



## Calamba Water District

Lakeview Subdivision, Halang, Calamba, Laguna  
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### SCOPE:

1. The Submersible pump and motor shall be designed for continuous submerged operation.
2. The pump shall be driven by a motor attached below the pump section.

### SUBMERSIBLE PUMP AND MOTOR SYSTEM CAPACITY:

DRIVEN BY THE FOLLOWING MOTOR	QUANTITY	TOTAL DYNAMIC HEAD-meters	DISCHARGE CAPACITY m <sup>3</sup> /hr.
40Hp, 230v, 3Ø	3-sets	120	68
40Hp, 230v, 3Ø	1-set	120	79
30Hp, 230v, 3Ø	1-set	120	58

### PUMP DESIGN:

1. There shall be a check valve integrally designed into the pump discharge housing.
2. The pump shall have integrated protection against up thrust load
3. The pumping down thrust shall be absorbed by the motor trust bearing.
4. Each impeller shall be fitted with a seal ring around its eye or skirt to prevent hydraulic losses.
5. A filter screen shall be included as part of the suction inlet assembly.
6. The pump shall be radial design and includes prime screw(s), fastened on the pump shaft.
7. 6" diameter pumps with LSR bearing can handle a maximum content of sand of 150 g/m<sup>3</sup>.

### PUMP MATERIALS OF CONSTRUCTION:

1. The pump bowl construction is made of stainless steel with built-in check valve.
2. The shaft and coupling shall be made of 300 to 400 stainless steel.
3. The intermediate and top bearings shall be Nitrile Rubber (NBR).

#### **MOTOR DESIGN:**

1. The motor shall be squirrel-Cage induction motor designed for continuous underwater operation in conformance to NEMA standards.
2. The motor shall have thrust bearing capable of carrying the maximum pump thrust loads.
3. The motor shall be water filled for cooling and lubrication. No oils or grease lubricants shall be used.
4. A flexible diaphragm shall be provided to permit expansion and contraction of the internal motor fluid when the motor heats and cools during operation.
5. A shaft seal shall be provided to ensure the internal motor fluids is not mixed with the pumped fluid.

#### **MOTOR MATERIALS OF CONSTRUCTION:**

1. The motor diaphragm shall be Nitrile Rubber or Type 100 Hydrin.
2. The shaft seal shall be a Nitrile Rubber or Type 100 Hydrin.
3. The motor shaft shall be of 300 Series stainless steel.

#### **ELECTRICAL OPERATION:**

1. The motor shall be rated for 230/440 volts, 1/3 phase, 60Hz., 1.15 S.F., NEMA standard, water lubricated, as follows.

#### **BASIC FEATURES:**

1. Full 3450 rpm, 6Hz design point
2. Maximum temperature winding wire Nema class 200
3. Double flange design
4. Stainless Steel splined shaft
5. Hermetically-seal stator
6. Resin encapsulated windings
7. Stainless steel shell
8. Epoxy coated end frames
9. Filter check valve
10. Kingsbury-type water-lubricated trust bearing
11. Pressure-equalizing diaphragm
12. 3-lead & 6 lead (wye-delta) configuration
13. Pre-filled with temperature-resistant fill solution
14. Sand fighting slinger
15. Copper bar rotor
16. Carbon ceramic rotating face seal.

## **TESTING METHOD AND EQUIPMENT:**

### **Delivery Acceptance and unpacking.**

1. The pump and motor must be delivered and shipped with complete documents and there has been no damaged in transportation.
2. The pump and motor shall be delivered in crates, boxes and with wrappings for any accessories or spare parts that packed separately with the equipment or attached to side walls of boxes or equipment.
3. The pump and motor shall have labels and rating plates of non-corrodible metal, be surely screwed or riveted to each pump and motor ( serial number, manufacturer, origin, head, discharge, speed, power, voltage, current, PF and frequency etc. ) including all information from ISO.

### **The deliverables shall include the following documents:**

- a. Original characteristic curves showing flow, head, power consumption, pump efficiency, operation range and NPSH (A photocopy of the curves shall not be accepted and the offer will be rejected.)
  - b. Installation, operation and maintenance instructions, workshop manuals and two copies each, Relevant standards used in the material, production and testing Certificate of testing according to ISO 2548 class-Appendix B. complete offer has to be submitted containing the following technical documents.
  - c. The attached detail sheet must be completely filled to every item (all materials of the submersible pump and motor parts have to be specified.)
  - d. The original characteristic curves have to be clearly marked at the duty point (specified in the bill of quantities) showing flow, head, power consumption, efficiency (motor and pump), operation range and NPSH. Incomplete offers will be rejected.
  - e. The supplier has to provide recent quality management certificate ISO 9001.
4. The pump set has to be tested over the complete performance range according to the ISO 2548 specifications, testing certificates for the pump set including country of origin and year of manufacture (not exceeding more than one year) must be provided upon delivery.