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## **PUMP REQUIREMENTS**

Supply (qty) \_\_\_\_\_, 2 inch discharge electric submersible pump(s). The pump shall be driven by a close coupled \_\_\_\_\_ HP, submersible electric motor with a nominal rating of \_\_\_\_\_ volts, \_\_\_\_\_ phase, 60 HZ, \_\_\_\_\_ RPM

The pump shall be capable of delivering \_\_\_\_\_ US GPM flow at \_\_\_\_\_ FT TDH. The pump shutoff head shall be at least \_\_\_\_\_ FT TDH. The pump shall be capable of a maximum submergence depth of 65 ft.

## **DESIGN AND CONSTRUCTION**

All pump parts in contact with the liquid shall be designed and constructed in all 304SS or Cast Iron metal with BUNA-N seals and gaskets.

### **Impeller**

The pump shall be supplied with a dynamically balanced impeller made of cast Cast Iron.

The impeller shall be affixed to the motor rotor shaft on: (choose one)

1 phase motor pumps by screwed on machined threads in the impeller bore and the shaft; or

3 phase motor pumps by placing the impeller onto the shaft, locating it into place with an impeller drive key, and locking it to the shaft with an impeller lock washer and nut screwed onto machined threads at the end of the motor shaft.

### **Volute/Suction Plate**

The volute casing design shall be concentric with multiple cutwaters, to reduce radial loads. The suction cover shall be cast integrally with the volute. The volute/suction cover shall be constructed from Cast Iron.

### **Top Discharge**

The pump design and construction shall have a top discharge, with a 304SS NPT connection. Pumped liquid shall pass through the pump housing and around the motor housing. This design will function as a cooling jacket allowing the pumped liquid to cool the motor and to permit pumping down to a liquid level of 2.25 inches without overheating the motor.

### **Seals**

The pump shall be supplied with double mechanical seal design that has two independent mechanical seals designed to prevent fluid from entering the motor housing. The lower seal faces shall be made of silicon carbide vs. silicon carbide. The upper seal faces shall be carbon vs. ceramic. The seal elastomers shall be made of BUNA-N. The seals shall be held in contact by a common spring between the lower and upper seals.



The pump seals shall be isolated from the pumped liquid by a lip seal constructed from BUNA-N rubber in an oil filled seal chamber.

The two mechanical shaft seals shall be cooled and lubricated by an ISO32- food grade NSF approved, non-toxic mineral oil, in a seal chamber separate from the volute and motor pump housing.

### **Motor**

For 3 phase pumps, the motor shall be a NEMA design B induction air filled motor designed for submersible pump usage and rated for continuous duty of pumped liquid up to 104 °F.

For 1 phase pumps, the motor shall be a NEMA design L induction air filled motor designed for submersible pump usage and rated for continuous duty of pumped liquid up to 104 °F.

The stator windings and leads shall be insulated with moisture resistant Class F insulation rated for 311 °F.

The motor horsepower shall be non-overloading over the full range of the performance curve, from shut-off to full-flow. The combined service factor (frequency, voltage and liquid specific gravity) of the motor shall be 1.10.

The motor shall be protected from failure from overheating and from low voltage or high amperage by a separate thermal overload switch installed in the pump top cover.

The 3 phase motor design is capable of a VFD turn down ratio that will allow a frequency operation range from 60Hz to 50Hz. 1 phase motors are not suitable for VFD operation.

The motor housing shall be constructed of corrosive resistant 304SS.

The motor cover shall be constructed of 304SS and have a threaded fitting to permit air pressure testing of the motor cover and power cord entry seal.

### **Rotor / Pump Shaft**

The rotor (pump) shaft shall be constructed of corrosive resistant 304SS and be of sufficient diameter to handle all radial loads over the full range of the pump's performance curve.

Rotor shall be made of steel with cast aluminum insulation and shall be dynamically balanced.

### **Bearings**

The upper and lower bearings shall be prelubricated single row, deep groove design to provide optimal axial and radial support.

The upper and lower bearings shall be permanently sealed and shall be lubricated by Chevron SRI high temperature grease.



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**Power Cable**

The pump shall be supplied with a 50 foot power cable (alternative lengths optional) connected to the motor lead wires in a water and oil resistant sealed epoxy potting. The power cable shall be sized in accordance with NEC standards. The outer jacket of the power cable shall be oil resistant PVC and capable of submergence in water up to 104° F.

Optional: (delete above and insert): The pump shall be supplied with a \_\_\_\_\_ foot power cable.

The power cable shall be protected by a strain relief, attached to the motor cover. The strain relief will be sized to absorb the load and prevent the power cable leads from being separated from their connection to the motor lead wires, if the power cable is pulled, as in the act of attempting to lift the pump by the cable.

The power cable entry shall have a dual sealing system. The first seal will be comprised of a compression squeezed sealing gland made from BUNA-N rubber in a cast 304SS gland housing, attached to the pump cover. The power leads will have a second, independent seal comprised of a high temperature dielectric potting compound.

**Supporting the Pump**

The pump shall be mounted on a strainer constructed of 304SS.

The pump shall be fitted with a 304SS handle, attached by screws into the pump cover.

**TESTING**

The pump shall undergo the following tests, which shall be recorded and certified.

- Leak Check (Motor & Seal Chambers)
- Noise
- Vibration
- Winding: phase angle and impedance tests
- Insulation to ground

A copy of the test record tag shall be attached to the pump when delivered to the customer or job site.

**OVERALL**

The pump shall be a BJM Pumps® R series model \_\_\_\_\_.

The pump shall be \_\_\_\_\_ inches in height; \_\_\_\_\_ inches in diameter and shall weigh \_\_\_\_\_ lbs.

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