

CAST IRON HBM SUBMERSIBLE BASIN MIXERS

GENERAL

Contractor shall furnish all labor, materials, equipment and incidentals required to provide _____ (Qty.) submersible basin mixer(s) as specified herein.

OPERATING CONDITIONS

Each pump shall be rated _____ HP, _____ volts, 3 phase, 60 hertz, and _____ R.P.M.

CONSTRUCTION

Each mixer shall be of the sealed submersible type, model HBM(X)200M____ as manufactured by Hydromatic Pump, Inc. The propeller, motor and seal housing shall be high quality gray cast iron, ASTM A-48, Class 30. All external mating parts shall be machined and Buna-N rubber O-ring sealed on a beveled edge. Gaskets shall not be acceptable. All fasteners exposed to the pumped liquid shall be 300 series stainless steel.

ELECTRICAL POWER/CONTROL CORD

Electric power/control cord shall be SOW/SOW-A water resistant 600V, 60 degrees C, UL and CSA approved. The HBM200 single cord shall incorporate both power and sensor leads and shall be a minimum of seven (7) 12-gauge conductors. The HBMX200 power cord shall be four 14-gauge conductors while the sensor cord shall have five 18-gauge conductors.

The mixer shall be protected with compression fitting and epoxy potted area at the power cord entry to the pump. A separation between the junction box areas of the pump and the motor by a stator lead sealing gland or terminal board shall not be acceptable.

The power cable entry into the cord cap assembly shall first be made with a compression fitting. Each individual lead shall be stripped down to bare wire, at staggered intervals, and each strand shall be individually separated. This area of the cord cap shall then be filled with an epoxy compound potting, which will prevent water contamination to gain entry even in the event of wicking or capillary attraction.

The power cord leads shall then be connected to the motor leads with extra heavy connectors having copper inserts with a crimped wire to wire connection, rather than a terminal board that allows for possible leaks.

The cord cap assembly shall be sealed with a Buna-N rubber O-ring on a beveled edge to assure proper sealing.

MOTOR

The stator, rotor and bearings shall be mounted in a sealed submersible type housing. The stator windings shall have VFD duty rated Class F insulation, (155°C or 311°F), and a dielectric oil filled motor, NEMA B design (3 phase), NEMA L design (single phase). Because air-filled motors do not dissipate heat as efficiently as oil-filled motors, they shall not be acceptable.

The mixer and motor shall be specifically designed so that they may be operated partially dry or completely submerged in the liquid being pumped. The mixer shall not require cooling water jackets. Dependence upon, or use of, water jackets for supplemental cooling shall not be acceptable. No special tools shall be required for mixer and motor disassembly.

Mixer shall be equipped with heat sensors. The heat sensor(s) shall be a low resistance, bi-metal disc that is temperature sensitive. It (they) shall be mounted directly in the stator and sized to open at 120°C or 130°C and automatically reset at 30–35°C differential. The sensor shall be connected in series with the motor starter coil so that the starter is tripped if a heat sensor opens. The motor starter shall be equipped with overload heaters so all normal overloads are protected by external heater block.

BEARINGS AND SHAFT

An upper single row ball radial bearing and a lower single row ball thrust bearing shall be provided. Bearings shall be permanently lubricated by the dielectric oil which fills the motor housing.

The shaft shall be machined from solid 400 series stainless steel and be designed with large diameters and minimum overhang to reduce shaft deflection and prolong bearing and seal life.

SEALS AND SENSORS

The rotor and stator in the motor housing shall be separated and protected from the pumped liquid by an oil-filled seal housing incorporating two type 21 carbon ceramic mechanical seals mounted in tandem. The seal housing shall be equipped with a moisture sensing probe installed between the seals, and the sensing of moisture in the seal chamber shall be automatic, continuous, and not require the pump be stopped or removed from the wet well.

To reduce solids buildup to the outboard mechanical seal, which would limit free-spinning operation of the propeller, a lip seal of Type SB2/B1 nitrile construction shall be present between the mixer propeller and seal housing components to provide additional protection to the mixer unit.

PROPELLER

The propeller shall be designed for rough duty service and shall be constructed of high quality gray cast iron, ASTM A-48, Class 30. The propeller shall provide blockage-free mixing action sufficient to prevent solids buildup within a typical sewage lift station.

TESTING

Commercial testing shall be required and include the following:

The mixer shall be visually inspected to confirm that it is built in accordance with the specification as to horsepower, voltage, phase and hertz.

The motor and seal housing chambers shall be hi-potted to test for moisture content and/or insulation defects.

Mixer shall be allowed to run dry to check for proper rotation.

PAINT

The pump shall be painted with waterborne hybrid acrylic/alkyd paint. This custom engineered, quick dry paint shall provide superior levels of corrosion and chemical protection.