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Zero Gravity Pump

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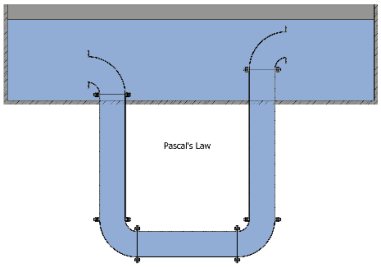
The Switching Siphon

A Zero Gravity Pump

The switching siphon is based on Pascal's law.

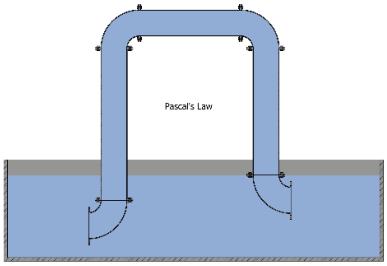
If you have a pipe horizontally in a tank, you will not have any circulation, because the system is in equilibrium, defined by the level in the tank.

Applying pressure will enable circulation through the pipe, where only friction is influencing the circulation. Gravity has no effect.



The siphon work in a similar manner if it is extended upwards from the tank and filled with water.

Again, this siphon will not have any circulation due to gravitational equilibrium, unless you insert a circulation device.

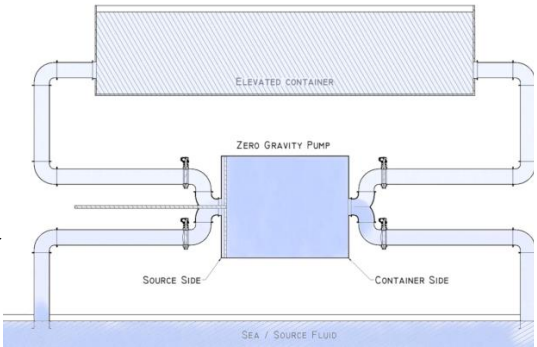


The patented technology, is a dual siphon extended with four valves, a tank, and a circulation mechanism (piston).

The tank is operating as the exchange mechanism, and the valves switch between the two siphons.

When the lower siphon is operating the tank is filled with source fluid, and when the upper siphon is operating, the source water moved up, and the tank is filled with elevated container fluid.

This process circulates water upwards, with the purpose to replace water in a elevated container.



Pressure and energy

The Zero gravity pump's efficiency can best be described with two examples comparing how friction and gravity will influence energy consumption.

This is a simple example, but the difference is huge, and the most important thing is that gravity cannot be manipulated, but that is possible with pressure drop due to friction.

Friction and gravity for a Zero Gravity Pump

Let's say we want to move 1000 m3/hour (1000 tons every hour), up 30 meters.
We assume straight and vertical pipes. For a Zero Gravity Pump, the pipe length is duplicated and equal 60 meters.

If we use an online pumps power calculator with a 0,8 efficiency, and an online pressure drop calculator, we will get these results for a Zero Gravity Pump:

Pressure Drop – DN500 (60m)	15.25 mbar
Pressure from Gravity	NA
Total Pressure	0,01525 bars
Total Differential head	0,1525 meters
Energy Consumption	**0.52 kW**

Friction and gravity for a normal pump

Let's say we want to move 1000 m3/hour (1000 tons every hour), up 30 meters.
We assume straight and vertical pipes.

If we use an online pumps power calculator, and an online pressure drop calculator, we will get these results for a normal pump:

Pressure Drop – DN500 (30m)	7,63 mbar
Pressure from Gravity	3 bars
Total Pressure	3,00763 bars
Total Differential head	30,0763 meters
Energy Consumption	**102.45 kW**

The examples are theoretical but accurate results. The friction can be adapted, and with a DN600, the pressure drops to 6,28 mbar (0,21 kW), where the power consumption can be optimized by changing the pressure drop from friction.

Compared to any other pump, the energy is wasted in the drain, and you need to repeatedly lift water.