

**DIVISION 40 – PROCESS INTEGRATION**  
**40 23 00 WATER PROCESS PIPING**  
**40 23 13 DEIONIZED WATER PROCESS PIPING**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes providing and installing all items necessary for the construction of the header assembly, tanks, fittings, controls and piping necessary to complete the deionization system for new and remodel construction projects.

1.02 DESIGN REQUIREMENTS

A. General:

1. The deionization system shall reduce the total dissolved solids of the water so that the specific resistance of the water generated is not less than 18 Megaohms at the resin tanks. The system cannot guarantee delivery of 18 Megaohm water throughout the piping network. Higher purity water must be provided by the user.
2. WSU maintains all deionizing tanks and resin at the Facility Services Refrigeration Shop facility. All resin installation and tank flushing is performed by the WSU Refrigeration Shop.
3. Resin standard: NR-30 MEG Mixed Bed Resin.

B. System Description:

1. Deionization systems shall be a two-tank system, unibed, with carbon filter, RO generator, and storage tank for treated water. Distribution system is 100% recirculated throughout the building.
2. When designing a second (redundant) set of deionized water tanks, the Consultant shall design the tanks to function automatically when the first set has reached its capacity based upon total gallons purified.

- C. Deionization system shall be designed and constructed to provide a minimum of three (3) feet clear width for access to all equipment.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Contractor shall deliver empty treatment tanks to the WSU Facility Services Refrigeration Shop for installation of resin.
- B. The WSU Refrigeration Shop will furnish and install the deionizing resins into the Contractor-provided tanks. The project shall bear the cost of this work.

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1. Contractor shall allow two working days for resin installation.
2. Contractor shall pick up activated tanks from the WSU Facility Services Refrigeration Shop for installation at the project.

**PART 2 - PRODUCTS**

2.01 EQUIPMENT

A. Water Meters:

1. Only required for input domestic water. Digital network reporting not required. Water meters are inspected and recorded by WSU Refrigeration Shop.
2. Badger turbine meter or approved equivalent.

B. Carbon Filters:

1. Pre-Approved Manufacturers:
  - i. Evoqua Vantage PTC Series

C. Softener:

1. Pre-Approved Manufacturers:
  - i. Evoqua Vantage PTC Series

D. Reverse Osmosis (RO) units:

1. Pre-Approved Manufacturers:
  - i. Evoqua M41 Series

E. Storage Tanks:

1. Standard storage tank size on the WSU campus, where building conditions permit, shall be 500 gallons.
2. Pre-Approved Manufacturers:
  - i. Snyder Industries

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F. Booster Pumps:

1. Pre-Approved Manufacturers:
  - i. Grundfos

G. Ultraviolet Water Treatment Units:

1. Pre-Approved Manufacturers:
  - i. Aquafine CSL Series

H. Conductivity / Resistivity Meters:

1. Pre-Approved Manufacturers:
  - i. Thornton

I. Back Pressure Relief Valves:

1. Pre-Approved Manufacturers:
  - i. Ryan Herco

J. Flow Control Valves:

1. Preferred materials are PVC valves with EPDM diaphragms. No metal valve components shall contact the DI water.
2. Shall maintain constant flow with inlet pressure changes between 15 – 120 PSI.
3. Suitable for operation in the 40 – 140° F range.

K. Piping:

1. All piping and components shall be Schedule 80 PVC.

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**