



Precision Marine Systems

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## Calcium Reactor Models CR422 & CR622

### Instructions

Congratulations on the purchase of a state of the art calcium reactor manufactured by Precision Marine Systems. READ ALL INSTRUCTIONS. Your warranty begins from the date of purchase, so please keep your receipt and see warranty on last page.

### Plumbing and Installation

Before installing, locate the plumbing kit inside your reactor. You should have the following fittings and other included parts:

- 1 - 1/2" Black Barbed fitting
- 1 - White Check Valve and related fittings
- 1 - Roll Teflon Tape
- 1 - Length of 1/4" Poly Tubing for reactor return to reservoir
- 1 - Length of silicone Tubing (for CO2)

★ In addition to the included parts, you will need a CO2 cylinder (filled) and a regulator with a needle valve. A solenoid is recommended, but is optional.

### Assembly...

#### *Using the supplied teflon tape...*

★ Wrap the threads on the 1/2" black barb fitting and white check valve adapter 2-3 times in the opposite direction of the threads (so that the teflon tape will not unravel when you tighten the fitting). There is only one place each of these fittings will go on your reactor. The check valve at the bubble counter and the barbed fitting at the tee at the water pump.

#### *Choosing a water source for your Calcium Reactor...*

- ★ You can either bleed-off an existing pressure line (i.e. protein skimmer pressure pump or water return line), or use a dedicated powerhead/pump to feed the reactor to the black 1/2" barbed fitting.
- ★ If you choose the bleed-off option you will need to install a Tee and divert water to your Calcium Reactor. The plumbing should be 1/2". This method requires some basic plumbing knowledge.
- ★ If you use a dedicated pump, a MaxiJet 1200 (or equivalent) works very well and uses the same 1/2" connection.
- ★ The long length of 1/4" poly tubing carries the effluent (output water) back to the reservoir and should be placed over the side of the reservoir in a fashion that the water flow coming out of that line can be seen. The other end connects to the needle valve located at the top of the reactor marked "output to reservoir".
- ➔ A tip is to drill a 1/4" hole near the top of your reservoir and push the tubing through.

## Set Up...

- ★ Thoroughly rinse media in freshwater (preferably R.O. water).
- ★ Precision Marine recommends CaribSea A.R.M. filter media because it dissolves at a higher pH.
- ★ Depending upon model, remove the 6 or 12 bolts securing the reactor lid.
- ★ Place sponge on one of the supports the bottom of the reactor.
- ★ Carefully fill the reactor with media approximately four (4) inches from the top.
- ★ Take care in preventing any media from getting into the threads while adding.
- ★ Place the second sponge on top of the media followed by the second support.
- ★ Place the lid onto the reactor. Be sure the o-ring and mating surface are clear of debris prior to assembly to assure a good seal. Establish uniform pressure over the flange face by tightening the bolts in 1/4 turn increments. Do not over-tighten.
- ★ Tighten the successive bolt opposite the previous (similar to a cylinder head on a motor).

### ➔ Be sure...

- ★ The PVC unions are secured (hand-tight is sufficient).
- ★ The 1/2" water input line is connected to the water source and clamped at both ends (a tie wrap is sufficient).
- ★ The effluent line is secured at the reservoir.
- ★ The needle valve on the lid of the reactor is opened (turned counter-clockwise).
- ★ To connect the silicone tubing from the CO2 regulator to the check valve nipple.

## Start Up...

- ★ Be sure the needle valve on the lid of the reactor is opened (turned counter-clockwise).
- ★ Open the bleed-off valve, or start the feed water pump.
- ★ The reactor will slowly begin to fill.
- ★ It is important the needle valve is open at this time so the reactor vents properly while filling.
- ★ Once the reactor is completely filled and water is flowing out of the effluent line, start the water pump by plugging it in.
- ★ The bubble counter is self priming.
- ★ Close the needle valve (adjusting the effluent back to the reservoir) to what is best described as a "**broken stream**". The valve is sensitive, but you will be able to set the flow as described.
- ★ Open the valve controlling the CO2 to the bubble counter at a rate of 1 bubble per second.
- ★ **Do not flow too much water through the reactor to start!** The alkalinity in your aquarium will rise too quickly and the pH will fall by flowing too much water through the reactor.



## Operation...

- ★ The most accurate method of determining the proper amount of CO<sub>2</sub> is by using the probe-holder integrated into the lid of your Calcium Reactor using a pH monitor or controller.
  - ★ To start, set the flow to maintain a pH value of 7.5. Monitor the aquarium pH to be sure it is not falling rapidly. It is expected to see the pH in the aquarium fall slightly, but should not drop below 8.0. If it does, reduce the CO<sub>2</sub> bubble count. or increase water flow through the reactor.
  - ★ The ideal pH of the effluent is 6.5 - 7.5 depending upon the media you are using, however it will take a few weeks to get there. When using the recommended media, there is no reason to maintain a pH lower than 7.0.
  - ★ Slowly increase or decrease the amount of CO<sub>2</sub> to maintain this value. The idea is to watch the pH in your aquarium as you lower the effluent water pH to 6.5 - 7.5 The amount of CO<sub>2</sub> required is relative to the water flow through the reactor. The lower the pH, the faster the dissolution of media, and the more calcium is released. If for any reason you do not understand the above instructions, contact your dealer for clarification, this is very important and simple once set-up.
- ➔ The alternate method of setting your calcium reactor is to measure the alkalinity in your tank and adjust the calcium reactor to maintain the target value. Be sure to follow the above steps to be sure the pH value in the tank isn't falling below 8.0.

After 24 hours of operation, measure the carbonate hardness of the effluent water. It should be 12-20 dkh. The calcium level in the aquarium should be between 380 - 500ppm. From this point, how quickly your calcium reactor releases calcium, depends upon the media you are using. Aragonite dissolves the fastest, releasing calcium and raising the alkalinity. There are other medias available on the market which do not break down as quickly, resulting in a longer time before you start to see your calcium level increase. Consult with your dealer for media selection. Continue the addition of Calcium until your reactor begins to release calcium. Once you have your reactor dialed in, few, if any adjustments are needed.

- ➔ To raise the pH, increase water flow or decrease CO<sub>2</sub>.
- ➔ To lower the pH, decrease water flow or increase CO<sub>2</sub>.

## Maintenance...

With normal operation, the grain size, and the amount of media will decrease. We advise cleaning and refilling the reactor at three-month intervals. The Sicce water pump is supplied with a 3-year manufacturer's warranty. Read the included warranty card and have your dealer stamp it. Follow water pump maintenance instructions as outlined in the manual.

Lastly, we at Precision Marine would again like to thank you for purchasing one of our products.

# Precision Marine Systems, Inc.

## **LIMITED ONE YEAR WARRANTY**

**IMPORTANT NOTICE:** Read this entire Limited Warranty before purchasing, installing, or using this product. By purchasing, installing, or using this product, you are acknowledging that this Limited Warranty is part of the sale terms.

**COVERED PRODUCTS.** This Limited Warranty applies to the following PRECISION MARINE products: RFCa & CR Series Calcium Reactors (hereinafter referred to as the "Covered Products"). PRECISION MARINE makes the following express limited warranties for the Covered Products purchased within the United States, subject to the conditions and limitations stated below. These limited warranties are the exclusive warranties for the Covered Products. PRECISION MARINE disclaims all warranties, express or implied, for other products.

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**FAILURE TO COMPLY WITH THE INSTALLATION AND OPERATING INSTRUCTIONS STATED IN THE MANUAL VOIDS ALL WARRANTIES.** This Limited Warranty does not extend to the use of the Covered Products under abnormal conditions, conditions that exceed the stated performance parameters of the products as provided on the product labeling and in the manual or instructions provided with the Covered Products, or under conditions not reasonably foreseeable to, or beyond the control of, PRECISION MARINE. Buyer assumes all risk of any such use. Any attempts at self repair shall void this limited warranty. Water and electricity are a deadly mix it is the sole responsibility of the owner to provide adequate protection for children, and other persons, including themselves from the dangers of electrocution.

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**NOTICE OF CLAIM.** Buyer shall promptly notify PRECISION MARINE of any claim under this Limited Warranty. PRECISION MARINE reserves the right to deny any claims made by the Buyer more than one (1) year after any defect or other basis of a claim covered by this Limited Warranty is discovered by the Buyer or should have been discovered by the Buyer.

**CLAIM PROCEDURE.** You should make claims under this Limited Warranty in writing to Precision Marine Systems at [sales@precisionmarine.com](mailto:sales@precisionmarine.com) or by calling 830-626-2401. Claims to Precision Marine should include the following information: (1) the claimant's name, address, and telephone number; (2) the product description, purchase price, and the date and location of purchase; (3) copy of the sales invoice or receipt; (4) a description of your product concerns (you may include photos); and (5) a brief summary of the attempts you made to address the concerns. Buyer shall be responsible for shipment and insurance costs to send Covered Products to Precision Marine.

**ENTIRE AGREEMENT.** This Limited Warranty, and all of the terms and limitations contained herein, constitutes the entire agreement between PRECISION MARINE and the Buyer. By purchasing, installing, or using the Covered Products, Buyer is not relying on any oral statements made by anyone, including its authorized dealers, which are in any way different or contrary to the terms and limitations of this Limited Warranty. By purchasing, installing, or using any of the Covered Products, Buyer acknowledges that authorized dealerships are not agents of PRECISION MARINE and any statements or representations made by authorized dealerships and their employees are not attributable to PRECISION MARINE.

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