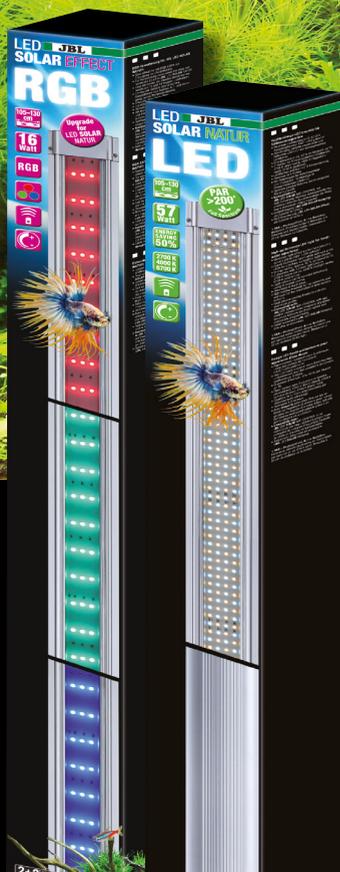


LED **JBL** SOLAR

The right LED for your Aquarium



JBL LED SOLAR NATUR
JBL LED SOLAR EFFECT

The latest generation of
energy-saving and intelligent
LED aquarium lighting



LED JBL SOLAR NATUR

High-performance LED light
for freshwater aquariums
incl. remote control



Maximum light efficiency for more beautiful
aquatic plants: PAR* >200 $\mu\text{M}/\text{s}/\text{m}^2$

ENERGY
SAVING
50%

Energy-saving at twice the light output
compared to fluorescent tubes

2700 K
4000 K
6700 K

3 light colours to choose from:
2700 K (warm white)
4000 K (daylight white)
6700 K (cool white)



*) PAR = Photosynthetic Active Radiation. Measured value: photon density in micromole per second and square metre. Measured at 20 cm distance to the light.

LED JBL SOLAR EFFECT

Special lamp with RGB LEDs to
create colour effects



For use with an existing light
JBL LED SOLAR NATUR



Enables more dramatic colour simulations
of sunrise and sunset, as well as weather
situations



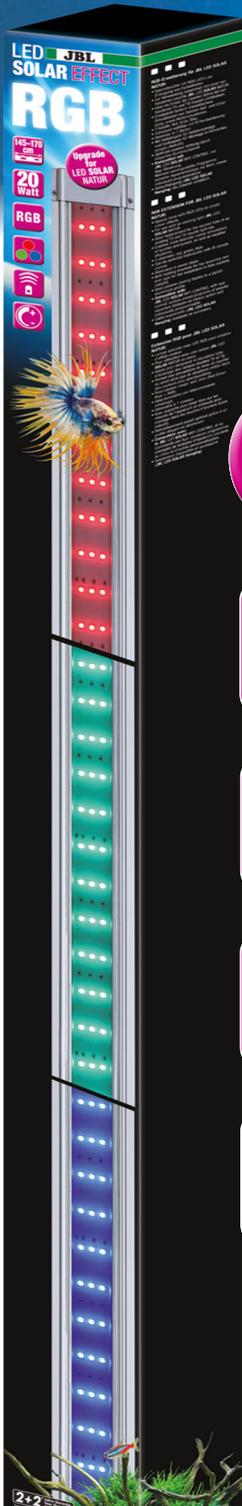
3 channels: red, green, blue



Can be selected individually with
IR remote control



Dimmable in seven steps



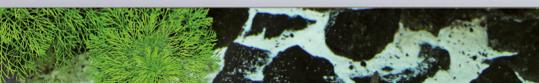
What can modern LED lighting do?



The LED technology has revolutionised our lives: long-lasting torches, stylish car headlights, energy-saving room lighting and, of course, natural aquarium lighting. But why has a JBL LED concept taken so long? LEDs have been around for a long time!

Because LEDs have only recently become more energy-saving than fluorescent tubes, there has been no common technology and no demand (!) to optimise the LED light spectrum for aquarium plants. Up to now LEDs have only been used in the technical sector and in the home. The light spectrum of aquatic plants, however, varies considerably from the spectrum in the home or LEDs torches. Here we are talking about the photosynthetically active radiation range of the light, called PAR (Photosynthetic Active Radiation), and a full spectrum which contains the TOTAL range within the visible light spectrum. Only with those two components has it been possible to manufacture the perfect light for aquarium plants!

Since JBL was the first manufacturer worldwide to develop a full spectrum modelled on sunlight with its JBL SOLAR fluorescent tubes our development department didn't just want to use the available home spectrums for LED aquarium technology, it wanted to create a SOLAR full spectrum, especially for aquariums! This took some time – but now it is available!



Why does your aquarium need special light?



Over millions of years aquarium plants have adapted to our sunlight and use it to produce energy. Even if our eyes perceive sunlight only as white light, water drops in the air or prisms show us that it consists of “rainbow colours”. During photosynthesis plants use individual spectral components of the light in their leaf green, to transform CO₂ with water into nutrition (sugar), and thus oxygen is released. This oxygen sustains the life of all animals on Earth. They, in turn, exhale CO₂ which the plants use for photosynthesis. This cycle keeps our planet alive. Aquarium plants are also dependent on CO₂ (carbon dioxide), and the photosynthetic active radiation elements of sunlight LED lighting for living rooms and LEDs for vehicles have totally different objectives: they don't need to imitate the sunlight but to appear warm, light a wide area, or set lighting accents. For the aquarium lighting the focus is only on the photosynthetically active spectrum. The new

JBL LED SOLAR concept has been developed to meet this requirement! The plant promoting radiation (PAR = Photosynthetic Active Radiation) can be measured using electronic measuring instruments. The JBL Research and Development department has managed to achieve a full spectrum with a PAR value of over 200*! This is the best thing that can happen to your plants! Since there is only a small demand for sun-like LEDs compared those for living space or ornamental LEDs the prices for these special LEDs are unfortunately a bit higher.

**) measured as PPF (Photosynthetic Photon Flux Density) in $\mu\text{mol}/\text{m}^2/\text{s}$ in a distance of 20 cm to the light.*



What are the benefits of the JBL SOLAR range?



JBL LED SOLAR NATUR and EFFECT with remote control unit

An immediately accessible, elegant LED light system, incl. remote control, with maximum light efficiency for beautiful aquarium plants.



JBL LED SOLAR NATUR

Perfect light for your fish, invertebrates and aquarium plants, since the warm-white and cold-white LEDs are evenly distributed in the light bar (Unique to JBL!)



Lux measurements compared

An energy-saving aquarium light, since the JBL LED SOLAR provides twice as much light compared to lighting with fluorescent tubes, while simultaneously halving the electricity costs.



Remote control

Gives you the possibility, with the help of the enclosed remote control, to slowly increase the light levels in increments or to simply switch the light on or off. You can also select one of three set colour temperatures: 2700 K (warm light), 4000 K (daylight – ideal for aquatic plants) or 6700 K (cold-white daylight).



Mounting

All required components for the attachment: fits into the existing T5 or T8 fluorescent tube light unit (Both T5 and T8 end cap sizes are included) or position with the telescopic V4A stainless steel holding brackets (also included) on the aquarium rim. Special brackets for suspension from the ceiling are also available as accessories.



Cooling fins prolong the service life

Optimal passive cooling through cooling fins in the lamp body lead to very long service life. The LED module has a service life of more than 50,000 hours. With an illumination time of 10 h/day it lasts for more than 13 years! (The extremely long service life of 50,000 hours applies only to the LED module. The other components are subject to the guarantee: 2 + 2 years).



Ideal PAR value

Specially optimised for aquarium plant growth: ranges of the visible light are used by the plants to produce energy in the photosynthesis process. The quantity of this Photosynthetically active spectrum (PAR) can be measured with special devices. With a PAR value of >200* the JBL LED SOLAR NATUR provides the perfect light, just as the plants would get from the sun in their natural habitat!



Safety

A safe system with double effect: watertight in accordance with IP67. If a water ingress were to cause a short circuit, the power supply would switch off automatically.

**) measured as PPF (Photosynthetic Photon Flux Density) in $\mu\text{mol}/\text{m}^2/\text{s}$ in a distance of 20 cm to the light.*

The changeover to modern LED technology is easy

You can easily exchange your fluorescent bulbs for JBL LED SOLAR lights, even if the technical equipment of these tubes doesn't work anymore. You only need the holders left and right to attach the JBL LED lights. Here's how it works:



Removing fluorescent tubes

Remove your fluorescent tubes (T5 or T8) from the sockets and measure the tube length without the pins at the ends. In the following table you can find the suitable LED for the appropriate tube length you want to replace.

Tube	Length	Equivalent to fluorescent tube				
T5	113	113	113	113	113	113
T5	150	150	150	150	150	150
T5	180	180	180	180	180	180
T5	229	229	229	229	229	229
T8	113	113	113	113	113	113
T8	150	150	150	150	150	150
T8	180	180	180	180	180	180
T8	229	229	229	229	229	229

Selecting JBL LEDs

Start with the basic equipment of the JBL LED technology (JBL LED SOLAR NATUR) in the required length mentioned on the back of the packaging.



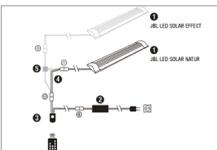
Plugging in the adapters

Press the JBL retrofit adapters (included in the kit) onto both ends of the JBL LED light and then into your moisture-proof sockets of the tube holder. Screw them back on both ends of the tube sockets – finished! The LED lights are freely rotatable and can be precisely aligned into a horizontal position.



Putting light on aquarium rim

If you don't want to use the existing fluorescent tube holders you can also put the JBL LED light directly on the aquarium rim with the enclosed V4A stainless steel holding brackets.



Wiring

Now connect the cable of the LED light with the infrared receiver (enclosed in the kit) and connect the IR receiver with the driver (ballast). The driver has a power plug which you put into a timer or directly into the power socket.



Putting remote control into operation

With the enclosed remote control you can now switch the LED light on and off or slowly switch it up and down. With the remote control you can also choose between three light colours. The buttons for the colours Red (R), Green (G) and Blue (B) are only relevant if you extend your basic equipment with a JBL LED SOLAR EFFECT light.

Get the most out of LED light technology



Would you like to double the lighting intensity?

No problem: just buy a second JBL LED SOLAR NATUR and connect it. But careful: 1 JBL LED light is already brighter than 2 fluorescent tubes!



How about some light effects?

If you want to create some special light effects (such as coloured light, red sunrise and sunset or blue deep water) ADDITIONALLY to your current light you need a second light, the JBL LED SOLAR EFFECT. You can connect this LED light to the second connection of your main light (JBL LED SOLAR NATUR). With the remote control unit, enclosed in the JBL LED SOLAR NATUR, you can now activate the individual colour channels (Red/Green/Blue). To adjust the effects (biotopes, lightning storm, clouds, rain etc.) you need a special controller (JBL LED SOLAR CONTROL), which you can then use precisely and easily with your mobile phone.



Would you like to illuminate habitats (biotopes) based exactly on nature's model?

This can be done easily and precisely with the JBL LED SOLAR CONTROL, a free app and your mobile phone. You can either create your light yourself or use pre-set biotope values.



Does the LED light need to be suspended from the ceiling?

For that you need the suspension system accessory JBL LED SOLAR HANGING. With the enclosed 2 m long steel cords you can suspend the JBL LED lights any way you want. You can easily attach the cables to the light.



What do each individual JBL LED models contain?

JBL LED SOLAR NATUR

It contains a light unit in the desired length, 2 m of cable fitted to the light, an LED driver (ballast) with cable and plug for your socket and an infrared receiver, integrated between light and driver. Now the system is ready to use and can receive commands from the enclosed remote control. With the remote control you can switch the light on and off, slowly switch it up and down and set 3 different colour temperatures (2700 K = warm light, 4000 K = warm daylight, 6700 K = cold-white daylight). The kit also contains 2 adapters for T5 sockets, 2 adapters for T8 sockets and 2 stainless steel holding brackets, with which you can use to fix the light onto your aquarium.



JBL LED SOLAR EFFECT

It contains a light unit in the desired length with 2 m of cable. This light doesn't need its own power supply and infrared receiver because it can easily be plugged into the second connection of your JBL LED SOLAR NATUR. The light contains so-called RGB LEDs with which, almost any desired colour can be created. You can also use the remote control buttons to control the 3 individual colour channels on your JBL LED SOLAR NATUR. You can then adjust the LEDs of the effect light according to your wishes.



If you already use the JBL LED SOLAR NATUR with a JBL LED SOLAR CONTROL you will get an even more life-like light control : sunrises and sunsets will contain strong and natural undertones of red, lightning storms will be more colourful and even the biotope conditions can be imitated in more detail.

JBL LED SOLAR CONTROL

This light computer is extremely versatile and easy to control using a free app on your mobile phone. You have 2 control options: automatic or manual mode. The manual mode allows you unlimited access to the light control and you can create your own light climate.



In the automatic mode you can choose between 5 lighting types and in addition start an acclimatisation program for plants, which have previously been kept under fluorescent tubes and now need to become accustomed to the stronger LED light for a few weeks.

For the 5 lighting types, incl. sunrises and sunsets, lightning storms and clouds, the complementary light is not mandatory. The JBL LED SOLAR CONTROL in combination with the JBL LED SOLAR NATUR offers you very realistic light situations but without red, green and blue tones.

JBL LED SOLAR NATUR – The Colour Temperatures

LED SOLAR NATUR – 2700 K



LED SOLAR NATUR – 4000 K

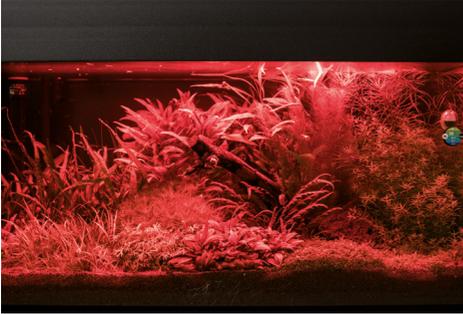


LED SOLAR NATUR – 6700 K



JBL LED SOLAR EFFECT – Light Colours and Combinations

LED SOLAR EFFECT – RED



LED SOLAR NATUR + LED SOLAR EFFECT – RED



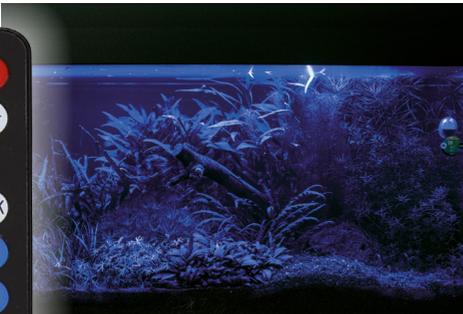
LED SOLAR EFFECT – GREEN



LED SOLAR NATUR + LED SOLAR EFFECT – GREEN



LED SOLAR EFFECT – BLUE



LED SOLAR NATUR + LED SOLAR EFFECT – BLUE



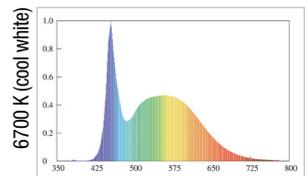
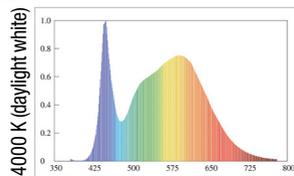
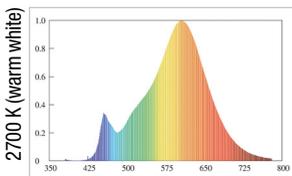
LED JBL SOLAR NATUR

High-performance LED light for freshwater aquariums

PAR
>200*
Full Spectrum



- Maximum light efficiency for more beautiful aquatic plants: PAR* >200 $\mu\text{mol/s/m}^2$
- Evenly distributed warm white and cool white LEDs for a biotope-compatible light climate.
- Energy-saving: approx. 50 % compared to T5.
- 2 channels with 3 preset light colours: 2700 K (warm white), 4000 K (daylight white), 6700 K (cool white).
- Light colours can be selected individually using IR remote control.
- Dimmable in eight steps.
- With holding brackets for top assembly and end caps for the installation in tube sockets (T5 and T8 retrofit).
- Ideal passive cooling thanks to a stylish aluminium profile.
- Compatible with:
JBL LED SOLAR CONTROL
with app control: various preset programs of popular aquarium biotopes available and individually programmable.
- Cable suspension (**JBL LED SOLAR HANGING**) available as accessory.



Wattage	Lumen (4000 K)	K	PAR*	Retrofit for aquarium	Top piece for aquarium	Replaces 2 x type T5/T8	LED module length
22	2400	2700-6700	200 +	60 cm	45-70 cm	438	383 mm
24	2600	2700-6700	200 +	80 cm	55-80 cm	549/590	495 mm
37	3900	2700-6700	200 +	80/100 cm	75-100 cm	742	687 mm
44	4800	2700-6700	200 +	100 cm	85-110 cm	849/895	795 mm
57	6300	2700-6700	200 +	120 cm	105-130 cm	1047	992 mm
59	6300	2700-6700	200 +	130 cm	115-140 cm	1149/1200	1095 mm
68	7300	2700-6700	200 +	160 cm	145-170 cm	1449/1500	1395 mm

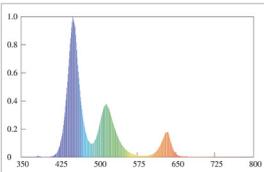
*) PAR = Photosynthetic Active Radiation. Measured value: photon density in micromole per second and square metre. Measured at 20 cm distance to the light.

LED JBL SOLAR EFFECT

Special lamp with RGB LEDs to create colour effects.

- RGB extension for JBL LED SOLAR NATUR
- For use with an existing light JBL LED SOLAR NATUR.
- Ideal replacement for the second tube of an existing T5 and T8 double light bar.
- Enables more dramatic colour simulations of sunrise and sunset, as well as weather situations.
- 3 channels: red, green, blue.
- Can be selected individually with IR remote control.
- Dimmable in seven steps.
- With holding brackets for top assembly and end caps for the installation in tube sockets (retrofit).
- Ideal passive cooling thanks to a stylish aluminium profile.
- Compatible with: **JBL LED SOLAR CONTROL** with app control: various preset programs of popular aquarium biotopes as choice option and individually programmable.
- Cable suspension (**JBL LED SOLAR HANGING**) available as accessory.

Upgrade for LED SOLAR NATUR



Wattage	Lumen	Retrofit for aquarium	Top piece for aquarium	Fits type T5/T8	LED module length
8	160	60 cm	45-70 cm	438	383 mm
9	200	80 cm	55-80 cm	549/590	495 mm
13	300	80/100 cm	75-100 cm	742	687 mm
15	320	100 cm	85-110 cm	849/895	795 mm
16	360	120 cm	105-130 cm	1047	992 mm
19	400	130 cm	115-140 cm	1149/1200	1095 mm
20	440	160 cm	145-170 cm	1449/1500	1395 mm

LED JBL SOLAR CONTROL

WiFi control unit, to be adjusted by app

Preset programme selection of popular aquarium biotopes

- **Community aquarium**
day cycle programme for community aquariums
- **Rio Pantanal®**
Season programme, as in south-west Brazil
- **Malawi Rocks®**
Season programme, as in Lake Malawi
- **Goldfish Paradise®**
Season programme, as in South China
- **Dreamscape®**
High power light programme for scapes enthusiasts

Options for individual programming



LED JBL SOLAR

Would you like to exactly of a tropical living

With the accessory **JBL LED SOLAR CONTROL** you have the opportunity to imitate the light conditions of a habitat exactly, with dry and rainy seasons or lightning



Rio Pantanal®

The Pantanal in South America has the clearest tropical water on earth and is the home of countless species of fish we keep in the aquarium. The clearwater rivers are surrounded by jungle and have their own particular rain-forest character. The jungle river theme is definitely one of the most fascinating biotope when setting up an aquarium. Your plants will thrive and your tetras or dwarf cichlids will be displayed in their most beautiful colours!



Malawi Rocks®

The very bright and cold-white illumination corresponds to the light in both African Rift Valley waters of Lake Malawi and Lake Tanganyika. In the clear water of the lakes, the blue tones are especially visible! Your Lake Malawi and Lake Tanganyika cichlids with their wonderful colours are wonderfully displayed, as in Nature.

reproduce the light environment (biotope)?

storms, or to set the perfect light for a densely planted aquascaped aquarium. The JBL development team is offering 5 aquarium types with the **JBL LED SOLAR CONTROL**.



Dreamscape®

Aquascapers will be happy about this type of light because it supplies maximum light efficiency with a very high PAR value (photosynthetically active radiation) which promotes the healthy and vigorous growth of your plants. Aquascapers reproduce landscapes under water which e.g. feature a mountain with meadows, a forest or cliffs with vegetation. This setup style definitely belongs to the most spectacular setups of all aquariums! The plants used generally make very high demands on the light quantity and quality. The light type "Dreamscape" has been programmed precisely for them.



Goldfish Paradise®

The pre-set light colour accentuates the beautiful colours of the goldfish! Even hardy plants, such as the hornwort or the waterweed will grow fast under this light.



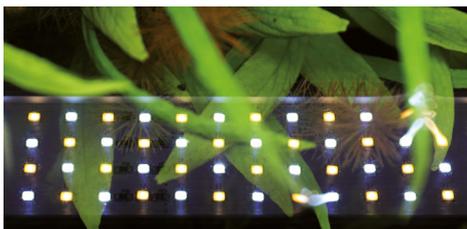
Community aquarium

You have put together a suitable fish and plant community. With this program you will receive the ideal illumination to highlight your fish and promote the growth of your plants.



Special program to acclimatise plants

If you want to adjust aquarium plants from being kept under fluorescent tubes to LEDs you need to do it slowly, since the light intensity of LEDs is significantly higher. JBL has added an acclimatisation mode at the beginning of each program which can, if required, be selected or skipped. This way the plants can slowly get used to the new light.



Individual program

You will find out exactly what the individual LED components contain, the way they function and what effects they can have, here.

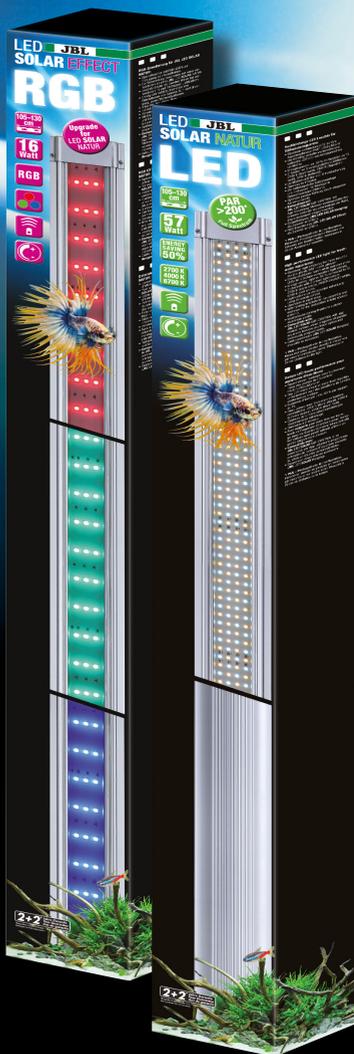
LED JBL SOLAR

LED aquarium lighting based on nature's model

JBL LED SOLAR NATUR JBL LED SOLAR EFFECT

- **JBL LED SOLAR NATUR:** complete kit incl. remote control. Can be installed in 5 minutes.
- 2 channels with 3 preset light colours: 2700 K (warm white), 4000 K (daylight white), 6700 K (cool white).
- Energy-saving at double light output compared to fluorescent tubes.
- Highest PAR values (Photosynthetically Active Radiation) for perfect plant growth.
- Incl. adapter for existing tube holders (T5/T8 retrofit) and V4A holding bracket.
- **JBL LED SOLAR EFFECT:** Special lamp with RGB LEDs to create colour effects.
- For use with an existing light JBL LED SOLAR NATUR.
- Enables more dramatic colour simulations of sunrise and sunset, as well as weather situations.
- 3 channels: red, green, blue.
- Can be selected individually with IR remote control.

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**VORSPRUNG
DURCH FORSCHUNG**
AHEAD THROUGH RESEARCH

