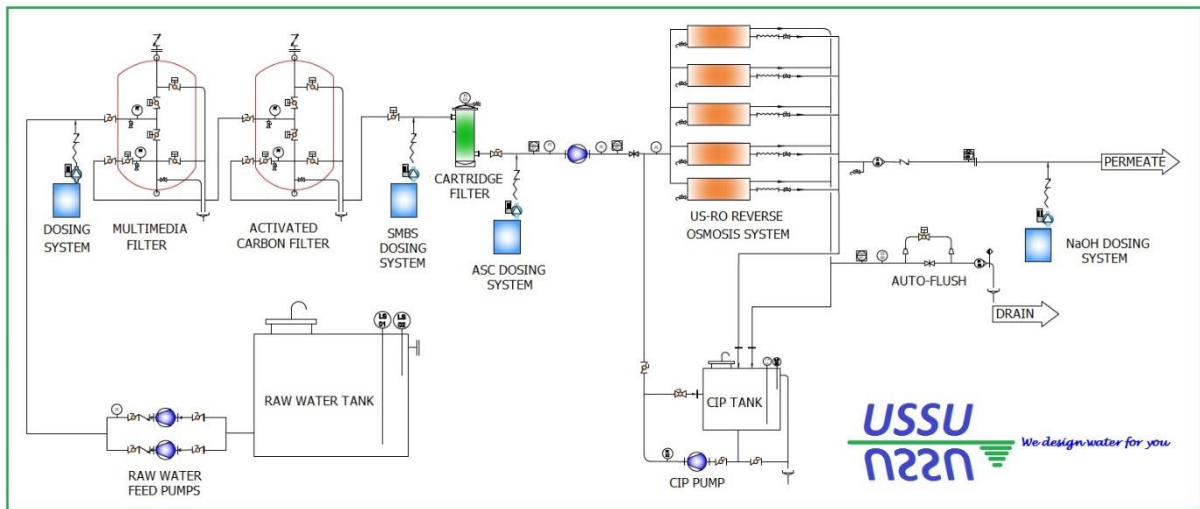


## US-RO Reverse Osmosis Systems

Reverse osmosis system is, removal process of the anions and cations by an advanced filtration method used as a water treatment system.

Water is forced to pass from a semi permeable membrane that has 5 angstrom pores with diameter by applying high pressure.



Water, flow from the surface to the center of the membrane. During this pass, organic and inorganic substances, heavy metals, veins, bacteria, etc. in the water filtered by the membrane and discharges from the reject line.

%95 - %99 Purified water can be collected to a center permeate line. System flush before the stop procedure and before the start procedure in order to clean the surface of the membrane. In this type of systems, for longer and effective use of membranes, pre-filtration and dosing systems must be designed and installed correctly. Automation is always most important point for the US-RO systems.

There are pressure transmitters that are measuring the pressure at different points of system continuously. One unit is for low pressure at inlet, one is for high pressure after the high-pressure pump and one is for the drain line.

In addition to these pressure switches, conductivity meter, permeate and drain flowmeter, dosing systems level switches and tank level switches are controlled from Siemens PLC are in standard manufacturing scope.

Standard US-RO systems we use; Filmtec/USA membranes, Grundfos/Denmark pumps, Siemens PLC, Codeline pressure vessels, Wika or Danfoss pressure switches and Proval control valves.

**US-RO** is our company registered trademark.



For the RO Design:

Pressure transmitter mounted at the high-pressure pump inlet, prevents the pump from the damages due to low pressure at inlet. In the case "Low Inlet Pressure" warning being given automatically and the system stops.

In order to protect the membranes from the damages of high pressure above the permitted limits, another pressure transmitter is mounted to the outlet of the high-pressure pump. When the pump outlet pressure exceeds the set point than "High Membrane Inlet Pressure" warning being given automatically and the system stops.

In order to protect the membranes from the damages of closed drain valve, a pressure transmitter is mounted to the drain line. When "High Reject Line Pressure" warning being given automatically; system stops.

Membrane software program is selecting high pressure pump capacity based on the performance of the membranes after 2 years running. For the start-up time, capacity of high-pressure pump is higher so as an option we can install VFD on this pump and you can save energy for first 2 years.



## Sample System US-RO 30

Pre-chlorination Dosing System	:Seko 1 duty
Raw Water Feed Pumps	:Grundfos, SS 316, CRN Series 1 duty + 1 stand-by
Automatic Sand Filter	:Ussu Engineering, D : 1900 1 duty
Automatic Carbon Filter	:Ussu Engineering, D : 1900 1 duty
Antiscalant Dosing System	:Seko 1 duty
Cartridge Filter	:15 x 40", SS316 1 duty
Membranes	:Filmtec BW30 440i 30 duty
Membrane Vessels	:Codeline, 300 psi 5 duty
High Pressure Pumps	:Grundfos, SS 316, CRN Series 1 duty
Piping	:SS 316 for HP, uPVC for LP
Flow Meters	:6 – 40 m <sup>3</sup> /h, rotameter type 2 duty
Conductivity Meter	:GF+ 0 - 2000 mikros/cm 1 duty
Manometers	:0 – 6 bar and 0 – 20 bar 8 duty
Pressure Switches	:Wika/Germany 3 duty
CI P Pump	:Grundfos, SS 316, CRN Series 1 duty
CIP Tank	:2000 Liter PE 1 duty
CIP Filter	:12 x 40", SS304 1 duty
Post-Chlorination Dosing System:	Seko 1 duty
Control Panel, MCC and PLC	:Siemens PLC 1 duty