

AN ENERGY SAVING SYSTEM FOR WASTE HEAT

USAGE IN AQUARIUM FISH FARMING FACILITIES



AS-ReHeater

For a long time, the Czech Republic belongs among the world great powers in breeding and export of aquarium fish. Apart from a wide community of enthusiastic small breeders, we keep this position due to many professional large scale breeders. Our new application – **AS-ReHeater, the all stainless heat recovery exchanger** – is particularly intended for them. Were it not for this exchanger, waste heat would be literally drained to a sewer without any use.



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Considering the current prices of water and energy, there is no wonder that enlightened breeders are trying to reduce the cost side in their business without jeopardising health and lives of the most precious assets they have in their aquariums – their aquarium fish.

However, any repeated use of drained water is questionable for the necessity of meeting the concentration limits of various substances dissolved in water (in particular, this concerns the total nitrogen content in the form of nitrates). Anoxic denitrification (i.e. the method for degradation of these substances in discharged wastewater) is a rather complex and expensive process and therefore it is not used so far for aquarium wastewater.

In contrast to this, the use of waste heat only is less complicated and it does not require any special treatment of water. The drained water is led over the special heat recovery exchanger – AS-ReHeater – where it hands its heat over to the water stream used for topping up of the tanks. As this water is already preheated, its additional heating is far less costly.

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Advantages

- Significant energy savings in heating of aquarium water
- High return on investment
- Almost maintenance-free operations
- Almost no operating costs
- Closed circuit without any effect to the topping up water quality
- Almost limitless equipment lifetime
- Very easy maintenance of absorbers



Equipment description

- The equipment is completely made of stainless steel (AISI 304)
- The exchanger takes up only a small space: 1,915×1,090×1,300 mm, including connections
- The absorbers are enclosed in a stainless steel cabinet enabling an easy access
- Drain pipe connection: DN 100, water supply connection: DN 1"
- Max. temperature: 100°C
- Max. flow rate: 2 litres per second
- Min. flow rate: 0.4 litre per second
- Number of absorbers: max. 4



Practical example

Hobby ZOO CZ, a Czech aquarium fish breeding company, uses a three absorber exchanger for several years. Due to this arrangement, the topping up water is preheated by approximately 12°C. This means that the original water temperature of 10°C is increased up to 22°C, and due to this (at the flow rate of 35 m³ per day), we can guarantee daily energy savings in the level of 480 kW. In this way, the return on investment was shorter than one year.



In 2014, another aquarium fish breeding plant at Velké Přílepy started to use the same heat exchanger. The daily flow rate there is approximately 30 m³ and the return on investment was even shorter – only eleven months.



FOR A DETAILED DESIGN OF THE SYSTEM AS REGARDS SPECIFICATIONS OF INDIVIDUAL OPERATING CONDITIONS, PLEASE CONTACT THE RESPONSIBLE MANAGER OF ASIO, SPOL. S R.O.