

SECTION 44 42 56.13
PROGRESSING CAVITY PUMPS

EQUIPMENT AND COMPONENT NUMBER(S)

PMP-8113: Digester 1 Sample Pump.

PMP-8213: Digester 2 Sample Pump.

PART 1 GENERAL

1.01 SUMMARY

- A. All equipment called for under this section shall be provided by a single manufacturer.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Bearing Manufacturers' Association (ABMA).
 - 2. Hydraulic Institute Standards (HIS).
 - 3. National Electrical Manufacturer's Association (NEMA): MG 1, Motors and Generators.

1.03 DEFINITIONS

- A. Terminology pertaining to pumping unit performance and construction shall conform to the ratings and nomenclature of the Hydraulic Institute Standards.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Make, model, weight, and horsepower of each equipment assembly.
 - b. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
 - c. Performance data curves showing head, capacity, horsepower demand, and pump efficiency over the entire operating range of the pump, from shutoff to maximum capacity. Indicate separately the differential pressure, capacity, horsepower demand, and overall efficiency required at the guarantee point.
 - d. Detailed mechanical drawings showing the equipment dimensions, size, and locations of connections and weights of associated equipment.

- e. Power and control wiring diagrams, including terminals and numbers.
- f. Complete motor nameplate data, as defined by NEMA, motor manufacturer, and including any motor modifications.
- g. Factory finish system.
- h. Anchorage and bracing drawings and cut sheets, as required by Section 01 88 15, Anchorage and Bracing.

B. Informational Submittals:

- 1. Anchorage and bracing calculations as required by Section 01 88 15, Anchorage and Bracing.
- 2. Factory Functional Test Reports.
- 3. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 67 00, Product Requirements.
- 4. Special shipping, storage and protection, and handling instructions.
- 5. Manufacturer's printed installation instructions.
- 6. Suggested spare parts list to maintain the equipment in service for a period of 1 year and 5 years. Include a list of special tools required for checking, testing, parts replacement, and maintenance with current price information.
- 7. List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.
- 8. Operation and Maintenance Data: As specified in Section 01 78 23, Operation and Maintenance Data.
- 9. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 43 33, Manufacturers' Field Services.

1.05 EXTRA MATERIALS

A. Furnish for each pump:

- 1. Complete set packing.
- 2. Complete set of bearings.
- 3. Complete set gaskets and O-ring seals.
- 4. Complete set rod washers.
- 5. Complete set keys, dowels, pins, etc.
- 6. One complete set of special tools required to dismantle pump.

PART 2 PRODUCTS

2.01 GENERAL

A. Physical Characteristics:

1. Provide a complete, coordinated, and fully functional operating system.
2. Coordinate pump requirements with motor manufacturer and be responsible for pump and motor requirements.
3. Pumps supplied under this section to be a standard product of manufacturer.

B. Functional Characteristics: None.

C. Performance Characteristics: None.

2.02 SUPPLEMENTS

A. Some specific requirements are attached to this section as supplements.

2.03 ACCESSORIES

A. Physical Characteristics:

1. Equipment Identification Plate: 16-gauge stainless steel with 1/4-inch die-stamped equipment tag number securely mounted in a readily visible location.
2. Lifting Lugs: Equipment weighing over 100 pounds.
3. Anchor Bolts: Type 316 stainless steel, sized by equipment manufacturer, 1/2-inch minimum diameter, and as specified in Section 05 50 00, Metal Fabrications.

B. Functional Characteristics: None.

C. Performance Characteristics: None.

2.04 FACTORY FINISHING

A. Physical Characteristics Prepare, prime, and finish coat in accordance with Section 09 90 00, Painting and Coating, System No. 4.

B. Functional Characteristics: None.

C. Performance Characteristics: None.

2.05 SOURCE QUALITY CONTROL

- A. Factory Tests and Adjustments: Test all equipment actually furnished.
- B. Factory Test Report: Include test data sheets.
- C. Functional Test: Perform manufacturer's standard test on equipment.
- D. Motor Test: See Section 26 20 00, Low-Voltage AC Induction Motors.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions.
- B. Level base by means of steel wedges (steel plates and steel shims). Wedge taper not greater than 1/4 inch per foot. Use double wedges to provide a level bearing surface for pump and driver base. Accomplish wedging so there is no change of level or springing of the baseplate when anchor bolts are tightened.
- C. After pump base has been set in position, and shimmed to the proper elevation, grout space between bottom of baseplate and concrete foundation with a poured, nonshrinking grout of the proper category, as specified in Section 03 62 00, Grouting. Remove wedges after grout is set and pack void with grout.
- D. Connect suction and discharge piping without imposing strain to pump flanges.
- E. Anchor Bolts: Accurately place using equipment templates and as specified in Section 05 50 00, Metal Fabrications.

3.02 FIELD FINISHING

- A. Touchup damaged areas in accordance with and as specified in Section 09 90 00, Painting and Coating.

3.03 FIELD TESTING AND FACILITY STARTUP

- A. Field Testing and Facility Startup shall be in accordance with the requirements of Section 01 91 14, Equipment Testing and Facility Startup.

- B. Facility startup specifies the order and prerequisites for the following tests of the equipment:
 - 1. Field functional testing.
 - 2. Software operational testing.
 - 3. Performance testing.
 - 4. Demonstration testing.
- C. All Field Testing and Facility Startup shall be performed using a qualified representative provided by the Manufacturer as specified in Section 01 91 14, Equipment Testing and Facility Startup, Section 01 43 33, Manufacturers' Field Services, and as elaborated upon in this section.

3.04 FIELD QUALITY CONTROL

- A. Functional Tests: Conduct on each pump.
 - 1. Alignment: Test complete assemblies for correct rotation, proper alignment and connection, and quiet operation.
 - 2. Measured by plant instrumentation and storage volumes.
 - 3. Operating Temperatures: Monitor bearing areas on pump and motor for abnormally high temperatures.
- B. Performance Test: In accordance with Hydraulic Institute Standards.

3.05 MANUFACTURER'S SERVICES

- A. Manufacturer's Representative: Present at Site or classroom designated by Contracting Officer for minimum person-days listed below, travel time excluded:
 - 1. 1/2 person-day for installation assistance and inspection.
 - 2. 1/2 person-day for functional and performance testing and completion of Manufacturer's Certificate of Proper Installation.
 - 3. 1/2 person-day for prestartup classroom or Site training.
 - 4. 1/2 person-day for facility startup.
 - 5. 1/2 person-day for post-startup training of Contracting Officer's personnel.
 - 6. Training shall not commence until an accepted detailed lesson plan for each training activity has been reviewed by the Contracting Officer. Provide training session in accordance with Section 01 79 00, Demonstration and Training.
- B. See Section 01 67 00, Product Requirements, for Certificate of Proper Installation, Certificate of Compliance, and other relevant requirements.
- C. See Section 01 91 14, Equipment Testing and Facility Startup.

3.06 SUPPLEMENT

A. The supplement listed below, following “End of Section,” is a part of this specification:

1. Digester 1 Sample Pump and Digester 2 Sample Pump Data Sheet.

END OF SECTION

**DIGESTER 1 SAMPLE PUMP AND DIGESTER 2
SAMPLE PUMP DATA SHEET**

Tag Numbers: PMP-8113 and PMP-8213

Pump Name: Digester 1 Sample Pump and Digester 2 Sample Pump

Manufacturer and Model Number: (1) Seepex, model BN 10-6L / A1-J0-L8-F0-GAM
(2) Or equal.

SERVICE CONDITIONS

Liquid Pumped (Material and Percent): Aerobic Digested Sludge 3% (max)

Pumping Temperature (Fahrenheit): Normal: 60 Max: _____ Min: _____

Specific Gravity at 60 Degrees F: _____ Viscosity Range: _____

pH: _____

Abrasive (Y/N): Y Possible Scale Buildup (Y/N): Y

Inlet Pressure at Pump (psig): Flooded (non-pressurized)

PERFORMANCE REQUIREMENTS

Rated Capacity: 25 US gpm at 5 psi differential pressure.

Range (US gpm): N/A

Max. Pump Speed (rpm): 210 Constant (Y/N): Y Adjustable (Y/N): N

Speed Range: _____ % to _____ % of Rated Speed
Constant Torque (Y/N): Y

PHYSICAL CHARACTERISTICS

Pump Body Material: Cast iron Drive Housing Material: Cast iron

Pump Stages: One

Connections:

Suction: Flanged: _____ Flange Type: _____ Open-Throat: _____ Screwed: X
Discharge: Flanged: _____ Flange Type: _____ Screwed: X

Stator Material: NBR Stator Thermal Protection (Y/N): N

Rotor Material: AISI 1045, ductile iron with chromium coating

Connecting Rod Material: AISI 316L Drive Shaft Material: AISI 316L

Joints: Gear Type Universal (Y/N): Pin Type Universal (Y/N): Y Other:

Joint Sleeve (Y/N): Y Material: NBR

Shaft Seal: Packing (Y/N): Material:

Lantern Ring (Y/N): Material:

Mechanical (Y/N): Y Type: Single Mechanical

Lubrication: Quench, Design 3, with refillable supply tank.

ABMA B-10 Bearing Life (hrs): Lubrication:

Coupling: Falk (Y/N): Fast (Y/N):
Gear Type (Y/N): Manufacturer Standard (Y/N):

Baseplate: Design: Frame Material: Painted steel

Drive Type: Direct-Coupled: Belt: Hydrostatic Adjustable Speed:
Close Coupled Gear Reducer: X Other:

DRIVE MOTOR (See Section 26 20 00, Low-Voltage AC Induction Motors)

Horsepower: 3 Voltage: 460 Phase: 3 Base Speed (rpm): 1,800

Service Factor: 1.15 Inverter Duty (Y/N) N

Motor nameplate horsepower shall not be exceeded at any head-capacity point on pump curve.

Enclosure: DIP EXP ODP TEFC X CISD-TEFC TENV
WPI WP2 SUBM

Drive Arrangement: In-Line: X Vertical "Z": Piggy Back:
Horizontal Offset: C-Face Mounted:

Nonreverse Ratchet (Y/N) : N

REMARKS: