DISINFECTION OF REVERSE OSMOSIS UNITS FITTED WITH COMPOSITE MEMBRANES	EXP 46

Even appropriate pre-treatment and properly monitored operating conditions cannot prevent the gradual microbial pollution of reverse osmosis membranes or other components (piping, valves, etc.) of the whole unit.

Systematic disinfection is always necessary in order to keep the installation functioning at its rated capacity.

CLEANING FREQUENCY

The decision to disinfect may be due to :

. a bacteriological result obtained from the osmosed water no longer corresponding to operating standards,

. a systematic disinfection schedule designed to prevent the development of micro-organisms.

The preventive solution is the more appropriate one as regular disinfection maintains a constant degree of bacteriological purity in the osmosed water.

DESINFECTANT REAGENTS

The choice of disinfection method depends on the kind of membrane used or the nature of the materials liable to come into contact with the solution.

The hydrogen peroxide (H_2O_2) produces excellent results, or better still, a combination of hydrogen peroxide and peracetic acid such as BWT CS-3012, Oxy-Anios 5, Oxy-Aniolyse.

N.B.
Case of composite membranes

The use of a chlorinated substance (Javel, etc.) is prohibited as it causes the membranes to deteriorate rapidly and irreversibly.

The use of glutaraldehyde is prohibited for the same reasons.

The use of Formaldehyde is strictly banned.

PREPARATION

SAFETY

Disinfection requires the use of chemical substances. Basic safety rules must be adhered to concerning the use and handling of these substances. Consult a chemical manufacturer or supplier for further details.

N.B.

Before starting to disinfect, the membranes must be chemically cleaned to eliminate possible deposits (see notice "Chemical cleaning of reverse osmosis unit - EXP 47 ").

N.B.

Depending to the available euipment and flow, if the disindectant must be diluted, this must be made, this must be made from osmosed water or at least from clean water such softened, filtrted and dechlorinated water.

It is strongly recommended NOT TO USE raw water.

DILUTION CHART FOR DISINFECTANT REAGENTS

Disinfectants	Concentration of the commercially available solution in weight	Concentration in weight of the disinfectant solution to be flushed over the membranes	Dosing pump flow to adjust for 1 m3 of water to be treated	Quantity of disinfectant to use for 1 m3 of water to be treated Q DES (see examples)
Hydrogen peroxide	30 %	0.2 %	6 l/h	6 l/m^3
	35 %	0.2 %	5 l/h	5 l/m^3
	50 %	0.2 %	3 l/h	3 l/m^3
Oxy-Anios 5	-	0.2 %	6 l/h	6 l/m^3
BWT CS - 3012	-	0.2 %	6 l/h	6 l/m^3
Oxy-Aniolyse	-	0.2 %	50 l/h	50 l/m^3

PROCEDURE

N.B.

Before flushing the disinfectant through the installation, check that the latter is perfectly isolated from the production outlet and that no accidental handling can pollute the treated water stores or direct treated water towards user destination.

For this purpose we recommend that you physically disconnect the permeate pipe (see diagrams).

The disinfectant solution can be fed into the apparatus in a number of ways, depending on the chaining of the installation (see diagrams of cases No 1, 2, 3 and 4).

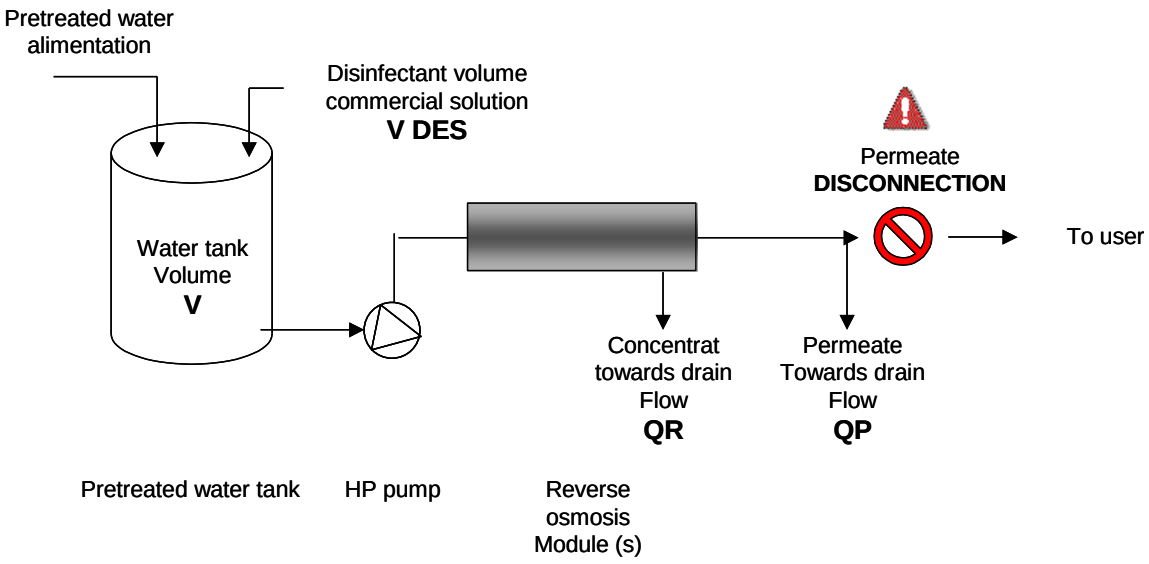
Case No 1 *: Injection with the HP pump of the reverse osmosis unit*

In the pretreated water tank situated upstream of the pump, prepare a disinfectant solution at 0.2% using osmosed water or else pretreated water (TH = 0 - Filtrer 5 microns - Cl_2 = 0).

Disconnect the permeate piping and move it to the drain.

Open the discharge and by-pass valves as wide as possible.

Inject the disinfectant solution using the apparatus' pump (diagram 1). As soon as the disinfectant appears in the drain, discharge and permeate outlets, stop the pump and leave the solution to take effect for approx. 30 mins (see paragraph on checking and testing methods).



The disinfectant Volume **V DES** in the tank is :

V DES (in liter) = **V** (in m3) X **Q DES** (in liter/m^3 see chart)

Case No 2 – 3 - 4 **:** *injection with subsidiary pump (example dosing pump)*

Depending the feeding flow of the reverse osmosis and the dosing pump caracteristics, the disinfectant solution can be injected without dilution. However it's necessary to adjust the feeding and the injection subsidiary pump flow to obtain 0,2 % of concentration on the reverse osmosis membranes.

Disconnect the permeate piping and move it to the drain or do not use loop osmosed water (case of loops).

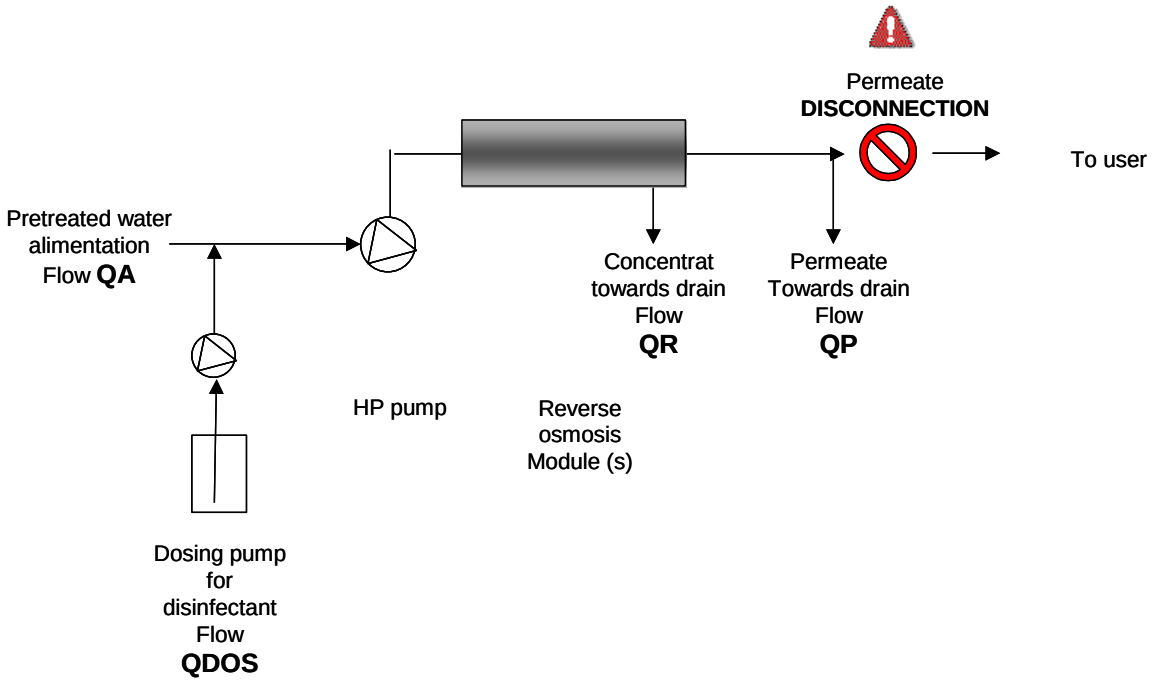
Open the discharge and by-pass valves as wide as possible.

Start the reverse osmosis unit.

Inject the disinfectant solution.

As soon as the disinfectant appears in the drain, discharge and permeate outlets, stop the pump and leave the solution to take effect for approx. 30 mins (see paragraph on checking and testing methods).

Simple reverse osmosis, OFF LINE

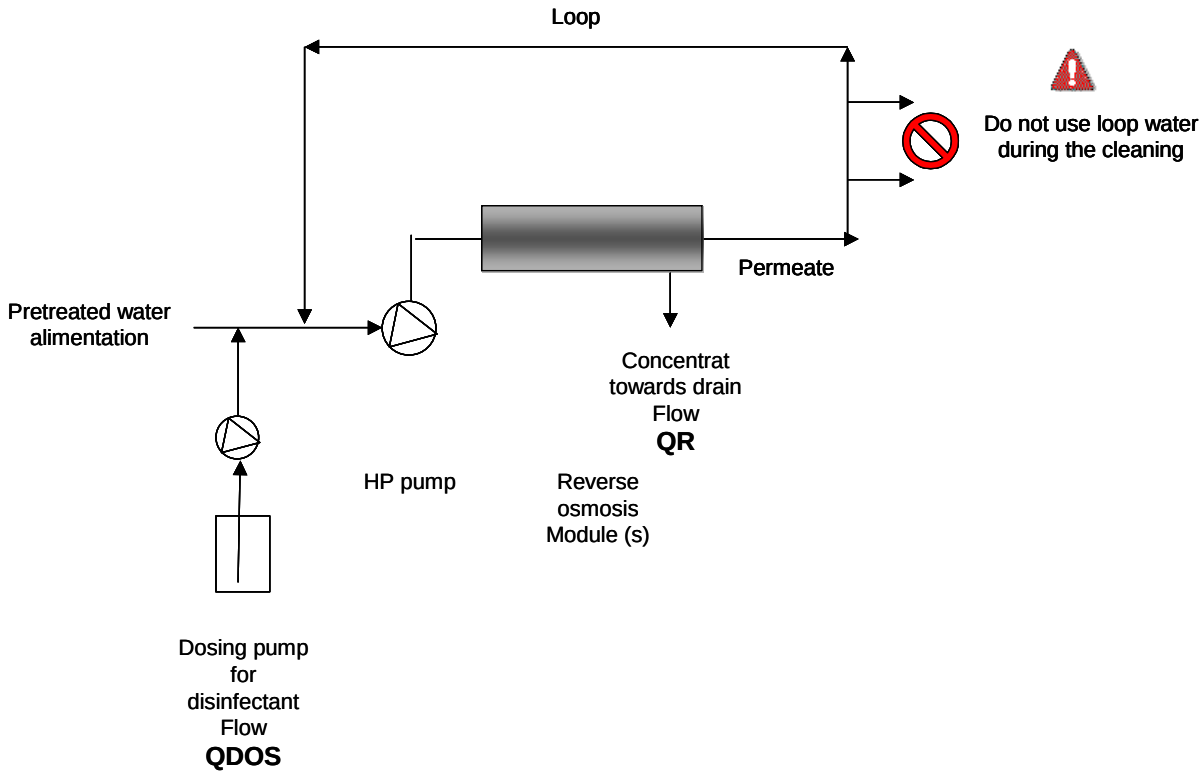


Dosing pump flow adjustment :

Feeding flow calculation **QA** (in m3/h) **= QR** (in m3/h) **+ QP** (in m3/h)

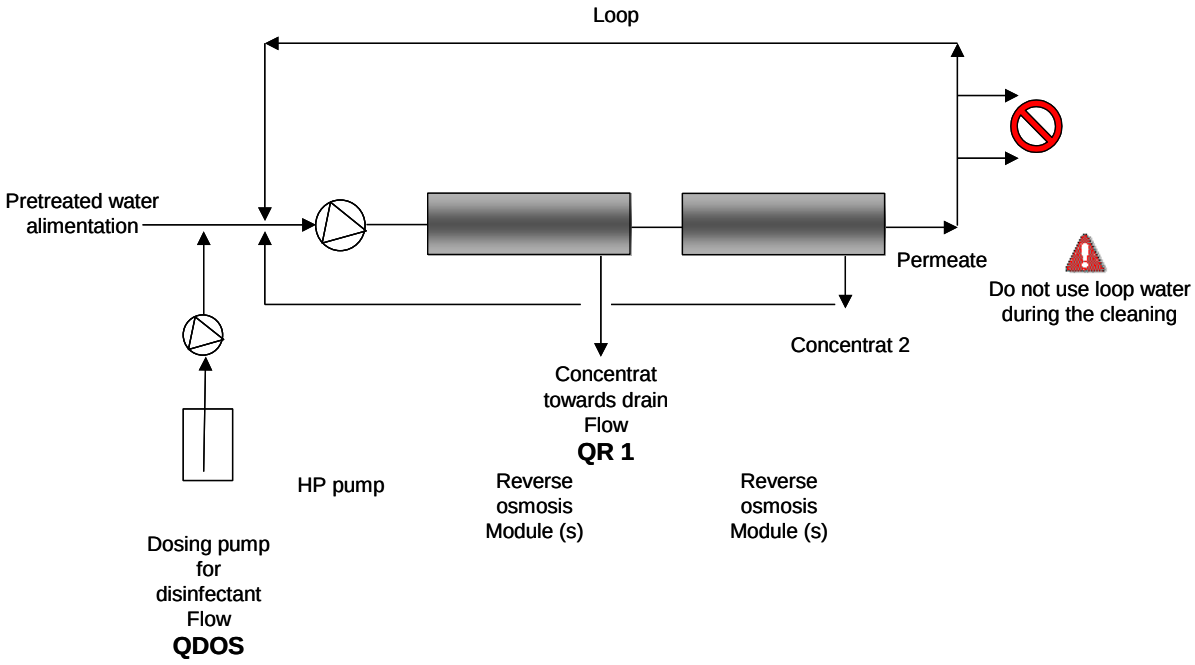
Dosing pump flow **QDOS** (in l/h) = **QA** (in m3/h) X **QDES** (in l/h refer page 3/7)

Loop feed back at the single reverse osmosis inlet



Dosing pump flow **QDOS** (in l/h) = **QR** (in m3/h) X **QDES** (in l/h refer page 3/7).

Loop feed back at the double reverse osmosis inlet



Dosing pump flow **QDOS** (in l/h) = **QR1** (in m3/h) X **QDES** (in l/h see refer page 3/8).

NOTE

In the event of serious pollution, flush the disinfectant through again and leave for 30 min. Once the 30 minutes have elapsed, rinse out the apparatus with pre-treated water. Rinse until all traces of disinfectant have been eliminated.

Methods for testing disinfectants

A number of ready-to-use products are commercially available to test disinfectants quickly (Strips, tintometers or comparators, etc.)