MODEL 431

HORIZONTAL MOUNTED DIAGONALLY SPLIT CASE CENTRIFUGAL PUMPS

PART I - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish materials, equipment and labor to furnish, install and test the pumping system complete with the pumps, motors, mounting bases, piping, valves and appurtenances, as indicated on the contract drawings and as herein specified.

1.02 INSTALLATION

The Contractor shall insure that the pumps and motors are properly installed with no pipe strain transmitted to the pump casing.

1.03 RESPONSIBILITY

To assure a properly integrated and compatible system, all equipment described in this section shall be furnished by the Pump Manufacturer, who shall assume full responsibility for the proper operation of the pumps and associated equipment.

1.04 SUPERVISION

The Contractor shall arrange for the Pump Manufacturer to provide a factory-trained representative as required for the purposed of supervising installation, start-up, final field acceptance testing, and providing instruction to the owner's operating personnel in the proper operation and maintenance of the equipment in this section.

1.05 REFERENCE STANDARD

The work in this section is subject to the requirements of applicable portions of the following standards:

Hydraulic Institute Standards
IEEE Standards
NEMA Standards
OSHA Rules and Regulations

PART II - PRODUCTS

2.01 GENERAL DESCRIPTION

The pump shall be a two-stage centrifugal horizontal mounted diagonally split case pump, Aurora Pump Model 431 or pre-approved equal. Pre-approval must be obtained a minimum of ten days before bid date.

2.02 MATERIALS OF CONSTRUCTION

Casing	Cast Iron (ASTM A48)
Impeller	Bronze (ASTM B62)
Shaft	Carbon Steel (AISI C1045)
Shaft Sleeve	Bronze (ASTM B62)

Case Wear Ring ..... Bronze (ASTM B62)

2.03 CASING

The casing shall be of the horizontal split case design, with opposed internal cutwaters to balance hydraulic thrust loads. The suction and discharge flanges shall be on the same side of the casing, with the discharge outlet located to provide self-venting of the casing. The casing parting flange will be on a 45 degree angle to facilitate removal of the upper casing half. The casing shall have tapped and plugged holes for priming, vent and drain. Removal of the upper half of the casing must allow removal of the rotating element without disconnecting the suction or discharge piping. The lower half of the casing shall be furnished with cored passage ways from the high pressure area of the volute to each seal box for positive lubrication without the use of external flushing lines. The bearing arms shall be cast integrally with the lower half of the casing to assure positive bearing alignment. In no case will bolt on bearing arms be acceptable. Each bearing arm will provide a reservoir area for accumulation of weepage from the stuffing box, and a drilled and tapped opening will be provided at the lowest portion to allow piping by the Contractor to the nearest floor drain.

2.04 IMPELLERS

The impellers shall be designed to give the characteristics outlined under "Performance". They shall be of the enclosed type, cast in one piece. They shall be finished all over, the exterior being turned and the interior being finished smooth and cleaned of all burrs, trimmings and irregularities. The impeller will be dynamically balanced. They shall be held securely to the shaft by a key of ample size and shall be locked in place by threaded shaft sleeves.

2.05 SHAFT SLEEVES

The shaft sleeves shall extend from the hub of the impeller, through the seal box area, and beyond the gland. They shall be sealed at the impeller hub by a Buna O-ring to prevent pumped liquid from contacting the shaft. They shall be threaded to hold them securely in place, and designed so as to lock the impeller.

2.06 CASE WEARING RING

The pump casing shall be fitted with case wear rings to minimize abrasive and corrosive wear to the casing. The wear rings shall be of the radial type, shall have a shoulder machined around the circumference to match a machined shoulder in the casing to provide two sealing faces and to locate the rings in the casing. The rings shall be securely located from rotation by means of pins to the lower casing half. A spacer and spacer wear ring will be included between the impellers. The spacer wear ring will also be pinned to the lower casing half.

2.07 STUFFING BOX

A stuffing box shall be provided on each side of the pump casing, designed with sufficient area for incorporation of either packing rings or mechanical seals.

2.08 MECHANICAL SEALS

Each stuffing box shall be furnished with mechanical seals. All metal parts of the seal shall be 303 stainless steel, with "Buna-N" elastomers, Ni-Resist seat and carbon washer.

2.09 SEAL GLAND

Each stuffing box shall be furnished with a one-piece O-ring sealed gland to securely hold the mechanical seals in place.

2.10 SHAFT

The pump shaft shall be one-piece, finished and polished on all sections. The shaft shall be of ample strength and rigidity and the shortest practicable distance between bearings shall be used to keep deflection and vibration to a minimum. The maximum allowable deflection of the shaft is 0.002" at any point of operation the pump curve.

2.11 BEARINGS

The pumps shall be supplied with a single row inboard bearing primarily for radial loads and a double row outboard bearing primarily for thrust loads. Both bearings shall be regreaseable lubrication ball type, designed for 250,000 hours average life. Each bearing shall be mounted in a machined housing that is moisture and dust proof. The housing shall have registered fits to assure alignment, pinned to prevent rotation, and bolted to the bearing arms. Each housing shall be supplied with a grease fitting and a plugged relief port.

2.12 COUPLING

A flexible coupling shall be provided to connect the pump shaft to the motor shaft. The coupling shall be of an all metal type with a flexible rubber insert. The entire rotating coupling element shall be enclosed by a coupling guard.

2.13 BASEPLATE

The pump and motor shall be mounted on a groutable steel baseplate or steel driprim baseplate with integral drip channels incorporated on each side. Each channel shall include an NPT connection and plug. The base shall be sufficiently rigid to support the pump and motor without the use of additional supports or members.

2.14 MOTOR

The motor shall be horizontal and in accordance with the latest NEMA standards, and shall have the following characteristics:

Enclosure ..... Open Drip Proof
Number of Phases ..... Three
Cycles ..... 60 Hz
Voltage ..... 230/460 Volt
Speed ..... 1800 RPM
Horsepower ..... ? hp

Each motor shall have a sufficient horsepower rating to operate the pump at any point on the pump's head-capacity curve without overloading the nameplate horsepower rating of the motor, regardless of service factor. The motor shall have a service factor of 1.15. The service factor is reserve for variations in voltage and frequency.

PART III - PERFORMANCE

3.01 CONDITIONS OF SERVICE

The following conditions of service shall be strictly adhered to:

Number of Units ..... ?
Type of Drive ..... ? (variable or constant)
Discharge Size, minimum ..... 2 in
Suction Size, minimum ..... 4 in
Design Capacity ..... US gpm
Design Head ..... ft
Efficiency at Design, minimum ..... %
Rotative Speed, maximum ..... 1750 RPM
Shut-off Head, minimum ..... 254 ft
Driver Horsepower, minimum ..... 17.1 hp
NPSHR at Design, maximum ..... ft

3.02 INSPECTION AND FACTORY TESTS

Each centrifugal pump furnished under these specifications shall be tested at the factory to verify individual performance. Certified copies of all test reports shall be submitted to the Engineer for approval prior to shipment. Each unit shall be hydrostatically tested in accordance with the Hydraulic Institute Standards.

3.03 INSTALLATION AND ACCEPTANCE TESTS

A. The pumping units shall be installed in accordance with the instructions of the manufacturer and as shown on the drawings by the Contractor.

B. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations.

NOTES: Teflon is a registered trademark of E.I. DuPont.

Additional information is available from any Aurora Pump authorized distributor.

Aurora Pump reserves the right to make revisions to its products and their specifications without notice.