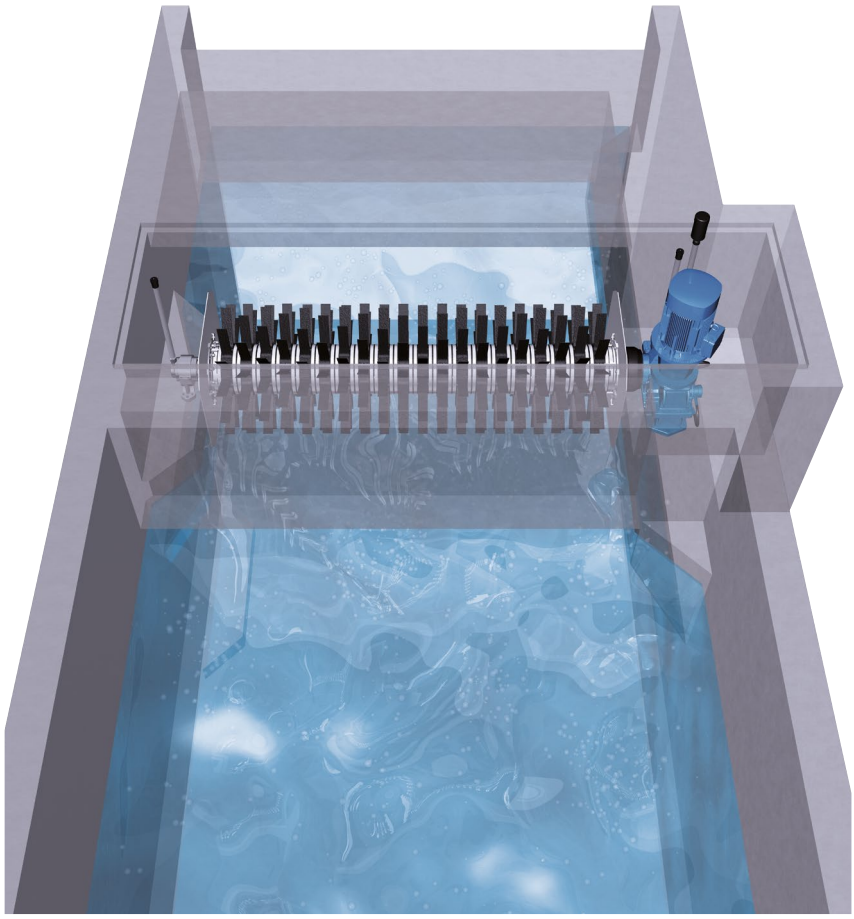
Passavant

A brand of
Aqseptence Group

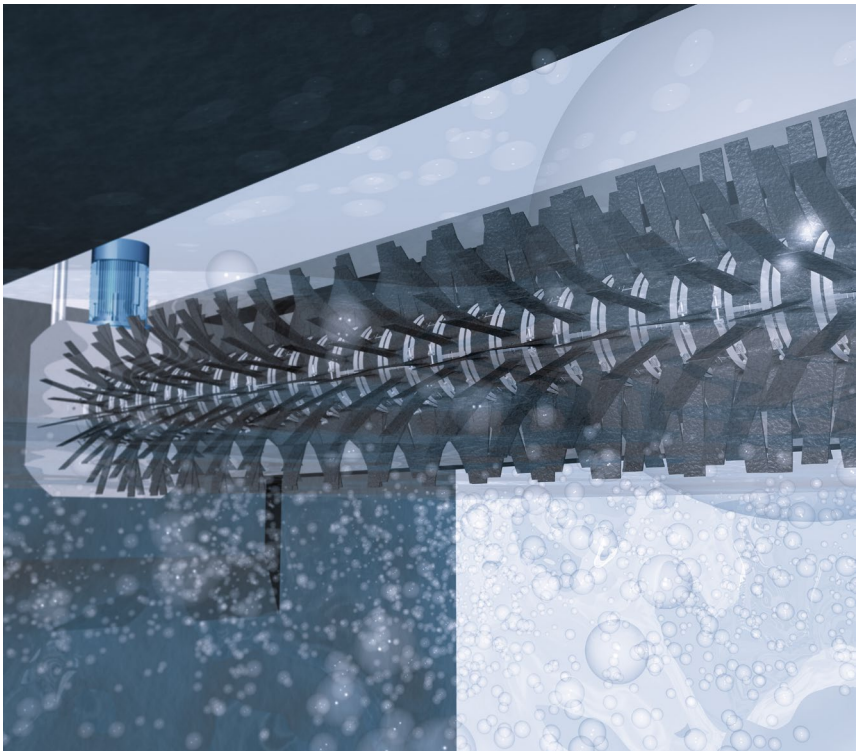
Passavant®
Surface Aerator Mammutrotor® Check-up

We support you in having a reliably and efficiently running plant. With the help of the following aspects you may discover potentials also for your system. Furthermore, we illustrate suitable options for optimization.



1. Immersion depth
An immersion depth between 25 cm and 28 cm making the equipment very economical and achieving a good machine efficiency at the same time. Of course, there are still remaining reserves – in the case of a higher oxygen demand, the immersion depth can be increased up to 30 cm. If lower oxygen inputs are required, the immersion depth could be lowerded (approx. 20 cm highest efficency).

2. Water level
In order to obtain an optimum immersion depth, the water level should be kept constant during operation. For setting the water level we recommend to a controlled weir. It is normally controlled by an ultrasonic sensor or electromagnetic flowmeter. If the weirs are manually operated we recommend that the immersion depth of the Mammutrotor® be set at all times within the optimum range for the minimum as well as the maximum inflow.



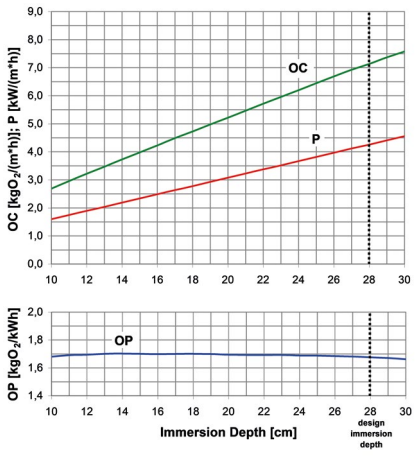
Mammutrotor® under concrete bridge

3. Arrangement

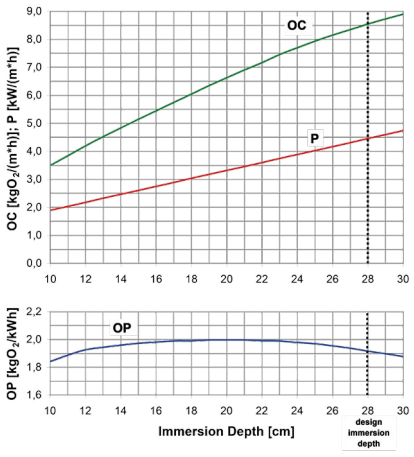
The rotors should be equally arranged with the largest spacing possible. Thus, an adverse mutual interference is prevented. In order to use single areas of the tank specifically for denitrification, these remain non-aerated, i.e. no rotor is to be operated in these areas.

4. Guide baffle

Have you installed guide baffles? For an optimal and efficient oxygen input by means of the Mammutrotor® it is essential to install a guide baffle along the outflow side. This guide baffle, if properly positioned, effectuates an increase in oxygen input of up to 20%.



Operation witl guide baffle, rotor speed n = 72 min-1, vertical tank walls



Operation with guide baffle, rotor speed n = 72 min-1, vertical tank walls

5. Motor replacement

If a new motor is required consider a more energy efficient model (e.g., IE3 instead of IE2).

Are you familiar with Intech Aqualogic®?

With this control system intended for all operation mode the aeration period and intensity is optimally adjusted to the current load of your plant. Thus, your plant with Mammutrotors can operate at all times with its best energy efficiency.

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6. Control

In tanks with a larger number of Mammutrotors (>2 pcs) the rotor speed should not be changed for controlling the oxygen input; 72 rev/min for the MR 1000 or 85 rev/min for the MR 700. By the number of rotors in operation a sufficient amount of switching stages can be achieved. The sequence of switching them on or off should be arranged so that you obtain the maximum distance between the units which are running. In this way, you can minimize the mutual interference.

In tanks with just a few units (≤ 2 pcs) the oxygenation can be adjusted by changing the rotor speed. By applying dual-speed motors further switching stages can be realized. The operation with a frequency inverter provides for a continuous control. However, the following applies too: Optimal efficiency is achieved at full rotor speed.

If you are targeting a pure carbon removal, we recommend a control system with the oxygen content as control factor. In the best of cases at least two oxygen sensors are installed in each tank.

If intending to carbon removal with additional nitrification, ammonium is a suitable control factor. Along the horizontal flow and within the vertical gradient the differences in the concentration of ammonium are generally smaller than those of oxygen. Additional oxygen sensors facilitate the monitoring of the tank's condition and the controlling of your plant.

In the case of a simultaneous denitrification, the Mammutrotors can normally be controlled solely via a nitrate sensor. Nevertheless, it is recommendable to monitor the ammonium value.

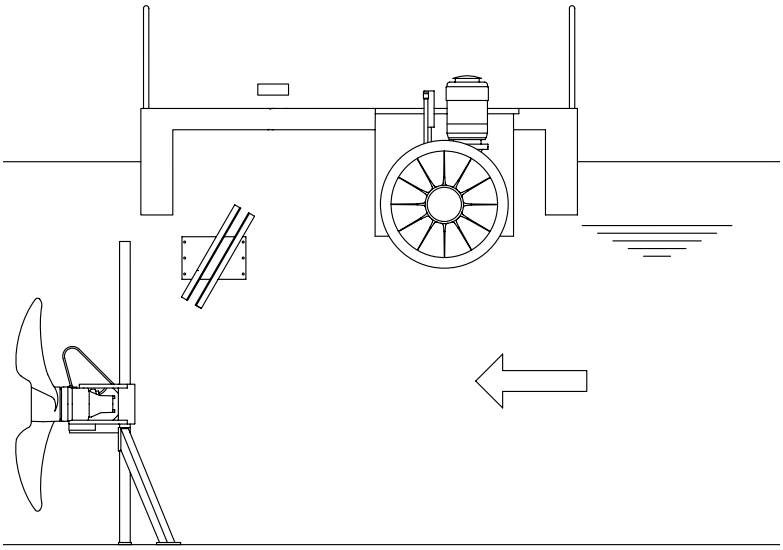
In the case of an pre-denitrification process, the nitrate content in the denitrification tank should generally be considered. According to the concentration, the recirculated volume into the upstream denitrification tank is adapted. The control of the Mammutrotors in the aeration tank is likewise based on the ammonium and oxygen values.

For intermittent denitrification the Mammutrotors are completely switched off during the denitrification phase. The duration of the nitrification and denitrification phases can be controlled in various ways: the simplest way is via a clock timer and fixed time intervals. Alternatively e.g., a control system based on the nitrate or redox potential can be used which grand a better energy efficiency.

Regardless of the intended clarification target, the following applies: The more detailed the data is provided, the finer you can adjust the control to your requirements and the more efficient the aeration units are able to operate.

7. Stirrers

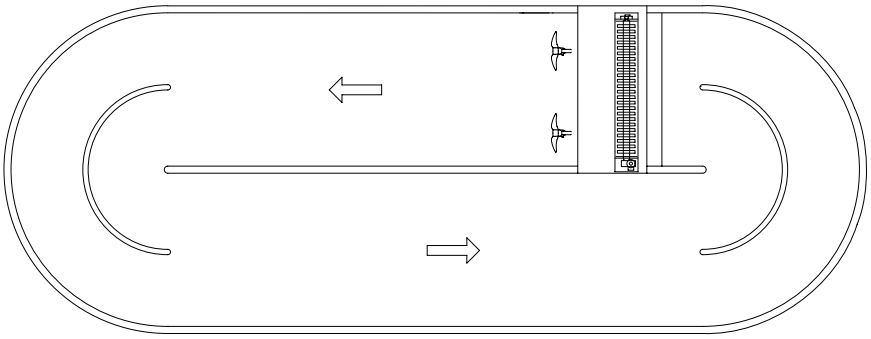
If denitrification takes place intermittently in your tank or the tank is deeper than 3.5 m, additional stirrers must be operated. Combined with the Mammutrotors the stirrers should be positioned at the outflow side of the concrete bridge. They should be placed at the beginning of a channel which provides for the best flow conditions. In circulating tanks this applies to the rotors which are installed after a bend. An energy density of approx. 1.2 – 1.5 W/m³ c ould be considered for the dimensioning of the stirrers when retrofitting.



Arrangement Mammutrotor®, guide baffle, stirrer

Would you like to know more details?

Via CFD-simulation we have the possibility to precisely the hydraulics and the oxygen input in due consideration of your individual circumstances



Arrangement of Mammutrotors and stirrers in circulating tank

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