

## SeaBones Calcium Reactor v2 Set Up Instructions

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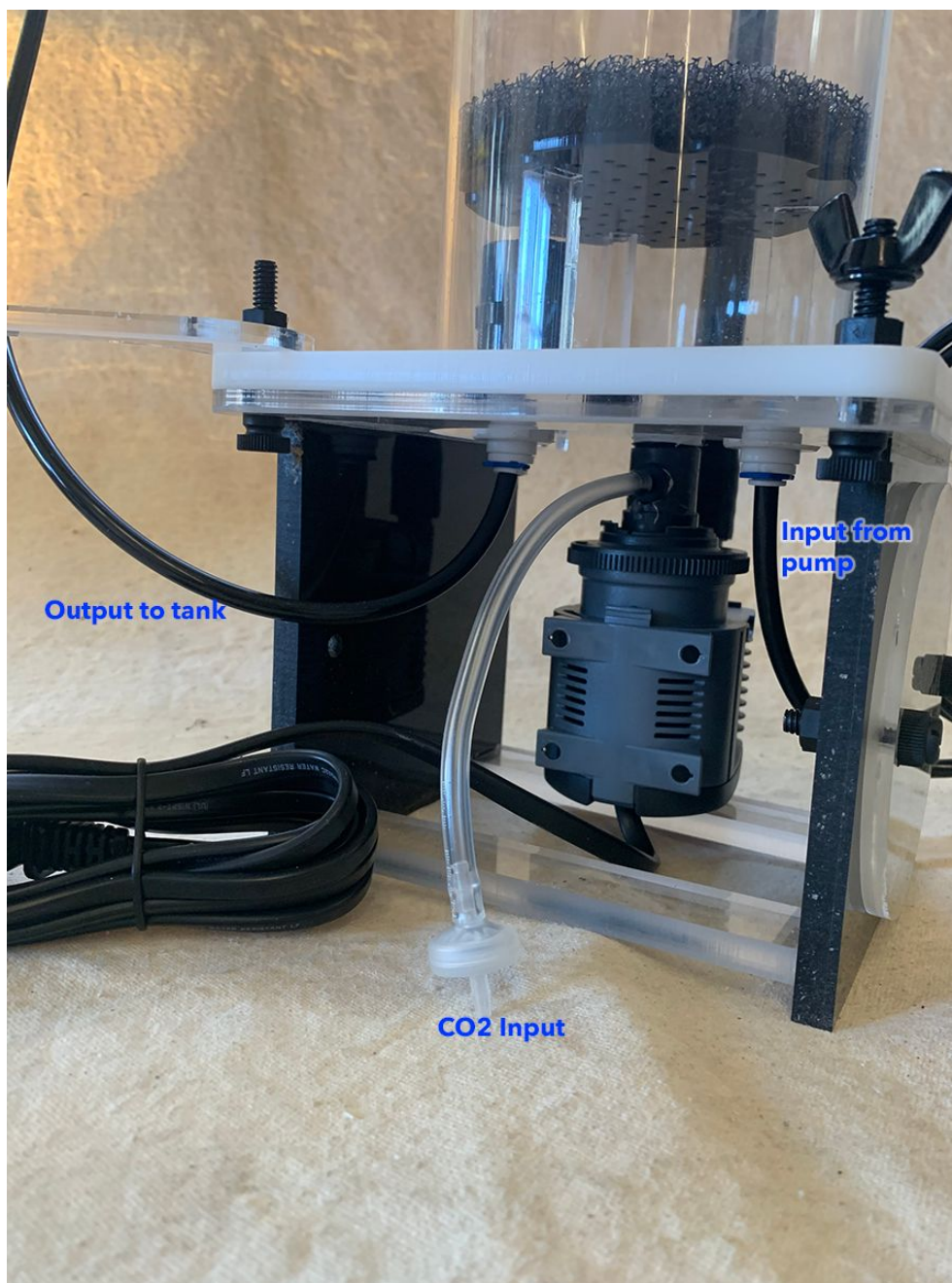
### Introduction

Balanced replenishment of calcium and alkalinity is among the most important water quality corrections required for a thriving reef aquarium. The SeaBones reactor dissolves calcium carbonate “coral bones” into seawater using carbon dioxide (CO<sub>2</sub>) gas. This produces calcium and bicarbonate alkalinity in equal proportions required for the calcification process in living organisms. Once properly installed, the reactor will deliver a consistent supply of calcium and alkalinity (often referred to as “Ca” and “Alk”) with very little maintenance. Please read through the following instruction manual before beginning the reactor installation.

### Setup

Your Seabones calcium reactor has been assembled and tested, and is ready for installation when you receive it. Follow the diagrams below to connect the supplied tubing:





The supplied DC feed pump should be located in a constant water level area of your sump. Connect this pump's output to the pushlock fitting labelled "Input from pump" above, using supplied black poly tubing. For best results, the reactor should be located not more than four feet above the sump water level. Similarly, the output fitting labelled above, which has a grey cylindrical fitting on its other end inside the reactor, should be connected either to the input of the secondary chamber, or routed back to the sump. Connect the small black drip emitter fitting to the output end tubing. If using the secondary chamber, the drip fitting should go on the output tubing there, rather than between the main chamber and the secondary chamber.

Make sure the CO2 check valve is in place, and oriented in the correct direction. You can now test this valve by turning on the feed pump. Water will begin to fill the reactor, and if the reactor top is sealed, it will rise to the top of the grey fitting of the water output. Water will then exit through the output side, through the optional secondary chamber, and out the drip emitter back into the sump. Check that the flowrate through the drip emitter is a rapid but steady drip. No water should come out of the check valve installed on the CO2 input tubing. Once this is confirmed, you can connect CO2 gas tubing from your CO2 regulator to the check valve.

If you plan to use a pH probe with the reactor, now is the time to install it. Calibrate your probe per manufacturer's instructions. Remove the PVC dummy rod from the probe holder in the tee on the lid and replace it with your probe. Note that the probe should not "bottom out" in the tee, as this will block water flow from the recirculation pump. Carefully push the probe in until you feel it stop in the tee, then pull it back out about an inch. Tighten the black compression fitting so that the probe is no longer loose. If you are not using a probe in the unit, make sure that the compression fitting nut is hand tight on the dummy rod.

Make sure the bottom media plate and mesh screen are in place, then fill the reactor with rinsed coral bones style chunky media to within about an inch of the top. This will leave room for the shower head style water diffuser attached to the lid. If you leave the feed pump running when you remove the lid to add media, you'll notice the chamber will start to fill with water. You can start with the reactor full of water, but it is designed to operate with what is basically a giant pocket of CO<sub>2</sub> in the top, using the media as a diffusion chamber. The water level will self regulate as it is displaced by CO<sub>2</sub>. Once the media is loaded and there is at least a small amount of water in the chamber, you can turn on the recirculating pump. You should see water fill the shower head diffuser and rain down over the media.

Once water is flowing, do a final check for any leaks, and make sure the top o-ring is free of any sand grains from adding media. A light coating of silicone grease will typically fix any o-ring leak issues, both in the lid and in the recirculating pump volute. The drip rate through the emitter should be rapid and steady. Once the water flowthrough is established, you can turn on the CO<sub>2</sub> at the regulator. We recommend starting CO<sub>2</sub> addition at around one bubble per second if you are using a visual bubble counter. If you are using the Carbondoser CO<sub>2</sub> regulator, set the output to one flash of the red light per second. As you increase the rate of CO<sub>2</sub> gas input, the pH of the water in the reactor will drop, which in turn will dissolve the media more rapidly. More CO<sub>2</sub> input = faster dissolving = more calcium and alkalinity added to your tank.

## **Monitoring/Control**

We recommend using a pH probe installed in the top tee for optimal CO<sub>2</sub> control and media dissolution. Depending on your tank's calcium and alkalinity requirements, the pH in the reactor should be maintained from 6.5 on the low end, up to about 7 on the high end. The lower the pH, the more calcium and alkalinity there will be in the reactor effluent. We recommend starting pH 6.8. We do not recommend running the pH any lower than 6.5 in the reactor without careful monitoring of the media. The media will dissolve very rapidly as the water becomes more acidic (lower pH), and can clog pumps and the drip emitter. This just means more frequent maintenance, but is otherwise safe to do. Just be aware that you may be adding a lot of calcium and alkalinity!

You can check the effluent alkalinity by diluting the effluent sample typically 2:1 or 3:1 with 0 TDS RO/DI water, or distilled water from the grocery store. Then do a normal alkalinity test and multiply the result accordingly. An effluent alkalinity of 30 to 40 dKH at pH 6.6 is normal. We recommend testing the alkalinity of your aquarium water daily while you tune the reactor to match your system's alkalinity demand.

## **Maintenance**

The calcium reactor chamber itself should not require any regular maintenance, except for periodic cleaning of undissolvable particles from the media that might accumulate in the reactor bottom. The recirculation pump should be inspected for wear every 6 months. If you hear a slight buzzing sound from the pump over time, it is likely the impeller shaft starting to wear down. Replacing the shaft typically solves the problem and the pump should run like new. A vinegar bath for the recirculation pump can be done to eliminate any long term calcium buildup. The pump has a five year warranty through Sicce, and can easily last twice that given reasonable care. The impeller may need to be replaced every few years however, as the sometimes harsh environment of a calcium reactor can wear down the spinning magnet and/or shaft more quickly than in typical aquarium use.

pH probes should be calibrated every 4-6 months as well, or per manufacturer's instructions.

The small DC feed pump should be cleaned in a vinegar bath as with any standard marine aquarium pump.

## **Warranty and contact information**

AVAST Marine Works products are warranted for a period of one year from the date of purchase against defects in materials and workmanship. AVAST will provide necessary parts and factory labor to repair or replace any failed component without cost to the Buyer.

### **Service**

Warranty shall be void if any alteration or service is performed without written authorization from AVAST Marine Works or if the equipment has been connected to incorrect power. Buyer will be responsible for requesting warranty service through the AVAST Marine RMA process which requires buyers to return the defective unit for repair. The Buyer is liable for properly packaging the equipment and shipping cost for the initial return for repair. Return shipping cost is covered by AVAST if within the warranty period.

Equipment damaged due to accident, neglect, abuse, misuse, natural or man-made disasters is not covered by this warranty, and the Buyer will be contacted with cost and approval for repair.

### **Liability**

In no event will AVAST Marine Works be liable for any lost livestock, profits or any special, indirect or consequential damages due to loss of use.

The laws of the Commonwealth of Virginia will govern this warranty plan.

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