

# HORIZONTAL, CLOSE COUPLED, 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 STANDARDS

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 centrifugal horizontal close-coupled end suction pump, Cornell Pump Company, Model (*enter Model Number Here*) 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, class 30)  
Impeller.....Bronze (SAE 40, ASTM B584, C83600)  
Shaft.....Steel (AISI C1045)  
Case Wear Ring.....Bronze (ASTM B144-3B, C93200)  
Shaft Sleeve.....Bronze (ASTM B144-3B, C93200)

### 2.03 CASING

The casing will be of the end suction design with tangential discharge outlet. For connection diameters of 2" or less, the suction and discharge connections shall be NPT threaded. For connection diameters of 2.5" or greater, the suction and discharge shall be a flat-faced flange connections. Flange connections shall be ANSI 125# rated. The casing shall have tapped and plugged holes for priming and draining. The casing bore shall be large enough to allow "back pullout" of the impeller without disturbing the casing or suction and discharge piping, except for Models 5WB,4YB,5YB. The casing shall be supported by the driving unit.

### 2.04 IMPELLER

The impeller shall be of the enclosed type, cast in one piece. It 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 shall be statically balanced. The impeller will be keyed to the shaft, and fastened with a washer, gasket and cap screw.

### 2.05 CASE WEARING RING

The pump casing shall be fitted with a casing wear ring to minimize abrasive and corrosive wear to the casing. The case wear ring shall be of the radial type, press fitted into the casing, made of the material required in para.2.02

### 2.06 STUFFING BOX

The stuffing box shall be integrally cast with a mounting bracket, and shall provide an adequate area for internal recirculation of the pumped fluid around the sealing medium.

## 2.07 BALANCE LINE

An external hydraulic balance line extending from the backplate to the pump suction shall be included on pumps 2.5" discharge and larger, to provide a reduced stuffing box pressure, reduce abrasion wear at the shaft sleeve, and to prolong seal life.

## 2.08 MECHANICAL SEAL

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

## 2.09 SHAFT

The impeller shall be direct-coupled to the motor shaft. The motor shaft shall be machined to provide a keyway, and drilled and tapped to accept the impeller fastener. Stub shafts are not acceptable.

## 2.10 SHAFT SLEEVE

The pump shaft shall be fitted with a shaft sleeve to minimize shaft wear. **The sleeve shall be sealed a shrink fit to the shaft** (check). The use of adhesive compounds to fasten the sleeve to the shaft shall not be accepted. The sleeve material shall be as specified in Para 2.02

## 2.11 MOTOR

The motor shall be designed and built 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.  
Voltages.....\_\_\_\_ Volt  
Speed.....\_\_\_\_ RPM

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 at least 1.15. The service factor is reserved 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..... in, minimum  
Suction Size..... in, minimum  
Design Capacity..... US gpm  
Design Head..... ft  
Efficiency at Design..... %, minimum  
Speed..... RPM, maximum  
Shut-off Head..... ft, minimum  
Drive Horsepower..... 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 performance. Certified copies of all test reports shall be submitted to the Engineer for approval prior to shipment.

### 3.03 INSTALLATION AND ACCEPTANCE TESTS

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

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