

Cornell Vertical Frame Mounted Solids Handling Pumps

Furnish and install (1) end suction centrifugal pumps. The pumps shall be designed for continuous operating service and constructed as follows to meet the intended service. Pumps shall be as manufactured by CORNELL PUMP COMPANY of Portland, Oregon, USA and shall be warranted for a period of two full years after start up, not to exceed 30 months after shipment.

Pumps shall be Model Number _____ - Vertical Mount

Design Capacity	_____	Pumpage Temp	_____ Deg f
Design Total Head	_____ Ft	Max. NPSHR @ Design Pt.	_____ Ft
Min. Shut Off Head	_____ Ft		
Maximum Speed	_____ RPM		
Min. Efficiency Design Point	_____ %		
Discharge Size	_____ "		

The vertical frame mounted end suction centrifugal pump shall be coupled to the motor by a flexible coupling as Manufactured by _____. The keyed straight bore impeller shall be mounted directly to the pump shaft.

The bearing frame shall be constructed of close grained ASTM A48 cast iron. Bearings shall be ball or roller type sufficient to withstand radial and axial loads and result in a L-10 Bearing life of _____ hours. Bearing lubrication shall be **grease/oil (select one)** with fittings provided to facilitate lubrication.

The pump and bearing frame shall be connected by an ASTM A48 Class 30 fine grain Grey Iron bracket with machined registers to assure proper alignment.

The pump casing shall be **tangential/centerline discharge (select one)** of back pullout design allowing for removal of rotating element without disturbing piping connections. The casing shall be constructed of fine grain Cast Iron of ASTM A48 Class 30. All casing sections shall have heavy wall thickness to provide long life under abrasive and corrosive operating conditions. All mating surfaces shall have register fits to ensure proper alignment. Piping connections shall be ANSI 125# flat face drilled flange. Flange face surface finish shall be a minimum of 250 micro-inch finish.

Replaceable wear rings shall be provided. The wear rings shall be of the peripheral design requiring no axial adjustment. One ring shall be press fit into the suction cover and the opposite ring shall be pressed onto the impeller. The wear rings shall be constructed of AISI 420 Stainless Steel, Heat Treated to 350-500 BHN, with a minimum of 50BHN difference to prevent galling.

The impeller shall be of heavy section Cast Iron ASTM A48, Class 30 with the two, three or four **(choose)**-port design. Impellers shall be capable of passing a 3" or larger soft solid. Impellers will have back vanes to reduce axial thrust and lower the stuffing box pressure. Internal vane edges

shall be well rounded to present smooth flow. Impeller shall have a straight non-tapered bore, be statically balanced, keyed to the shaft and further secured with a Stainless Steel washer and a Stainless Steel impeller lockscrew. The impeller shall be fixed at location with no expected or required adjustment.

A Cornell Cycloseal backplate with deflector vanes constructed of ASTM A48 Class 30 Grey Iron shall be provided, including a single John Crane mechanical seal, tungsten carbide vs silicon carbide). The design shall allow for continuous operation without the need for external flush water or venting.

(** Cycloseal is a Registered Trademark of Cornell Pump Company **)

(** Patent Number 5,489,187 **)

Optional

The shaft shall be of high strength Alloy Steel. The shaft shall be accurately machined and polished and of sufficient size to transmit full driver output without excessive flexure or stressing. The shaft shall have a minimum diameter of _____ inches under the sleeve. All steps in the shaft shall be radiused to reduce stress concentrations. Shaft deflection shall not exceed 0.005 inch measured at end of shaft when operating at specified design condition. A complete shaft stress analysis calculation shall be supplied by the pump manufacturer to illustrate conformance with this requirement.

The shaft shall be protected by a renewable shaft sleeve which extends through the stuffing box and under the gland. The sleeve shall be grooved on the inside for an o-ring to prevent leakage along the shaft and shall be positively locked to prevent rotation. The sleeve O.D. shall be a minimum of 0.375 inches wider than the shaft and constructed of 420 S.S H.T. min 400 BHN.

Suction elbows shall be of one piece cast iron, heavy section, construction, with a bolted and contoured clean out plug. The base shall be constructed with sufficient strength to support the entire weight of the unit, and of sufficient height so that no part of the elbow will touch the floor.

The motor shall be of United States manufacture, vertical mount, induction type with rodent screens on all ventilating passages. It shall be not less than ____ HP at ____ rpm, **open drip proof/TEFC (select one)** and non-overloading exclusive of the service factor at any point on the pump head capacity curve. Motor supply power is _____ volt, 60 hertz, 3 phase. The motor bearings shall be selected to withstand thrust loads and have a minimum B-10 life of 50,000 hours. The motors shall be equipped with grease fittings and automatic grease reliefs.