
Submersible Turbine Pumps Specifications 200.F.04

A. Scope

This specification covers a deep well submersible turbine pump with above ground discharge and furnished with suitable driver and accessories as specified herein. The pumping unit shall be designed and furnished in accordance with the latest Hydraulic Institute and AWWA Standard for submersible turbine pumps.

B. Service Conditions

The pump shall be designed and constructed to operate satisfactorily with a reasonable service life, when installed in a dependable and adequate water resource location. The pump shall be the product of, and manufactured by Goulds Water Technology. Other manufacturers will be considered providing the unit offered is an approved equal in all respects to the brand and model preferred by the customer. Factory pump performance curves for alternate pumps shall be submitted with the bid.

C. Operating Conditions

Design conditions: _____ Gallons per minute
Design head: _____ Feet total dynamic head (TDH)
Minimum pump efficiency of: _____ Percent
Maximum allowable speed: _____ RPM
Pump bowl setting: _____ Feet
Well diameter I.D.: _____ Inches

D. Pump Construction

- 1. Bowl assembly:** The bowls shall be flanged type constructed of close grained cast iron conform to ASTM A48, class 30. They shall be free from sand holes, blowholes, or other faults and must be accurately machined and fitted to close tolerances. They shall be capable of withstanding a hydrostatic pressure equal to twice the pressure at rated flow or 1.5 times shut-off head, which ever is greater. The intermediate bowls shall have enamel or epoxy lined waterways for maximum efficiency and wear protection. All intermediate bowls shall be of identical design for interchangeability. All the bowls shall be fitted with sleeve type bearings of bronze alloy C89835. A discharge bowl shall be used to connect bowl assembly to the discharge pipe. An extra long bronze bearing packed with non-soluble grease shall be provided in the top bowl and extended into the discharge bowl. The bearing shall have a threaded cast iron cap or plug at the top to protect the bearing from abrasives. The hub of the discharge bowl should be such that the bearing can be easily removed through the top of the hub. A thrust ring shall be above the top impeller to prevent excessive vertical upthrust.
- 2. Impellers:** The impellers shall be constructed from ASTM B584 Silicon Bronze and shall be the enclosed type. They shall be free from defects and must be accurately cast, machined, balanced, and filed for optimum performance and minimum vibration. Impellers shall be balanced to grade G6.3 of ISO 1940 as minimum. They shall be securely fastened to the bowl shaft with taper locks of C1018.

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- 3. Motor Adapter:** The inlet motor adapter shall be of ASTM A536 Gr. 60-40-18 ductile iron and shall contain an extra long bronze bearing. The inlet area shall have a net open area of at least four times the eye of the impeller and shall be protected with a 304 stainless steel screen. The openings on the screen shall not be more than 75% of the minimum opening of the water passage through the bowl or the impeller.
- 4. Shaft:** The pump shaft shall be of ASTM 582 type 416 stainless steel. It shall be precision ground and polished with surface finish better than 40 RMS.
- 5. Coupling:** The shaft coupling shall be of stainless steel and be capable of transmitting the total torque and total thrust of the bowl assembly in either direction of rotation.

E. Discharge Pipe

The discharge pipe shall be ASTM A53 grade B standard weight steel pipe, in — feet (or random) lengths and connected by threaded sleeve type steel coupling. The ends of the pipes shall have ANSI B1.20.1 standard tapered pipe threads. Inside diameter of the pipe shall be such that the head losses shall not be over 5 feet per 100 feet of pipe.

F. Submersible Cable

Pump cable shall be sized to limit the voltage drop to no more than 5%. The cable shall have three separate conductors and a ground and shall be included in a single continuous jacketed assembly. The insulation shall be water and oil resistant, and suitable for continuous immersion. The cable should be the length of the discharge pipe plus — feet to extend from the surface plate to the electrical controller. The cable should be adequately secured to the discharge pipe by plastic ties, or other non metallic means, at 10 foot intervals.

G. Surface Plate

The surface plate shall be of fabricated steel. The plate shall incorporate a long radius elbow welded securely to a ANSI Class 150 — " flange and shall rigidly support the total weight of the motor, bowl assembly, discharge pipe, cable, and column of water. The plate shall have a cable seal of adequate size to accommodate the cable size and well vent and water level indicator.

H. Submersible Electric Motor

The motor shall be a heavy duty canned (or wet wound) type of NEMA design — RPM, with outside diameter not to exceed — inches. The motor shall be capable of continuous operation under water at the specified conditions outlined above. A suitable thrust bearing shall be incorporated in the lower end of the motor adequate to receive the entire hydraulic thrust load of the pump unit plus the weight of the rotating parts regardless of the direction of rotation. The motor shall have a 1.15 service factor, and suitable for use on — volt, three phase, 60 Hz electric service.

The motor leads shall be of sufficient length so that they may be spliced above the bowl assembly and the leads shall be protected by a type 304 stainless steel cable guard held in place with stainless steel banding. As the motor lead exit the top of the cable guard it shall be properly protected to prevent damaging or cutting the lead by the cable guard material.

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