Hydroflo Pumps USA, Inc.
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Deep Well Pump Installation

Specifications: Vertical Turbine Pump, Product Lubricated

A. Scope

This specification is for a deep well lineshaft pump with an above ground discharge, manufactured for water lubrication of the lineshaft bearings by the water being pumped and furnished with a specified driver and accessories. The pumping unit shall be designed and manufactured in accordance with the latest hydraulic institute and AWWA specifications for lineshaft turbine pumps.

B. Service Conditions

The pumps shall be designed and built to operate satisfactorily with a reasonable service life, when installed in a proper turbine pump application. The product shall be manufactured by Hydroflo Pumps USA, Inc. or other manufacturers that can meet the required material standards and performance specifications.

C. Operating Conditions

Design conditions:	_____	gallons per minute
Design head:	_____	feet TDH (total dynamic head)
Minimum pump eff:	_____	Percent
Maximum Pump speed:	_____	RPM
Liquid pumped:	Water	
Pump Bowl setting:	_____	Feet
Well diameter I.D.	_____	Inches

D. Pump Construction

1. Bowl assembly: the intermediate bowls, discharge cases and suction bowls shall be flanged type constructed from close grain cast iron, and shall conform to ASTM A48, class 30. They shall be free from sand holes, blow holes or other faults and must be accurately machined and fitted to close tolerances. The intermediate bowls shall have glass lined enamel or epoxy enamel coated waterways for maximum efficiency. All threaded discharge cases shall be threaded to an 8 TPI butt standard for product lubricated column assembly. All assembly bolting shall be stainless steel.

2. Impellers: the impellers shall be investment cast 201 stainless steel ASTM A296 and shall be enclosed type. They shall be free from defects and must be investment cast, machined, backfiled and balanced for optimum efficiency and performance. They shall be securely fastened to the bowl shaft with stainless steel taper locks, C1045 steel will not be accepted. The impellers shall be adjustable by means of a top shaft adjusting nut or adjustable solid shaft coupling.

3. Bowl shaft shall be constructed from PSQ 416 stainless steel, ASTM A582 pump shaft material. It shall be precision machined and straightened within .002 - .004 tolerance.

E. Discharge Head Assembly – Water Lubricated

1. Discharge head shall be of the high profile type and have a suitable motor base. It shall be constructed of high grade ductile iron, ASTM A536, class 65 or fabricated steel. The head shall have a _____ size discharge flange, ASTM 125 lb., suitable for the capacity of water being pumped. The head shall allow the top shaft to couple above the stuffing box. The head shall be threaded to accept the desired column pipe in this specification.

2. The stuffing box shall be ductile iron and shall contain a minimum of five rings of John Crane 1345 packing. It shall have an available fitting for pressure relief if needed. The packing gland shall be stainless steel and secured in place by stainless steel studs and nuts. The packing box bearing shall be Hydroflo FEP (Flow Engineered Polymer). A rubber slinger shall be provided to operate on the top shaft, above the packing gland.

F. Column Assembly – Water lubricated

1. Intermediate column lengths and lineshaft bearing spacing shall not exceed 10 feet with pump speeds up to 2200rpm. Pump speeds between 2200rpm and 3600rpm shall have column and bearing spacing no greater than 5 feet.

2. Column pipe shall be a minimum grade B steel pipe with ends machined with 8 TPI butt thread and faced. Pipe shall be connected with threaded sleeve type ductile iron couplings and accept ¼" ring spider bearing retainers.

3. Spiders shall be 304 stainless steel and furnished for shaft stabilization at each column pipe coupling. A rubber fluted bearing, retained with a shoulder at each end, shall be installed in each spider below the static water level. A Hydroflo FEP bearing will be installed in each spider above the static water level.

4. Lineshaft shall be 416 stainless steel and sized according to the horsepower requirements of the designed pump. The butting faces shall be machined square to the axis of the shaft, with the maximum permissible axial misalignment on the thread axis with the shaft axis .002" in 6". These shafts shall be coupled with 416 stainless steel lineshaft couplings.

G. Suction Strainer

A suitable size cone strainer of 304 stainless steel shall be provided and threaded into the pump suction case.

H. Electric Motor

The motor shall be a heavy duty squirrel cage induction type, NEMA MG-1 PART 31 rated for VFD, _____RPM, vertical hollowshaft motor shaft motor, with a non-reverse ratchet to prevent reverse rotation. A suitable thrust bearing shall be required to meet the designed pump's hydraulic thrust load plus the weight of the rotating parts under the operating conditions. The motor shall be premium efficiency with a WP-1 enclosure, 120V space heater a 1.15 service factor and match the required voltage and phase at 60HZ.