

# Water Softener Engineering Specifications

## Excalibur Water Systems Model EWS SC2HF4240 Quadplex Progressive Water Softener Electronic Metered Initiated Service Operation

Supply one (1), only Excalibur Water Systems Model EWS SC2HF4240 Sodium Quadplex Progressive Water Softener. The system shall be designed to operate under pressure from 40 psig (minimum) to 110 psig (maximum).

### Mineral Tank

Supply four (4), only 24" diameter x 72" high 6" flanged 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 four (4), only 2.0" high impact FDA approved hub and lateral high flow distributor that shall be utilized to evenly collect and distribute the flow of water over the entire bed.

### Brine Tank

Supply four (4), only 30" diameter x 50" 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 1,400 lbs of salt.

### Brine Float

Supply four (4), 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 a brine well with cap and secured utilizing a two-piece overflow set.

### Control System

Supply four (4) main operating control valve will have 2.0 "HF Female NPT Inlet, Outlet, and drain connections. The control valve must have 1/4" inlet/ outlet sample tap ports with 316 stainless steel plugs installed if sample taps are not used. The control valve must have a quick connect style base with hinged clamp to allow for quick connect or disconnect to the 316 Stainless Steel 4" base adapter when utilized. The brine port must have a quick disconnect 1" mnpt elbow or 3/4" x 1" solvent weld elbow that can swivel 360 degrees for easy orientation. The distributor pilot for the control valve must be 2.0" NPS pipe. Control valve will have a single main piston, patent 1-piece compressible seal/spacer stack assembly with internal brine regenerant piston. The control valves internal wetted parts shall be made of non-corrosive materials. Control valve shall have a lead-free brass valve body with a non-corrosive NSF / FDA approved food grade electro-deposited black Epoxy Coating Certified to NSF/ANSI/CAN 61 and 372.

### Microprocessor Controller

The 24-volt solid state microprocessor shall have a removal POD to allow for easy access and remote mounting. The system shall be capable of operating a single or network up to 16 multi-tank design system utilizing CAT5 cable or better in a single, alternating, progressive flow or series regeneration design. The display shall be able to show time of day, current flow rate, total gallons used and volume remaining/days until regeneration, it shall be capable of initiating regeneration by meter delayed, meter immediate, time clock delayed or pressure differential. All cycles shall be fully adjustable in any order providing up to nine maximum cycle sequences including multiple cycles.

The diagnostics shall be capable of providing data days since last regeneration, gallons or gallons x 1000 since last regeneration, reserve history for the current day and previous 6 days, total volume processed for the current day and the previous 63 days by daily total and hourly, the peak flow rate for each of the last 28 days of operation along with the time of day for each day that the peak flow

rate occurred, peak flows may also be viewed by the hour along with total volume processed through. Communication with (BAS) building automation system duplex Modbus RS485.

**No Hard Water Bypass Valve:**

Supply four (4), only 2.0" full ported no hard water bypass valve which prevents the raw water bypass during the regeneration cycle at a time while the other unit is in service. This system shall provide a continuous supply of soft water with the control valves and system controller 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. sight glass that allows you to view the position of the valve to know whether the unit is on-line or on stand-by without removing any covers.

**Turbine & Volumetric Meter**

Supply four (4), only 2.0" Male X Female NPT made of 316 stainless steel meter with magnetic pulse hall effect turbine remote meter accuracy must be +/- 5% with a flow rate range of 1.5 – 150.0 GPM and must also be certified to NSF/ANSI 61 and 372.

**Power Supply**

Supply four (4), only North American plug-in type power transformer with electrical specifications output voltage of 24 VDC with the output current not exceeding 800 mA.

**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 WQA Gold Seal.

**Performance**

Each unit shall provide 240,000 (216,000) [160,000] grains capacity between regenerations utilizing 120lbs (80lbs) [48lbs] of salt. Max System capacity 960,000 (864,000) [640,000] utilizing 480lbs (320lbs) [192lbs] of salt per regeneration.

**Flow Rate**

Minimum flow rate 6.3gpm (0.40 l/s), Critical flow rate of softened water 100.0gpm (6.31 l/s) Service flow rate 160.0gpm (10.09 l/s), 15psi ΔP 308.0gpm (19.43 l/s), 25psi ΔP 400.0gpm (25.24 l/s)

**Drain Flow Rate**

Water shall be discharged during the regeneration process at a flow rate of 15.0 GPM (0.95 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 with 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