

SERIES 370  
TWO STAGE FRAME MOUNTED END SUCTION 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 purpose 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 frame-mounted end suction pump, Aurora Pump Model 374 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.....Cast Iron (ASTM A48)
- Shaft.....Steel (AISI C1045)

Case Wear Ring.....Bronze (ASTM B62)  
Shaft Sleeve.....Bronze (ASTM B62)  
Power Frame.....Cast Iron (ASTM A48)  
Stuffing Box Cover.....Cast Iron (ASTM A48)

### 2.03 CASING

The casing will be of the end suction hydraulic design, with a tangential NPT threaded discharge outlet. Internal passages with opposed cutwaters to balance hydraulic thrust loads shall transfer the pumped fluid from the first to the second stage. The casing will be fitted with a removable front cover to allow access to the second stage impeller and impeller fastener.

### 2.04 IMPELLERS

The impellers shall be of the enclosed type. 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 impellers shall be dynamically balanced. The impellers will be keyed to the shaft, and fastened with a washer, gasket and cap screw.

### 2.05 CASE WEARING RINGS

The pump casing and stuffing box cover shall each be fitted with a case wear ring to minimize abrasive and corrosive wear to the casing. An additional case wear ring shall be supplied between the impellers. The case wear ring shall be of the radial type, press fitted into the casing.

### 2.06 STUFFING BOX

The stuffing box shall be integrally cast with an NPT threaded suction inlet and mounting bracket. An adequate area for internal recirculation of the pumped fluid and a flush line from the pump casing to the stuffing box shall be provided. The stuffing box shall be designed to accept a seal cup without the use of a separate gland.

### 2.07 MECHANICAL SEAL

Shaft sealing shall be accomplished by means of a mechanical seal with a Ni-Resist seat, carbon washer, Buna-N elastomers and stainless steel metal parts.

### 2.08 SHAFT

The impellers shall be direct-coupled to the power frame shaft. The shaft shall be machined to provide an impeller keyway, and drilled and tapped to accept the impeller fastener. The shaft shall be one-piece. Stub shafts are not acceptable. The outboard shaft extension shall be machined with a keyway to accept a coupling to the driving unit. Water slingers shall be furnished on both the inboard and outboard shaft extension.

### 2.09 SHAFT SLEEVE

The pump shaft shall be fitted with a shaft sleeve to minimize shaft wear. The sleeve shall be sealed to the impeller hub by an O-ring, and shall be positively driven by a pin to the keyway. The use of adhesive compounds to fasten the sleeve to the shaft shall not be accepted.

2.10 POWER FRAME

The power frame shall house a single-row inboard radial bearing and double-row outboard thrust bearing. All bearings shall be regreaseable ball type furnished with conveniently located grease fittings. Both bearings shall be selected for a 2 year minimum life at maximum load. The outboard bearing shall be locked in place by a retaining ring. The inboard bearing shall not be locked in order to accommodate thermal expansion of the shaft. A bearing cartridge end cap shall be provided on the outboard side of a power frame to allow inspection and replacement of the thrust bearing without the need for disassembling the power frame housing.

2.11 FOOT SUPPORTS

The pump unit shall be supported from beneath the mounting bracket and the power frame by separately cast mounting feet.

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 the motor shall be mounted on a groutable formed steel baseplate or a steel driprim baseplate with integral drip channels incorporated on each side. Each channel shall include a NPT drain connection and plug. The base shall be sufficiently rigid to support the pump and the 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/TEFC/X-Proof
Number of Phases.....	Three
Cycles.....	60 Hz
Voltage.....	230/460 Volt
Speed.....	3600 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.....1.5 in, minimum  
Suction Size.....3 in, minimum  
Design Capacity..... US gpm  
Design Head..... ft  
Efficiency at Design..... %, minimum  
Rotative Speed.....3500 RPM, maximum  
Shut-off Head.....721 ft, minimum  
Driver Horsepower.....50.6 hp, minimum  
NPSHR at Design..... ft, maximum

#### 3.02 INSPECTION AND FACTORY TESTS

Each centrifugal pump furnished under these specifications shall be tested at the factory to verify individual performance (VIP). 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.