

SECTION 22 11 23

DOMESTIC WATER PUMPS

PART 1 - GENERAL

1. DESCRIPTION

- A. Hot water recirculation pump and domestic water pressure booster system.

2. QUALITY ASSURANCE

- A. Domestic Water Pressure Booster System:
- B. Components shall be furnished by a single manufacturer and the system shall be the standard cataloged product of the manufacturer.
- C. Shop Test: Water booster unit and its component parts shall undergo a thorough electric and hydraulic operating test prior to shipment. Tests shall include a system operating flow test from zero to 100 percent of design flow rate under specified suction and system pressure conditions. Certified performance curves shall be furnished.

3. SUBMITTALS

- A. Submit in accordance with GENERAL CONDITIONS and SUPPLEMENTARY GENERAL CONDITIONS.
- B. Manufacturer's Literature and Data:
 - 1. Pump:
 - a. Manufacturer and model.
 - b. Operating speed.
 - c. Capacity.
 - d. Characteristic performance curves.

2. Motor:

- a. Power rating.
- b. Speed.
- c. Electrical Characteristics.
- d. Efficiency.

C. Associated trim, check valves, isolation valves, balancing valves,

D. Complete operating and maintenance manuals including wiring diagrams, technical data sheets and information for ordering replaceable parts:

4. DELIVERY, HANDLING AND STORAGE

A. Protect all products from damage, weather and contamination. Clean potable wetted surfaces of any contamination; protect all openings with plugs and caps.

PART 2 - PRODUCTS

1. INLINE HOT WATER RECIRCULATING PUMP

- A. Centrifugal in-line horizontal oil lubricated pump designed for quiet operation and 125 psi working pressure.
- B. Bronze body construction, furnished as scheduled and detailed on the drawings. Pump shall be non-overloading at any point on the pump curve.
- C. Pump controlled from on/off aquastat located at pump. In addition, the pump shall be provided with "on-off" switch for shut down. In the inlet and outlet piping of the pump shutoff valves shall be installed to permit service to the pump without draining the system. A check valve shall be installed in the pump discharge piping immediately downstream of the pump.

2. DOMESTIC WATER PRESSURE BOOSTER SYSTEM

- A. General: Provide a factory prefabricated, prewired and pretested multi-stage pumping system including variable speed drive motors, pressure regulating valves with integral check valves, pressure transducers, vibration pads, emergency switches, duplex flow switches, power and control panels, suction and discharge manifolds, gate valves, bypass loops with appropriate valves and check valves, low pressure cut off switches, hydro pneumatic tanks and accessories. All components shall be factory installed on a common structural steel skid and shall be completely tested in the factory before shipment. Provide compatible open-protocol type interface to building DDC control system (if building is equipped as such).
- B. System Operation and Controls:
1. System shall automatically maintain constant system pressure setpoint. The unit control panel will monitor system pressure and cycle the booster pump(s) in lead/lag fashion to maintain setpoint. The building DDC shall have full interface with the unit controller, including the reading of points and alarms and the adjustment of operating parameters (if equipped).
 2. Pumps shall be vertical multistage short-coupled industrial turbine pumps with variable speed drive motor, low pressure cutoff switches and bypass loops with ball, gate, check valves as indicated on the Contract Drawings.
- C. Pressure Regulating Valves: System pressure shall be maintained by pilot-operated, diaphragm type pressure regulating valves, rated at 300 psi minimum, one for each pump. Valves shall be piloted to control system pressure and to cause the valve to act as a non-slam check valve. Pilot shall be rated at 175 psi minimum.
- D. Hydro pneumatic Tank: Bladder type, hydro pneumatic, designed and constructed in accordance with requirements of the ASME Pressure Vessel Code and stamped with appropriate symbol. Tank shall include pre-pressurized, sealed-in air cushion which shall accommodate pressure increases expanded water volumes in the tank. Tank shall include

butyl rubber or poly-propylene liner in lower, or water side of chamber. Minimum working pressure of tank shall be 175 psi. Unit shall be designed and manufactured for domestic water applications. Insulate tank as specified. Check valve at hydro pneumatic tank shall include small orifice for undue loading.

E. Power and Control panel: Class "A" shadow box double NEMA 1 enclosure, UL labeled, bonderized double prime coated with baked enamel finish:

1. Fused disconnect switches with external operating handles.
2. Magnetic contactor for each motor with H.O.A. switch.
3. Thermal overload protection relay for each motor, three leg type.
4. Running light for each motor.
5. Power light for each motor.
6. Minimum run timers to prevent short cycle operation.
7. Control transformer, switch, circuit breaker, light.

F. Lead pump failure protection.

G. Motor and Starter: Maximum 40 degrees C ambient temperature rise, drip proof type motor, ball bearings, voltage and phase as shown in schedule on drawings, conforming to NEMA 250-Type 4

H. Instrumentation: All instrumentation shall be factory installed and shall include the following:

1. Pump pressure gage for each pump. 4-1/2 inch dial gages with shut-off cock.
2. System pressure gage.
3. Suction pressure gage.

- I. Factory Test: The booster system and its component parts shall undergo a complete operation flow test from zero to 100 % design flow rate under the specified suction and net system pressure conditions. The system certification shall include copies of the test and test data as performed in the factory prior to shipment. Performance test certifications should be placed inside the system control panel and two extra copies shall be provided with the installation manual.

PART 3 - EXECUTION

1. STARTUP AND TESTING

- A. Install unit with supports and vibration isolation as required. Furnish complete unit start-up report, including final adjustment settings to circuit balancing valves.
- B. System Test: After installation is completed provide an operational test of the completed system including flow rates, pressure compliance, alarms and all control functions.

2. DEMONSTRATION AND TRAINING

- A. Provide services of manufacturer's technical representative to instruct facility staff in operation and maintenance of units.

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