Reverse Osmosis Technique

starting with 90 liters per day*

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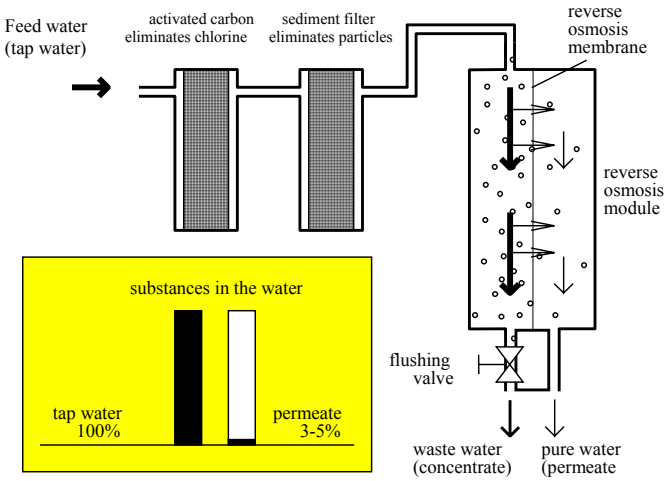
Why reverse osmosis (R.O.) technique?

- filters reliably hardness, unwanted substances like nitrate, silicic acid, pesticides and medical residues and withholds successfully bacteria, viruses, algae and radioactive particles
- easy in handling; any chemicals are necessary



scheme of a reverse osmosis unit

Advantage of an AquaCare reverse osmosis units at a glance

- all units are equipped with an activated carbon filter for eliminating chlorine and with a sediment filter to protect the reverse osmosis.
- only high-grade polyamide / polysulfone thin film composite (TFC) membranes are used: rejection 97%* (minimum 95%); permeate flow: 30, 90 or 160 liter per day and module; realistic concentrate / permeate ratio of 3:1 (units with concentrate recycling 1:1)
- you can extent the model *Excel* with additional modules up to 480 liters per day* - even afterwards – special models on request.
- the built in flushing valve enlarges the life span considerably
- all tubing is made with safe push fit fittings; mounting material is included
- accessories for all units are available
- professional consultation about water treatment and aquaristics
- steadily and fast service

How does R.O. technique works?

With the help of the tap pressure on one side of the R.O. membrane the working pressure is created. This pressure induces the water to migrate through the membrane. Salts and other substances are rejected.
(more information you will find in www.aquacare.de)

Model *Classic*

The type *Classic* is the typical beginner model. It is build with two inline filters that must be replaced after about one to two years.

The unit *Classic* is cheaper to buy, but the running costs (inline filters) are slightly more expensive than the filter of the model Excel (see below).

The Classic is available in a 90 liter version. The full range of accessories is practical.

auch bei diesem Modell ver-wendet werden.

Model	Order number
Classic 90 (90 liters per day*)	100-009
Activated carbon inline filter for *Classic*	273-022
Sediment filter 5µm for *Classic*	273-012

Model *Excel*

Excel 160 with pressure gauge mounted on mounting

The model *Excel* is assembled on a white mounting plate. The 10” combi filter (activated carbon and sediment filter) has a big volume and is available with a clear housing (option), too. A pressure gauge for display the membrane pressure is mounted in series. There is enough space for enlargements or automation. The running costs are lower than of the model *Classic*, because only one filter is needed and this filter has more volume than the two of the *Classic*.

Model	Order number
Excel 90 (90 liters per day*)	101-009
Excel 160 (160 liters per day*)	101-016
Excel 320 (320 liters per day*)	101-032
Excel 480 (480 liters per day*)	101-048

* performance ±15% at 4 bar feed pressure, 15°C, waste water : pure water = 3:1 and 500 mg/l (ppm) TDS; rejection measured with conductivity

Surcharge of clear 10“ filter housing	201-000
Combi filter cartridge 5µm	221-105

Model *Classic* versus *Excel*

Feature	*Classic*	*Excel*
Daily water flow	90	90, 160
Extensible	-	480
rejection*	95 - 97%	
Pre filtration	Activated carbon + sediment filter 5µm	Combi filter 5µm
Type of filter	Inline	cartridge
Flushing valve	yes	
Concentrate-permeate ratio	3 : 1	
weight	1.7 kg	3.9…5.9 kg
Dimensions W × H × D	20 × 24 × 9 cm	41 × 41 × 14 cm

Reverse osmosis control for small R.O. units

The AquaCare reverse osmosis control has three features: first the membrane is flushed automatically in regular intervals to ensures a long life of the membrane and to get a better water quality. Second: if the unit is for a longer time on standby it will flush after 24 hours to prevent rotting water. At last a pressure less tank is filled automatically.

The feed solenoid is mounted between pre filtration and reverse osmosis membrane – this is very easy to do because AquaCare uses the push fit fittings. The flushing solenoid is mounted instead of the manual flushing valve. A minimum and maximum level sensor (level switches) must be installed inside of the pressure less tank.

If the water level inside of the tank falls below the minimum sensor the R.O. unit starts to produce water until the maximum level is exceeded.

Model	**Order number**
Reverse osmosis control for small R.O. units complete with solenoids and level switches	600-005

Pressure less tank on request

Mineral filter to get more hardness

The water of an R.O. system is very soft and for some purposes not suitable. If you need 2...3°dH hardness (carbonate and total hardness) a mineral filter should be mounted after the R.O. unit.

For more hardness the mineral filter should be equipped with a CO_2 connector (maximum 15°dH with a 90 liter per day unit).

10” mineral filter with white housing (left); 10” mineral filter with clear housing (center); mineral cartridge (right): the cartridge is refillable.

10“ mineral filter with bracket, calcium carbonate granules and 6 mm push fit fittings	AH0001
10” mineral filter (ditto) but with CO_2 connector	208-005
Check valve with T-piece for afterwards mounting a CO_2 connector (not suitable for sea water)	208-006
2.5 kg bag *Turbo* granules (calcium carbonate)	560-003

Coarse filter against much particles

If the tap water contains a lot of particles and you must change the R.O. filter more than once a year it is useful to use an additional coarse filter. The life time of the R.O. filters will be extended. (Filter housing looks like the housing of the mineral filers)

10“ coarse filter with 6 mm push fit fittings, bracket and 50 µm filter cartridge	208-001
Surcharge clear housing	201-000
10“ filter cartridge 50µm	221-038

Other filters on request

Pressure gauge

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The water pressure is one of the most important factor for producing water with R.O. technique. If you are not sure to have enough pressure (more than 3 bar) of if the pressure is very variable it is useful to use a pressure gauge.

To measure the membrane pressure the pressure gauge should be installed between pre-filters and R.O. membrane. If you install an additional pressure gauge before the pre-filters you can see the quality of the pre filters. If the difference between pre-filter pressure and membrane pressure rises the filters gets worse and should be changed (see filter check, too). If you use a R.O. system with pressure tank a pressure gauge installed in the tank line will show the condition of the pressure tank.

Pressure gauge set for R.O. unis *Classic* or *Excel*, complete	119-110
Pressure gauge, Ø 40 mm, 0...10 bar, connector 1/8" male at the bottom	700-010

Other pressures, connectors and diameter on request.

Filter check

The filter check measures the water pressure before and after the filters. If the difference gets to high the display turns from green to red. Then the filter cartridge must be changed immediately.

If you order the filter check together with an R.O. unit Excel the filters check is build in directly at the filter housing (see picture). If you upgrade it afterwards or if you need it for the model *Classic* the compatible fittings are delivered.

Bei Bestellung zusammen mit einer Umkehrosmoseanlage Typ *Excel* wird der Differenzdruckanzeiger direkt am Filtergehäuse montiert geliefert (siehe Abbildung). Bei Nachrüstung oder für das Model *Classic* liegen die passenden Schlauchfittings dabei.

Filter check	119-111

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Float valve

A cheap alternative for electrical level controls are mechanical float valves. Especially if you must fill up two or more tanks with water float valves are perfect solution.

If the water level drops the valve fills fresh water up to 95 liters per hour (at 3 bar).

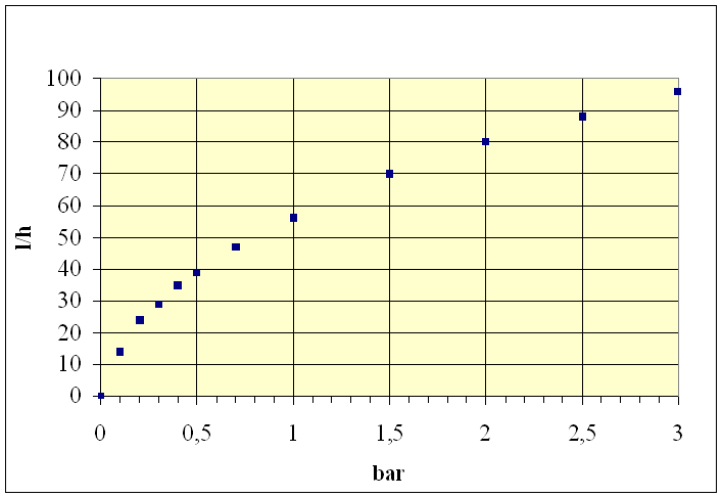
The valve are suitable for sea water tanks, too.

Salt crusts cannot occur because the fresh water cleans the valve automatically.

The float valves are suitable to maximum 3 bar pressure but will work at very low pressures (a few cm water level is enough).

They will not work directly at a reverse osmosis unit, because the water flow (concentrate) will not stop. If you want to use float valve directly with a R.O. system the R.O. must be equipped with a pressure tank and its control (hydraulic switch or electrical control).

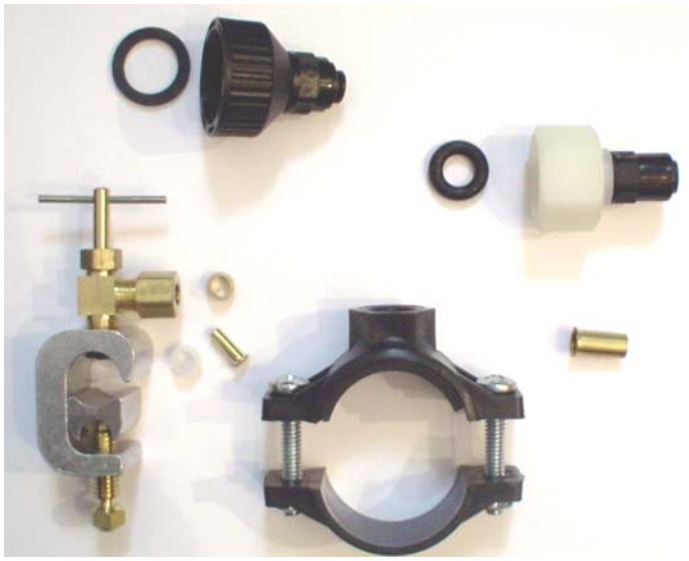
The float switch has a 3/8" male connector for fixing and a 1/8" female connector for water input. A bracket for a vertical 20 mm tube is available, too.



water flow through a fully opened float valve versus the inlet pressure

Float valve made of plastic	896-006
Bracket for a vertical 20 mm tube (system BasiTech)	601-006

Special connectors for R.O. units



With every AquaCare R.O. unit a ¾" tap water connector is delivered. If you need another connector AquaCare will help.

Water connector ½" female - 6 mm female	897-033
Self-sealing connector for copper tubes 10-15 mm	897-005
Waste water connector for PVC pipes 35-50 mm, ¼" female thread	897-006

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Booster pump (hobby version)

If the tap water pressure is below 3 bar R.O. technique will not work properly. In this case you need a booster pump. The AquaCare booster pump is suitable for all unit up to 160 liters per day. This pump works with low voltage, is extremely silent but not made for continuous operation. After 6 hours the pump should stop for a while. The pump is delivered with a transformer.

The pump should be equipped with a run dry protection (pressure switch) if the water supply is not steady.

12 V DC pressure pump with transformer	119-121
Pressure switch as a run-dry protection	690-001

Add-on kit: pressure module with professional industry pump

If you need a continuous working R.O. system or if you have a unit with more than 160 liters per day the low voltage pump (see above) will not fit. The AquaCare pressure module is suitable for all R.O. systems up to 420 liters per day (rated flow at 4 bar and 15°C). The pressure module is equipped with a concentrate recycling – so the R.O. unit can be driven with considerable less waste water (1:1).

The pressure module is delivered with a run-dry protection and a glycerol filled pressure gauge. The pressure module raises the inlet pressure to maximum 10 bar and therefore the water production will be 2.5 times more than the R.O. system will produce at 4 bar.

Pressure module 300	
Order number	119-125
Maximum water flow with a *Excel* 420	1000 l/d
Dimensions	41 × 41 × 20 cm
Electrical connection	230V, 50 Hz, 245 W
Weight	approximate 5 kg

Model *Excel Turbo*

The model *Excel Turbo* is best choice for hobbyist with large water needs (breeders). The unit is build with professional parts to ensure a long life with less maintenance. The integrated concentrate recycling saves a lot of water.

Advantage of *Excel Turbo* at a glance

- Booster pump (industrial version) for high water flow, good retention (1:1) and best water quality
- Run-dry protection
- Two glycerol filled pressure gauges (filter pressure, membrane pressure)
- Concentrate recycling for long life time and best retention
- High precision needle valves for operating pressure and retention
- Flow meters for permeate (pure water) and concentrate (waste water)
- Compact design on a mounting plate

Scope of delivery: R.O. system complete with PVC mounting pate, *BasiTech* run-dry protection , 10 m PE pressure tube, tap water connection ¾", mounting material.

Model *Excel Turbo*	**400**	**800**	**1200**
Order number	102-040	102-080	102-120
Water flow (at 2 bar, 15°C)	400 l/d	800 l/d	1200 l/d
Rejection	96 – 98%		
Operating pressure	6...10 bar		
Pre filter	10" Combi filter 5µm		
Concentrate-permeate ratio	2:1 or better		
Dimensions	75 × 59 × 20 cm		
Weight	20 kg	21 kg	22 kg
Electrical connection	230V, 50 Hz, 245 W		

If you need more water or special equipment AquaCare can help

R.O. system HP 720.000 with 30 m^3/h

* performance ±15% at 4 bar feed pressure, 15°C, waste water : pure water = 3:1 and 500 mg/l (ppm) TDS; rejection measured with conductivity