

OSDI-5

On-Site Regenerable Ion Exchange

System Components

Carbon/Ion Exchange Tank Size	8" x 44"
Total Tank Volume	1.04 ft ³
Carbon Type	Granular Activated Carbon
Carbon Volume per Tank	0.6 ft ³
Regeneration Valve	Kinetico Control Valve Module
Cation Resin Type	Strong Acid, Monosphere, Gel
Cation Resin Volume per Tank	0.7 ft ³
Cation Resin Total Volume	1.4 ft ³
Anion Resin Type	Strong Base, Monosphere, Gel, Type II
Anion Resin Volume per Tank	0.9 ft ³
Anion Resin Total Volume	1.8 ft ³
Inlet Pump	None
Acid Education Assembly	Dual Check Valves, Viton Seals
Caustic Education Assembly	Dual Check Valves, EPDM Seals
System Resistivity Monitor	50,000 ohm Resilite
System Operational Controller	In Spec / Off Spec Relay

Skid Configuration

Construction	Carbon Steel
Protective Coating	Blue powder coating
Length	65"
Width	27"
Height	72"
Operating/Shipping Weight	1400/865 lb.
Acid/Caustic Secondary Containment	10 gal Tank each

Inlet Water Quality

Pressure	60-110 psi
Temperature	40-110° F
pH	4-10 SU
Chlorine (Free)	2 mg/l
Total Dissolved Solids (Max.)	500 mg/l as CaCO ₃

Operating Specs

Inlet Flow Rate (Min/Max)	1-5 gpm
Regeneration Type	Countercurrent
Regeneration Flow (Max)	1.5 gpm
Regeneration Volume	62 gal.
Total Regeneration Time	65 minutes
Acid (30% HCl*) Used/Regen	1.0 gal.
Acid Dosage @ 1.02 SG	4 lb. HCl/ft ³ Resin
Caustic (50% NaOH) Used/Regen	0.85 gal.
Caustic Dosage @ 1.04 SG	6 lb. NaOH/ft ³ Resin
System Capacity Set Point	18,450 grains

Connections

Power	110 VAC, 60 Hz
Power Consumption	20 watts
Inlet Connection	0.75" PVC Thread
Process Connection	0.75" PVC Thread
Purge Connection	0.75" PVC Thread
Acid Inlet Interconnection	0.5" PP Tubing
Caustic Inlet Interconnection	0.5" PP Tubing
Neutralization Connection	0.5" PP Tubing
Turbine Drain Connection	0.5" PP Tubing

Cost Savings

Approximately \$4 per 1000
gal DI water compared to
\$40 for service exchange

Rental or Purchase

Rental at \$550 per month
Skid-mount unit \$8,750
Components only \$6,250



OSDI-5 *On-Site Regenerable Ion Exchange*

Operating Profile

The OSDI shall remove ions from tap water through a two-stage, separate bed ion exchange process. A water quality greater than 50,000 ohm/cm (20 umhos conductivity) can be achieved based on inlet quality. The deionizer shall provide a near continuous flow of deionized water through the use of a duplex (two tank) configuration. This duplex configuration shall operate with 50% of the resin in reserve or in regeneration. System regenerations shall be initiated by an adjustable disc meter measuring the processed volume. The deionizer will include one 5-u cartridge filter and one up-flow activated carbon filter.

Regeneration Valve

One regeneration valve shall be used with each set of cation and anion tanks, providing service and regeneration control for the pairs of media tanks. Interconnection between the tanks shall be made through the regeneration valve with a 3/4" quick connect adapter. The valve shall operate using a minimum inlet pressure of 60 psi. Pressure shall be used to drive all valve functions with no electric hook-up required for the control valve. Control valve shall incorporate three cycles for the regeneration process of the cation vessel including; acid draw, slow rinse, and fast rinse. The control valve shall incorporate four cycles for the regeneration process of the anion vessel including; stand-by tank purge, caustic draw, slow rinse, and fast rinse. The chemical draw cycles shall flow opposite the service flow, providing a countercurrent regeneration. The control will prevent the bypass of tap water to service during the regeneration cycle.

Media Tanks

The tanks shall measure 8" in diameter and 44" tall. Two each of cation and anion tanks will be used, with one tank in service at all times. One carbon tank will be used. Tanks shall be made of fiberglass reinforced polyester with a 2.5" threaded top opening, and NSF approved. The upper and lower distribution system shall be of a slot design providing for the even distribution of regeneration water and the collection of processed water.

Deionization Media

Each deionizer shall include 1.4 cubic feet of high-capacity, strong acid cation resin, with an exchange capacity of 26,000 grains per cubic foot when regenerated with 4 pounds of hydrochloric acid per cubic foot of resin. The deionizer shall also include 1.8 cubic feet of high-capacity, strong base anion resin, with an exchange capacity of 20,000 grains per cubic foot when regenerated with 6 pounds of sodium hydroxide per cubic foot of resin. Inert polypropylene beads shall be used to tightly pack the resin tanks, while still allowing the resin space for expansion and contraction.

System Controls

The system shall use a 120V relay controller that measures the resistivity of the processed water. The controller will divert water with less than 50,000 ohms resistivity through a purge valve and send it to drain. If the processed water resistivity reaches 50,000 ohms during purge, the purge valve closes and water returns to service.

Chemical Draw System

The control valve will draw regeneration chemicals from 5 gallon chemical pails located in 10-gallon capacity secondary containment HDLPE tanks. The system will provide for an adjustable throttling valving, allowing the flow of chemical to be regulated from 0-10 pounds per cubic foot. Waste regenerant is directed to an on-skid 75-gal tank in which the acid and alkaline solutions will be self-neutralized prior to manual discharge of neutral pH solution.

System Schematic

The system is mounted on a 27" x 65" carbon steel skid, with zinc undercoat and powder-coating, with wheels for portable use. All components are interconnected and anchored to the skid with only incoming and outgoing connections required.

