



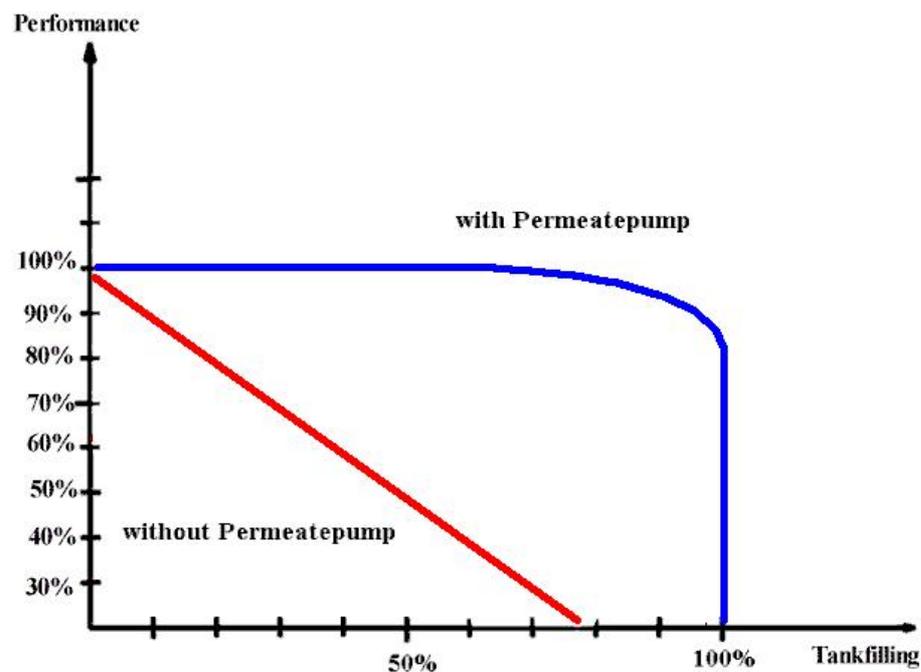
Aquatec ERP 1000 Permeate Pump

Benefits to your System:

- **Faster production against tank pressure**

In an RO- systems that uses the ERP- 1000 Permeate pump the RO- membrane always sees the full pressure across the membrane even if the tank is almost up to the same pressure. This way the system does not loose its performance.

In a normal system you would for example have 60 PSI of line pressure. If the tank sees 30 PSI you only would have 30 PSI left for your membrane. In reality, this gives you less than 50% of your normal performance. In a permeate pump system you would still have 60 PSI across your membrane even on 50 PSI tank pressure.



- **No loss of recovery during the filling cycle**

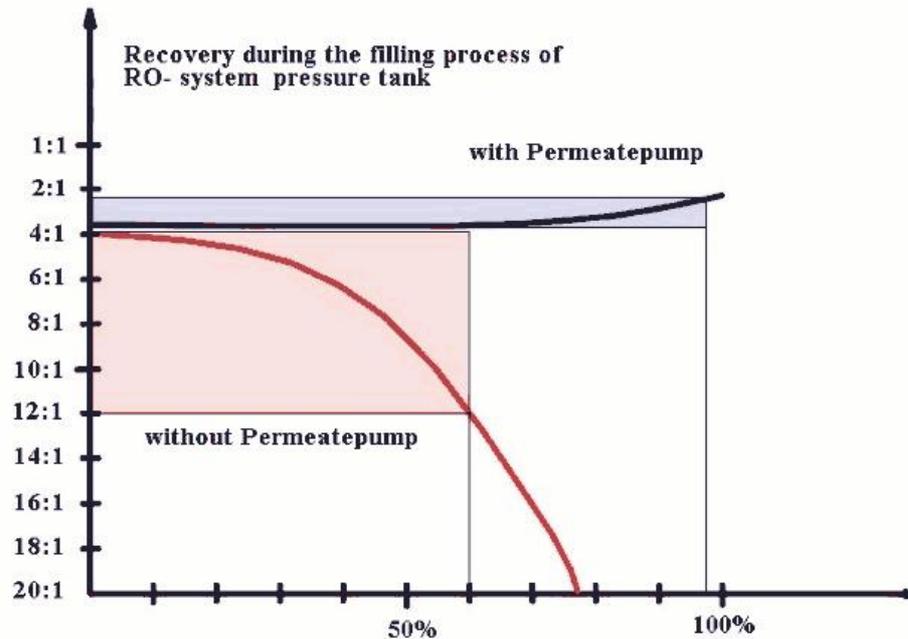
Systems Using the Aquatec Permeate pump Technology Don't Show Negative Changes In the System Recovery Rate.

The following graphic is the result of tests on an RO- Unit, that allowed to disable the built in Permeate pump using a ball valve. The unit was adjusted to a 4:1 concentrate to product ratio on an empty tank and an open faucet. Feed pressure was 6 bars.

The red curve shows the changes in recovery on rising tank pressure. To minimize the problem shut off devices are used that allow to produce about 55-75% of line

pressure in the storage tank. Note, that in practice the whole storage tank is not used very often. Normally you work out of the top portion of the tank.

The blue curve shows the recovery using the Permeate pump. Here you can see, that the recovery rate does not go down until the Permeate pump shuts the system down close to 100% of line pressure in the tank. This advantage can be used in systems that guarantee that there is always a bigger amount (> 1 Liter per use) of water used. In household applications a shut off device must be installed. This prevents the production of small amounts each time you draw a cup of water which would cause TDS- Creep.



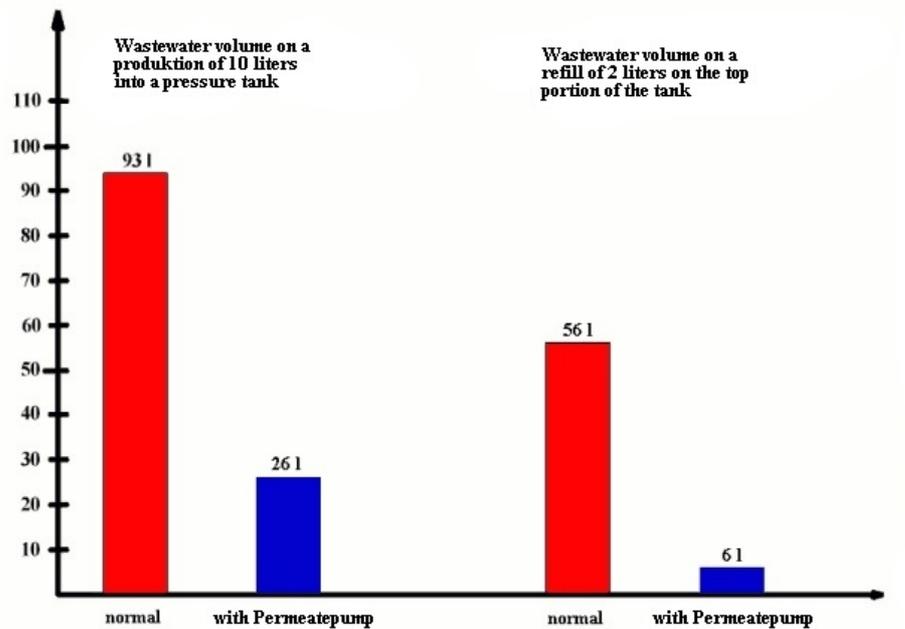
The coloured areas show the possible parameters you will see on different systems. You can easily recognize that even on the early shutdown at 60% of line pressure, the concentrate to permeate ratio is 12:1 at the end.

- **Better quality water out of your System**

As RO- Water quality improves, the higher your differential pressure on the membrane is, a system with a permeate pump always makes better water. Let us say that your membrane reduces 98% of the TDS in your water if you got 60 PSI across your membrane. On 30 PSI differential it will only do about 95%. In the permeate pump system, you always see full line pressure across your element, which gives you always the maximum quality water out of you system.

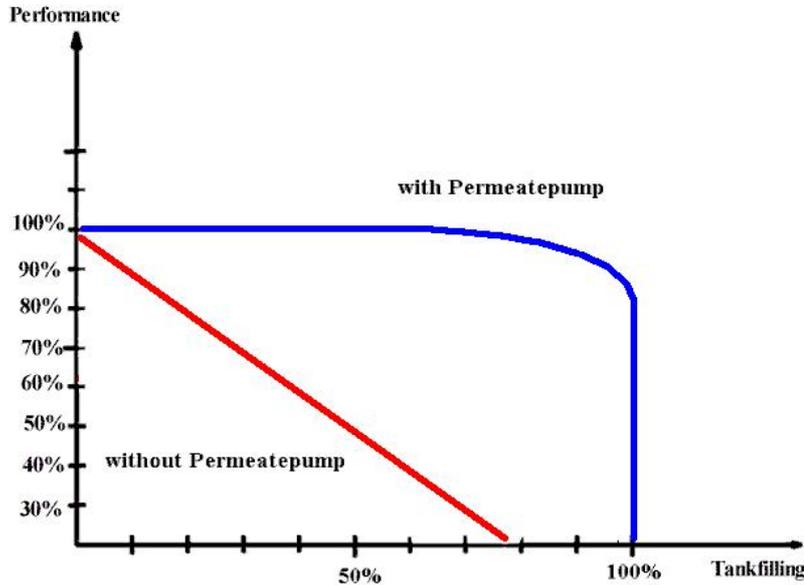
- **Saves up to 85% of the Water that normally goes to drain**

The following graphic is the result of tests on an RO- Unit, that allowed to disable the built in Permeate pump using a ball valve. The unit was adjusted to a 30% recovery. Feed pressure was 6 bars. On 4.5 bars of tank pressure, the unit was shut down. With a disabled Permeate pump, the last water was produced on a differential pressure of only 1.5 bars across the RO- membrane. See the results of the test.



- Saves up to 85% of your prefilter- and booster pump life**
 As you are saving up to 85% of the water that is going to drain, your system does not see all that water. This way, the permeate pump will also improve the life of your pre filters and booster pump.
- Allows up to line pressure in your tank**
 Till now, we saw, that a normal system loses performance, recovery and rejection, the closer we get the tank to line pressure. Because of that, most systems are limited to about 60- 70% of line pressure in your tank. With the permeate pump, you don't need that. You can even get 95% line pressure into your tank without losing your design parameters. This of course gives you a far better Flow out of your faucet or to your equipment.
- Allows you to use smaller system components**
 Water needs per person in the household are around 2 gallons per day. To have a fast recovery on your tank, nowadays systems have 35 GPD Membranes and up to five stages of filtration. To produce about 8 gallons of water per day, such system sends far more than 80 gallons of water down the drain. Actually on the top portion of your tank a 35 GPD membrane makes only around 15 GPD. Now with the permeate pump, you could go to a 15 GPD Membrane and still have the same amount of water that you used to get from your unit.
 If you used to sell 100 GPD systems for a light commercial system, you could now use a 50 GPD system with a permeate pump.
- Gets household technology to be used in commercial applications that were normally requiring industrial systems**
 The problem with using standard systems for commercial applications is the fact that you have high minimum pressure requirements for equipment such as coffee makers, ice makers etc..
 To have all stored water above this minimum pressure, you need to increase your pre charge on the tank. This increases the back pressure on your membrane right from startup. As the normal unit can only put 60- 70% of line pressure into the tank, you are only able to use a small section of the performance curve of your system.
 For example a system that starts at 30 PSI pre charge on 80 PSI feed it would shut

down at 56 PSI tank pressure. On our diagram you would see that you basically start at 37.5% filling and only use the system to fill the tank up to 70%. The system performance would be between 30- 65% of your rated membrane performance. With the permeate pump, you run the same unit up to 100% of line pressure and you only see a slight performance drop of 15% at the very end.



How does the permeate pump work?

The ERP 1000 Permeate pump is using the energy of the brine Water of your RO system, to pump the permeate into your pressure Tank. It does not require electricity for that. It is just using hydraulic energy that normally goes to drain unused.

This way, it isolates your Tank from the membrane and lets your membrane perform like in an atmospheric tank system.

How do you install the permeate pump?

The permeate pump can be installed into almost every existing under counter RO- system. The main thing is, that you install it horizontal with both outlet ports in the highest position so that any air purges out automatically.

BENEFITS:

- For Reverse Osmosis Systems rated from 10 to 100 GPD
- Requires No Electricity
- Powered by energy from brine normally lost to drain
- Improves water quality
- Effective for inlet water pressure as low as 30 PSI
- Fills product tank up to 5 times faster
- Saves 400% of waste water vs. conventional units
- Prevents "membrane TDS creep" providing better quality water
- Provides higher pressure in holding tank giving you greater flow out of the faucet
- Add to any Standard Reverse Osmosis System
- Increases water flow from faucet
- Saves water
- Ideal for low water pressure (30 PSI) applications