

Water Softener Engineering Specifications

Excalibur Water Systems Model EWS SD3900 Duplex Water Softener Electronic Metered Initiated Service Operation

Supply one (1), only Excalibur Water Systems Model EWS SD3900 Sodium Duplex 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 42" diameter x 72" high 6" top flange opening premium quality PE liner with FRP filament winding mineral tank. Maximum operating pressure up to 150 psig with a maximum operating temperature of 150°F. Mineral tank must be NSF/ANSI Standard 44 as well as PED certified.

COLLECTION & DISTRIBUTION: Supply two (2), only 3" high impact FDA approved hub and lateral 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 two (2), only 50" diameter x 60" 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 4,500 lbs of salt.

BRINE FLOAT: Supply two (2), only series 494 brine float 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 VALVE: The main operating control valve will have 3" Female NPT Inlet, Outlet, and Drain connections. The control valve must have a remote inline flow meter. The valve is top-mount design with a 20-volt electronic microprocessor controller. 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 6" flange base adapter. The quick connect feature allows valve to swivel 360° once it is mounted which provides easy plumbing alignment. The brine port must have a quick disconnect 1" elbow fitting with union nut that can swivel 360 degrees for easy orientation. The distributor pilot for the control valve must be 3.0" NPS pipe. Control valve will have a single main piston, patented 1-piece compressible seal/ spacer stack assembly, and have an 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. The control valve must also be certified to NSF/ ANSI 61 and NSF/ ANSI 372 to contain less than 0.25% lead. Control valves that do not meet these specifications are not acceptable.

MICROPROCESSOR CONTROLLER: The 20-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 and twin design systems in an alternating system, parallel with both units online at one time or as a progressive flow system. 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 for each of the following: backwash, brine (a separate cycle from slow rinse) slow rinse, fast rinse and brine tank refill with treated water on either a pre-fill or post-fill regeneration format. All cycles will be fully adjustable cycle time durations. Controller will be capable of operating on an optional clock basis with either a 7-day calendar or 28-day calendar, along with an optional 1 - 28 day calendar override and have up to (four time periods) for regeneration to occur for either time clock or metered demand regeneration. Optional programming shall allow for pre-programming an alternate regeneration sequence in which the microprocessor can be set to an alternate salting level automatically every so many regenerations or just change the order of the regeneration cycle arrangement to meet a specific need. The microprocessor must be able to control up to four units and be able to add a third or fourth unit at a later date if needed to adjust to increased water usage demand after plugging the system board into the first/master unit. 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.

PROGRESSIVE FLOW: Progressive Flow systems utilize motorized no hard water bypass valves on the outlet of each softener control and opening or closing water flow based on flow rate demand. The valves allow multiple control valves to become a multi-tank progressive flow system with one unit on line at all times and the remaining units in stand-by or in regeneration. Note: only one unit is in regeneration at a time. The progressive flow systems use a predetermined flow rate set point to bring on-line additional units to meet peak flow rate requirements. Once the flow rate set point is reached for greater than 30 seconds the unit(s) in stand-by will be driven on-line or immediately if the flow exceeds 120% of the predetermined set point to meet peak flow rate demands. Once the peak flow rate demand decreases by 95% of the set point for greater than 1 minute the stand-by unit(s) that were driven on-line will return back to stand-by mode. This system configuration determines the need to regenerate based on a unit reaching zero capacity or day override.

NO HARD WATER BYPASS: Supply two (2), only 3" full ported 316 stainless steel 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 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 no hard water bypass has a 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. Tested and certified to NSF 61.

INTERCONNECT CABLE: Supply one (1), only interconnect cable to make connection between units must be pre-wired and electrically tested by the water softening system manufacturer at the factory prior to shipment.

METER: Supply two (2), only 3" Male NPT x 3" Female NPT 316 Stainless Steel electronic meter with Hall Effect sensor shall be provided with control to monitor water usage. Any other meters are not acceptable. This meter shall be accurate from 3.5 to 350 gallons per minute at +/- 5%. This meter must also be certified to NSF/ ANSI 61 and NSF/ ANSI 372 to contain less than 0.25% lead.

POWER SUPPLY: Supply two (2), only North American plug in type power transformer with electrical specifications output voltage of 20 VAC with the output current not exceeding 750 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) grains per cubic foot when regenerated with 15 lbs (10 lbs) 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 900,000 (810,000) grains capacity and total system shall provide 1,800,000 (1,620,000) between regenerations based on a regeneration of 15lbs (10lbs) of salt per cubic foot of resin. This setting will utilize 450 lbs (300 lbs) of salt per regeneration.

FLOW RATE: Critical flow rate of softened water may be drawn continuously between the service flow rate of 19.2 GPM (1.21 l/s) to 300 GPM (18.9 l/s), and a peak flow rate up to 480 GPM (30.28 l/s). While regeneration process of any one unit the maximum service flow and peak flow rate will be half of total flow rates.

DRAIN FLOW RATE: Water shall be discharged during the regeneration process at a flow rate of 45 GPM (2.84 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 – TEN (10) YEARS
- Control Valves & Electronics – FIVE (5) YEARS
- All other components – ONE (1) YEAR