

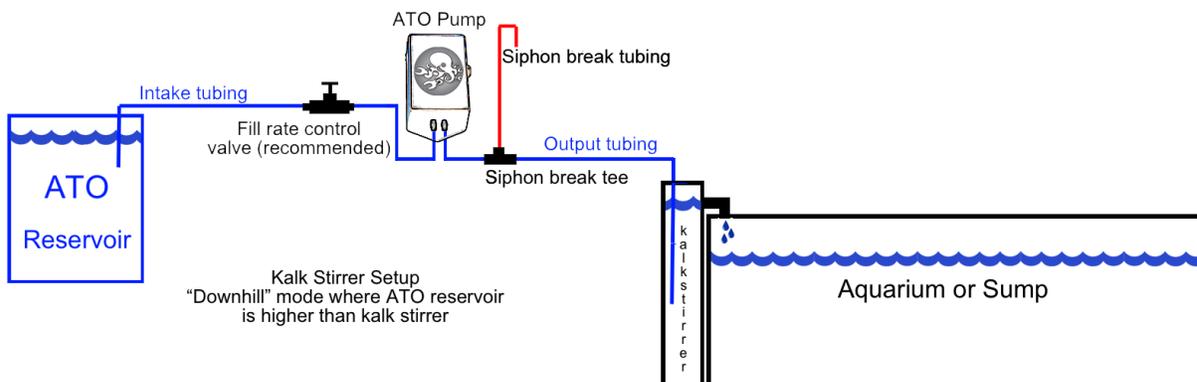


## K1/K2 Kalkwasser Reactor Set Up

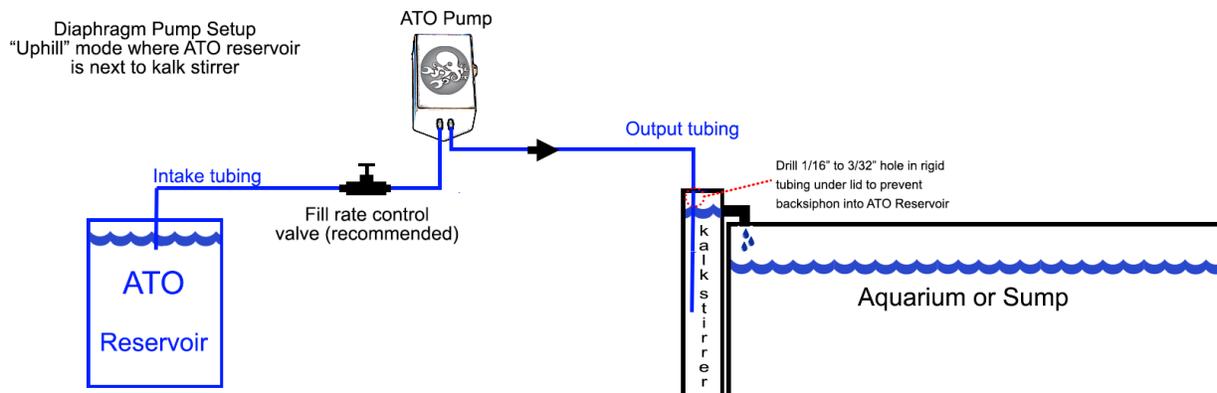
ver. 2.0 12/01/20

### Quick Start Instructions

1. Place the reactor next to your sump or tank so that the barbed side outlet is higher than the sump wall. Kalk solution will drip from the outlet. If you need to extend the reach of the outlet, place a length of 1/2" tubing over the barb fitting. Make sure there are no places for water to accumulate in the line; it must be allowed to flow downhill.
2. Connect the pump that will feed fresh water from your top-off reservoir to the push connect input fitting in the lid of the reactor. The input fitting accepts 1/4" polyethylene tubing. Peristaltic pumps are the preferred pump style due to their accuracy and anti-siphon characteristics, but any small pump will work. **Important:** use a small valve if needed to slow the pump's input flow rate to a **fast drip**. Any faster than that risks adding too much kalkwasser too quickly, which can raise pH
3. If you are using a peristaltic pump, skip to step 4. Otherwise, if the water level in your fresh water top-off reservoir is higher than the reactor's outlet fitting, you will want to create a siphon break to ensure that water does not continue to flow from the reservoir into the reactor once the pump turns off. To do this, connect the output of the pump to a short section of 1/4" tubing and install a tee fitting. This diagram describes the location of the siphon break:



If your ATO reservoir water level is lower than your reactor's outlet fitting, you may need to drill a small hole in the rigid tubing under the stirrer lid. This will prevent backsiphoning of the kalk solution into your ATO reservoir. Note that new stirrers have this hole pre-drilled at one end. Simply insert that end into the pushlock fitting in the lid.



4. The reactor can now be filled 2/3 full of RO/DI water and plugged into a power source. The reactor is designed to run 24/7, although it is acceptable to run the stirrer motor on a timer to further prolong motor life. We recommend at least several hours of stirring per day.
5. Using the Kalk Calc, determine the correct amount of kalkwasser powder you will need to sustain your aquarium for a two week period, and add it to the reactor. After a 2-3 minute initial settling period, your reactor is now ready to dose saturated kalkwasser to your aquarium. Again, be sure that your pump only delivers water at a fast drip to avoid rapid pH increases in your aquarium.
6. Fresh kalkwasser powder should be added to the reactor every two weeks and calculated using the Kalk Calc. The reactor should be completely emptied and rinsed out every two or three fills to avoid buildup of precipitated calcium carbonate, which looks just like kalkwasser powder, but does not dissolve. Remove the union fitting on the outlet of the reactor and wash out the barb fitting and any attached hose with hot water to loosen calcium deposits. Every six months, the same cleaning should be done using vinegar instead of water, and the reactor rinsed with water prior to refilling. This will keep your Avast Marine Kalkwasser reactor clean and running smoothly for years to come.

## The Kalk Calc

First, determine your daily, weekly, or biweekly evaporation rate based on tank observations. Next, find that number on the chart and follow to the far right column. This is the amount of kalkwasser powder that is used for initial setup and for biweekly refills.

Gallons/day	Gallons/week	Gallons/biweekly	Cups biweekly
0.25	1.75	3.5	0.25
0.5	3.5	7	0.5
0.75	5.25	10.5	0.5
1.0	7.0	14.0	0.75
1.25	8.75	17.5	1.0
1.5	10.5	21	1.25
1.75	12.25	24.5	1.5
2.0	14.0	28.0	1.75
2.25	15.75	31.5	2
2.5	17.5	35	2
2.75	19.25	38.5	2.25
3.0	21.0	42.0	2.5
3.25	22.75	45.5	2.75
3.5	24.5	49	3

For users with more than 25 gallons per week of evaporation, weekly refills are recommended.

Gallons/day	Gallons/week	Cups Weekly
3.75	26.25	1.5
4.0	28.0	1.5
4.25	29.75	1.75
4.5	31.5	1.75
4.75	33.25	2.0
5.0	35.0	2.0
5.25	36.75	2.25
5.5	38.5	2.25
5.75	40.25	2.5

## Detailed Installation Considerations

Kalkwasser, which has a very high pH, is best added to your system very slowly. We recommend a slow drip for small tanks and a fast drip for larger tanks. The best pump choice for this application is a peristaltic pump. This style of pump has a positive shutoff when turned off, meaning no water can flow through in either direction, which means no siphoning in either direction when inactive. A peristaltic pump with a flow rate of about 20-30mL/min is ideal. Other pumps, such as our Diaphragm pump, micro pump, or a Tom's aqualifter will also work fine, but they may need a small valve installed between the pump and the stirrer to regulate the flow rate to the stirrer. Many people opt to use their automatic top-off system in conjunction with a kalk stirrer. This method is fairly simple and convenient, but does have its drawbacks. An ATO that gets stuck on for an extended period, for example when the ATO is forgotten while salt water is taken out during a water change, can result in too much kalk being added to the system in a short period. The ideal kalkwasser dosing setup is a dedicated pump set to drip about 90% of the aquarium's daily evaporation total through the stirrer over the nighttime hours, when pH typically drops. The ATO system ideally functions independently of the stirrer, adding the remaining ~10% of the system's evaporated water as needed.

Our reactor is designed with an “open top”, meaning that the lid rests on the top of the reactor and does not create a pressure resistant seal between the body and lid. Therefore, water must be allowed to flow freely by gravity out the side drain fitting to your sump or aquarium. Place the reactor so that this output fitting is higher than the sump wall. If you need to extend the reach of this fitting, use a length of 1/2” (13mm) tubing that curves consistently downwards, making sure there is no place for water to collect along the way. This length of tubing is also a good idea if you have problems with precipitated calcium carbonate blocking the output fitting. Note that because of the gravity drain requirement, the stirrer cannot be used with our backup float valve, which is an option for our Auto Top-off system.

## Troubleshooting Guide

If the output fitting is clogging up with calcium deposits too quickly, try cleaning it out with vinegar, then adding a section of curved soft tubing to the output barb. Make it long enough that it nearly touches the water level in the sump, but is not submerged. This will reduce airflow near the barb fitting. CO<sub>2</sub> exposure is what makes the calcium precipitate out of solution as calcium carbonate, clogging the line. Minimizing this effect typically helps prevent clogs.

If the stirrer isn't turning when plugged in, the first thing to check is the coupler that connects the motor shaft to the plastic stir rod. This coupling is held on with two small set screws that can sometimes work themselves loose. Gently tighten the hex screw with the included Allen wrench, but be careful not to over-tighten and strip the threads in the plastic coupling. If you accidentally do this, the opposite side of the coupler has a second threaded hole as a backup.

If the motor still isn't turning, or is making a clicking or grinding noise, it may be that a gear has failed and the motor needs replaced. Motors typically last around three to four years under continuous duty. Replacing the motor is straightforward. You can open the motor housing by heating up the lid with a hairdryer or heat gun to soften the hot melt glue holding the lid on. Then, it's just a matter of changing a few wire nuts and unscrewing the motor. You can see details on motor wiring in this video around the 3:00 mark:

<https://youtu.be/RgyfC1a83Ho>

To replace the lid, just reheat the existing hot melt adhesive and stick the lid on, giving it a 1/4 turn while the glue is soft.

Please reach out to us for additional troubleshooting help at [support@avastmarine.com](mailto:support@avastmarine.com).