



*Instructions and Warranty*

**CO<sub>2</sub>**

*Plant Care Program*

Standard and Professional kit



**Aquatic Nature**

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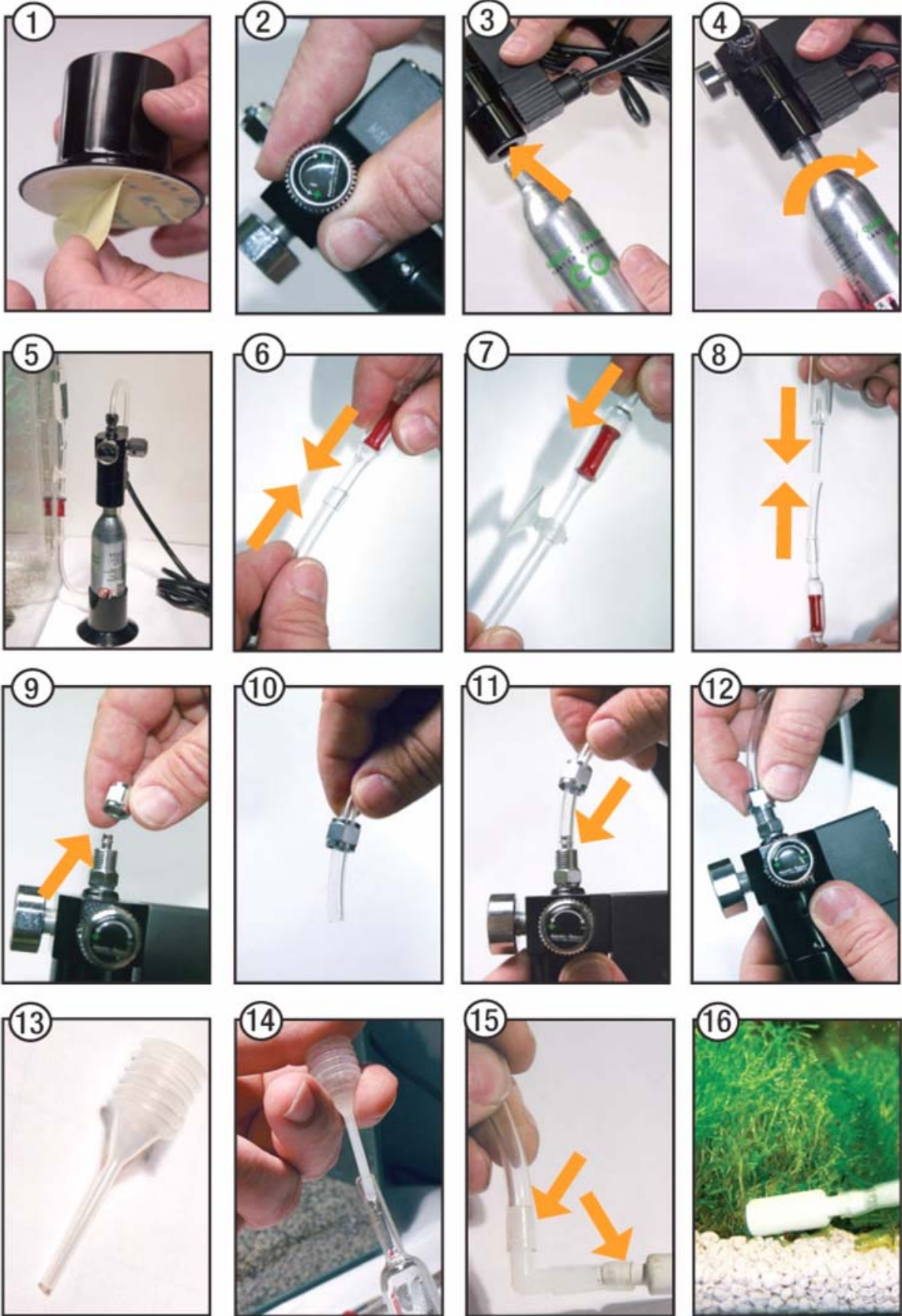
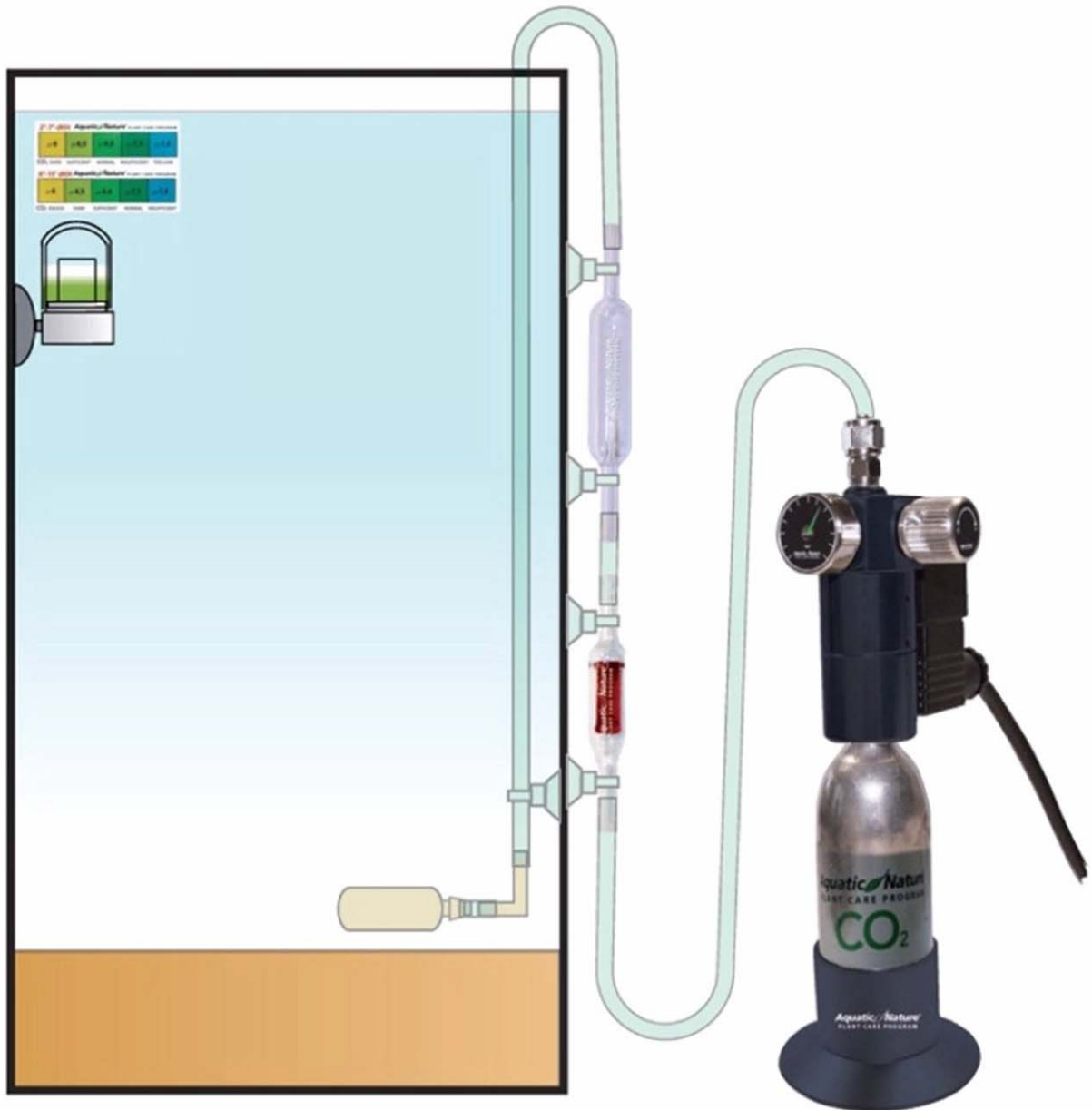
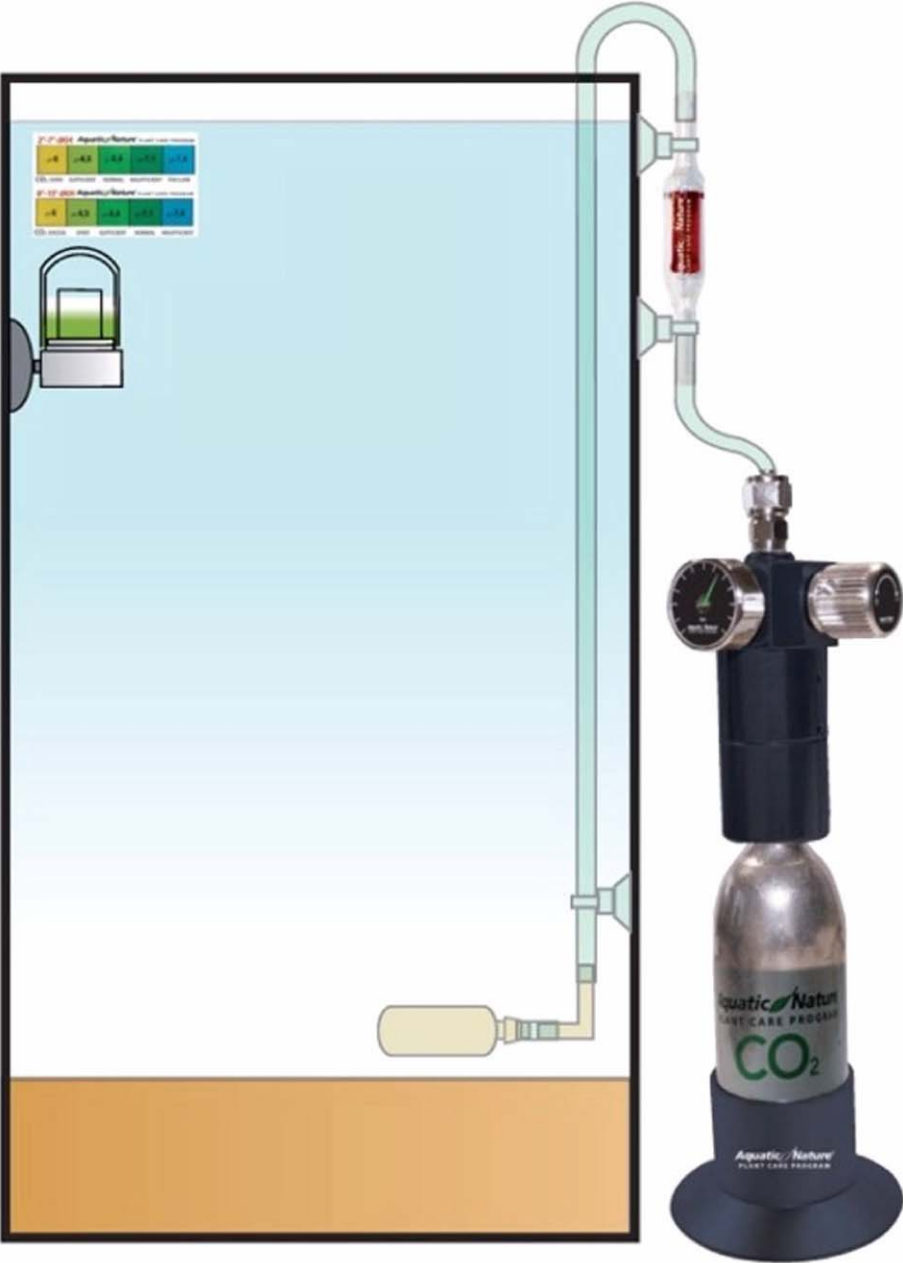


Fig.A: Professional kit



Developed and designed by the R&D of  
**Aquatic Nature®**

Fig.B: Standard kit



Developed and designed by the R&D of  
**Aquatic Nature®**

# Plant – Care Program

Dear customers,

We congratulate you for the purchase of your **CO<sub>2</sub> Standard Kit** or **CO<sub>2</sub> Professional Kit**. Aquatic Nature developed this new type of CO<sub>2</sub> system for several reasons.

First of all, for the wellbeing and the flourish growth of aquarium plants, thus preventing the accumulation of phosphates (PO<sub>4</sub>) and of nitrates (NO<sub>3</sub>) in the aquarium. Secondly, to increase the facility of employment and to bring a very high degree of accuracy.

The disposable cartridges were selected because those are completely recyclable and in proper use without danger to the user. The aesthetic aspect was studied to obtain a system with a functional design. The perfect adjustment gives you the possibility of distributing CO<sub>2</sub> for each aquarium going from 20 L up to 300 L, and this with a very high precision. The CO<sub>2</sub> Professional Kit can be completely automated thereafter when adding a pH controller on the magnetic valve. Moreover, Aquatic Nature developed an adapter for bottles which gives you the possibility of using traditional bottles CO<sub>2</sub> (depending on the brands) of more important size.

This adapter can be ordered under Art. N° 02 728.

To guarantee a good service, each apparatus was controlled before being packed. No disassembling of the fixed parts can be carried out (pressure gauge, adjustable tangent of the pressure reducer...) under penalty of immediate cancellation of the guarantee.

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Pressure reducer with manometer	*	*
Solenoid valve	*	0
Bubble counter with 2 suction cups	*	0
Check valve with 2 suction cups	*	*
1,5 m special CO <sub>2</sub> tube Aquatic Nature	*	*
Ceramic diffuser	*	*
CO <sub>2</sub> Visual test	*	*
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## NOTE OF SAFETY

- Keep out of reach of children.
- The kit will not be placed in direct sunlight or close to a heat source, It is absolutely necessary to remain a temperature of 40°C.
- Once connected and in function the kit stays on his place and will not be moved.
- Important : the cartridge/bottle shall not be unscrewed once she is connected to the pressure reducer (**Photo N°4**) and as long as there is gas in the bottle, this could cause severe damage or even injuries due to the escape of CO<sub>2</sub> under pressure. The pressure gauge shows the presence of CO<sub>2</sub> in the cartridge/bottle.
- When the cartridge/bottle has to be changed, make sure that there is no more CO<sub>2</sub> in the cartridge/bottle, open the button of adjustment, for **CO<sub>2</sub> Professional Kit**, make sure that the magnetic valve is connected and unscrew the cartridge/bottle from the pressure reducer only when no more CO<sub>2</sub> is in the cartridge/bottle.
- Use only Aquatic-Nature 80 g cartridge/bottle, Article N° 02 720 if not you are likely to destroy the threading of the pressure reducer and the apparatus would not be under guarantee.

## ADVICES ABOUT THE PLANTS

The quality of water is very important for a perfect assimilation of CO<sub>2</sub> by the plants. Advised water values of the various parameters.

pH: 6,8 to 7,2  
dKH: 3 to 7°  
dGH: 5 to 12°

A good lighting also plays a very important part. The use of Professional Glass Diffusor is recommended for the aquariums having a dense or very dense plantation. A greater quantity of CO<sub>2</sub> is then diffused in an optimal way. CO<sub>2</sub> is not recommended to decrease the pH over a short period. This occurs generally in the long run.

## INSTRUCTIONS

(to be read attentively before the installation)

### INSTALLATION

Choose the place where you will install your Standard CO<sub>2</sub> Kit or your CO<sub>2</sub> Professional Kit (preferably beside the aquarium) or if necessary below the aquarium.

- a) A two-sided sticker is below the support of bottle. This sticker is used to ensure the stability of the system CO<sub>2</sub>. Remove the paper of the sticker (photo N°1) and place the support at the place which you chose. Caution: once the sticker placed, you will not be able to move the support any more. For reasons of safety and to ensure an optimal adjustment, the cartridge/bottle CO<sub>2</sub> must always be placed in the support stuck on a plane surface and horizontal.
- b) Take the pressure reducer and close it with the hand while turning the button of adjustment towards the sign (photo N°2) without tightening.
- c) Take the CO<sub>2</sub> Cartridge, control if there is no dust or of dirtiness in the threading of the pressure reducer and on the head of the Cartridge, clean if needed, blowing strong, and connect it to the pressure reducer while turning the bottle clockwise until you feel a light resistance (photo N°3). At this time, the bottle is against the punch of drilling. Still turn until the bottle is tight correctly (photo N°4).
- d) Place the Cartridge in the support with the pressure gauge forwards the button of adjustment is then on the right side (photo N°5).

### STEP 1

For practical reasons, the assembly of the Check Valve and the Bubble Counter (only for CO<sub>2</sub> Professional Kit) is done at forehand, before placing them on the aquarium (see drawing). Caution: the Check-Valve and the Bubble-Counter are made of glass and must thus be handled with the greatest prudence. While assembling, never force, because this could break the glass and cause wounds. We are not responsible for broken glass, no warranty is accorded.

On the other hand when disassembling, it is necessary to make a small cut in the pipe before removing the tube.

### ASSEMBLY :

Take the Check-Valve with the arrow sign, and slip the CO<sub>2</sub> tube on it for approximately 5mm on the end of the top (photo N°6). To be able to slip the pipe more easily, soak it in tepid water. Cut then the pipe over a length of +/- 3 cm (photo N°7).

The other side of the pipe is fixed on the Bubble-Counter (only with CO<sub>2</sub> Professional Kit) (photo N°8).

Attention, the Bubble-Counter must be assembled with the arrow upwards (see drawing).

### STEP 2

After assembling the Check-Valve and the Bubble-Counter (only with CO<sub>2</sub> Professional Kit), place the remainder of the tube below the Check-Valve and fix the whole with the suction cups on the aquarium at a quite visible place (see drawing A or B). Cut the pipe to the desired length and connect it to the pressure reducer. Unscrew the small nut bored on the head of the pressure reducer (photo N°9) and slip it on the tube (photo N°10). Fix the end of the pipe on the pressure reducer (photo N°11) and firmly fix the small nut with the hand on the pressure reducer (photo N°12).

The Bubble-Counter has a controlling function. It is filled for  $\frac{3}{4}$  with water of the aquarium. To fill the Bubble-Counter, you will find a pipette (photo N°13) in the CO<sub>2</sub> Visual Test. This pipette has two functions :

- a) filling of the CO<sub>2</sub> cylinder-test
- b) it is used while filling the  $\frac{3}{4}$  of water in the Bubble-Counter.

The filling of the Bubble-Counter is done by the top, and it needs three pipettes to fill it (photo N°14). After filling the Bubble-Counter, connect the tube on the Bubble-Counter.

Cut the tube to the wanted length to be able to place the diffuser in the front of the aquarium and just above the layer of gravel in order to provide the best way for the assimilation of the CO<sub>2</sub> in the aquarium.

The small ceramic diffuser will be connected with a small elbow, (photos N°15 and 16) and permits thus a placement in horizontal position. Optimizing the distribution of CO<sub>2</sub>, fix the ceramic diffuser at the inside of the aquarium with the suction cup (drawing A). The placement in the aquarium in the front and just above the layer of gravel enables you to visualize his correct operation and the good distribution of CO<sub>2</sub>.

Caution : take guard the special tube neither is folded, nor blocked.

### STEP 3

Placement of CO<sub>2</sub> Visual test (for the assembly of the test see its instructions).

The CO<sub>2</sub> Visual test is a test which is used as indicator of CO<sub>2</sub> values. Each test has two stickers with a colorimetric scale. The first scale goes from 2 to 7 dKH and the second from 8 to 15 dKH. To determine the dissolved quantity of CO<sub>2</sub> in water, it is important to know the carbonated hardness of water (dKH). A KH test will give you the value of the aquarium water. Place the CO<sub>2</sub> Visual test in the aquarium, on the front pane, approximately 10 cm below the level of the water. Take the sticker with the colorimetric scale corresponding to the water hardness. If for example, water has a

hardness of 5°dKH, use the colorimetric scale of 2 to 7°dKH. For a hardness of 11°dKH, use the scale of 8 up to 15°dKH.

Place the sticker right under the permanent test on the front of the aquarium (see FIGURE A or B). The values recommended with their corresponding colours are below the colorimetric scale. If you try to obtain the correct value – **Sufficient** - too fast, you are likely to cause the death of fish in the aquarium. Moreover, too much CO<sub>2</sub> diffusion is of no utility for the plants and can even be harmful.

It is thus strongly advised to distribute the CO<sub>2</sub> in a slow and effective manner.

## INSTALLATION

After the installation of Standard CO<sub>2</sub> Kit or CO<sub>2</sub> Professional Kit, we start handling.

### CO<sub>2</sub> Standard Kit

As seen earlier, you will find the button of adjustment on the right side of the apparatus. While slightly turning the button towards the sign +, you will open the system and CO<sub>2</sub> will be liberated. Wait during a few minutes until small CO<sub>2</sub> bubbles gently leave the ceramic diffuser and go up slowly towards surface. It is important that CO<sub>2</sub> thus released remains as long as possible in contact with water, thus helping the optimal dissolving process and plants can assimilate the dissolved CO<sub>2</sub>. The finer the bubbles are, the easier they will be dissolved, the quantity of CO<sub>2</sub> used will be optimised and the best assimilation is achieved for the plants.

So you see we have important benefits :

- dissolved CO<sub>2</sub> in the water, the assimilation by the plants is strongly improved,
- the CO<sub>2</sub> consumption is reduced.

It is important to follow these rules.

If after 5 minutes, no CO<sub>2</sub> comes out the ceramic diffuser, open a little the adjustment knob.

When you obtained a good distribution of the CO<sub>2</sub> the Standard CO<sub>2</sub> Kit is operational. Do not forget to stop the CO<sub>2</sub> diffusion when lighting is cut of.

Indeed, while lightning the aquarium the plants starts there photosynthesis process , a distribution of CO<sub>2</sub> is requested.

Thus, the plants do not assimilate CO<sub>2</sub> when there is no light. For this reason, turn the button of the pressure reducer towards the sign -. Turn the button of the pressure reducer towards the sign + when you start lighting your aquarium. Repeat this operation each time you light and extinguish lighting.

One can partly automate this operation for Standard CO<sub>2</sub> Kit, by installing a Solenoid Valve Art. N°02 707. The Solenoid valve of Aquatic Nature was especially developed for this purpose. It is equipped with a pulsator thanks to which it is characterized by very low power drain electric and the fact that it does not produce any noise.

### CO<sub>2</sub> Professional Kit

With CO<sub>2</sub> Professional Kit, the adjustment is carried out as indicated for Standard CO<sub>2</sub> Kit but by means of the meter of bubbles. One can count approximately 4 bubbles per minute (for aquariums of a volume going until 30L) or approximately 15 bubbles (for aquarium until 150L).

Be careful :

CO<sub>2</sub> Professional Kit is equipped with Solenoid Valve (magnetic valve) with pulsator (see above). When it is connected on the electrical current, it is placed in open position. That means that it lets pass CO<sub>2</sub>.

You can use the magnetic valve in several ways :

1. Manually: that means that it is necessary to connect the magnetic valve the morning and to disconnect it the evening. You should not forget to disconnect it, because the distribution of CO<sub>2</sub> is not needed during the night (see above).
2. One can possibly connect the magnetic valve to a timer. If chosen for this possibility we recommend to place the Solenoid Valve and lighting on the same timer. That means that when lighting functions, the Solenoid Valve opens at the same time and releases CO<sub>2</sub>. Foot-note: CO<sub>2</sub> can start to leave the diffuser with a delay of a ½ hour up to 1 Hour. This is not abnormal, because it is necessary that the pressure who left the tube after being cut off, gets back in the tube after been re-started.
3. Another possibility is piloting the CO<sub>2</sub> by means of a pH-meter. For that, ask advise to your retailer.

Important to know :

- After closing the Solenoid-Valve (with CO<sub>2</sub> Professional Kit), the CO<sub>2</sub> still leave the ceramic diffuser for a period. This is normal: the remaining CO<sub>2</sub> in the tubes is still under pressure.
- Note: In the morning after the Solenoid-Valve is open, wait for approximately 30 minutes or more, to see the released CO<sub>2</sub>.
- This procedure is ideal for the photosynthesis process while the plants are not able to assimilate CO<sub>2</sub> from the very start after lighting.
- If no more CO<sub>2</sub> leaves the diffuser, it is a first indicator that the CO<sub>2</sub> Cartridge is empty. One can control by checking the indication of pressure given on the pressure gauge.

## GOOD TO KNOW

Because we don't know upon the departure, with which volume of aquarium, the Standard CO<sub>2</sub> Kit or CO<sub>2</sub> Professional Kit will be connected, all the kits are equipped with a uniform small ceramic diffuser. The small ceramic diffuser is appropriate in most of the cases. But for the large aquariums, it is advisable to use a diffuser adapted to the volume of the aquarium. 3 different sizes of diffusers are available. Their capacity varies and can be appropriate for aquariums going until 300 L : for example, for an aquarium with 60 L, the glass diffuser 40/60 Art. N° 02710 is recommended, for an aquarium with 100 L, the glass diffuser 80/120 Art. N° 02712, and for an aquarium with 140 L, the glass diffuser 120/200 Art. N° 02714.

Meanwhile the small ceramic diffuser (art. N° 02 708) is still of use for ex., when the Glass Diffusor has to be rinsed. For any information concerning the cleaning of your Glass diffusor or the ceramic diffuser, ask your retailer further information.

- Use only the CO<sub>2</sub> tube from Aquatic Nature, to ensure the function of the Check-Valve and especially to avoid CO<sub>2</sub> loss. If using another type CO<sub>2</sub> tube, the water of the aquarium is likely to drive back in the pressure reducer in spite of Check Valve. The effects on equipment as well as the damage caused by this misuse are not guaranteed.

- The Check-Valve from Aquatic Nature could contain water to approximately half or even more. Do not worry if you see water in the Check-Valve. Water should not be under the obstructor ("red stopper").

### If for an urgent reason, you must unscrew the CO<sub>2</sub> Cartridge, do it as described beneath:

- For Standard CO<sub>2</sub> Kit : Remove the tube from the pressure regulator. Let escape the CO<sub>2</sub> present in the bottle by opening the button adjustment and wait until all CO<sub>2</sub> present in the bottle is gone. Unscrew the empty bottle.
- For CO<sub>2</sub> Professional Kit : Put the plug of the Solenoid-Valve in the current, then turn the adjustment knob of the pressure reducer to the open position, empty all CO<sub>2</sub> present in the bottle, unscrew the empty bottle.

## MAINTENANCE

From time to time, check the water level in the Bubble-Counter (only CO<sub>2</sub> Professional Kit) when needed refill it.

### Content CO<sub>2</sub> in mg/l – Carbonate hardness (°dKH)

KH / pH	Too much CO <sub>2</sub>		Optimal values		Not enough CO <sub>2</sub>						
	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0
0.5	15	9.3	5.9	3.7	2.4	1.50	0.93	0.59	0.37	0.24	0.15
1.0	30	18.6	11.8	7.4	4.7	3.0	1.86	1.18	0.74	0.47	0.30
1.5	44	28	17.6	11.1	7.0	4.4	2.8	1.76	1.11	0.70	0.44
2.0	59	37	24	14.8	9.4	5.9	3.7	2.40	1.48	0.94	0.59
2.5	73	46	30	18.5	11.8	7.3	4.6	3.0	1.85	1.18	0.73
3.0	87	56	35	22	14.0	8.7	5.6	3.5	2.2	1.40	0.87
3.5	103	65	41	26	16.4	10.3	6.5	4.1	2.6	1.64	1.03
4.0	118	75	47	30	18.7	11.8	7.5	4.7	3.0	1.87	1.18
5.0	147	93	59	37	23	14.7	9.3	5.9	3.7	2.3	1.47
6.0	177	112	71	45	28	17.7	11.2	7.1	4.5	2.8	1.77
8.0	240	149	94	59	37	24	14.9	9.4	5.9	3.7	2.30
10	300	186	118	74	47	30	18.6	11.8	7.4	4.7	3.00
15	440	280	176	111	70	44	28	17.6	11.1	7.0	4.40
20	590	370	240	148	94	59	37	24	14.8	9.4	5.90