



## 1.1 FILTRATION SYSTEM

### A. General

1. Provide a high efficiency media filtration system. The filtration system shall operate continuously to remove suspended particulate from the condenser water. The filtration system shall backwash automatically upon reaching a 16 psig differential pressure set-point across the media bed or after 24 hours, whichever occurs first. A manual pushbutton switch shall also activate the automatic backwash cycle.
2. Filtration system shall be sized for 5% side-stream flow or 16 system volume turns per day, whichever is greater. Filtration flux rate shall not exceed 20 gpm/ft<sup>2</sup>. To assure that all filtered solids are removed during backwash, backwash flux rate shall not be less than 15 gpm/ft<sup>2</sup> for two minutes.
3. Filtration system shall be as manufactured by Process Efficiency Products (PEP Filters) or approved equal.

### B. Equipment

1. The filtration system shall consist of a filter vessel, high efficiency filtration media, system matched pump with close coupled motor, pump pre-strainer with removable stainless steel strainer basket, UL control panel, face piping, pressure gauges, control valves and actuators. All filtration system components shall be mounted on an epoxy coated carbon steel base.
2. Filtration system shall be assembled and tested at the factory prior to shipment.
3. Filter Vessel and Vessel Components
  - a. The filter vessel shall be fabricated of fiberglass reinforced plastic. The vessel shall be rated for 50 psig maximum operating pressure. Filter vessel shall have suitably sized inlet and outlet connections, drain connection, access ports and vent fittings. Internal over and under-drain shall be of PVC construction.
  - b. The filter vessel shall include both automatic and manual air vents.
  - c. For vessels 20" through 30" diameter, the filter vessel shall be compression molded FRP. For vessels 36" through 48" diameter, the filter vessel shall be filament wound FRP.

#### 4. Face Piping

- a. Filter vessel face piping shall be [**select: schedule 80 PVC, type L copper or 304 stainless steel**].
- b. Face piping shall allow for field configuration of either system or city water backwash.
- c. **Optional** – The filter shall incorporate a water/chemical conservation mode. The filter shall automatically select source or city water for backwash depending on system conductivity. If conductivity is low, city water shall be selected. If high, the filter shall automatically select system water for backwash. The filter shall also be equipped with a suitable interface for selection of backwash water source via the building monitoring system.

#### 5. Valves

- a. Valves shall be ball type with bronze body and corrosion resistant steel alloy ball with Teflon seat.
- b. To eliminate water hammer potential and “out of sequence” operation, the control valves shall be mechanically linked.

#### 6. Actuator(s)

- a. Motorized type electric actuators shall be utilized to cycle 3-way ball valves between filter and backwash modes.
- b. Actuators shall be oversized for 150% over torque requirement for long life and dependability.

#### 7. Pump/Motor

- a. Filtration system shall include a system-matched TEFC close-coupled bronze fitted pump/motor. The pump shall be rated for 150 psig maximum operating pressure and sized for the rated filter flow at 20 gpm/ft<sup>2</sup> at 50 ft. TDH. If sweeper jet nozzles are utilized on the filter discharge, the pump shall be sized at 70 ft. TDH to compensate for the additional pressure drop. The pump shall include a cast bronze body intake strainer with removable basket.

#### 8. Control Panel

- a. The control panel shall be UL listed.
- b. All electrical components shall be housed in a lockable NEMA 4X enclosure.



- c. A lockable main disconnect switch shall be mounted on the enclosure door.
  - d. The control panel shall include a differential pressure switch to automatically cycle the backwash.
  - e. Panel shall have pump motor overload protection.
  - f. Panel shall include step-down transformer.
  - g. Panel and pump motor shall be factory pre-wired for single point connection to power source.
9. Skid
- a. The filtration system shall be mounted on a C4 channel 304 stainless steel base.

10. Filter Media:

- a. Media shall be permanent type, rechargeable by backwashing at a flow rate no less than 15 gpm/ft<sup>2</sup> for two minutes. Filter manufacturer shall supply all required media. Media shall meet AWWA or NFS standards.
- b. The standard media pack shall rated to remove suspended particulate down to 10 microns. High efficiency media pack shall remove particulate down to 0.5 micron. Provide [**standard or high efficiency media pack**].