



MRC

Building Success

## MRC Calcium Reactor – Dual Chamber

Congratulations on your purchase of a MRC Calcium Reactor; the world's finest calcium reactor.

Please read all of the instructions before starting to assemble your reactor in order to assure proper assembly and operation.

The reactor comes disassembled for shipping. Refer to instructions and assembly diagram for reactor set up. Failure to follow the assembly instructions could cause the reactor to fail.

### Section A - Setting Up Your New Reactor

**Placement of the Reactor** - Place the reactor as close to your sump and CO2 tank as possible. The longer the tube length the longer it will take for adjustments to take effect. This makes adjusting a calcium reactor more difficult.

**Pressure Feed Setup** – This is the preferred method to hook up any reactor. For this setup we recommend using a Cobalt MJ1200 or similar as the feed pump.

-  Connect the recirculation pump to the reactor manifold.
-  Connect the 1/2" feed tube to the feed pump and place the feed pump into the sump.
-  Connect the other end of the 1/2" feed tube to the 1/2" hose barb on the manifold.
-  Screw the Effluent Valve into the threaded hole of the top flange. Do not over tighten- hand-tighten only. Insert the 1/8" effluent line into the Effluent Valve and run to the sump. The preferred location is a high flow or turbulent area.
-  Connect the 1/8" CO2 tube to the CO2 Regulator and the other end to the 1/8" barb on the manifold. Refer to the CO2 Regulator section for set up of the Regulator and Bubble Counter.
-  Screw the 90 degree elbow into the top of the primary chamber (right).
-  Run the 1/8" connection tube from that elbow to the elbow located towards the bottom of the buffering chamber (left).
-  Fill the media chamber to within 1.5 inches of the top. Be sure not to spill any media in the O-Ring groove.
-  After all the connections are complete and tight, fill the unit with water. Replace the lid on the chamber and hand-tighten the nylon thumbscrews in an alternating pattern. Do not over tighten.
-  Plug in the feed pump and adjust the flow rate of the effluent line using the Effluent Valve to a fast drip.
-  Plug in the recirculation pump.

**Filling the Bubble Counter** - The bubble counter must be in upright position when in use.

-  Unscrew the top of the bubble counter.
-  Fill the bubble counter with R/O water 3/4 of the way up.
-  Replace and hand-tighten the top of bubble counter.

## Bubble Counter Setup

- ☞ The provided bubble counter attaches to your CO<sub>2</sub> regulator. It will fit most standard regulators.
- ☞ Attach the 1/8" tubing to the top of the bubble counter and then run to the 1/8" barb on the calcium reactor manifold.
- ☞ Adjust the bubble rate to 40 bubbles per minute

## CO<sub>2</sub> Regulator Setup

- ☞ After getting your CO<sub>2</sub> cylinder filled, keep the main valve located at the top of the aluminum cylinder **OFF** (turned clockwise). Insert the Teflon gasket and attach the dual gauge regulator and tighten securely. The gauge on the left reads the amount of CO<sub>2</sub> in the cylinder, expressed in **PSI** (pounds per square inch). The gauge to the right reads the pressure of the gas leaving the regulator.
- ☞ Connect the bubble counter per the instructions above or per the regulator manufacturer's instructions.
- ☞ Attach the tubing supplied to the bubble counter.
- ☞ Close the regulator needle valve (completely turned clockwise).
- ☞ Slowly open the main cylinder valve.
- ☞ Dial in the adjustment knob on the regulator until the outlet pressure gauge reads 10 PSI.
- ☞ Slowly open the needle valve to desired setting (see Dialing in Calcium Reactor Section).
- ☞ When the cylinder pressure gauge drops below 500 PSI, it is time to consider getting the cylinder refilled.

## Section B - Basic Operation

The calcium reactor operates by dissolving the aragonite within the reactor chamber(s) by lowering the pH value of the water inside the reactor chambers caused by the injection of CO<sub>2</sub>. The effluent is high in calcium, alkalinity, and loaded with all of the trace elements needed for coral growth. The effluent pH should be between 6.6 and 7.0. The calcium reactor is best used to maintain levels, not raise them. It is recommended that you add calcium to achieve the desired level after installing the reactor and using the reactor to maintain it. The same is true for alkalinity.

Every system will have different calcium and carbonate demands from a calcium reactor. The effluent and bubble rates are recommended starting points, but will have to be adjusted to meet the needs of your system. Using a controller will greatly simplify operation and setup.

- ☞ Increasing the bubble count will lower the pH inside the reactor. This will increase the Carbonate Hardness (KH) and calcium (Ca) of the effluent. Lowering the pH below 6.5 may cause the media to create 'mush' or 'mud'.
- ☞ Decreasing the bubble count will raise the pH inside the reactor. This will decrease the KH and Ca of the effluent.
- ☞ Increasing the drip rate alone will raise the pH inside the reactor. This will decrease the KH and Ca of the effluent.
- ☞ Decreasing the drip rate alone will lower the pH inside the reactor. This will increase the KH and Ca of the effluent.
- ☞ We recommend the use of a pH controller. Using a controller to adjust your pH will make tuning the reactor much easier.

You can use these adjustments to achieve the desired results for your system.

## Adjustment Notes:

- ☞ Monitor your system pH closely for the first few days. If your system pH drops, slow down the flow of CO<sub>2</sub>.
- ☞ Monitor your alkalinity. It may take a few weeks before you see any increase in alkalinity. DO NOT let it rise above 14 DKH. Remember each system is different and settings will vary or have to be adjusted from what is recommended here.
- ☞ When adjusting your reactor, do so in small increments of 8-10 ml/min. Adjust the effluent first and then adjust the CO<sub>2</sub> rate. Measure the effluent pH and maintain 6.6-7.0.

### **Section C - Routine Maintenance and Notes**

Check the effluent flow rate and the CO<sub>2</sub> rate periodically as your bubble count may become erratic when your CO<sub>2</sub> cylinder begins to drop below 500PSI.

Refilling the media should have to be done every 3-4 months or when the level has dropped about half way. If the media becomes muddy, replace it.

The PVC union O-ring should have a bit of grease (dielectric) applied to keep it from freezing up due to high calcium output. The O-ring provides the seal and no Teflon tape is needed.

Do not lift a full reactor by the extended flange areas.

