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Zero Gravity Pump

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Turn-Key Salt water Swimming pools

Our Zero gravity pump can enable flow rates in any range, and compared to traditional pumps, they are zero differential (displacement) pumps that reduces complexity and components.

With up to 90% energy efficiency when lifting water, our pump will have a huge impact on sustainability, motor-sizes, maintenance schedules etc. for any flow through system.

Our technology enables simple, fully automated saltwater pools for any size

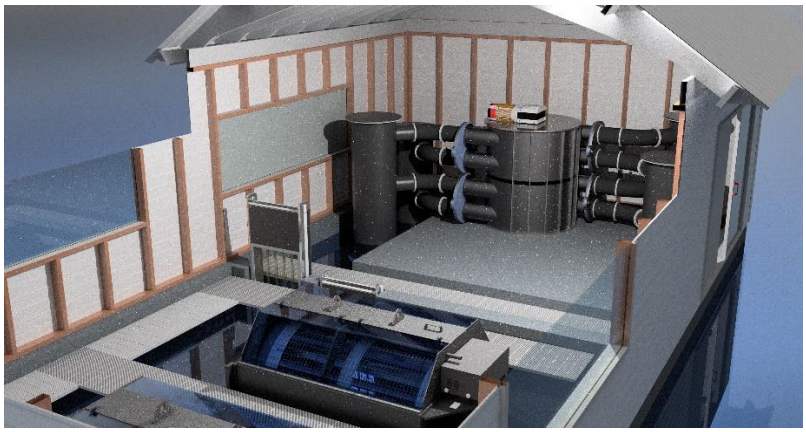


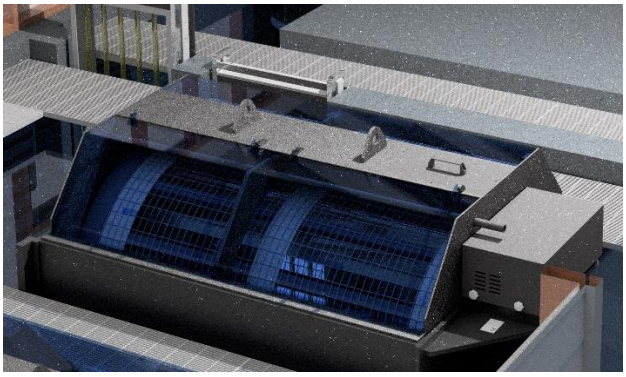
Figure 1 – Illustration of the pump shed for an saltwater swimming pool

Components

The turn key solution have few components and they are all fitted for a 100 m3/hour facility. This is the standard size, but can be scaled to any size as a multiple of 100 m3, or much smaller pools.
Main components for our turn key solution:

Zero Gravity Pump		
Swimming pool	Optional	< 5 mBar pressured drop
Drum filter	Optional	< 10 mBar pressure drop
UV desinfection	Optional	< 1 mBar pressure drop
Pipe assembly		< 20 mBar pressure drop
Priming pump		For redundancy and priming
Solar panels	Optional	Disconnected from energy grid

Drum filter



Description

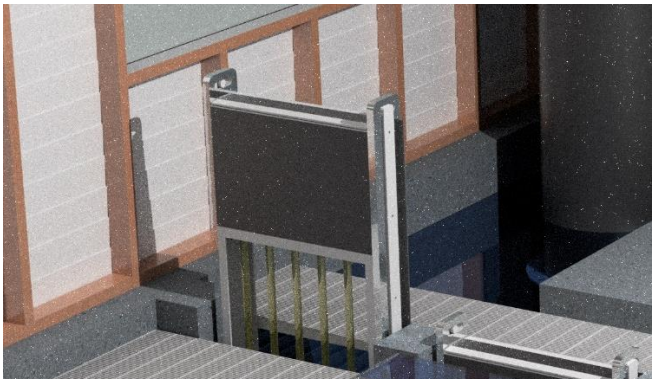
For a turnkey solution, the drum filter is one of the optional components, and depending on mesh sizes the filter is not influencing flow much. Pressure differential can be as low as 10 mBar or lower.

It will be placed in the pump-shed at the inlet of the facility, before the pump, and it will be submersed in the sea.

The drum filter may be an optional choice if other cheaper filter solutions like simple sump filters are chosen.

The cost of this drum filter will be 10-15% of the total cost of the facility.

UVC Desinfection



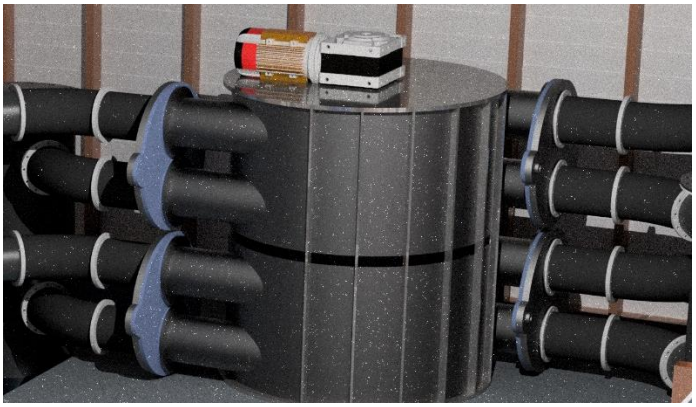
Description

The UVC disinfection is another optional component.
It is placed at the inlet of the facility, and requires approximately 2 kW of power.

The cost of this is low, but for saltwater pool systems with high volumes the energy consumption can be substantial!

UV filtration is often a requirement for traditional fresh water pools, but for saltwater pool systems these filtration devices do not have the same purpose. Saltwater pool systems are not reusing water and does not face similar contamination since they normally are only considered an extension of the sea!

Pump



Description and Energy use

The pump can be delivered in a pump-shed as a stand-alone component together with a sump filter, for smaller applications.

For a pump delivering 100 m3/hour it will have a theoretical energy usage of maximum 1 kW, probably lower. This is configurable based on pump housing sizes and pipe sizes between tank, pump and sea.

For fully automated saltwater pools, this is a stand-alone system that can be run on Solar panel with battery support and UPS backup. This is not a requirement if you want a system that will be shut down and drained during periods of the year.

Solar panels

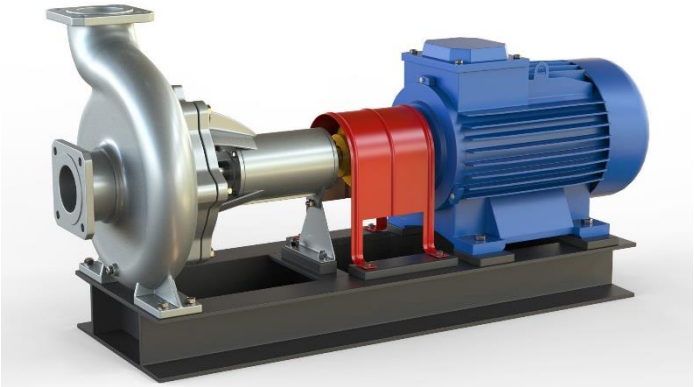
Description

For a totally stand-alone solution we can deliver optional solar panel systems for your pumping solution.

The energy-calculations are based on the minimal possible energy generation from a solar panel array at the location, meaning that if the maximum pump power is 1 kW the solar panel must deliver a minimum of 29kW during sun-hours (4-6 hours), for continuous operation during nights and winter-time.

This solution can also be delivered with an optional battery package and a generator for redundancy.

Priming pump



Description

If the primary Zero Gravity Pump is redundant (two to three) the priming pump can be a very small traditional centrifugal pump coupled in parallel with the input stage of our Zero Gravity Pump. It can be dimensioned to be a tenth of the required flow, or based on how long you would be comfortable with when you are filling the system with water.

For a whole day (24 hours priming cycle), the flow specifications for the priming pump is Total Volume divided by 24.

Control system

Description

A fully automated salt water pool system is fairly simple to control and is delivered with a remote-control system. The pump control system is fully integrated and does not have any interfaces towards optional equipment.

Optional remote monitoring and control systems integrating optional equipment can be delivered.

The pumps are low power pumps and have a much lower maintenance schedule than traditional pumps, except for the valves that require an exchange and cleaning schedule.