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# 2000L/H Reverse Osmosis Water Treatment System

## 1. Design basis and treated water standard:

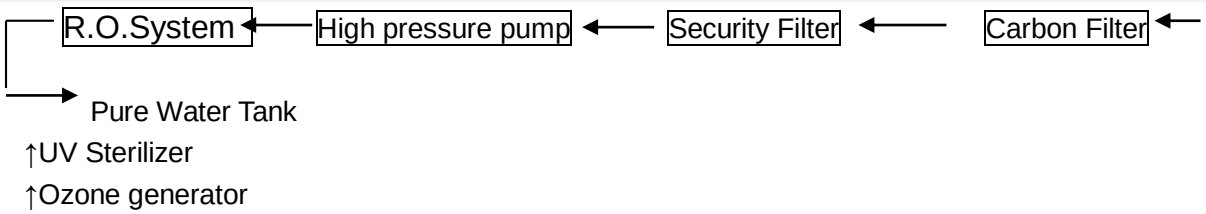
1. Design Basis
1.1 Produced water's application: Bottle drinking water
1.2 The capacity of produced water: 2000L /H
1.3 System Configuration: Pretreatment + One Stage Reverse Osmosis Desalination System.
1.4 Designed recovery: 50-65%.
1.5 Rejection rate:**≥ 97%**
1.6Voltage: 3 phases, 380V, 50Hz; Power: 5KW
1.7 Operation Process: Automatic Running

## 2. System requirements:

2.1 Inlet pipelines: inlet pipe connected with the raw water tank entrance.
2.2 Cable: According to the calculated capacity of electric power, the user should send it on the control cabinet.
2.3 Outlet water pipelines: From pure water tank to the pure water using point.
2.4 Concentrated Water Treatment: Discharge to the wastewater pool (user considered).
2.5 Water temperature:5-35˚C

## 3. Process:

Water Source → Raw Water Tank → Booster Pump → Sand Filter →




## 4. Process Description:

**The process includes pretreatment, reverse osmosis system, and post treatment (Ozone generator)**

**1) Raw water pretreatment part:**

Raw water contains many impurities, such as suspended solids, colloidal, organic and inorganic. To ensure Reverse Osmosis Desalination System at normal operation, the suspended solids, colloids, organic matters must be removed in advance, so that feed water to reverse osmosis system meets the requirement. So, the pretreatment part should be equipped. The pretreatment part includes: Mechanical Filter, Activated Carbon Filter and Security Filter.

**(1) Mechanical filter:**

Reverse osmosis equipment has the high requirement to the turbidity of the feed water, especially reverse osmosis water's pollution index value requests less than 4 SDI and turbidity less than 1NTU. Multi-media filter filled with several specification quartz sand, which remove suspended solids, colloid from raw water.

**(2) Activated Carbon Filter:**

Reverse osmosis equipment requests residual chlorine content be less than 0.1mg / L, so used activated carbon filter removing chlorine from raw water avoiding reverse osmosis membrane getting contamination.

Meanwhile, it can absorb organic matter in raw water. Activated carbon filter inside filled with the coconut shell refined activated carbon , for adsorbing the chlorine , organic matter, some pigments and harmful substances, reducing the chemical oxygen demand( COD).

Activated carbon is widely used in life water, the food industry, chemical and other industries. Due to large specific surface are and the surface covered with lots of micropores , therefore, activated carbon with high adsorption capacity.

**(3) Security Filter:**

Security filters are micro-filtration equipment, playing the insurance role in the pretreatment, to prevent the particles into the water pump and reverse osmosis system.

**2) Reverse osmosis desalination parts:**

Water reverse osmosis unit can remove most of inorganic salts, particles, bacteria, viruses, heavy metals, and other soluble substances.

The rejection rate can reach 98%.It is simple, low energy consumption, non-pollution, etc, so, it is widely used for producing pure water.

## 5. Features of Electric Control:

1)Inlet low pressure protection switch of high-pressure pump：
Linkage with the high-pressure pump, pressure below the set value, high-pressure pump will stop running.
2) The membrane inlet high pressure protection switch:
Linkage with the high-pressure pump, if operated high pressure too high, the membrane will be easy to get blocked, even penetrated. When the membrane system operating pressure exceeds the setting value, the high-pressure pump will stop running.
3) The reverse osmosis unit equipped with low pressure automatic flush valve:
Linkage with the high-pressure pump, set by the time relay, when the reverse osmosis unit start to work, the system auto startup, washing the film surface with large-flow, so the sediments on membrane surface washed away in time, to ensure the normal operation of membrane.
4) Raw water tank / pure water tank high and low level control switch
The raw water pump / high pressure pump linkage, the raw water tank at low level, the raw pump automatic shutdown for protection, when pure water tank full, high-pressure pump to stop.

## 6. Main Components List:

| Basic Configuration | Item | Description |
|---|---|---|
| Pretreatment part | Raw Water feed pump | CNP CDL4-40 0.75 |
| | Sand filter | Dia 500*1900 (filter 350kg) SUS304<br>Dia 500*1800 (filter 350kg) FPR |
| | Active Carbon filter | Dia 500*1900 (filter 10kg) SUS304<br>Dia 500*1800 (filter 100kg)) FPR |
| | Micron filter | 20" X 5 micron filter |
| RO Part | Pressure pump | CNP CDL4-190 4.25KW |
| | RO membrane | FILMTEC BW30-4040 x 6pcs |
| | Membrane vessel | 4040 stainless steel VESSEL 6 SETS |
| | Indicators | TDS,PH and Conductivity indicator |
| Piping and controlling valve | Piping and valves | PVC-U piping & Valves |
| | Control system & Indicator | Water level control, Pump protecting, Automatic electric valve control |
| Other fittings of machine | Pressure gage | 4 sets |
| | Conductivity table | CM230 X 2sets |
| | Main frame | Stainless steel 1set |
| | solenoid valve | DN20 1set |
| | Pipeline flow meter | 14GMP 2sets |

## 7. Pictures of Reverse Osmosis Water Treatment System