

**SECTION 22 14 33**  
**PACKAGED, PEDESTAL DRAINAGE PUMP UNITS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Packaged pedestal drainage pump units.

**1.2 RELATED WORK**

- A. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.
- B. Section 22 05 12, GENERAL MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT.
- D. Section 26 29 11, MOTOR CONTROLLERS.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Pump:
    - a. Manufacturer and model.
    - b. Operating speed.
    - c. Capacity.
    - d. Characteristic performance curves.
  - 2. Motor:
    - a. Manufacturer, frame, and type.
    - b. Speed.
    - c. Current Characteristics and W (HP).
    - d. Efficiency.
- C. Certified copies of all the factory and construction site test data sheets and reports.
- D. Complete operating and maintenance manuals including wiring diagrams, technical data sheets and information for ordering replaceable parts:
  - 1. Include complete list which indicates all components of the system.

2. Include complete diagrams of the internal wiring for each item of equipment.
3. Diagrams shall have their terminals identified to facilitate installation, operation and maintenance.

#### **1.4 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. National Electrical Manufacturers Association (NEMA):  
  
ICS6-93 (R2006).....Industrial Control and Systems Enclosures  
  
250-2008.....Enclosures for Electrical Equipment (1000 Volts  
Maximum)
- C. Underwriters' Laboratories, Inc. (UL):  
  
508-99 (R2008)..... Standards For Industrial Control Equipment

### **PART 2 - PRODUCTS**

#### **2.1 PEDESTAL DRAINAGE PUMP**

- A. Centrifugal, vertical, designed for 60 degrees C (140 degrees F) maximum water temperature. Pump shall have a capacity as indicated on the Contract Drawings. Driver shall be electric motor. Provide perforated suction strainer. Systems may include one, two, or more pumps with alternator as required by the Contract Documents:
  1. Pump housings may be cast iron, bronze, aluminum or stainless steel. Cast iron housings for submersible pumps shall be epoxy coated.
- B. Impeller: Brass, bronze or cast iron.
- C. Shaft: Bronze, stainless steel or other approved corrosion-resisting metal.
- D. Bearings: As required to hold shaft alignment, anti-friction type for thrust permanently lubricated.
- E. Motor NEMA 4: Maximum 40 degrees C (104 degrees F) ambient temperature rise, drip proof , voltage and phase as shown in schedule on Electrical drawings conforming to NEMA 250-Type 4. Motor shall be non-overloading

over the entire pump curve. Refer to Section 22 05 12, GENERAL MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT.

- F. Starting Switch: Manually-operated, tumbler type, as specified in Section 26 29 11, MOTOR CONTROLLERS.
- G. Automatic Control and Level Alarm: Furnish a control panel in a Nema 1 enclosure for indoors or in a Nema 4X enclosure for outdoors. The controls shall be suitable for operation with the electrical characteristics listed on the Electrical drawings. The control panel shall have a level control system with switches to start and stop pumps automatically, and to activate a high water alarm. The level control system will include sensors in the sump that detect the level of the liquid. The sensors may be float type switches, ultrasonic level sensors, transducers, or other appropriate equipment. The high water alarm shall have a red beacon light at the control panel and a buzzer, horn, or bell. The alarm shall have a silencing switch. Provide auxiliary contacts for remote alarming to the Energy Control Center and BAC net compatible open-protocol type interface to DDC Controls System. The circuitry of the control panel shall include:
1. power switch to turn on/off the automatic control mechanism
  2. HOA switches to manually override automatic control mechanism
  3. run lights to indicate when pumps are powered up
  4. level status lights to indicate when water in sump has reached the predetermined on/off and alarm levels
  5. magnetic motor contactors
  6. disconnect/breaker for each pump
  7. automatic motor overload protection
- H. For a duplex system, provide an alternating relay to automatically alternate leadoff and standby duties of each pump of a duplex unit at the end of each pumping cycle. Standby pump shall start when water level in sump rises to a predetermined level that indicates excessive inflow or failure of the lead pump.
- I. Sensors that detect the level of water in the sump shall be so arranged as to allow the accumulation of enough volume of liquid below the normal

on level that the pump will run for a minimum cycle as recommended by pump manufacturer to prevent short cycling. Sensors shall be located to activate the alarm adequately before the water level rises to the inlet pipe.

- J. Provide two separate power supplies to the control panel, one for the control/alarm circuitry and one for power to the pump motors. Each power supply is to be fed from its own breaker so that if a pump overload trips a breaker, the alarm system will still function. Each power supply is to be wired in its own conduit.
- K. Wiring from the sump to the control panel shall have separate conduits for the pump power and for the sensor switches. All conduits are to be sealed at the basin and at the control panel to prevent the intrusion of moisture and of flammable and/or corrosive gases.
- L. Sump: Furnish fiberglass or high density polyethylene basin with gas tight covers. Covers shall have a manhole with a bolted cover of minimum size to inspect and service the pumps, vent connection, and openings for pumps and controls. Sump shall be sized to allow an adequate volume of water to accumulate for a minimum one minute cycle of pump operation.
- M. Provide a union, check and ball valve in the discharge of each pump.
- N. Removal/Disconnect System: A removal/disconnect system shall be provided where indicated on drawing. The system will consist of a discharge fitting mounted on vertical guide rails attached to the sump. The pump shall be fitted with an adapter fitting that easily connects to/disconnects from the discharge fitting as the pump is raised from or lowered into the sump. The discharge piping will connect to the discharge fitting so that it is not necessary to disconnect any piping in order to remove the pump. Where the sump depth is greater than five feet or other conditions exist to make the removal of the pump difficult or hazardous, the system shall include a rail guided quick disconnect apparatus to allow the pump to be pulled up out of the sump without workers entering the sump and without disconnecting the piping.

### **PART 3 - EXECUTION**

#### **3.1 STARTUP AND TESTING**

- A. Make tests as recommended by product manufacturer and listed standards and under actual or simulated operating conditions. Tests of the

various items of equipment shall be performed simultaneously with the system of which each item is an integral part.

B. Tests shall include system capacity and all control and alarm functions.

C. When any defects are detected, correct defects and repeat test.

### **3.2 DEMONSTRATION AND TRAINING**

A. Provide services of manufacturer's technical representative for four hours to instruct VA Personnel in operation and maintenance of units.

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