

Information for use seramic CO₂ control system

1. Features and field of application

The **seramic CO₂ control unit** is a micro-processor-based controller that automatically keeps the pH value stable in an aquarium by targeted addition of CO₂. Dosage of the CO₂ is achieved by a high-quality solenoid valve. The desired pH value of the water can be adjusted precisely at any time by using the keyboard of the unit. (As CO₂ (or carbonic acid, respectively) reacts acidic, the **seramic** only allows for lowering the pH value, not for raising it.)

The system is user friendly with easy to read liquid crystal display (with background illumination) on the control unit.

The control unit operates on the following functions:

- pre-adjustment of the water temperature (manual temperature compensation)
- adjustment of the pH alarm window
- adjustment of the desired pH value
- calibration of the pH electrode
- display the present pH value
- switching the background illumination ON/OFF

The pH value shows whether a liquid is acidic (pH below 7.0), neutral (pH = 7.0), or alkaline (pH above 7.0). In natural waters, pH values are mostly between 5.5 and 8.0.

pH values between 6.8 and 7.5 are suitable for fish and plants in a community aquarium. If this pH value is stable and maintained by appropriate CO₂ addition, the plants will grow considerably better. Many species of plants that could only endure a few weeks in the aquarium can now be kept for the long term with the **seramic CO₂ control system**. Of course, the aquarium must be equipped with the correct lighting as well.

Typical pH values

- for optimum care of discus, angelfish, cardinal tetra, dwarf gouramis, killifish, etc. pH 6.0 – 7.0
 - in the community aquarium pH 6.8 – 7.5
 - for platies, mollies, guppies, Malawi/Tanganyika cichlids pH 7.0 – 8.5
 - in natural saltwater pH 8.1 – 8.4
 - in saltwater aquariums pH 8.1 (morning) – 8.4 (evening)
- Ideal pH: 8.2

The display of the **seramic CO₂ control system** shows a 2nd decimal place (e.g., 7.57 pH). This is for recognizing tendencies only and will never be completely stable. Light differences or a slight wandering are considered normal.

Contents:

- electronic CO₂ control unit with power cord and built-in solenoid valve
- **sera pH electrode**
- 2 suction holders
- 3 meters of CO₂ leak-proof hose
- **sera test solution pH 4.0** (with security color indicator "red") 100 ml
- **sera test solution pH 7.0** (with security color indicator "green") 100 ml

2. Important notes!

To ensure proper functioning and durability of the system, the user must thoroughly understand the instructions for use and comply with the application conditions.

The **seramic CO₂ control system** controls the CO₂ dosage by means of the solenoid valve.

WARNING: You require a high-quality pressure reducer valve (sold separately) for discharging CO₂ from the bottle. The maximum operating pressure is 1 bar (14.5 psi).

Do not connect the **seramic CO₂ control system** without a pressure reducer valve from the CO₂ bottle!

Always connect the pH electrode to the control unit **before** the electrical cord is plugged in (fig. 9).

Before installing the **seramic CO₂ control system**, soak the pH electrode in distilled water in a clean glass (fig. 1) for at least 12 hours. To do this, carefully unscrew and remove the electrode protection cap. A white salt-like deposit may coat the electrode tip. This is normal and dissolves after a few minutes in the water.

Keep in mind that only the electrode shaft is made of plastic. The inner capillary tubes, however, are made of glass and very fragile. To rinse the electrode you will need distilled water. Use only **sera aqua-dest** or distilled water from the pharmacy.

3. Assembly

Attention: Unplug all electrical devices before installation!

Permanently mount the CO₂ control unit in a dry place near the aquarium, for example, attach it to the aquarium cabinet or to the wall (fig. 2). The electrical cord of the control unit is 1.5 meters (5 ft.) long and you should consider the distance of your electrical outlet for this connection. The junction of pH electrode is always immersed in the aquarium water (fig. 11). The 1.5 meter (5 ft.) flexible cord of the pH electrode should be laid freely (fig. 3) and connected to the control unit.

Integration of **seramic CO₂ control system** to an existing installed CO₂ system with bubble counter and CO₂ reactor (fig. 4 – 8)

Procedure:



Shut off the CO₂ supply. The pressure reducer and the outlet valve should remain shut off (fig. 4) as well. You may begin with the installation when the bubbles stop escaping in the bubble counter. Connect the **seramic CO₂ control system** between pressure reducer and bubble counter as follows:

Use **at least one sera non-return valve** for safety reason. The non-return valve will prevent any back-siphoning of aquarium water when the CO₂ bottle has become empty) protecting the **seramic CO₂ control system** from water damage. Every time water has been drawn back into the safety valve it must be replaced, as it can become leaky due to mineral deposits.

Remove the hose that runs between the outlet of the pressure reducer valve and inlet of the non-return valve (fig. 5). Cut the supplied CO₂ hose to make two hoses of suitable lengths. Connect one hose between the outlet of the pressure reducer valve and the CO₂ intake (left connecting piece) of the control unit (fig. 6). To secure, unscrew and slip the hose into the retainer ring of the CO₂ intake. Insert the hose into the plastic nozzle of the CO₂ intake as far as possible. Screw and tighten the retainer ring to the CO₂ intake (fig. 7). In the similar fashion, connect the second hose to the outlet (right connecting piece) of the CO₂ control unit and the non-return valve (fig. 8).

Caution: The seramic CO₂ control system should always be installed with at least one high-quality non-return valve (e.g., sera non-return valve, item no. 8818).

Display illumination

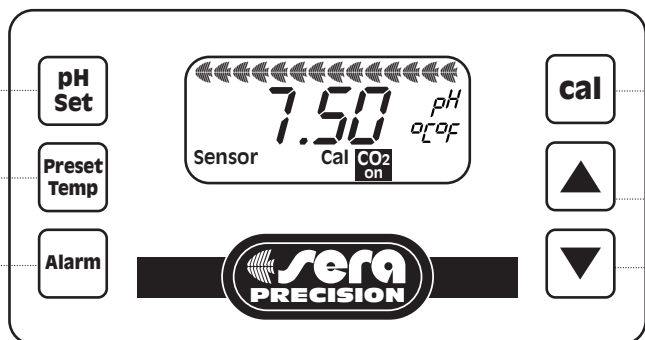
You can switch the display illumination on or off by pressing one of the  or  keys for two seconds.



4. Operational features, displays and adjustment of desired pH value

The illustration shows the front panel of the CO₂ control unit. The unit is equipped with a multi-figure display that tells

- momentary pH value or
- desired pH value
- adjusted water temperature
- plus these additional functions:
- "Sensor" notification for common electrode errors
- "CO₂ ON" – solenoid valve is open (CO₂ can enter the aquarium)
- "🐟" wanders from the right to the left: Each new Fish Logo represents a new calculation of the measured value.
- "Cal" for the calibration mode



Key	Function / description
cal	calibration pH electrode
pH Set	adjustment of desired pH value
Preset Temp	adjust temperature compensation / switching °C ↔ °F
Alarm	adjustment of alarm window
▼	lower desired pH value / lower temperature compensation value / reduce alarm window / switch display illumination on/off / switch alarm signal off
▲	raise desired pH value / raise temperature compensation value / expand alarm window / display illumination on/off / switch alarm signal off

5. Starting up

The electrode tip must be soaked in stale tap water for 12 hours (observe Min/Max immersion depth: remove protection cap first). This is more urgently required if the electrode tip has been dry for more than a few minutes. (The electrode tip must be kept permanently moist.) Then connect the BNC plug of the electrode to the corresponding socket of the CO₂ control unit (fig. 9). Now the control unit can be put into operation by plugging in the mains plug. The next step is to calibrate the pH electrode. First fill approx. 10 ml (2 teaspoons) of the test solution pH 4.0 into a small, clean vial to do so (e.g. into the measuring vial of a *sera Test*). It is important to close the test solution bottle afterwards. Then rinse the pH electrode with distilled water.

Safety color indicators of the sera test solutions

Caution: The *sera test solutions* contain color indicators. The *sera test solution pH 4.0* is red, the *sera test solution pH 7.0* is green. Test solutions that are dirty or too old change or lose these colors.

Using such test solutions can lead to dangerous measuring and regulation errors!

Note: Not all impurities cause color destruction or color change. Therefore it is especially important to treat the test solutions carefully. Never use test solutions more than once or fill them back into the bottle!

We recommend storing opened test solutions for a maximum of 12 months at room temperature, even if the color indicators are still intact.

Calibration: General

Uncalibrated units and units with incomplete calibration, display "Cal" instead of the measured value. Calibration mistakes can lead to letter displays ("A," "C," "E," "L"). These letters are technician codes only. In all these cases please carry-out a complete calibration.

If the unit detects one of the pre-set electrode function errors the display will read "Sensor." Check the electrode, its cord and plug. Clean the electrode in *sera cleaning solution* if applicable. Calibrate the *seramic anew* to reset the "Sensor" warning. If the display does not turn off, the electrode must be replaced. Attention: Not all electrode problems have been touched-on in these directions. Accordingly, the pH electrode can also be faulty if "Sensor" is not displayed.

Never leave the electrode tip in the test solutions pH 4.0 or pH 7.0, or in distilled water, longer than necessary for calibration.

The unit will display "Cal" during the whole calibration process. Always carry out the calibration at pH 4.0 and pH 7.0 completely.

Calibration process

Adjust temperature correction:

Adjust CO₂ control unit to the temperature of the test solutions as to achieve optimal calibration values. The *sera precision thermometer* is perfect for doing this. Check the room temperature once the temperatures are balanced. Press the (Preset Temp) key of the CO₂ control unit.

Enter the measured temperature with the (▲) und (▼) keys. Then press the (Preset Temp) key again to save this compensation value.

Always thoroughly rinse the electrode tip with sera aqua-dest before dipping it into one of the test solutions.

1. To start the calibration process, press the (cal) key for approx. two seconds until a second acoustic signal occurs.
2. Now dip the measuring electrode into the red *sera test solution pH 4.0* (matching the value on the far right in the display) and move it lightly.
3. Now the actual calibration starts. The display shows a number between 0 and 999. As soon as the number on the display remains stable, pressing (cal) finishes the calibration for the first point (pH 4.0), and the value is stored (Note: Depending on electrode age and quality it may take a few seconds up to 2 – 3 minutes until the reading stops "wandering" into one direction. However, a slight variation of the value is normal).
4. Rinse the electrode tip with *sera aqua-dest*.
5. Now dip the electrode into the green *sera test solution pH 7.0* and wait until the value on the display remains stable. Pressing (cal) again will finish calibration, and the unit will automatically return to measuring and regulation mode.

Please note that the numbers displayed during calibration are not measured values but are merely a help for you to estimate whether the measured value is stable. (standard values: For pH 4.0 between approx. 20 and 100, for pH 7.0 between approx. 400 and 600. These values differ from unit to unit and from sensor to sensor. The higher the values at pH 4.0 and/or the lower the values at pH 7.0, the worse the electrode quality compared to the start values of a new electrode. If the above mentioned value ranges have



gone considerably outside the range, reliability of the electrode is questionable.)

Temperature compensation

The influence of temperature on the measurement is minimal. Still, it is possible to enter the average water temperature of your aquarium as a correction factor. You can change this pre-adjustment at any time.

1. Check the water temperature with an aquarium thermometer.
2. Press the **PresTemp** key.
3. Adjust the actual water temperature using the **▲** and **▼** keys.
4. Press the **PresTemp** key. This will confirm and store the correction factor.

Switching °C ↔ °F

The display shows the momentary pH value.

Press the **PresTemp** key for about 2 seconds until a second acoustic signal occurs for switching the display between °C and °F.

Adjusting the desired pH value

Usually, the display shows the momentary pH value. The desired pH value ("S" + "desired pH value") will be displayed after pressing the **pH Set** key. The **▲** and **▼** keys allow you to raise (**▲** key) or lower (**▼** key) the desired value within a range from pH 4.0 – 9.0.

To leave the adjustment mode, press the **pH Set** key again. The momentary pH value is again displayed. The adjusted desired value is stored at zero voltage proof. This means it will not be lost in the event if the mains/power supply is interrupted.

Lowering the pH value has a major influence on water chemistry. Sudden and considerable pH value changes are always a threat for the whole biotope. Therefore, please do not change the desired value too strongly, and only in steps as small as possible over several days. For all changes, check if the desired value is suitable for all animals and plants. (You will find a chart as a further basis and recommendation on page 1, typical pH values. Please also pay attention to section 6, activating and dosing CO₂.)

Adjusting the alarm window

The measured pH value can vary freely within the adjusted window. If the measured value leaves this window, an alarm sounds. This protects the fish against extreme values and also notifies you that the CO₂ bottle is empty. Do not adjust the window range too narrowly because, as in nature, variations are expected in a natural aquarium.

Sample ranges:

With the optimal value a pH 7.0

Window setting 0.5: The resulting window range (A) is from pH 6.5 – 7.5 (The adjusted range is not a dangerous limit, but may reveal possible mistakes. This will give you enough time to react calmly if an alarm occurs)

Window setting 1.5: The window (B) would accordingly range from pH 5.5 – 8.5. (The adjusted range describes possibly dangerous limits. If now an alarm occurs, there is an urgent problem.)

You must select the alarm window individually suiting your aquarium. For most tropical community aquariums a window similar to example (A) may serve as a basis. Please consult your specialized retailer if in doubt.

1. Press the **Alarm** key.
2. Adjust the distance towards the upper and (automatically at the same time also the) lower window limits using the **▲** and **▼** keys. The difference between desired value and alarm level adjusted by you is always the same upwards as downwards.
3. Confirm by pressing the **Alarm** key. The unit will automatically return to the measuring and regulation mode.

The buzzer can be switched off by pressing one of the **▲** or **▼** keys after a pH alarm has been triggered. The pH display will blink until the pH value is back within the alarm window.

Installation of the pH electrode in the aquarium

Attach the two suction holders (supplied) to the pH electrode shaft. Then place and attach the suction holders with the pH electrode to the inside glass of the aquarium. The pH electrode should have the correct immersion depth (fig. 10, "Immersion depth of the electrode"), and if possible, be set in a dark place (fig. 11). Avoid areas with a strong current.

Do not place the pH electrode close to the reactor. This may result in false reading of pH measurement.

A new pH electrode needs a period of "breaking in," and it is necessary to recalibrate every few days for the first few weeks. Follow the procedure as described above. On the premise that the pH electrode is used constantly, recalibrate the pH electrode every 4 – 6 weeks after that.

6. Activating and dosing CO₂

The solenoid valve of the control unit is open when it activates and doses CO₂. The desired value of the control unit must be set to a level below the displayed, actual pH value to do so (see section 4, adjustment of desired pH value). The opening of the solenoid valve is shown by the symbol "CO₂ ON" on the display.

Then pull the CO₂ hose off the pressure reducer for safety reasons and place the loose end in the aquarium water or a glass filled with water. This allows you to pre-adjust the bubble number without the risk of damaging parts of the system by too high pressures.

Now open the CO₂ addition at the bottle (**For bottles with external valve only:** Open the CO₂ at the bottle by slowly and slightly opening the hand-wheel).

The CO₂ supply at the pressure reducer is opened. However, the pressure on the operating pressure manometer must not exceed 0.5 bar (7.25 psi). Consider the respective data provided by the manufacturer.

Now put the CO₂ hose back on the pressure reducer.

Shortly after opening the needle valve, CO₂ will flow into the aquarium via the control unit. The display will read: "CO₂ ON"

For functional control, now raise the desired pH value until the solenoid valve switches off. If the desired value is lowered, the solenoid valve opens again. (see section 4, adjustment of desired pH value).

Do not forget now to re-adjust the desired pH value!

value of carbonate hardness	pH adjustment at the control system
0	use sera KH/pH-plus to increase carbonate hardness to 4°dKH
1	
2	
3	first lower the carbonate hardness by filtering via peat, e.g. sera super peat
4	
5	
6	
7	
8	
10	
12	
15	
20	
21 and higher	

After a few days, you can continue to lower the pH value in steps of one-tenth of a pH unit, e.g., from 7.0 to 6.9. When doing so, watch out for accelerated breathing behavior of the fish. If this happens, reverse to the last pH value. Remember! The higher the carbonate hardness, the more CO₂ is required in order to lower the pH value. Large amounts of dissolved CO₂ improve the living conditions for the water plants but may not be tolerated equally as well by all the fish.



With the values as stated in the above chart, CO₂, pH value and carbonate hardness are in equilibrium.

With low carbonate hardness (<4°dKH), the buffering capacity (ability to bind acids) of the water is at a high risk. Negligible influences, such as a heavily burdened filter or a dead fish that has not been removed immediately, will cause the pH value to drop drastically (acid drop). We recommend increasing the carbonate hardness with **sera KH/pH-plus** if it is below 4°dKH.

The following tips and troubleshooting checklist (see **page 5**) are important and we urge you to read and understand it thoroughly.

Important tips for pH electrode care

a. Do not use the pH electrode during treatment of fish disease, treatment of algae, or while combating a snail infestation. (re: contamination)! A contaminated electrode cannot be repaired and is not covered under warranty claim! Remove the electrode from the aquarium during treatment and put it into the protection cap, filled with **sera care solution KCl**. Remember to switch off the CO₂ control system, shut off the pressure reducer valve and remove the plug of the control unit. Otherwise, uncontrolled CO₂ addition to the aquarium can occur without the pH electrode.

Do not leave the electrode standing in the test solutions or in distilled water for lengthy periods of time. Storage (exceeding a few minutes) is permitted only in clean aquarium water or in **sera care solution KCl**. Never use the electrode for any other than the intended purpose.

b. If the display on the control unit does not remain stable after a certain time during calibration in the test solution, but drifts slowly into one direction, the electrode is dirty and needs cleaning. Immerse the tip of the pH electrode in the **sera cleaning solution** for 10 minutes maximum. You must never clean the pH electrodes with common cleaning solutions, cloth, brush or the like! After cleaning, soak the pH electrode in **sera care solution** for 12 hours, then rinse with distilled water and recalibrate.

c. Please note that the pH electrode must stay moist always. It dries out within a short time when in contact with air, and this leads to incorrect measuring results. In such cases, soak the pH electrode for 12 hours then recalibrate.

d. Water change

Before the water change, remove the pH electrode and put it into the protection cap filled with aquarium water. Otherwise, the electrode will dry out when the water level is lowered, which requires recalibration.

If the electrode is dried out, it creates havoc on the control unit and displays a false pH value. Should the electrode accidentally report an alkaline value, the solenoid valve will open and cause uncontrollable CO₂ flow into the aquarium. The pH electrode does not react any longer, leading to a rapid decrease of the pH value in the aquarium.

Another possibility: Leave the electrode in the aquarium water during water change. Drill a hole of 12 mm (0.5 in.) diameter into a postcard-sized Styrofoam plate with a thickness of about 25 mm (1 in.). Insert the pH electrode into this hole and let it float during the water change.

Important! When applying this method, do not lower the water to the extent that the tip of the pH electrode is in contact with the stones or gravel at the bottom!

e. Immersion depth of the electrode (fig. 10)

Follow the immersion-depth indicators on the **sera pH electrode**. Insufficient immersion may lead to erroneous measurements. Immersing too deep may cause corrosion within the electrode.

f. Aging

Although the pH electrode can be optimally cared for with **sera cleaning solution** and **sera care solution KCl**, every pH electrode is technically subject to aging. Symptoms of aging are, delayed reaction time, inaccurate and drifting display values, etc. In this case, replace the pH electrode by a new one. Proper use provided, a **sera pH electrode** may function for several years. This includes storage (non-use) time. The (limited) life span of an electrode always begins at the time it is manufactured.

7. Description of regulation behavior and hysteresis

Control is achieved by a 2-point regulation. If the pH value exceeds the adjusted pH value, the solenoid valve is opened for CO₂ addition. If the pH value drops below the adjusted pH value, the solenoid valve closes again (switching hysteresis of + 0.1 pH units).

The regulation range of the system is within a pH range between 4.0 and 9.0, the desired pH value can be adjusted only in this range. The operation mode of the solenoid valve is shown on the display. If the valve is open, the display will show "CO₂ ON."

Switching hysteresis

The switching hysteresis describes a range of + 0.1 pH units around the actual measured pH value. The solenoid valve will switch only if this range is left.

Example: Measured value: pH 7.0 or pH 7.09 ⇒ desired value: pH 7.0
The solenoid valve will switch only if these measured values are exceeded. This is necessary as otherwise the valve would continuously switch on and off due to permanent, natural variations of the measured value in the aquarium.

Water flowing back into/through the ceramic (especially in salt-water):

Caused by old, defective or missing safety non-return valves, water may enter and destroy the CO₂ solenoid valve used in the **seramic** (in case of longer exposure).

Note: Safety valves can become leaky due to deposits after contact with water that has flowed-back, even if the connections are tight at this time.

What to do if the water from the aquarium has flowed-back into the **seramic**.

1. Open the solenoid valve.
2. Press through a few milliliters **sera aqua-dest** with a hose piece, e.g. by using a syringe. Allow the valve to switch several times while doing so.
3. Connect a membrane pump and allow it to pump dry room air instead of CO₂ through the open solenoid valve for several hours. Allow the valve to switch (close for a short time and re-open) several times while doing so.

8. Technical data

pH control unit	
with user guided calibration	
multi-digit display (LCD), 10 mm (3/8 in.) high	
Case protected against water splashing *	
Voltage requirement	230 V / 50 Hz (optional 115 V / 50 Hz; 110 V / 60 Hz)
Power consumption total	approx. 3 watts
Measuring accuracy	± 0.05 pH units
Measuring range (pH value)	pH 3.5 – 10
Input resistance of electrode	within Giga Ohm range
Electrical data of dosage valve	24 VDC / 2.5 watts

* The socket for connecting the pH electrode (electrode plug) is not moisture proof. Exposing this socket to moisture may cause incorrect pH measuring values. This may lead to uncontrolled CO₂ release into the aquarium.



Troubleshooting

Problem	Possible cause	Troubleshooting
Readout display drifts during adjustment	Electrode is dirty or covered with algae	Clean with sera cleaning solution , then soak in sera care solution KCl
	Electrode has been dried for long period	Soak electrode for 12 hours, then recalibrate. Replace electrode if electrode calibration is unsuccessful
	CO ₂ or air bubbles reach the tip of electrode	Move the electrode to another place in the aquarium
	Electrode too old / defective	Replace
	Electrode was / is immersed too deep in the water	Replace
No display shown	Defective cable or electrode	Replace
	Water has entered the control unit	See your retailer
	Control system is not connected to electrical outlet	Plug it in
Incorrect values displayed	Too old or contaminated test solutions	Replace with new test solutions
	Protection cap left on the electrode	Remove protection cap
	Incorrect calibration	Recalibrate, see instructions for use
Letter display ("A," "C," "E," "L") or blocking display	Calibration mistake	Calibrate, see "Calibration process". Are the test solutions intact?
Electrode shows discoloration inside the shaft	Electrode has been contaminated by other chemicals or medications	Replace
Despite low pH value, the system releases CO ₂ into the aquarium / Despite high pH value, the system does not release CO ₂ into the aquarium / Solenoid valve is not working	Solenoid valve is defective caused by water damage. Either non-return valve was not used or the non-return valve is defective	Needs repair (see your retailer)
Solenoid valve will not open	Operating pressure at the pressure reducer is too high – above 1 bar (14.5 psi)	At first manual control: close CO ₂ supply at the bottle. Shut off pressure reducer and outlet valves. Remove CO ₂ hose from outlet valve. Find out whether control system is working by changing the desired pH value. If not ⇒ see your retailer. If yes, attach hose again and adjust operating pressure (0.5 bar/7.25 psi) correctly as described in the instructions for use
pH value rises despite the solenoid valve is open	CO ₂ bottle is closed	Open CO ₂ bottle
	CO ₂ bottle is empty	Refill CO ₂ bottle
	CO ₂ gas is expelled from water by air stone, air diffuser, etc.	Avoid air bubbling in the water
	Exceeds the maximum aquarium size	Increase CO ₂ addition and install additional sera CO₂ fertilization system
No bubbles in the bubble counter	Pressure reducer incorrectly adjusted (insufficient or no operating pressure)	Increase operating pressure
	Non-return valve incorrectly connected	Check valve fittings and correct connection if necessary
	Non-return valve clogged or defective	Replace
	Leakage in hose system or in the hose fitting	Check hoses and fittings and replace hoses if necessary



CO ₂ consumption too high	Leakage in CO ₂ hose system or hoses too long	Replace or shorten hose
	Operating pressure too high	Lower operating pressure at the pressure reducer
	Sealing ring between pressure reducer and CO ₂ bottle defective / dirty	Replace
	Reactor dirty or water pressure too low, CO ₂ bubbles escape	Clean reactor or direct more water into the reactor
	Too strong aeration of the aquarium, no cover	Reduce CO ₂ loss by reducing oxygen supply
	Tightening nut at adjustment wheel of sera pressure reducer has become loose	Fasten tightening nut firmly by hand. Do not use a wrench!
	Threaded screw of pressure reducer was over-tightened (display reads in the RED area). Safety valve opens, and CO ₂ escapes with a hissing sound	Loosen threaded screw immediately . Open outlet valve (adjustment wheel) to release the built-up pressure. Close outlet valve and tighten threaded screw very slowly , so that operational pressure is 0.5 bar (7.25 psi)
Fish are below surface and breathing heavily or swimming abnormally through the water	CO ₂ gas having escaped from the water is trapped below aquarium cover	Provide better air circulation
	pH value is too low in relation to the carbonate hardness	Carry out a partial water change of 10 – 20%. Adjust to a higher pH value after
	Filter is not functioning properly	Clean filter
	Aquarium water is heavily burdened	Carry out a partial water change with gravel cleaning

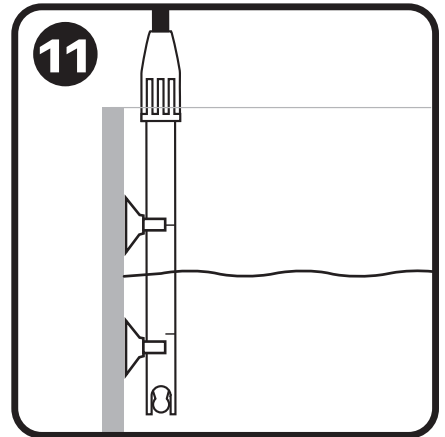
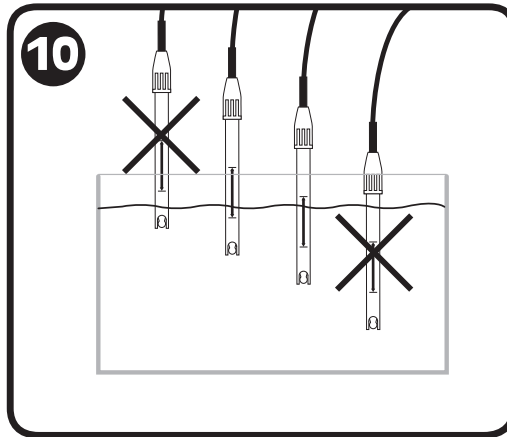
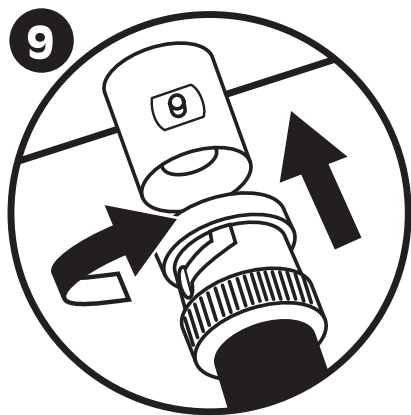
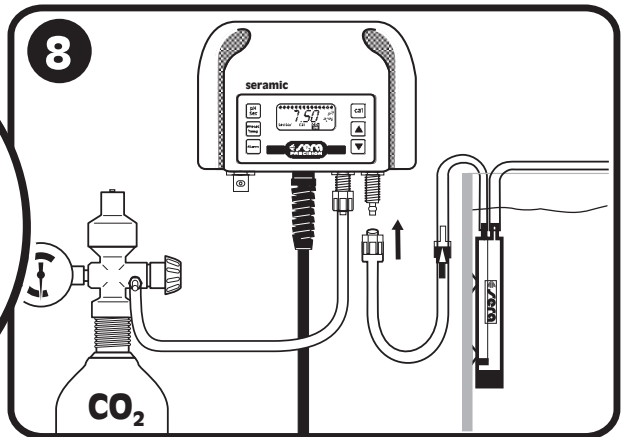
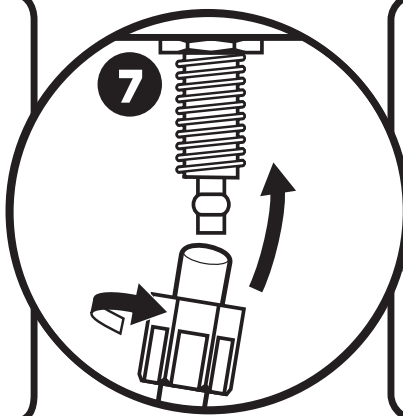
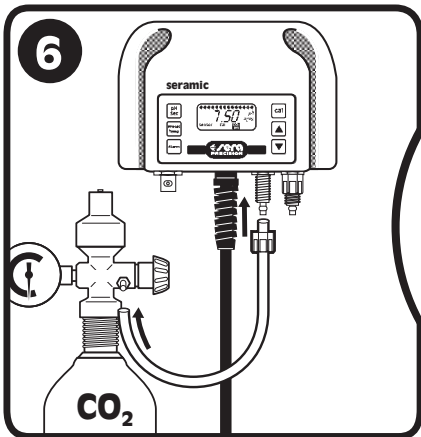
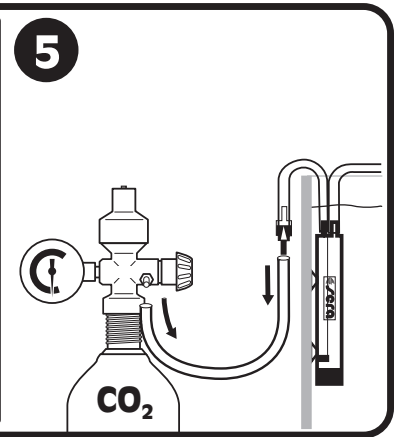
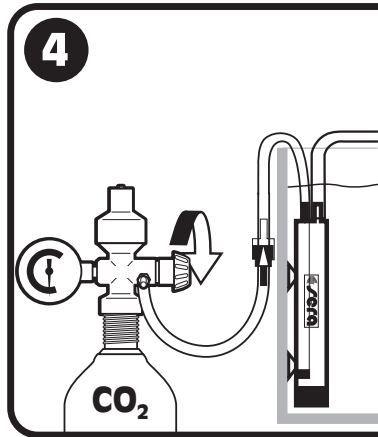
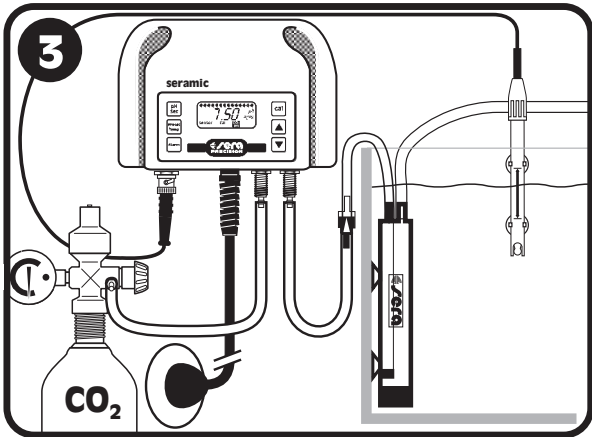
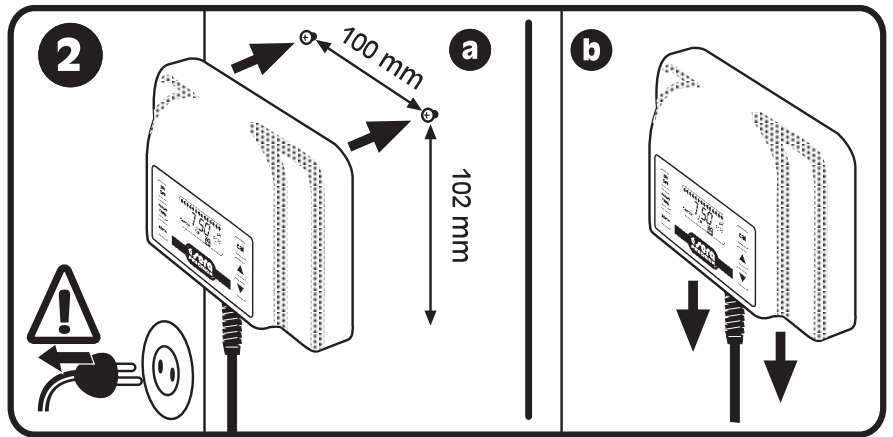
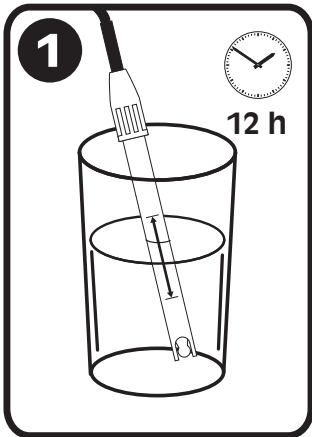
Warranty:

When following the directions for use, the **seramic CO₂ control system** will perform reliably. The **warranty is valid for 24 months** from the date of purchase of the unit (Exception: 12 months warranty on the pH electrode). **Please note that the sales slip will function as a warranty voucher.** Warranty covers only the unit itself and the electrode. Liability is limited to the purchase value of the complete system (control unit and electrode). Water and moisture damage, as well in the unit as in the electrode, damages to the electrode cable and other damages caused by improper treatment and consequences thereof are excluded from warranty. Please note the additional warranty information (*). **In case of malfunction please contact your retailer.**

Important warranty addendum (*):

- A new pH electrode is one that has been manufactured a short time before. Electrodes will age even if they are not in use. Depending on exact water composition, care and application range the expected life span ranges from a few months up to several years.
- **Warranty is void** for electrodes that have been corrupted by medications, colorants or chemicals, algae deposits or dirt. Also, warranty is void in case of storage in distilled water or test solutions, in case of electrodes damaged by drying up and ones with damaged cord, or broken electrodes, or ones that have been destroyed by other improper use. Proper use provided, however we grant 12 months warranty on the electrode.
- **Solenoid valve:** Water that has flowed-back into the integrated solenoid valve (see section "Water flowing back") may destroy the valve. This is not a warranty case. However, repair or replacement is possible. In this case please consult your specialty retailer.





sera
For a natural aquarium

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