

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Close-coupled, in-line centrifugal pumps.
  - 2. Separately coupled, base-mounted, end-suction centrifugal pumps.
  - 3. Automatic condensate pumps units.

### 1.2 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Mechanical Seals: Mechanical seal(s) for each pump.

## PART 2 - PRODUCTS

### 2.1 CLOSE-COUPLED, IN-LINE CENTRIFUGAL PUMPS

- A. Pump volute shall be Class 30 cast iron, and impeller shall be cast bronze enclosed type, dynamically balanced, keyed to the shaft and secured by a locking capscrew. Impeller trim shall be no greater than 85% of the maximum impeller size for the pump.
- B. The liquid cavity shall be sealed off at the motor shaft by an internally flushed mechanical seal with ceramic seal seat of at least 98% alumina oxide content, and carbon seal ring, suitable for continuous operation at 225° F. A replaceable shaft sleeve of bronze alloy shall completely cover the wetted area under the seal.
- C. Pumps shall be rated for minimum of 175 psi working pressure. Casings shall have gauge ports at nozzles and vent and drain ports at top and bottom of casing.

### 2.2 SEPARATELY COUPLED, BASE-MOUNTED, END-SUCTION CENTRIFUGAL PUMPS

- A. Pump volute shall be Class 30 cast iron, and impeller shall be cast bronze enclosed type, dynamically balanced, keyed to the shaft and secured by a locking capscrew. Impeller trim shall be no greater than 85% of the maximum impeller size for the pump.
- B. The liquid cavity shall be sealed off at the motor shaft by an internally flushed mechanical seal with ceramic seal seat of at least 98% alumina oxide content, and carbon seal ring, suitable for continuous operation at 225° F. A replaceable shaft sleeve of bronze alloy shall completely cover the wetted area under the seal.
- C. Pumps shall be rated for minimum of 175 psi working pressure. Casings shall have gauge ports at nozzles and vent and drain ports at top and bottom of casing.
- D. Pump bearing housing assembly shall have heavy duty regreaseable ball bearings, replaceable without disturbing piping connections and have foot support at coupling end.
- E. Base plate shall be of structural steel or fabricated steel channel configuration fully enclosed at sides and ends, with securely welded cross members and fully open grouting

area. A flexible type coupler, capable of absorbing torsional vibration, shall be employed between the pump and motor, and shall be equipped with an OSHA approved coupling guard.

2.3 MANUFACTURERS:

1. Armstrong Pumps Inc.
2. Bell & Gossett; Div. of ITT Industries.
3. Peerless Pump Co.
4. Taco
5. Grundos
6. Or approved equal.

2.4 AUTOMATIC CONDENSATE PUMP UNITS

A. Manufacturers:

1. Aurora Pump; Division of Pentair Pump Group.
2. Beckett Corporation.
3. Flowserve Corporation; Div. of Ingersoll-Dresser Pumps.
4. Hartell Pumps Div.; Milton Roy Co.
5. Little Giant Pump Co.; Subsidiary of Tecumseh Products Co.
6. Grundos
7. Or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. As required by Engineer and manufacturer to maintain warranty.
- B. The manufacturer shall provide start-up. The service technician shall verify correct installation, verify pump systems mounting, verify piping installation, verify control wiring, verify power wiring, and check for proper operation. The service technician shall provide final adjustments to meet the specified performance requirements. Fully staffed parts and service personnel shall be within four hours travel from the jobsite

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train University's maintenance personnel to adjust, operate, and maintain hydronic pumps. Refer to Division 1.

**END OF SECTION**