Operation manual
for
Reverse osmosis unit
Easy Line 90

Reverse osmosis units for the desalination of tab water

With the purchase of an AQUA MEDIC reverse osmosis unit, you have selected a quality product which has been especially developed for the use at home and has been tested by professionals.

With this unit you can remove the inorganic and organic substances, dissolved in your tap water to a percentage of about 95 - 98% without the addition of chemicals.

In the aquarium, you prevent overfertilisation of the water from the tap. The growth rate of diatoms and other microalgaes is reduced. Residues of pesticides and other toxic substances do not get into the aquarium.

Please read the manual carefully. This prevents failures and complaints!

1. Delivery

The AQUA MEDIC reverse osmosis units are compact and highly efficient units. They consist of the following parts:

- **Sediment prefilter,** 10“ 5 µm pore size,
- **Activated carbon prefilter, 10“**
- **Reverse osmosis module**, with a first class synthetic membrane (Polyamide/ Polysulfon, TFC) which has the following capacitie:

Reverse osmosis unit...	**Liter/Day**
Easy Line 90	75 – 90 l

- **Flow restrictor .** At this valve, the permeat/concentrate ratio is adjusted to 1 : 4.

- **Tap water connection fitting** with pressure tube.

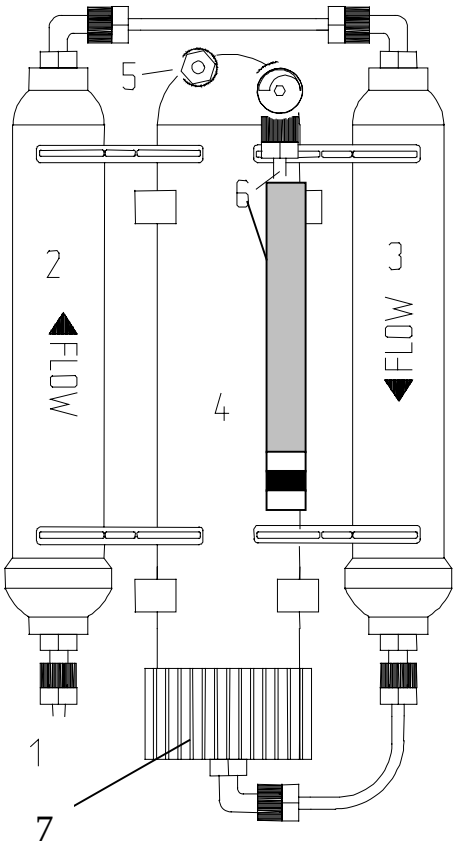


Figure 1

1 sediment filter
2 water inlet
3 activated carbon filter
4 reverse osmose module
5 pure water outlet
6 waste water outlet
with flow restrictor
7. Cap of module housing

2. Set-Up

To fix the unit at a wall, disconnect the 2 wall clamps from the module and fix them directly on the wall or on a mounting plate - preferably near a tap connection. Press the module into the clamps - ready.
Then mount the membrane and connect the tubes. To avoid any failures, follow the instructions carefully:

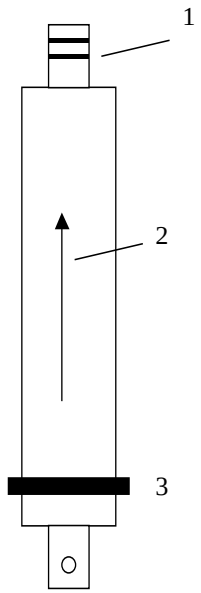
Tube Fittings:

- Put the nut and the small ring on the tube.
- Push the tube tight into the fitting and fix the nut.

The connections of the unit are:

1. connection between sediment filter and module
2. tap water inlet - into the sediment filter
3. concentrate outlet (waste water) at the flow restrictor
4. pure water (permeate)
5. tap water connection

Fix the water connection piece to a 3/4“ water cock. If it does not fit, use a reduction piece (not included).



Mounting of the membrane:
Remove the screw cap from the module housing (fig 1, 7).
Take the membrane from the plastic bag and put it into the menbrane housing. Take care to insert the membrane in the right direction, with both sealings (1) directed to the water outlet. The membrane has to be pushed forward, until the 2 sealings are inthe right position at the top and the big pure wastewater seal (3) is fixed. Now the housing can be closed again.

3. Starting

When all connections are tight, you can open the tap faucet. The minimum water pressure for the unit is 3 bar. The nominal capacity is reached at 4 bar. If the pressure drops below 3 bar, the production capacity is reduced, below 2 bar it reduces also the reduction rates.

Firstly, check all connections on water tightness. If leakage occurs, tighten the fittings or the housing.

Now the concentrate flows out of the outlet. After some minutes also the purified water flows out of the permeate outlet, however, with a lower flow rate.

Reverse osmosis unit...	**Flow Rate (Liter/Hour)** at 4 bar and 15° C	
	Pure water/permeate	**Waste water/concentrate**

Easy Line 90	3,0 - 3,75 l	approx. 14 l

The pure water, produced in the first 2 h has to be discarded, because it may contain residues of the desinfection liquid which has been filled in the module for storage. After 2 hours, the water can be used.

4. Use of the water

Rejection rate:
The rejection rate of the membrane for the most salts and organic substances varies between 95 and 98% (except nitrate and silicate). The water can be used in various areas:

In salt water aquariums:
- for the preparation of sea water,
- for the preparation of „Kalkwasser“ or Calcium enriched water,
- for the refilling of evaporated water.

In the fresh water aquaria:
- pure - for breeding soft water fishes (Discus, etc.),
- hardened up with Hydrocarbonate in all fresh water tanks,
- pure - for the refilling of evaporated water.

In households:
- for the preparation of drinks and meals,
- for car batteries and flat irons,
- for home plants, especially orchids, bromelids and cacti.

In laboratories and industry:
- everywhere, where up to now destilled or deionised water has been used and a conductivity of 20 - 50 µS/cm is accepted.

5. Maintenance

- **Prefilter.** If the tap water is not extremely polluted, a yearly replacement of both prefilters will be sufficient. If the water is higher polluted, the filters have to be changed more often - as required. If the prefilter is blocked, the water production will slow down.

- **Membrane.** The membrane normally has an lifetime of several years. Afterwards, it has to be replaced.

6. Failures

- The waste water flow rate is too low:
Test the prefilter on blocking. Connect the water inflow directly to the module. If the waste water flow is normal again, change the prefilter. If the flow is still too low, the flow restrictor has to be renewed

- The pure water flow rate is too low:
Check the waste water flow rate. If it is low too, change the prefilter.

- The tap water pressure is too low:
If you are connected to a municipal water supply, you are not able to influence the water pressure. For the reverse osmosis unit, a minimum water pressure of 3 bar is required.

- The module is blocked or used up:

The membrane has to be changed.

As spare parts all standard 18“- membranes with the model specific capacity can be used. Only TFC- membranes made of Polyamide/Polysulfone should be used. We recommend to use the original AQUA MEDIC TFC-membranes. If you want to use a membrane with a different capacity, you have additionally to change the flushing valve.

- The rejection rate is too low:

Check the water flow rates (waste water, pure water).

If the water flow is ok, flush the unit for approx. 60 min, by removing the flow restrictor. If the rejection rate increases, go on flushing until the value is acceptable. If the rate does not improve, change the membrane.

7. Important Notes

- Connection: Connect the reverse osmosis unit only to the cold water supply. Higher temperatures increase the pure water production, but at temperatures above 40°C, the membrane will be destroyed.

- Stopping the unit: If you stop the unit, always close the tap water supply. Put never a valve into pure water. If you run the unit automatically with a solenoid valve, switch the valve between prefilter and module. Take care that waste water and pure water can flow away freely.

- Disconnection of the unit: If you want to disconnect the unit for a period longer than 6 weeks, you should add AQUA MEDIC desinfection liquid into the module housing. If the unit is then started again, flush it for 15 min. We recommend flushing also after shorter periods of stopping.

- Storage: The unit has to be stored at temperatures above 0° C. Freezing would destroy the membrane.

- Temperature: At low temperatures in winter, the permeate production slows down. For the calculation of the production rate, see the following table.

8. Warranty

We guarantee 12 months on material defects. Wearing parts, e.g. prefilters as well as damages caused by use of force and incorrect storage (freezing) or handling are not covered under warranty.

AQUA MEDIC is not liable for consequential damages (e.g. caused by water).

Warranty only by proof of purchase by the original invoice.

- Technical changes reserved -

Appendix:

Table1: Relation between the pure water capacity of AQUA MEDIC reverse osmosis membranes and the water pressure before the membrane and the water temperature. The values are mean values, the spread is +/- 15% .

Pressure	Temperature °C	Capacity in l/day.Type 30 l/day	Capacity in l/day.Type 90 l/day	Capacity in l/day.Type 150 l/day
3 bar	**5°**	**24**	**46**	**79**
	10°	**28**	**55**	**94**
	15°	**33**	**64**	**110**
	20°	**38**	**76**	**130**
	25°	**45**	**88**	**151**
4 bar	**5°**	**31**	**61**	**105**
	10°	**37**	**73**	**125**
	15°	**44**	**86**	**147**
	20°	**51**	**101**	**173**
	25°	**61**	**118**	**201**
5 bar	**5°**	**39**	**76**	**131**
	10°	**47**	**91**	**156**
	15°	**55**	**107**	**184**
	20°	**65**	**126**	**216**
	25°	**75**	**147**	**252**
6 bar	**5°**	**47**	**92**	**157**
	10°	**56**	**109**	**221**
	15°	**66**	**129**	**267**
	20°	**56**	**156**	**267**
	25°	**90**	**177**	**302**