Operational manual

Marine sources

High performance aquarium products

NR-150-6520

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NR-150-6520

Nitrate Reactor

For aquariums up to 2200 Liters

Hailea 6520/35W

Thank you for purchasing a MARINE SOURCES series NITRATE REACTOR. All of our reactors are handcrafted using the latest tools and technology. It has been specifically designed for the aquarium use and tested by professionals. Before enjoying our high performance products, please read our operational manual carefully.

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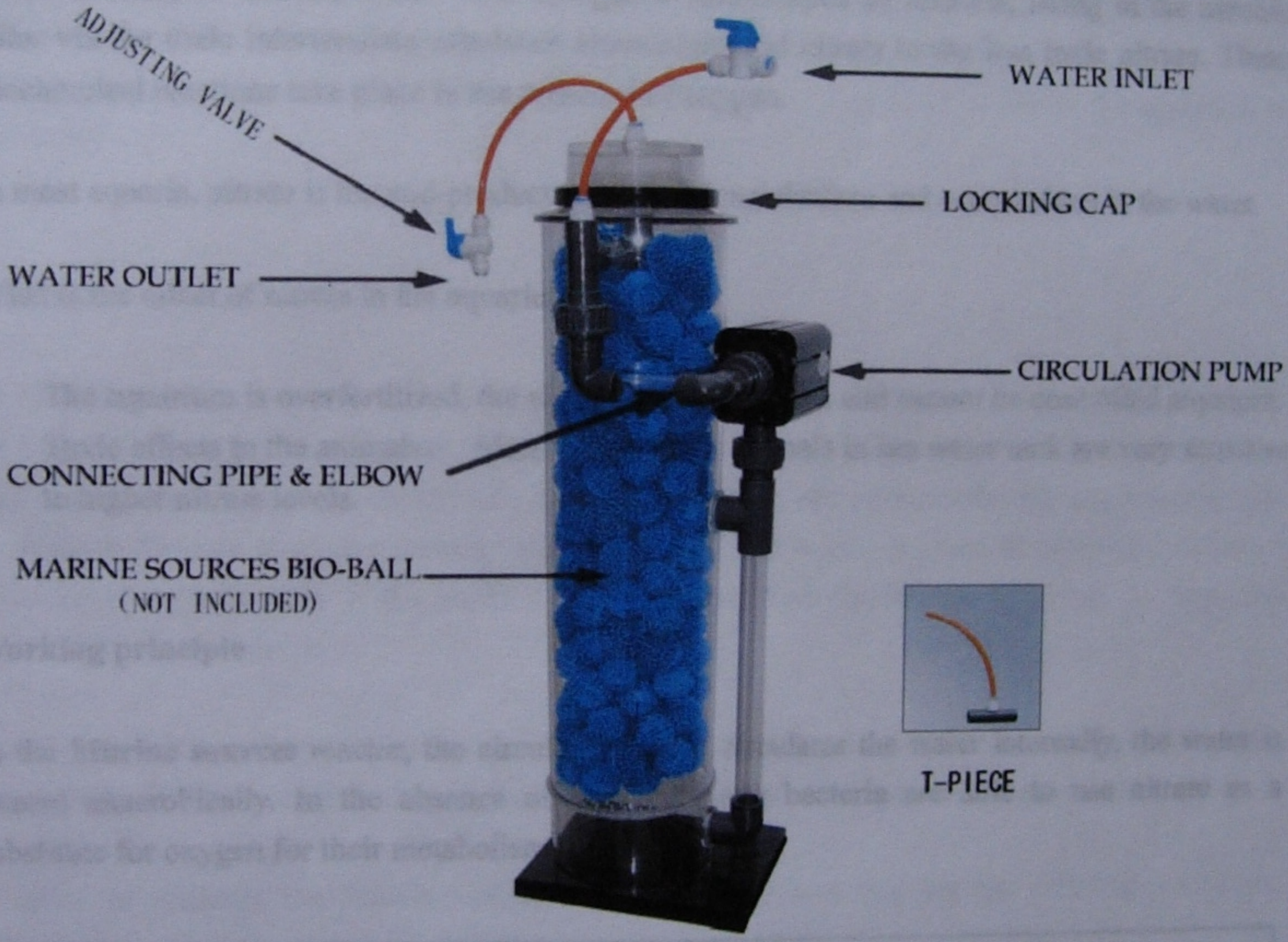
NITRATE REACTOR



PARTS CHECK LIST

- 2 ADJUSTING VALVE
- LOCKING CAP & O-RING
- CIRCULATION PUMP
- CONNECTING PIPE & ELBOW
- T-PIECE
- 3 UNION & SMALL O-RING

Basic knowledge

Nitrate is coming into the aquarium via 2 different paths:

- With the tap water, with every water change or with the replacement of the evaporated water
- By biological reaction in the aquarium. These reactions are responsible for the biggest part of the increase of the nitrate level.

How is nitrate produced in the aquarium?

When the animals are fed with dried, living or frozen food, proteinaceous substance get into the aquarium. These are basic of the diet for the animals. A big part of the nitrogen, from the food is however excreted into the water. This nitrogen is metabolized by bacteria, living in the aerobic filter via the toxic intermediate substance ammonium and nitrate to the less toxic nitrate. These biochemical reactions take place in the presence of oxygen.

In most aquaria, nitrate is the end-product of bacterial metabolism and accumulates in the water.

What is the effect of nitrate in the aquarium?

- The aquarium is overfertilized, the algae growth increases and cannot be controlled anymore.
- Toxic effects to the animals。 Many invertebrate animals in sea water tank are very sensitive to higher nitrate levels.

Working principle

In the **Marine sources** reactor, the circulation pump circulates the water internally, the water is treated anaerobically. In the absence of oxygen, many bacteria are able to use nitrate as a substitute for oxygen for their metabolism.

Chemical reaction

$$3NO_2 \rightarrow N_2 + 3O_2$$

3 Nitrate → Nitrogen gas + 3 oxigen

The oxygen is used for the metabolism, the nitrogen is excreted into the water. Nitrogen gas is a natural compound of the water and totally harmless.

The outflow is located in the top of the filter. From here the water flows into the aquarium or the filter tank.

Installation

1 Remove the Nitrate Reactor and all the assembly parts from the box according to the parts check list and check for damages

2 Get rid of any packing fabrication debris by rinsing the reactor thoroughly..

3 Install all the assembly part to the reactor according to the demonstration image as shown on page 2.

4 Screw and fix the circulation pump to the reactor.

5 Unscrew the locking cap and place the bio-ball (not included) or other filter material into the reactor chamber. **Marine source** bio-ball is recommended.

6 Fill the reaction chamber with the aquarium sea water and screw the locking cap to the reaction tower. Make sure the O-ring is available.

7 Connect the water inlet with the air tube. and the included T-piece. The inflow into the reactor can realized as a bypass from the circulation pump. The flow rate can be adjusted by the adjusting valve. The best value is app.8-20 l/hr.

8 Connect the water outlet with the air tube so that it can introduce the water to the aquarium or the sump.

Starting

Switch the circulation pump on. As soon as the Nitrate reactor is placed in the right position and all connection are ready, the water flow can be start. But Nitrate reactor is differing with other aquarium filter because **the inflow of aquarium water to the reactor should not immediately be started.** It must keep this closing state for around 3-4 weeks or more in order to cultivate a anaerobical microclimate. If the nitrite has disappeared from the reactor after app. 21 days, the water flow can switch on.

The Nitrate loading in the aquarium can be checked and controlled by means of the redox probe (not included). Please consult to your local dealer for the for mV probe if you are needed.

In order to optimize the function of the Nitrate reactor and increase the reliability, a redox potential control is recommended as below.

- The redox potential in the aquarium is kept at +200-380 mV(Millivolt).
- In the Nitrate reactor, because the water is treated anaerobically, so the ideal range is between -50 and -250 mV.

It is normal that after some time a slimy bacterial biomass is formed in the Nitrate reactor. A high bacteria population can ensure a high removal rate of nitrate.

Maintenance

- The inflow rate has to be checked regularly. The recommended is at 8-20l/hr. It needs to be readjusted from time to time
- Unscrew the circulation pump and clean it with fresh water regularly in case of the pump clogging.
- The bio-ball or other inside material should be cleaned if the bacterial biomass has increased after some years.

Safety hint

1 Never allow the circulation pump to run dry.
2 Never completely close the water outlet. The nitrate reactor is a hermetically closed system. The product gas can escape through the water outlet. If it is closed, an eventual overpressure may escape through the water inlet and interrupt the water inflow.
3 Never touch electrical plugs with wet hands to connect pumps to power outlet.
4 Never clean the nitrate reactor with any chemicals that contain alcohol or ammonia.

Warranty

The reactors have 1-year warranty on craftsmanship. We always guarantee the product if it has been installed correctly, is used for the purpose that was intended by us, is used in accordance with the operational manual. The warranty is not applicable on the consumable products.

Proof of purchase is required by presentation of an original invoice or receipt including the dealer name, the model item number and the date of purchase.
This warranty may not apply if the unauthorized persons or organizations have executed repairs, modifications or alterations, or damage is caused by accident, misuse or neglect.

We regret that we are unable to accept any liability for any consequential loss.

If your MARINE SOURCES product dose not appear to be working correctly or appears to be defective please contact your dealer.
Before calling your dealer please ensure you have read and understood the operational manual, if you have any questions your dealer cannot answer please contact us at www.marineart.com.cn

We reserve the rights to modify and adjust the specifications of our products without prior notification.