

## Reverse Osmosis (RO) Nano-Filtration (NF) Ultra-Filtration (UF)

In Co-operation with AquaCare®



*RO240 system, Iran, Fresh Water Application*

### Description

As a measure of last resort, the removal of dissolved solids is often the only option left, when only brackish water sources are available, or water with an unacceptably high level of dissolved minerals.

Reverse osmosis is a separation process used to reduce the dissolved mineral content of brackish water to a usable level. All RO processes involve three liquid streams: the saline or mineral-rich feedwater (brackish water), low-salinity product water, and very saline concentrate (brine or reject water).

The brackish feedwater is usually drawn from wells. It is separated by the RO demineralisation process into two output streams: the low-salinity product water (permeate) stream, and the very saline concentrate (reject) stream. The use of RO overcomes the paradox faced by many communities, that of having access to a sufficient supply of brackish water but having no way to use it. Although some substances dissolved in water, such as calcium carbonate, can be removed by chemical treatment, other common



*RO240 system, Iran, Brackish Water Application*

constituents, like sodium chloride, require more technically sophisticated methods, collectively known as desalination. In the past, the difficulty and expense of removing various dissolved salts from water made saline waters an impractical source of potable water. However, starting in the 1950s, desalination began to appear to be economically practical for ordinary use, under certain circumstances.

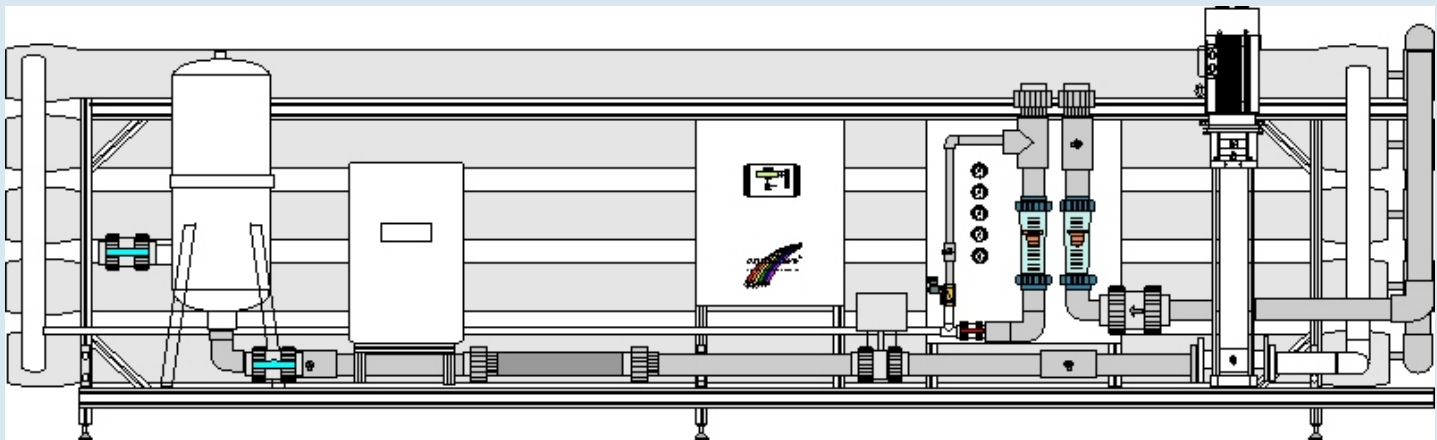
The product water of the desalination process is generally water with less than 200 mg/L dissolved solids, which is suitable for most domestic, industrial, and agricultural uses.

A by-product of RO demineralisation is brine. Brine is a concentrated solution that must be disposed of, generally by discharge into deep saline aquifers or surface waters, preferably those with a high salt content, such as the sea.

### Advantages

- Reverse osmosis is an efficient membrane filtration technique which reliably removes hardness and detrimental substances such as nitrate, silicic acid, pesticides, chlorine, and traces of pharmaceuticals from drinking water and effectively retains bacteria, viruses, algae, and radioactive particles
- Easy to operate: no addition of chemicals (only at high recovery)
- The units are equipped with a sediment filter to eliminate sediments to protect the reverse osmosis membranes – pressure gauges control the filter condition
- Only the best quality polyamide / polysulfone membranes (TFC) are used: rejection 95-99% depending on recovery and operation pressure
- The built-in automatically flushing system and concentrate recycling considerably increases the life of the membrane and provides best water quality
- A pressure pump raises the working pressure up to 16-70 bar and reduces the concentrate down to 30% (depending on incoming water quality)
- Flow meters show the water flow of permeate and concentrate
- Automatically start and stop of the system possible
- The RO-matic control with pre pressure control, connections to softening units and level switched, display with conductivity of the permeate, and many more
- Modifications for customer possible

# Reverse Osmosis



Sketch of Reverse Osmosis System (*modifications*)

## Order Information

Type	Order No.
HP 120.000 (5 m <sup>3</sup> /h)	142-005
HP 240.000 (10 m <sup>3</sup> /h)	142-010
HP 480.000 (20 m <sup>3</sup> /h)	142-020
HP 960.000 (40 m <sup>3</sup> /h)	142-040

## Equipment

All reverse osmosis units type HP of Osorno/AquaCare® are built on a profile frame and equipped with 5 µm sediment filter, multistage circulation pressure pump and pressure control switch, 5 pressure gauges, reverse osmosis module with TFC membrane, flow meters for permeate and concentrate, automatically flushing system, RO-matic control with conductivity display, shows permeate and concentrate disturbance, motor control switch (electrical supply: 400 V 50 Hz, other voltage is possible; chlorine elimination is recommended).

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## Applications

Preparation of potable water, or of water for industrial use from fresh or brackish water.

## Disinfection options

- Chlorine dioxide
- Chlorine or hypochlorite
- UV

## Construction Materials

The Osorno/AquaCare® RO / desalination systems can be individually designed, but are also available as standardised modules. Typical construction materials are or stainless steel, with pipes either stainless steel or polypropylene. The frame of the modules is typically welded aluminum alloy.

## Ordering Information

Please request our concept proposal for your application.

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