



COMMERCIAL WATER CONDITIONING EQUIPMENT

PART 1 GENERAL

SUMMARY

1.01 SUMMARY

1. Section Includes: Commercial water softening systems.
2. Related Sections:

1.02 REFERENCES

1. American National Standards Institute/National Sanitation Foundation (ANSI/NSF):
 - a. ANSI/NSF 61 Drinking Water System Components (Wetted parts, tanks, medias) – Health Effects.
2. International Organization for Standardization (ISO):
 - a. ISO 9001 Quality Systems – Model for Quality Assurance.
3. United States Food and Drug Administration (U.S. FDA):
 - a. U.S. FDA Standard No. 21CFR173.2500.

1.03 SYSTEMS DESCRIPTION

1. Design Requirements: Provide products and systems that have been manufactured, fabricated and installed to the following criteria:
 - a. Comply with ANSI/NSF 61.
 - b. Comply with UL Class 2 Power supply, Listed E197643-2524
 - c. Comply with WQA S-100.
2. Performance Requirements:
 - a. Operating Temperatures: 35 – 100 degrees F.
 - b. Pressure: 30 – 125 psi.
 - c. Electrical Requirements: 110 V, 60 Hz, 1 ph standard receptacle; operating voltage 24 VDC
 - d. Water Analysis: System capable of softening water based on raw water analysis:
 - i. Total Hardness Range as gpg as CaCO₃: 0 – 160 gpg.
 - ii. Soluble Iron (mg/L): 0 – 5.
 - iii. Soluble Manganese (mg/L): 0 – 0.1.
 - e. Flow Rate: Single tank performance - gpm continuous flow at no greater than psi pressure drop, gpm peak intermittent use at no greater than psi pressure drop.
 - f. Single Tank Capacity: Capable of supplying up to grain capacity at a 12lb salt dosage per tank, per regeneration with multiple tank regenerations per day.
 - g. Multiplex unit supplies 24-hour soft water with hard water bypass prevention during a regeneration cycle.

1.04 SUBMITTALS

1. General: Submit listed submittals in accordance with Conditions of Contract and Division 1 Submittal Procedures.
2. Products Data: Submit manufacturer's product data, including manufacturer's, for specified products.
3. Quality Assurance:
 - a. Manufacturer's Instructions: Manufacturer's installation instructions.
4. Closeout Submittals: Submit following:
 - a. Warranty: Warranty documents specified.
 - b. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.

1.05 QUALITY ASSURANCE

1. Qualifications:
 - a. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
 - b. Manufacturer Qualifications: Manufacturer certified under ISO 9001.
 - c. Manufacturer that makes the majority of components for its own systems.
2. Regulatory Requirements: Provide domestic water conditioning system components that complies with the following requirements:
 - a. ANSI/NSF 61.
 - b. UL FDNP2.MH17706.
 - c. U.S. FDA Standard No. 21CFR173.2500.
 - d. WQA S-100.
3. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings)

1.06 DELIVERY, STORAGE & HANDLING

1. General: Comply with Division 1 Product Requirements.
2. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
3. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
4. Storage and Protection: Store materials protected from exposure to harmful weather conditions.

1.07 PROJECT CONDITIONS

1. Installation Location: Confirm pressure and temperature specifications.
2. Check existing water quality to confirm that proper system has been specified.
3. Confirm that plumbing can provide required backwash flow rates and that adequate drainage is available to dispose of regeneration water.

1.08 WARRANTY

1. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
2. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents..
3. Warranty: Commencing on Date of Installation.
 - a. Fiberglass Resin Tank: 10 years; tank will not rust, corrode, leak, burst or in any other manner fail to perform its proper function (moisture barrier is not guaranteed).

- b. Salt Tank: 3 years; tank will not rust, corrode, leak, burst or in any other manner fail to perform its proper function.
- c. Electronic Face Plate: 3 years; free from defects in material and workmanship.
- d. Other System Components: 1 year; free from defects in material and workmanship.

PART 2 PRODUCTS

2.01 COMMERCIAL WATER SOFTENING SYSTEM

1.

2 Manufacturers: EcoWater Systems LLC

- a. Contact: PO Box 64420, Saint Paul, MN 55164-0420; Telephone: 800-627-3497, 651-739-5330; Fax: (651) 739-4547; Web site: www.ecowater.com

3 Proprietary Products / Systems: Commercial water softening systems, including the following components

Note: Select specific model number and dimensions from manufacturer's data sheets.

- b. Main Control Valves:
 - i. Size and Type: 1 inch, single rotary disk type valve with 1 inch – 1.5 inch quick clip inlet and outlet connections
 - ii. Clip/Clamp style valve to tank connection for ease of assemble.
 - iii. Features: Fixed orifice aspirator nozzle and backwash flow controls; capability for manual-initiated regeneration function diagnostics.
 - iv. Valve Composition: High impact, brass and lead free non-corrodible MC-90 Plastic.
- c. Control Module:
 - i. Computer based, fully programmable, electronic demand, self-prompting programming for simple starting up.
 - ii. Built-in program storage unaffected by power outages.
 - iii. Built in Power reserve to retain time of day for up to 48 hours.
 - iv. OLED panel displaying time, flow rates, regeneration time, hardness setting, recharge schedule, remaining system capacity.
 - v. Programmable Features:
 - 1. Controller capable of operating 1 –4 units.
 - 2. Operating Modes: Single, parallel immediate, parallel delayed and peak flow demand.
 - 3. Salt Doses: Set to auto adjust; salt efficient, boiler or specific dose ranging from 4 – 12 lb/cuft
 - vi. Features: Water usage counter to measure total water conditioned.
 - vii. Moisture Protection: Wiring assemblies coated to MIL specifications for use in humid environments, watertight enclosure to house the control.
 - viii. Power: Sized and listed UL/CSA power supply provided to convert 120 V, 60 Hz power for 24 VDC operation.
- d. Flow Sensor:
 - i. Type: Solid-state transducer, self-lubricating turbine flow meter.
 - ii. Construction: Free from packing glands or rotating shaft seals.
 - iii. Installation: Hand tools.
 - iv. Size: To match valve size.
 - v. Water meter activated at .3 gpm flow.
- e. Softener Tanks:

- i. Composition: The tank is constructed of a non-corrosive HDPE liner with fiberglass filament reinforcement.
 - ii. Working Pressure: 125 psi, hydrostatically tested at 50% in excess and rated at burst of three (3) times working pressure
 - iii. Freeboard: To accommodate bed expansion of ~50% volume during backwash.
 - iv. Exterior Sideshells: Reinforced by continuous roving glass filament overwrap.
 - v. Tank Support: Molded polypropylene structural base.
 - f. Brine Tanks:
 - i. Composition: Corrosion-free, 1-piece, molded polyethylene.
 - ii. Accessories: Cover, brine valve assembly.
 - iii. Nominal Dimensions: Diameter x Height.
 - iv. Capacity: lb of salt.
 - v. Quantity:
 - vi. The brine tank will contain non-corrosive field serviceable brine valve with a air check and float operated safety shut-off.
 - g. Ion Exchange Resin:
 - i. Resin: High-capacity solvent-free synthetic cation exchange resin, uniform particle size, clean and free of dirt and extraneous matter.
 - ii. Capacity: Minimum 33,000 grains/ft³ when regenerated with 12 lb of salt/ft³
 - iii. Quantity: ft³ per tank.
 - h. Underbedding:
 - i. Material: Quartz, washed to remove debris and fines.
 - ii. Quantity: Specified amount.
 - i. System Regeneration Sequences:
 - j. Service: Normal operation; water is conditioned as it flows down through resin.
 - k. Brine Fill: Exact amount of conditioned water flows into salt tank to create brine.
 - l. Brine Draw: Brine draw from salt tank flows up through resin bed (countercurrent).
 - m. Slow Rinse: Moves brine through resin, for complete hardness and iron removal (countercurrent).
 - n. Backwash: Countercurrent flush to further clean resin bed and prevent channeling.
 - o. Fast Rinse: Repacks resin bed and prepares system to return to service.

2.02 PRODUCT SUBSTITUTIONS

1. Substitutions: Substitutions permitted by Engineer Approval.

PART EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

1. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions and EcoWater Systems, LLC.

3.02 Site Examination

1. Site Verification of Conditions: Verify installation and operating conditions, including any previously installed equipment, are acceptable for product installation in accordance with manufacturer's instructions.

3.03 INSTALLATION

1. Associated Plumbing:
 - a. Provide inlet, outlet and drain line plumbing for softeners.

- b. Provide 3-valve bypasses.
- 2. Installation:
 - a. Position tank(s) in their final location.
 - b. Cut/check riser tube to recommended length and place in resin tank.
 - c. Load media into resin tank and fill with water.
 - d. Attach valve to resin tank.
 - e. Connect plumbing to valve.
 - f. Program control box.
 - g. Open valves to unit and close bypass valve so water flows through unit.

3.04 TESTING AND VERIFICATION

- 1. Perform manually initiated regeneration to verify required performance of softener system, in each of the regeneration steps.

3.05 COMPLETION AND CLEANUP

- 1. On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION