

BMF - STANDARD

SPEC 1: COOLING WATER FILTER

I. CONDENSER WATER FILTER

II. PROCESS WATER FILTER

A. GENERAL:

Contractor shall furnish and install a high efficiency media filtration system rated for (specifications and selections):

1. 5% of the HVAC system flow rate.
 2. 10% of the process water system flow rate.
 3. _____% of the system flow rate.
 4. System volume once per hour.
 5. Closed Loop system volume ÷ 360 = Filter flow rate.
- B. Filter system shall operate continuously to remove airborne contaminants from the cooling water until either a pressure drop across the filter is reached or 24 hours has elapsed. At either point filter will automatically backwash and returns to original filtration mode.
- C. Provide a complete system, filter, pump, valves and media as manufactured by PROCESS EFFICIENCY PRODUCTS, INC., or approved equal.
- D. Quality Assurance: Filter shall be capable of removing 90% of all particles ten-micron and larger with each pass through the media.
- E. Equipment – Product:
1. Unit to be a vessel with media, system matched pump with pre-filter and removable basket, and valves for flow control. Total system shall be on assembled (optional skid mounting), tested and adjusted at the manufacturer's plant prior to shipping. Backwash shall be automatic with a manual override.
 - a. Filter Vessel: Vessel to be manufactured of:
 - 1) ASTM-carbon-steel, all welded construction, with flanged inlet \ outlet, threaded drain and air release connections. Tank shall be rated for ____ PSIG operating pressure (ASME as option).
 - 2) Tank shall be cleaned of all rust and corrosion and provided with an epoxy interior lining and two coats of enamel paint on the exterior.
 - b. Vessel to be equipped with automatic air vent, manual air vent and pressure gauge.
 - c. Filter shall be provided with internal under-drain and over-drain piping assembly designed to equally distribute the water over filter media evenly. Material to be schedule 80 PVC.
 - 1) Optional, under-drain material to be .304 stainless.
 - d. System shall be designed/sized for a maximum flow rate of 20 gallons per square foot of filter media surface area.
 - e. Vessel to have top and side opening for ease of service.
 2. Filter Media:
 - a. Media to be permanent media, rechargeable by a backwash, at a minimum flow rate of 15 GPM per square foot of surface area. Filter manufacturer shall furnish filter media. Media to be AWWA approved or NSF.
 - 1) Media to be capable of removing particles of 10 micron and larger.
 - 2) Media to be capable of removing particles 5 micron and larger.

3. Filter Pump:
 - a. Filter pump shall be closed coupled, centrifugal type with open face impeller and mechanical seal. Pump shall be provided with a basket strainer with removable basket. Pump to be _____GPM at 50 TDH. Pump motors to be TEFC.
4. Unit Piping:
 - a. Face piping between filter unit components shall be _____.
 - 1) Schedule 80 PVC/UV stabilizer.
 - 2) Schedule 40 steel.
 - 3) Type L copper.
 Piping to be provided with service union or flange on connection to tank.
 - b. Valve system shall be designed to control flow through the filter. Butterfly valves shall be automatically actuated to provide for filter backwash. Actuator to be air operated to control valve.
 - 1) Optional electric operation.
 - c. The differential pressure switch shall control actuator and a 24-hour time clock located in the control panel.
5. Filter Unit Control Panel:
 - a. Filter unit shall be provided with a complete system. All control shall be mounted in a NEMA _____rated.
 - 1) NEMA3R watertight outdoors rated.
 - 2) NEMA4X watertight, FRP.
 - 3) Other.
 - b. Panel to contain the following:
 - 1) Filter systems electrical disconnect on door of panel.
 - 2) Step down transformer to convert main line power, 3 phase, to 110-volt control power.
 - 3) Program timer to control backwash cycle duration. A 24 hour backwash timer, pressure differential switch or manual override push button shall engage.
 - 4) A pressure differential switch, factory set to backwash filter.
 - 5) Overload and short circuit protection.
 - 6) Panel shall have single point connection to panel. Panel to be neatly wired and arranged to meet National Electric Code. Panel to be UL or E & L Stamped.

OPTIONS:

6. Total system to be skid mounted for ease of installation.
7. Control panel to have PLC to connect to BMS system.
8. Sweeper jet basin piping will be installed to follow the natural flow of the tower system. Isolation valves should be provided to permit maintenance of both tower and filter system. Drain lines should be sized based on full flow for backwash. A check valve should be installed in the suction piping to insure the pump will maintain prime. The return piping should be provided with sweeper jets to supply water at a 4 to 1 velocity and wash area underneath the fill. The filter manufacturer will provide the nozzles. A recommended design and

layout of suction and return piping shall be provided with manufacturer's submittal. All piping shall be Schedule 80 PVC.