



# ROTIRAS

## Turn-Key RAS Intensive Rotifer Production System

### INTRODUCTION

SEADUCER and IDEE AQUACULTURE are pleased to introduce this turn-key intensive and continuous rotifer production system using RAS technology and based on over 25 years of design and zootechnical experience in marine commercial hatcheries and R&D facilities.

The system has been developed in 2015 and continuously improved since then from customer feed-backs.

The ROTIRAS is supplied with thorough SOPs (Standard Operating Protocols) and short, medium or long terms Technical Assistancess are available.

The ROTIRAS is designed for high densities rotifer production and it is compact, robust and made mainly on recyclable heavy duty HDPE. It is complete, including culture tank, filtration systems, screens, heating system and feeding / harvesting pumps.

The ROTIRAS is supplied with thorough SOPs (Standard Operating Protocols) and short, medium or long terms Technical Assistancess are available upon request.

The ROTIRAS will significantly lower your operation and investment costs, as it will save you a lot of space and labour.



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### THE SYSTEM

- ✓ The culture volume is 1,000 litres and water treatment units are designed to ensure mechanical filtration, bio-filtration and protein skimming.
- ✓ A thermal control tool is included in order to keep the optimal stable temperature according to each rotifer strain (from SS to L).
- ✓ Only one circulation pump is used for the whole system.
- ✓ Air and new / RAS exchange water supply are controlled with flow-meters in order to keep water quality parameters stable.
- ✓ The system is provided on a HDPE base of 2300 mm x 1250 mm. It can be easily transported via sea freight container all over the world.
- ✓ Total installed power is 2 KW/400V (240V), mostly allocated to temperature control. Usual average consumption is around 1 KW.



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### PRODUCTIVITY

For better water quality control and daily productivity, the recommended rotifer feeds to be used are algal pastes such as *Nannochloropsis* spp. (or *Chlorella* spp.) at a dosage ranging from 1.5 to 5.0 ml / million rotifers, depending on rotifer strain and algal concentrations (or Dry Weight content).

Other types of micro-algae pastes can be added directly into the system for extra rotifer enrichment (*Tetraselmis* spp, *Isochrysis* spp. etc.).

Algal pastes must be distributed continuously over 24 hours and stored at low temperature.

Average daily productivity is ranging from 30 % to 70 % of the total culture volume at an average density of 2,000 rotifers / ml, making **the average expected harvest up to 1 billion rotifer per day.**

For optimal system stability and productivity, 24 hours continuous harvest is recommended.

Recommended starting and routine-off-production density is 100-200 rotifers/ml and on-going production density is 1,000 – 3,000 rotifers/ml.

If the system is well managed, and depending on the temperature, no pure oxygen is required up to 2,000 rotifers/ml, as adequate aeration is supplied to the tank. Typical cylindrical oxygen ceramic stones are recommended to diffuse pure oxygen into the culture tank. Oxygen flow required would be very low.



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### THE RAS COMPONENTS

#### A/ Culture tank :

- ✓ It is 1,000 litre conical shape and it is provided with an “aerated” 40-60 µm central screen that provides aeration to the tank and that must be cleaned on a daily basis. It has been designed to be easy to remove and put back.
- ✓ Two air-lift “floc-traps” or sediment filters are included in the tank to allow mechanical filtration and keep the culture clean of organic matter (aggregated micro-algae, dead rotifers, rotifer faeces etc.). They also have to be cleaned on a daily basis. Unlike the passive and hanging typical mats, they are not a breeding ground for ciliates and they are located outside the water column to prevent further contamination.
- ✓ A bar heater is installed with its thermostat inside the culture tank and the significant central aeration prevents any overheating.
- ✓ Recirculation rate is 5 to 6 m<sup>3</sup> per day (200-250 l/h, 20% to 25%/h) to keep water parameters stable and optimal. The whole concept is made to avoid dead zones and to prevent any build-up of organic matter.



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30/06/2022

### **B/ Bio-filter :**

- ✓ It has been designed to prevent the build-up of ammoniac and nitrites. Nitrates will be removed via the new water exchange rate.
- ✓ It is a MBBR (Moving Bed Biofilm Reactor) with top-grade plastic bio-media at a specific surface area (SSA) of 800 m<sup>2</sup>/m<sup>3</sup>.

### **C/ Protein Skimmer :**

- ✓ It has been designed to strip all the small particles (< 20 µm) generated from intensive rotifer culture and that are not removed with the floc-traps.
- ✓ It treats thoroughly the water from the bio-filter several times per hour to ensure its optimal function and to prevent any organic matter going back to the culture tank.

### **D/ New Water Requirement :**

- ✓ Make up water of 1,5 m<sup>3</sup> per day is implemented during the initial bio-filter maturation stage then reduced down to 0,5 m<sup>3</sup>/day depending also on the daily harvested volume. For biosecurity control, disinfected new water must be used.



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### **E/ Aeration requirement :**

- ✓ The system can be delivered with its own air supply, with an adapted blower upon request, or can be connected to the main hatchery air supply. It then required a minimum of 6 m<sup>3</sup>/h at 200 mb pressure.

### **F/ Bar heater :**

- ✓ Temperature can be adapted to local ambient conditions and to rotifer strain requirement using the thermostat.

### **G/ Feeding & Harvest :**

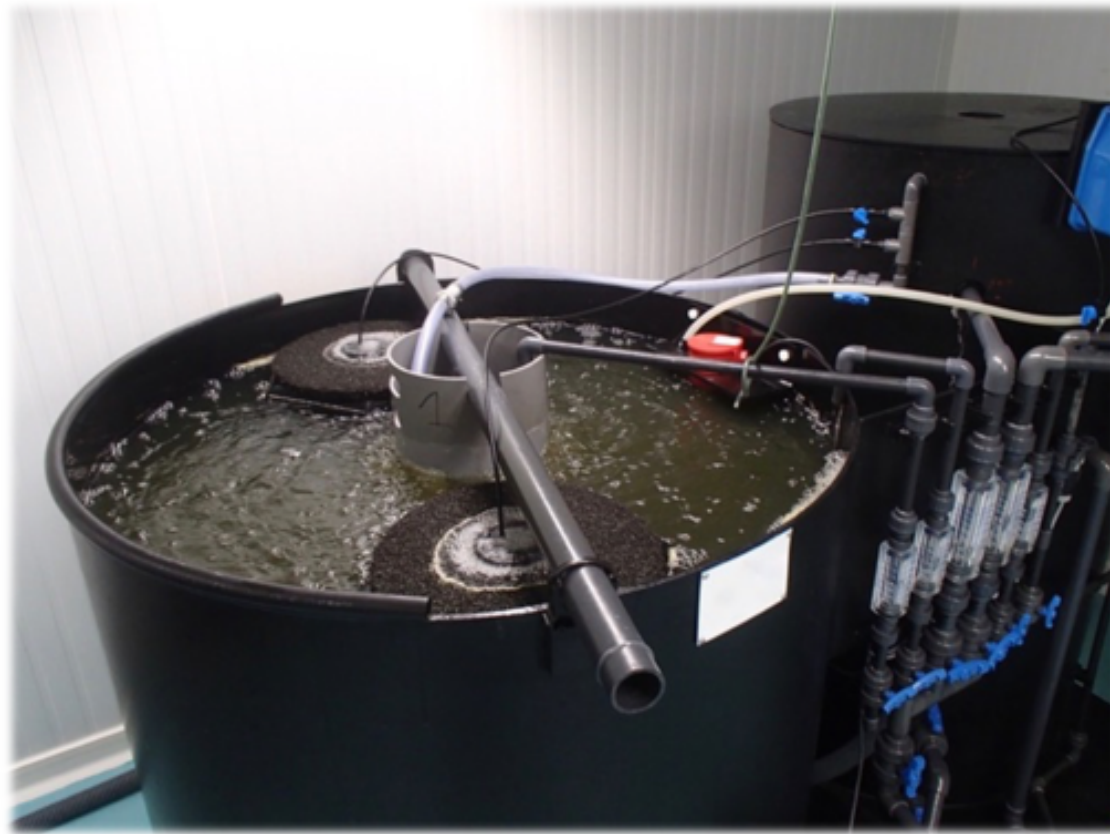
- ✓ Feeding must be done via a supplied peristaltic pump. Cold storage system is required but not supplied.
- ✓ Continuous daily harvest is recommended via a supplied diaphragm pump that will transfer the rotifers to any dedicated equipment to collect, concentrate, and to clean rotifers. Batch harvest is also possible but will affect the overall performance of the system.



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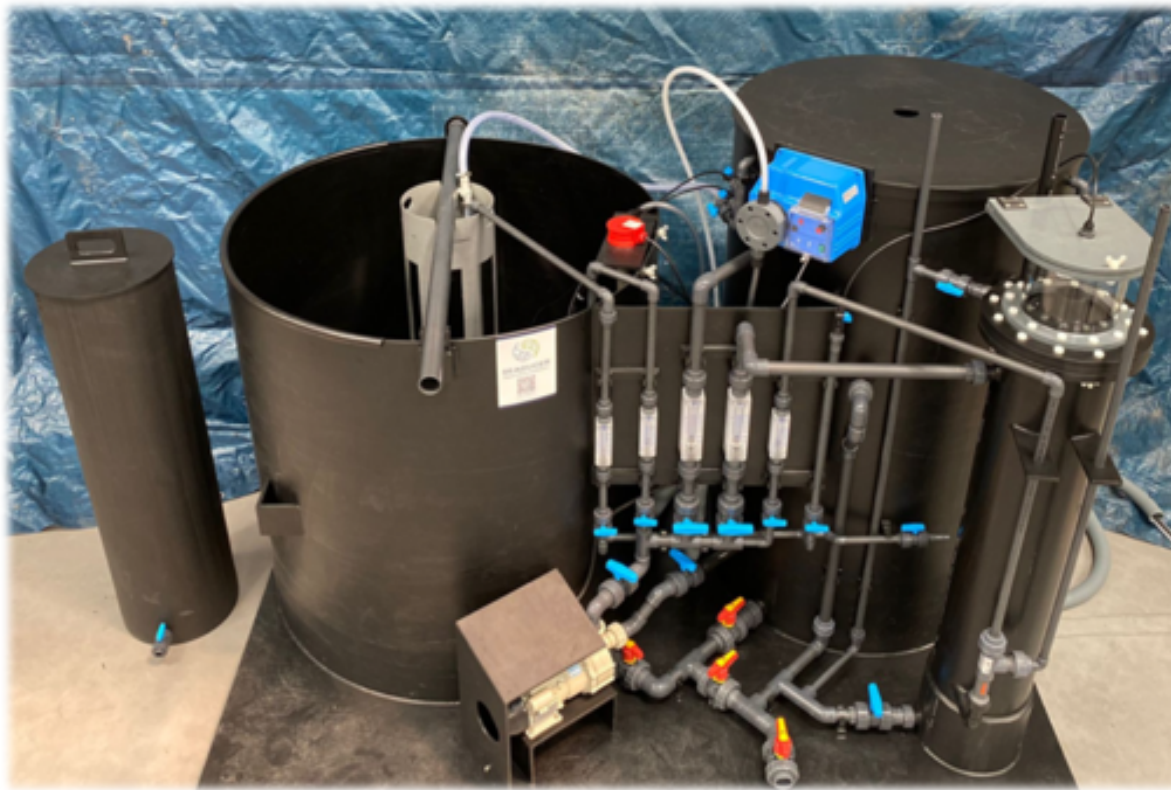




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