (up to 8 kV)

Max. operating temperature at t_c point: 70 °C

Lumen maintenance: L80/B10; > 150,000 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.

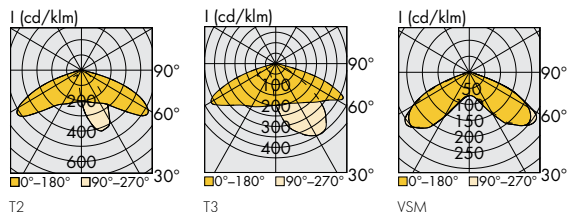
Initial colour accuracy: 5 SDCM

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)												Temperature coefficient mV/K
		500 mA			550 mA			600 mA			700 mA			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
BRV-12-541-SQ5-XXX-YY	12	30.9	32.6	34.4	31.0	32.8	34.5	31.1	32.9	34.7	31.4	33.2	35.0	- 18.3
BRV-24-541-SQ5-XXX-YY	24	61.8	65.2	68.8	62.0	65.5	69.1	-	-	-	-	-	-	- 18.3

Type	No. of LEDs	Power consumption (W)											
		500 mA			550 mA			600 mA			700 mA		
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
BRV-12-541-SQ5-XXX-YY	12	15.5	16.3	17.2	17.0	18.0	19.0	18.7	19.7	20.8	22.0	23.2	24.5
BRV-24-541-SQ5-XXX-YY	24	30.9	32.6	34.4	34.1	36.0	38.0	-	-	-	-	-	-

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		Storage temperature range °C		Max. allowed repetitive peak current mA
		min.	max.	min.	max.	
BRV-12-541-SQ5-XXX-YY	700	-30	70	-40	80	2000
BRV-24-541-SQ5-XXX-YY	550	-30	70	-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 $t_p = 60\text{ °C}$

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		
12 LEDs											
BRV-12-541SQ5-722-T2	on request	warm white	2200	1810	111	2100	107	2395	103	T2	≥ 70
BRV-12-541SQ5-730-T2	572580	warm white	3000	2185	134	2560	130	2930	126	T2	≥ 70
BRV-12-541SQ5-740-T2	572583	neutral white	4000	2355	144	2760	140	3165	136	T2	≥ 70
BRV-12-541SQ5-750-T2	on request	cool white	5000	2355	144	2760	140	3165	136	T2	≥ 70
BRV-12-541SQ5-722-T3	572972	warm white	2200	1860	114	2160	110	2460	106	T3	≥ 70
BRV-12-541SQ5-730-T3	572581	warm white	3000	2245	138	2630	134	3010	130	T3	≥ 70
BRV-12-541SQ5-740-T3	572584	neutral white	4000	2415	148	2835	144	3250	140	T3	≥ 70
BRV-12-541SQ5-750-T3	on request	cool white	5000	2415	148	2835	144	3250	140	T3	≥ 70
BRV-12-541SQ5-722-T VSM	on request	warm white	2200	1885	116	2185	111	2490	107	VSM	≥ 70
BRV-12-541SQ5-730-T VSM	572582	warm white	3000	2275	140	2660	135	3050	131	VSM	≥ 70
BRV-12-541SQ5-740-T VSM	572585	neutral white	4000	2450	150	2870	146	3290	142	VSM	≥ 70
BRV-12-541SQ5-750-T VSM	on request	cool white	5000	2450	150	2870	146	3290	142	VSM	≥ 70

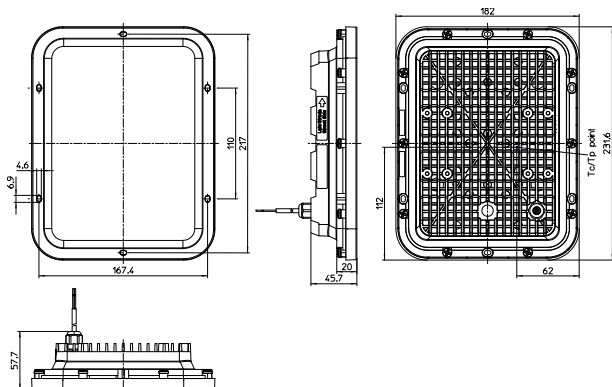
* Measurement tolerance of luminous flux and efficiency: $\pm 10\%$ | ** Measurement tolerance CRI: ± 2

Type	Ref. No.	Colour	Correlated colour temperature K	Typ. luminous flux* (lm) and efficiency* (lm/W) at				Light distribution	CRI** R_a
				500 mA		550 mA			
				lm	lm/W	lm	lm/W		
24 LEDs									
BRV-24-541SQ5-722-T2	on request	warm white	2200	3520	108	3810	106	T2	≥ 70
BRV-24-541SQ5-730-T2	572591	warm white	3000	4260	131	4620	128	T2	≥ 70
BRV-24-541SQ5-740-T2	572594	neutral white	4000	4580	140	4970	138	T2	≥ 70
BRV-24-541SQ5-750-T2	on request	cool white	5000	4580	140	4970	138	T2	≥ 70
BRV-24-541SQ5-722-T3	on request	warm white	2200	3570	110	3860	107	T3	≥ 70
BRV-24-541SQ5-730-T3	572592	warm white	3000	4310	132	4680	130	T3	≥ 70
BRV-24-541SQ5-740-T3	572595	neutral white	4000	4640	142	5040	140	T3	≥ 70
BRV-24-541SQ5-750-T3	on request	cool white	5000	4640	142	5040	140	T3	≥ 70
BRV-24-541SQ5-722-T VSM	on request	warm white	2200	3620	111	3910	109	VSM	≥ 70
BRV-24-541SQ5-730-T VSM	572593	warm white	3000	4370	134	4750	132	VSM	≥ 70
BRV-24-541SQ5-740-T VSM	572596	neutral white	4000	4710	144	5110	142	VSM	≥ 70
BRV-24-541SQ5-750-T VSM	on request	cool white	5000	4710	144	5110	142	VSM	≥ 70

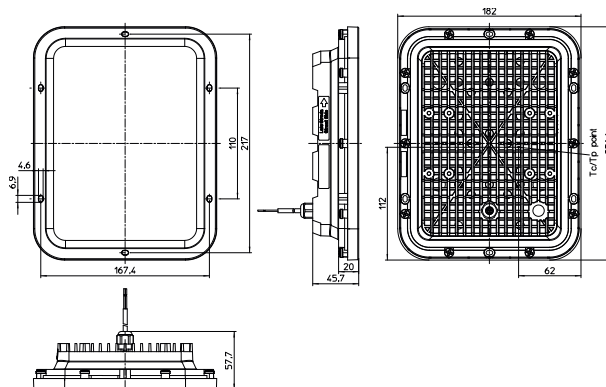
* Measurement tolerance of luminous flux and efficiency: $\pm 10\%$ | ** Measurement tolerance CRI: ± 2

Mechanical measurement

BRV-12-541-SQ5-XXX-YY



BRV-24-541-SQ5-XXX-YY



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General information

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

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 Types	Light Source Type	EPREL Reg.No.	EE Class
BRV-12-541SQ5-722	WU-M-541-SQ5-12-722	914598	D
BRV-24-541SQ5-722			
BRV-12-541SQ5-730	WU-M-541-SQ5-12-730	920467	C
BRV-24-541SQ5-730			
BRV-12-541SQ5-740	WU-M-541-SQ5-12-740	920468	C
BRV-24-541SQ5-740			
BRV-12-541SQ5-750	WU-M-541-SQ5-12-750	920469	C
BRV-24-541SQ5-750			

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

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-541-SQ5/xx
 - other applications
risk group 2: WU-M-541-SQ5/xx
- Assessment in acc. with IEC/TR 62778:
Given a clearance of more than d_{min} , within which the lighting intensity limit of $E_{thr} = 740 \text{ lx}$ 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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