

# Water Softener Engineering Specifications

## Excalibur Water Systems Model EWS SD145 Duplex Alternating Water Softener Electronic Metered Initiated, Service / Stand-by Operation

Supply one (1), only Excalibur Water Systems Model EWS SD145 Sodium Duplex Alternating Water Softener. The system shall be designed to operate under pressure from 40 psig (minimum) to 110 psig (maximum).

### Mineral Tank

Supply two (2), only 10" diameter x 54" high 2.5" top opening premium quality PE liner with FRP filament winding mineral tank. Maximum operating pressure up to 150 psig with a maximum operating temperature of 120°F. Mineral tank must be NSF/ANSI Standard 44 as well as PED certified.

### Collection & Distribution

Supply two (2), only 1.05" high impact FDA approved ABS bottom stack high flow distributor at bottom and upper basket at top shall be utilized to evenly collect and distribute the flow of water over the entire bed.

### Brine Tank

Supply one (1), only 18" diameter x 33" high density capacity polyethylene combination salt storage/brine storage tank complete with salt grid platform for dry salt storage. The brine tank will be of dry salt design capable of holding 375lbs of salt.

### Brine Float

Supply One (1), only series 474 brine float to eliminate brine tank overflowing. Safety float / brine valve delivers water demand for high flow brine draws and refill eliminating pre-checking during brine refill when air in the brine line could cause excessive flow rates. The brine float is to be enclosed inside of a brine well with cap and secured utilizing a two-piece overflow set.

### Control System

Supply two (2) main operating 1" control valves shall be made of Noryl™. The inlet/outlet connections need to allow for either a quick connect bypass valve or quick connect inlet/ outlet fitting kit that utilize a union style nut that only needs to be hand tightened to mount to the control valve. The drain ports consist of a 3/4" Male NPT quick disconnect elbow that can swivel 180 degrees for easy orientation. The brine ports utilize a quick disconnect 3/8" compression elbow that swivels 270 degrees for easy orientation. The distributor pilot for the control valve is 1.05" OD pipe. Control valve utilizes a built in internal electronic flow meter with Hall Effect sensor off the side of the outlet port of the control valve for easy maintenance. This meter shall be accurate from 0.25 to 27 gallons per minute at +/- 5%. Control valves will have a single main piston, patent 1-piece compressible seal/ spacer stack assembly and have an internal brine regenerant piston. Valve must be a top-mount design with a 15-volt electronic microprocessor controller. Control valves shall have fully adjustable regeneration cycle duration times for backwash, downflow brine/slow rinse, 2<sup>nd</sup> backwash, fast rinse, soft water brine refill, and return to service. Control valves shall be made of non-corrosive materials, including all wetted parts.

### Microprocessor Controller

The solid-state microprocessors shall have a coin cell lithium battery for 8-hour time of day upkeep. Microprocessor will have front panel displays to show current time of day, volume remaining, current flow rate, a system totalizer and days to regeneration if day override is programmed (availability range of 1 day to 28 days). The controller will allow for five methods to initiate regeneration; meter immediate, meter delayed, time clock delayed, or pressure differential delayed or immediate. It shall provide operating history for days since last regeneration, gallons used since last regeneration, total days in service, and total number of regenerations since it was installed which will all be stored in non-volatile memory.

### Motorized Alternating Valve

Supply one (1), only 1.25" full ported motorized alternating valve to allow one unit to be in regeneration or stand-by at a time while the other unit is in service. This system shall provide a continuous supply of soft water with the control valves indicating which unit is on-line and in stand-by operation. Its internal non-corrosive single piston & patented 1-piece compressible seal/ spacer stack assembly allow it to be

hydraulically balanced. The MAV has a sight glass that allows you to view the position of the valve to know which valve is on-line and which is on stand-by without removing covers.

#### **Interconnect Cable**

Supply one (1) only interlock wiring between controls must be pre-wired and electrically tested by the water softening system manufacturer at the factory prior to shipment.

#### **Turbine & Volumetric Meter**

Supply two (2), internal magnetic pulse Hall Effect turbine meter accuracy must be +/- 5% with a flow rate range of 0.25 – 27.0 GPM. External flow meters are not acceptable.

#### **Power Supply**

Supply two (2), North American plug-in type power transformer with electrical specifications output voltage of 15 VDC with the output current not exceeding 500 mA.

#### **Bypass Isolation Valve**

Supply two (2), Injection molded bypass Isolation valve full 1.25" porting plastic Noryl to be connected threaded connections adapter to the control valve for proper isolation. Isolation bypass valve operating pressures 20-125 psi, temperature range 40-110 F. Bypass isolation valve to offer normal operation, bypass operation, diagnostic mode, and shut off mode.

#### **Ion-Exchange Resin**

Each vessel shall be supplied with Aldex C-800 resin bead-form with a minimum 8% cross link gel type sodium form high-capacity polystyrene ion-exchange resin with performance capacity of 30,000 (27,000) [20,000] grains per cubic foot when regenerated with 15lbs (10lbs) [6lbs] of salt per cubic foot. The resin shall be solid, of the proper particle size and contain no plates, shells, agglomerates or other shapes which might interfere with the normal functions of the water softener. Tested & certified WQA according to NSF/ANSI 44, 61, 372 and WQA Gold Seal.

#### **Performance**

The unit shall provide 45,000 (40,500) [30,000] grains capacity between regenerations based on a regeneration of 15lbs (10lbs) [6lbs] of salt per cubic foot of resin. This setting will utilize 22.5lbs (15lbs) (9lbs) of salt per regeneration.

#### **Flow Rate**

Minimum flow rate 1.1gpm (0.07 l/s), Critical flow rate of softened water 4.5gpm (0.28 l/s) Service flow rate 6.5gpm (0.41 l/s), 15psi ΔP 14.0gpm (0.88 l/s), 25psi ΔP 21.0gpm (1.32 l/s)

#### **Drain Flow Rate**

Water shall be discharged during the regeneration process at a flow rate of 2.7 GPM (0.17 l/s) for proper regeneration bed expansion process.

#### **Start-up**

Successful equipment provider shall follow the manufactures printed instructions to start up the system after plumbing and electrical requirements are completed. This includes raw water testing, programming, individual start-up for each softener column, system operation, and product water testing for each column and training of personnel. Set system for medium salting/capacity levels with fixed reserve and immediate regeneration. If needed, the successful bidder shall contract an approved authorization service agent from the manufacture to assist with these procedures.

#### **Warranty**

Equipment and /or parts shall be covered by manufacturer's replacement warranty as follows:

- Fiberglass Mineral Tanks – TEN (10) YEARS
- Brine Salt Storage Tank – TEN (10) YEARS
- Cation Exchange Resin – FIVE (5) YEARS
- Control Valves & Electronics – FIVE (5) YEARS
- All other components – ONE (1) YEAR