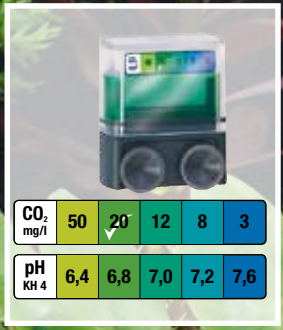
JBL

CO_2 fertilisation

The secret of magnificent plant growth in an aquarium



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L'avancée par la recherche

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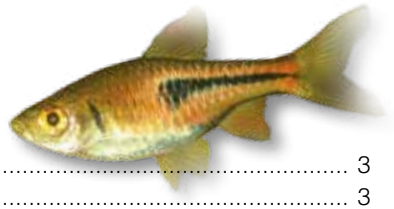


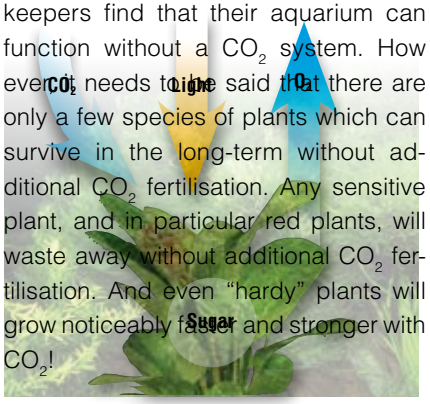
Content

Why CO_2?

All plants need carbon dioxide (CO_2) as a basic nutrient, supplemented by minerals from fertilisers (e.g. **JBL Ferropol**). During photosynthesis, the energy of light combines CO_2 with water, producing sugar (nourishment for plants). In the course of this process, oxygen (O_2) is released which is needed by other creatures. Incidentally, plants also need a certain amount of oxygen at night, which is why night-time ventilation is really a good idea for densely planted aquariums.

Can an aquarium run without CO_2?

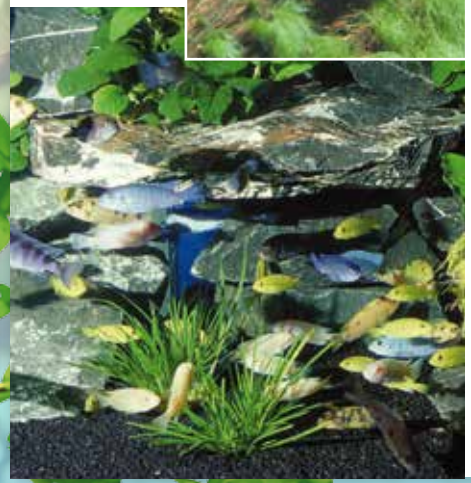
In an aquarium there is not sufficient CO_2 available for plants; that's why aquarium-keepers have to lend a helping hand by installing a CO_2 fertilisation system. Some aquarium-keepers find that their aquarium can function without a CO_2 system. How ever, it needs to be said that there are only a few species of plants which can survive in the long-term without additional CO_2 fertilisation. Any sensitive plant, and in particular red plants, will waste away without additional CO_2 fertilisation. And even "hardy" plants will grow noticeably faster and stronger with CO_2!



Why does CO_2 help combat algae?

Plants and algae compete for food in an aquarium. If plants flourish, there is not enough nutrition left for algae and they waste away. CO_2 fertilisation encourages plant growth, leaving no chance for algae to grow. Even in aquariums which usually have few plants, for example Lake Malawi-Tanganyika aquariums, these few plants should be particularly well-nourished to actively combat the growth of algae. By the way, in comparison to the availability of nutrients, light plays a very minor role!

Hair algae ➤

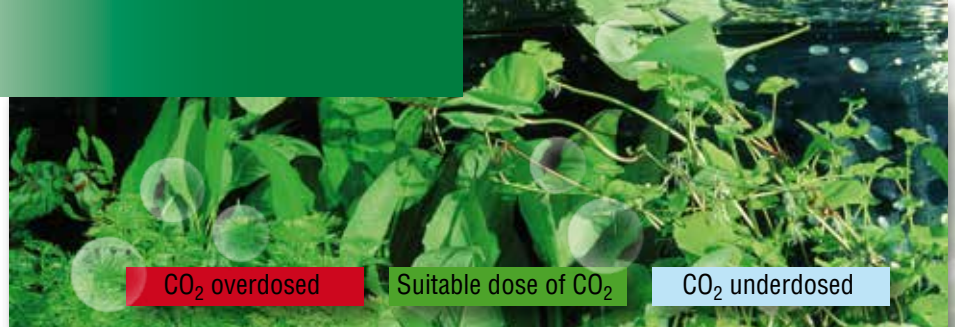


Does CO_2 fertilisation mean less oxygen in the water?

Many people believe that CO_2 reduces oxygen levels in the water. This is not correct! However, the link needs to be explained in more detail. If, despite adding CO_2, the surface of the water is strongly agitated by air stones or the spray bar from a filter, the oxygen level in the water will increase, but the CO_2 will be expelled at the same time (like shaking a bottle of Coca Cola). The calmer the surface of the water, the more CO_2 will remain in the water. Both gases (CO_2 and O_2) can be present together in high concentrations in the water.

How much CO_2 is needed?

The right amount of CO_2 depends on the carbonate hardness (KH) and the pH level. The harder the water (the higher the KH), the more CO_2 is required to reduce the pH level. However, CO_2 cannot be arbitrarily dissolved in the water to reduce the pH level. The proportions are shown in the table. The green sector shows the optimum CO_2 levels.



CO_2 overdosed | Suitable dose of CO_2 | CO_2 underdosed

KH \ pH	6,3	6,4	6,5	6,6	6,7	6,8	6,9	7,0	7,1	7,2	7,3	7,4	7,5
2	32	25	20	16	13	10	8	6	5	4	3	3	2
3	48	38	30	24	19	15	12	10	8	6	5	4	3
4	64	51	40	32	25	20	16	13	10	7	6	5	4
5	80	63	50	40	32	25	20	16	13	10	8	6	5
6	96	76	60	48	38	30	24	19	15	12	10	8	6
7	111	80	70	56	44	35	28	22	18	14	11	9	7
8	127	101	80	64	51	40	32	25	20	16	13	10	8
9	143	114	90	72	57	45	36	29	23	18	14	11	9
10	158	128	10	80	63	60	40	32	25	20	16	13	10
11	175	139	110	88	70	55	44	35	28	22	18	14	11
12	191	152	121	96	76	60	48	38	30	24	19	15	12
13	207	164	131	82	82	65	52	41	33	26	21	16	13
14	223	177	141	112	89	70	56	44	35	28	22	18	14

The right CO_2 level in the aquarium

The optimum CO_2 level is colour-coded in the table. It can be seen that each level of water hardness is linked to a certain CO_2 level which in turn determines the pH level. So although even at high degrees of hardness (e.g. 14 KH) a pH level of 6.3 can be attained by adding CO_2, the amount of CO_2 (223 mg/l) this would require is lethal for the inhabitants of an aquarium. If an aquarium-keeper wants to attain a low pH level of 6.3, for example, he must first reduce the carbonate hardness to 2. Conversely, the table also shows when too little CO_2 is available. If an aquarium has a KH of 5 and a pH level of 7.5, the CO_2 content is only 5 mg/l. By adding CO_2, a CO_2 level of 16 – 32 mg/l should be aimed for, which will then reduce the pH level to 7.0 – 6.7.

Is CO_2 alone sufficient or do I need other fertilisers?

A comparison with our own diet explains the situation well: CO_2 forms the basic nutrient (like carbohydrates for animals), but it is vital that this is supplemented. We humans need vitamins, minerals and fibre; plants “only” need minerals and light to grow.

1 START **Ground fertiliser**

The basis for plant roots with **JBL AquaBasis plus** (ready-mixed) or **JBL Florapol** (concentrate to mix yourself). This gives the plant roots all the vital nutrients over the long-term.

2 START **Basic fertiliser**

JBL Ferropol provides aquarium plants with all the essential nutrients which can be given on a weekly basis. JBL Ferropol is thus the liquid basic fertiliser.

3 START **Supplementary daily fertiliser**

JBL Ferropol 24 contains all the sensitive trace elements which have to be added daily and cannot be given as a dose to be held in stock.

4 START PLUS **The right light**

Light with similar properties to sunlight from JBL full-spectrum tubes (rated excellent by the scientific IFM Geomar Institute and specialist aquatic magazines). **JBL SOLAR Tropic** for warm colours and **JBL SOLAR Natur** for bright light.

5 START PLUS **CO_2- fertilising**

Provides plants with the main nutrient, carbon dioxide (CO_2), dissolved in the water. Promotes plant growth, combating algae!

6 PROFESSIONELL **Ground heating**

Warm feet for the plants with **JBL ProTemp Basis**, ensuring good current flow through the ground material. Nutrients reach the plant roots more quickly and the ground-covering material is always actively rinsed.

7 RESTART **Re-fertilising the roots**

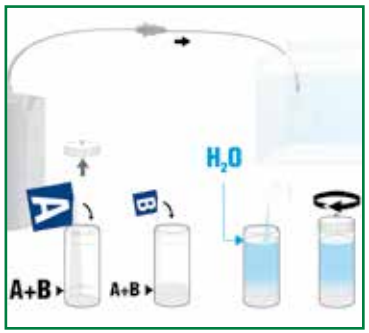
re-charges the ground fertiliser with nutrients, minerals and trace elements after several months, so that plant growth is boosted further.

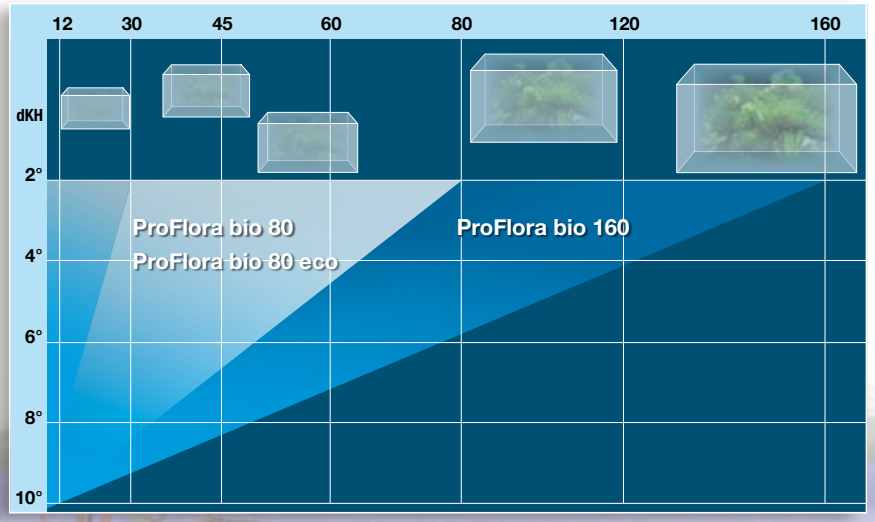
First steps in CO_2 fertilisation: JBL ProFlora BioCO_2

The JBL ProFlora BioCO_2 system is ideally suited to aquariums up to 160 litres. Reasonably priced and simple to install, it gives everyone the opportunity to see for themselves the advantages of CO_2-fertilisation. Then you have a choice: either to continue with JBL ProFlora BioCO_2 and only buy refills or to change to the gas cylinders of the JBL ProFlora u or m systems. In the JBL BioCO_2 system two components are combined in a reaction flask (nutrient-micro organism system), which then produce CO_2 for 40days, which is then simply dissolved into the water via an air stone or a JBL ProFlora Taifun (reactor).

JBL ProFlora bioRefill makes it simple to refill your JBL ProFlora BioO_2 unit after 40 days.

Fill the A and B bio components into the reaction flask, fill with water and your aquarium will be furnished with the basic nutrient for plants, carbon dioxide, once again for the next 40 days.





aquarium size in cm

Why select the JBL CO_2 fertiliser system?

Many of the advantages are in the small, but fine, details, whilst some of the advantages are obvious:

- The reactor (JBL ProFlora Taifun), which dissolves the CO_2 in the water, can be extended. If more plants are added or the pH level reduced, the JBL Reactor can be extended by simply adding modules.
- No separate pump is needed for the JBL ProFlora Taifun and it can be positioned anywhere in the aquarium (in the water current or not), as it produces its own micro-currents through the micro-slits between the modules.
- The JBL ProFlora u001/m001 (pressure regulator) can be used with refillable as well as disposable cylinders (fitting or removing adapter (accessory)). This means that for holiday periods (as a precaution) the system can simply be changed to disposable cylinders with reserve cylinders.
- The 500 g refillable cylinder (JBL ProFlora m500) does not require any complicated holder screwed or drilled into the cupboard, instead it is simply placed on the JBL Cylinder Base.
- The JBL CO_2/pH Permanent Test takes the water hardness (KH) into account! As described above, the optimum CO_2 amount varies depending on the carbonate harness of the water. Therefore the optimum CO_2 level is colour-coded according to the hardness of the water. That means a CO_2 overdose cannot happen!

Installing the JBL ProFlora u-m systems is as simple as this:

Installation is simple, anyone can do it in just a short time. In brief, this is how you install the system:

1. The pressure regulator is screwed onto the CO_2 storage cylinder, which is then connected by hose to a reactor in the aquarium.
2. CO_2 is fed through this into the aquarium, where it is dissolved in the water with the help of the reactor.
3. A solenoid valve can be connected to interrupt the CO_2 supply at night (plants only need CO_2 during the day). This is available separately and is already included in the JBL ProFlora u402 and JBL ProFlora m602.
4. If you would like to control the CO_2-supply and the pH level automatically, you can install the JBL ProFlora pH-Control (available separately or included in the JBL ProFlora u403, m603 and m1003). This computer measures and regulates the CO_2 supply.

JBL CO_2 Plant Care: Product Range

JBL ProFlora bio80 eco

Reasonably priced bio-CO_2 starter set

- Provides aquariums of 30 – 80 l with the basic plant nutrient, carbon dioxide (CO_2) for 40 days.
- Visible success through luxuriant plant growth – resulting in less algae.
- Simple to install. Ready to use within a few minutes.
- Contains storage cylinder, bio-components, 2 m special black CO_2 hose, suction pad and diffuser.
- Additional storage cylinders and bio-components can be purchased separately.

JBL ProFlora bio80

Complete bio-CO_2 starter set with mini-diffusor

- With professional mini-CO_2 diffuser (JBL ProFlora Taifun P) for loss-free CO_2-enrichment of the water.
- Even sensitive plants visibly flourish.
- Provides aquariums of 30 – 80 l with the basic plant nutrient, carbon dioxide (CO_2) for 40 days
- Simple to install within a few minutes.

JBL ProFlora bio160

Professional bio-CO_2 starter set with extendable diffusor

- With extendable mini-CO_2 diffuser (JBL ProFlora Taifun) for fast, loss-free CO_2-enrichment of the water.
- Even red, fine and sensitive plants visibly flourish.
- Provides aquariums of 50 – 160 l with the basic plant nutrient, carbon dioxide (CO_2) for 40 days.
- Simple to install within a few minutes.

JBL ProFlora bio Refill

Refill components for JBL bio-CO_2 systems

- Bio-components (A and B) for bio-CO_2 systems.
- Simply add complete refill to the diffusor container and fill with water.
- Provides aquariums of 30 – 80 l with the basic plant nutrient, carbon dioxide (CO_2) for 40 days.

JBL ProFlora u201

CO_2-fertiliser system with 95 g one-way cartridge

- New mini CO_2 fertiliser system with modern styling.
- Complete system with: 95 g CO_2 one-way cartridge and elegant stand, 2 m hose with clever anti-kink protection, mini pressure regulator, modern mini CO_2 porcelain diffusor, bubble counter with integrated non-return valve and CO_2 permanent test.
- Pressure regulator with pre-set pressure and a manometer which displays the remaining pressure of the bottle.

JBL ProFlora u401

CO_2-fertiliser system with 500 g disposable cylinder

- Complete system with: 500 g CO_2 cylinder, pressure regulator, CO_2 diffusion reactor JBL Taifun 190 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CO_2/pH Permanent Test.
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to multiple use system).
- The system is ready to use and designed for aquariums from 50 to 400 litres.
- With JBL Ferropol (liquid fertiliser) and JBL Ferropol 24 (daily fertiliser).

JBL ProFlora u402

CO_2-fertiliser system with 500 g disposable cylinder and night switch-off

- Complete system with: 500 g CO_2 cylinder, pressure regulator, night switch-off, CO_2 diffusion reactor JBL Taifun 190 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CO_2/pH Permanent Test.
- With night switch-off which interrupts the CO_2-supply by means of a time-switch (not included) as plants do not need CO_2 in the darkness (halves CO_2 consumption!)
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to multiple use system).
- The system is ready to use and designed for aquariums from 50 to 400 litres.
- With JBL Ferropol (liquid fertiliser) and JBL Ferropol 24 (daily fertiliser).

JBL ProFlora u403

CO_2-fertiliser system with 500 g disposable cylinder and pH control instrument

- Complete system with: 500 g CO_2 cylinder, pressure regulator, pH control instrument, CO_2 diffusion reactor JBL Taifun 190 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CH Test
- With pH control instrument (JBL pH Control), which automatically regulates CO_2 supply and adjusts to the pH level selected (incl. calibration solution but without pH electrode!).
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to multiple use system).
- The system is ready to use and designed for aquariums from 50 to 400 litres.
- With JBL Ferropol (liquid fertiliser) and JBL Ferropol 24 (daily fertiliser).

JBL ProFlora u001

Pressure regulator for disposable CO_2 cylinders

- Precision pressure regulator, regulates cylinder pressure from 60 to 1.5 bar. The correct bubble count (amount of CO_2) is then adjusted on the fine needle valve.
- Preset working pressure (1.5 bar) means no need for complicated re-adjusting (adjustment possible, if required).
- 2 pressure gauges display working pressure and cylinder pressure.
- Can be converted to refillable cylinder system using adapter.

JBL ProFlora Adapt u-m

Converts pressure regulator from disposable to refillable system

- For simple, problem-free conversion of the JBL CO_2 pressure regulator u001 to refillable cylinders (such as the JBL m-System).
- Conversion can be reversed at any time.
- Using a 6 Allen key (not included), the adapter is screwed in to the JBL u pressure regulator. Time taken: 20 seconds.

JBL ProFlora m601 to 600 litres

CO_2-fertiliser system with 500 g refillable cylinder

- Complete system with: 500 g CO_2 cylinder with stand, pressure regulator, CO_2 diffusion reactor JBL Taifun 270 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CO_2/pH Permanent Test.
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to disposable system).
- The system is ready to use and designed for aquariums from 100 to 600 litres.

JBL ProFlora m602 to 600 litres

CO_2-fertiliser system with 500 g refillable cylinder and night switch-off

- Complete system with: 500 g CO_2 cylinder with stand, pressure regulator, night switch-off, CO_2 diffusion reactor JBL Taifun 270 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CO_2/pH Permanent Test.
- With night switch-off which interrupts the CO_2-supply by means of a time-switch (not included) as plants do not need CO_2 in the darkness (halves CO_2 consumption!)
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to disposable system).

JBL ProFlora m603 to 600 litres

CO_2-fertiliser system with 500 g refillable cylinder and pH control instrument

- Complete system with: 500 g CO_2 cylinder with stand, pressure regulator, pH control instrument, CO_2 diffusion reactor JBL Taifun 270 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CH Test.
- With pH control instrument (JBL pH-Control), which automatically regulates CO_2 supply and adjusts to the pH level selected (incl. Calibration solution but without pH electrode!).
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to disposable system).

JBL ProFlora m1003 to 1000 litres

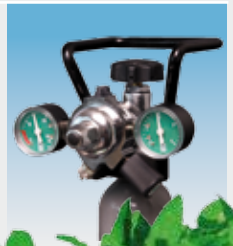
CO_2-fertiliser system with 2 kg refillable cylinder and pH control instrument

- Complete system with: 2 kg CO_2 cylinder with stand, pressure regulator, pH control instrument, CO_2 diffusion reactor JBL Taifun 430 mm, 2 meter CO_2 special hose, CO_2 non-return valve, CH Test.
- With pH control instrument (JBL pH-Control), which automatically regulates CO_2 supply and adjusts to the pH level selected (incl. calibration solution but without pH electrode!).
- Professional pressure regulator with pre-set working pressure (= no adjustment required, but possible if required) and 2 pressure gauges displaying the residual pressure in the cylinder and the working pressure set (can be adapted to disposable system).

JBL ProFlora m001

Pressure regulator for refillable CO_2 cylinders

- Precision pressure regulator, regulates cylinder pressure from 60 to 1.5 bar. The correct bubble count (amount of CO_2) is then adjusted on the fine needle valve.
- Preset working pressure (1.5 bar) means no need for complicated re-adjusting (adjustment possible, if required).
- 2 pressure gauges display working pressure and cylinder pressure.
- Can be simply converted to disposable cylinder system.



JBL ProFlora Taifun S

CO_2 High-performance diffuser „Small“

- Dissolves CO_2 gas in aquarium water without loss.
- Suitable for aquariums from 20 cm high to max. 200 litres with 4°KH (to 100 l for 10°KH).
- Can be extended for higher hardness levels or larger aquariums.
- Operates without additional pumps.
- No separate bubble counter required.
- Can be completely dismantled, easy to clean (with JBL PowerClean).

JBL ProFlora Taifun P NANO

Mini-CO_2 diffuser

- Small, attractively designed CO_2 diffuser with ceramic membrane for even enrichment of the aquarium water with the basic plant nutrient, carbon dioxide (CO_2).
- With special ceramic for particularly small and even-sized CO_2 bubbles.
- High quality glass design, easy to clean.
- Fits all CO_2 4/6 mm hoses.

JBL ProFlora Taifun

CO_2 High-diffusion reactor

- Dissolves CO_2 gas in aquarium water without loss.
- Suitable for aquariums from 30 cm high to max. 400 litres with 4° CH (to 200 l for 10° CH).
- Can be extended for higher hardness levels or larger aquariums.
- Operates without additional pumps.
- No separate bubble counter required.
- Can be completely dismantled, easy to clean (with JBL PowerClean).

JBL ProFlora Taifun extend

Extension module for JBL Taifun CO_2 Reactor

- If the capacity of the JBL Taifun is no longer sufficient (changed to larger aquarium or higher water hardness levels), JBL Taifun can be extended by adding this module.
- Increases capacity by 100 litres at 10° GCH or 200 litres at 4° GCH.
- Extends the diffusion length of CO_2 by 50 cm.

JBL ProFlora m2000

CO_2 refillable 2000 g storage cylinder

- Ready-filled with 2 kg CO_2. Dimensions: 46 x 11.5 cm.
- With external international valve (W 21.8 x 1/14). Safety valve protection (cage).
- Free-standing, no stand required.

JBL ProFlora m500

CO_2 refillable 500 g storage cylinder

- Ready-filled with 500 g CO_2. Dimensions: 43 x 11 cm (with stand: 45 x 16 cm).
- With external international valve (W 21.8 x 1/14). Safety valve protection (cage).

JBL ProFlora u500

CO_2 disposable 500 g storage cylinder

- Ready-filled with 500 g CO_2. Height: 29 cm, diameter: 7.5 cm.
- With integrated stand.
- High safety, tested to 165 bar.
- Thread connection: M 10 x 1.

JBL ProFlora u95

CO_2 cartridge refills at 95 g

- Ready-filled with 95 g CO_2. Height: 17,5 cm, diameter: 4 cm.
- High safety, tested to 275 bar.
- The screw thread does NOT fit normal one-way pressure regulators (JBL ProFlora u001).

JBL CO_2-fertilising system

The Easy Way of Professional Plant Care

JBL ProFlora m2000
2 kg Filled Gas Bottle

With cage and safety release panel. Large refillable gas storage bottle with 2000 g CO_2. CE (TÜV) approved

Art. No. 63202

JBL ProFlora Adapt u-m

Adapts the JBL ProFlora u001 pressure regulator for use with refillable cylinders (JBL m system). To use the JBL m001 pressure regulator on disposable cylinders (JBL u system) simply remove the locking nut from the pressure regulator. Adaptation can be reversed in either direction at any time.

Art. No. 64518

JBL ProFlora m001
JBL ProFlora u001
CO_2 pressure regulator

Reduces the high pressure of the gas bottle from approx. 50 bar to a lower working pressure of 1 bar. The amount of CO_2 required can be adjusted using the small handwheel.

Art. No. 63332
Art. No. 63333

JBL ProFlora T3
CO_2-hose

This special hose is designed to connect the individual devices. It is made of CO_2-resistant material. CO_2 gas leaks through the walls of normal hose.

Art. No. 63462

JBL ProFlora SafeStop,
Non-return valve

Prevents a flowback of aquarium water into the gas bottle, solenoid valve and pressure reducer It should be installed directly before the diffusor (JBL ProFlora CO_2 vario). Check the direction of installation.

Art. No. 64515

JBL ProFlora Count

Bubble counter. Using the bubble counter, the amount of CO_2 gas added can be precisely counted. The bubble counter is only required if the vario-Reactor is hidden behind decorative objects and cannot be seen.

Art. No. 63483

Sensor for temperature

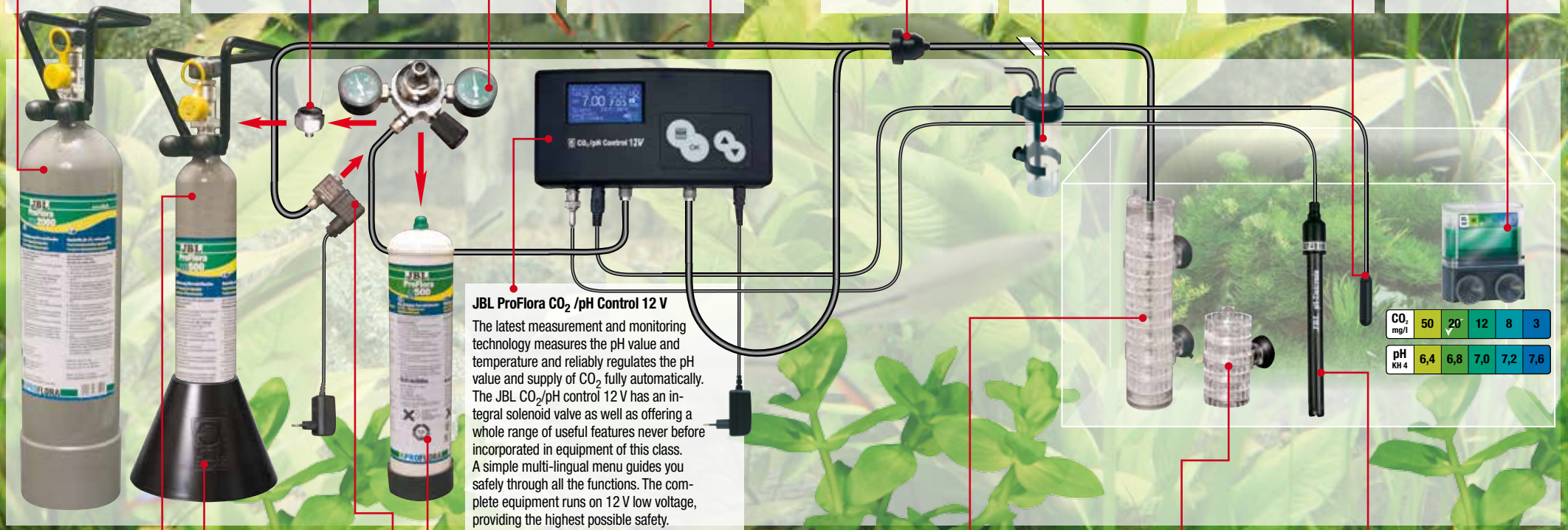
Checks the water temperature for the

JBL ProFlora
CO_2/pH Control 12 V

JBL Permanent Test
CO_2 plus pH

This device displays the CO_2 content and the pH level of the aquarium water. In the case of too high or too low CO_2 content, re-adjust the CO_2 supply on the pressure reducer.

Art. No. 25388



JBL ProFlora CO_2 /pH Control 12 V

The latest measurement and monitoring technology measures the pH value and temperature and reliably regulates the pH value and supply of CO_2 fully automatically. The JBL CO_2/pH control 12 V has an integral solenoid valve as well as offering a whole range of useful features never before incorporated in equipment of this class. A simple multi-lingual menu guides you safely through all the functions. The complete equipment runs on 12 V low voltage, providing the highest possible safety.

Art. No. 63418

JBL ProFlora m500
500g Gas Bottle

This CE (TÜV) approved bottle contains 500 g carbon dioxide (CO_2). The valve is protected by a safety bar (cage). The bottle can be refilled at a specialist pet shop.

Art. No. 63172

JBL ProFlora stand for
JBL ProFlora m500

Provides a firm base for a 500 g gas bottle. CO_2 bottles should always be placed in an upright position when in use.

Art. No. 63176

JBL ProFlora v002
Solenoid valve

The solenoid valve is designed to interrupt the CO_2 supply. This is useful at night as plants only require CO_2 during the lighting phase.

Art. No. 63413

JBL ProFlora u500
500 g CO_2 storage bottle

This disposable bottle cannot be refilled. It contains 500 g CO_2 gas. CE (TÜV) approved.

Art. No. 63174

JBL ProFlora Taifun
CO_2 diffuser

This dissolves the CO_2 gas in water. The CO_2 bubbles slowly rise inside the 1 meter long coil, dissolving in the water. The diffuser is sufficient for aquariums of up to 600 litres, given a carbonate hardness of max. 4° dCH.

Art. No. 63473

JBL ProFlora Taifun extend
diffuser extension set

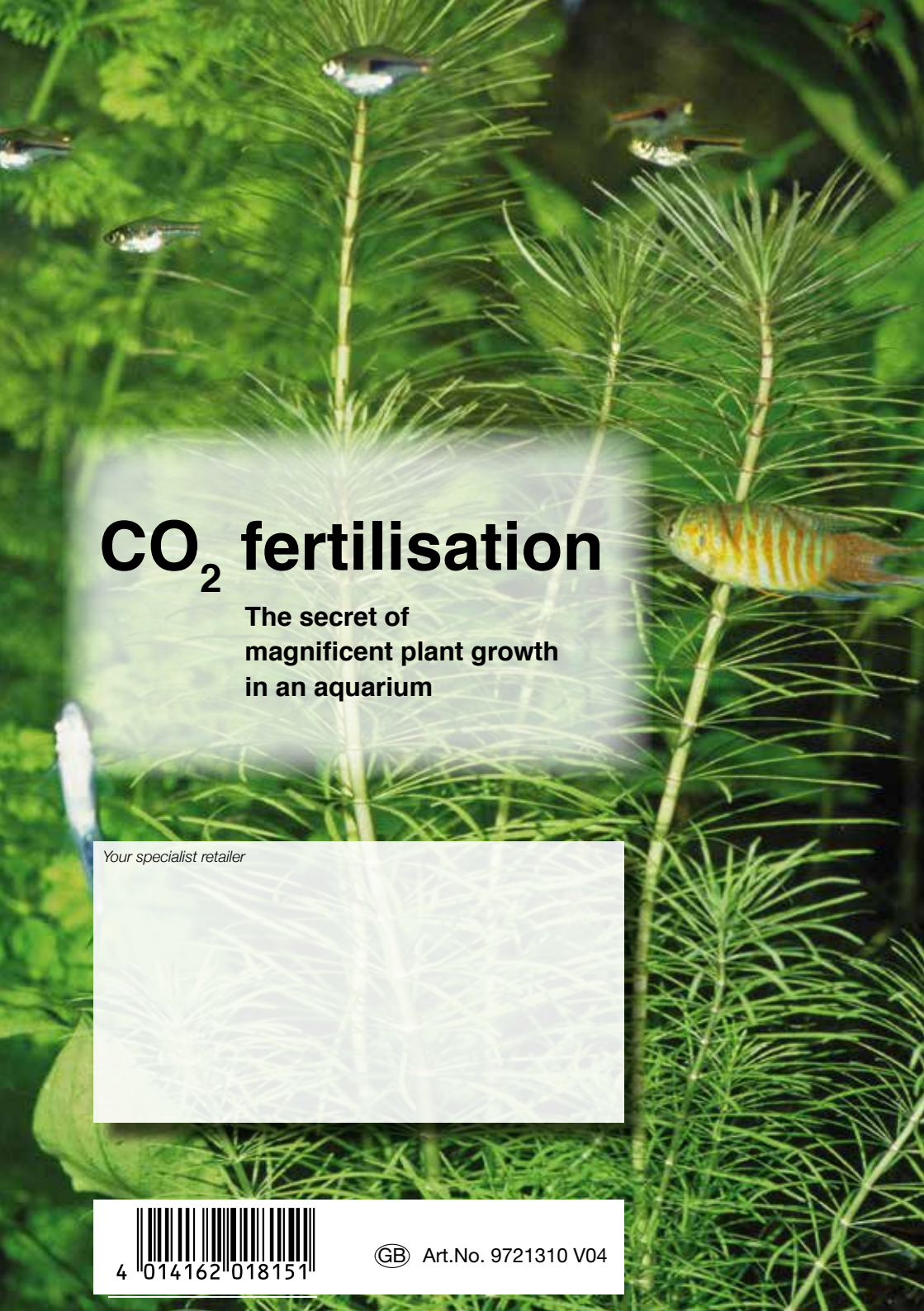
This set extends your JBL Taifun reactor for an aquarium of over 600 litres. The extension set is simply to install between the two modules of your JBL Taifun diffuser, extending the contact area to the aquarium by 50 cm.

Art. No. 63474

JBL ProFlora pH Sensor

High quality gel electrodes for measuring pH value. It is recommended that the electrodes are installed in a dark and quiet location in the aquarium and it would be advisable to calibrate them once a month. The JBL ProFlora CO_2/pH Control indicates when the calibration should be administered.

Art. No. 63414



CO_2 fertilisation

The secret of magnificent plant growth in an aquarium

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