

INTERMEDIATE SPEED SUBMERSIBLE MIXER SPECIFICATIONS Page 1

1. GENERAL

- 1.1 The following specifications direct attention to certain required features of the design package, but do not purport to cover all details entering into the design, construction, and/or installation of the equipment.
- 1.2 Furnish ____ units. Each unit shall consist of a motor, a gear reducer, propeller, and appropriate mounting device

2. PERFORMANCE

- 2.1 Each mixer shall be capable of high mixing rates at a minimum rate of _____ gallons per minute.
- 2.2 The mixer shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 131 feet.

3. SUBMERSIBLE MOTOR

- 3.1 The motor shall be a special Reliance Electric Duty Master Submersible AC motor designed for Class 1, Group D, Division 1, Hazardous Location (as defined by the National Electrical Code). The motor shall be UL listed for Class 1, Group D, Division 1, explosion-proof, for installation in water or sewage. Motor not having a UL listing or explosion-proof, Class 1, Group D, Division 1, for water or sewage will not be considered equal. The high efficiency motor shall be designed for continuous duty and shall be capable of sustaining ten (10) evenly-spaced starts per hour.
- 3.2 The motor shall deliver ____ horsepower at _____ rpm and operation on 230/460 volt, 60 HZ, 3 phase service and shall be pre-wired for 460 volts.
- 3.3 All electrical parts shall be housed in an air filled, corrosion resistant, cast iron, Class 25 frame. All mating frame fits shall have rabbet joints with large overlap, as well as O-ring seals of nitrile rubber.
- 3.4 The motor shall have special Class F insulated windings rated for continuous duty in 40 degrees C liquids with a 1.15 service factor and three (3) thermal switches in the end turns of the motor windings.

INTERMEDIATE SPEED SUBMERSIBLE MIXER SPECIFICATIONS Page 2

- 3.5 The internal components of the motor shall be protected by heavy duty tandem mechanical seals Type 21 of carbon ceramic for superior abrasive resistance and wear. The double seal design shall provide protection for the electrical parts by virtue of one seal set inboard and one seal set outboard the oil chamber. The motor shall have two (2) moisture sensing probes to detect any influx of conductive liquid past the outer seal and to provide ample warning of outer seal failure. Any motor using shaft lip seals or a combination of lip seal and mechanical seals shall not be considered equal.
- 3.6 The cable leads shall have strain relief internal to the entry consisting of a strain equalization plate and Buna-N grommets. The cable leads shall be butt spliced and epoxy sealed to prevent intrusion of any liquid from a damaged cable into the motor. Terminal boards shall not be considered equal to the leakproof threaded enclosure impregnated conductor epoxy seal system specified.
- 3.7 The motor shaft shall be continuous from lower motor bearing to upper motor bearing and manufactured from 18-8 stainless steel. The motor shaft shall be machined to a tolerance of plus or minus .002 T.I.R. from lower bearing to the upper end of the motor shaft. The motor shaft shall be supported by two (2) single row double shielded anti-friction prelubricated bearings, rated for B-10 life of 100,000 hours.
- 3.8 All external hardware, including the motor name plate, shall be made of 304 stainless steel.

4. SUBMERSIBLE GEAR REDUCER

- 4.1 The gear reducer shall be housed in corrosive resistant Class 30 cast iron.
- 4.2 The output speed shall be _____ rpm.
- 4.3 The output shaft shall be 18-8 stainless steel.
- 4.4 The output shaft shall be supported by two (2) heavy duty, single row bearings, rated for 100,000 hours.
- 4.5 The gear reducer shall be protected from liquid intrusion by a special heavy duty Type 21 mechanical seal of converted silicon carbide. For superior corrosive resistance and wear, any combination of lip seal/mechanical seal shall not be considered equal.

INTERMEDIATE SPEED SUBMERSIBLE MIXER SPECIFICATIONS Page 3

4.6 The gear reducer shall be removable for routine maintenance without disturbing motor seals or draining and refilling motor oil reservoir. Oil level gauge, oil drain plug, and fill plug shall be provided. Gear reducer oil reservoir shall hold not less than 4 quarts of 90W gear lube.

4.7 All external hardware shall be 316 stainless steel.

5. PROPELLER

5.1 The propeller shall be of Class 25 cast iron, dynamically balanced, three vane, non-clogging, backward curved design. The propeller shall be designed to handle solids and fibrous materials normally found in sludges.

5.2 The propeller shall be ____ inches in diameter (nominally).

5.3 The propeller speed shall be _____ rpm.

5.4 Primary pumping rate is _____ gpm.

6. POWER CABLE

6.1 The unit shall be provided with ____ feet of SOW, Type A power cable, 4 conductor, and a 5 conductor control cable UL listed for underwater use.

7. HARDWARE

7.1 The exposed nuts and bolts shall be 316 stainless steel.

8. MOTOR MOUNT FRAME

8.1 The motor mount frame and propeller shroud shall be 3/16", type 304 stainless steel.

8.2 The mast bracket shall be provided with LPE lining affording a non-sparking contact between bracket and mast.

8.3 The motor/gear reducer shall be foot-mounted to the frame with four (4) bolts within a secondary support.

8.4 The support structure shall be capable of not only vertical adjustment, but also shall be capable of being adjusted in a radial horizontal plane of 160 degrees.

9. PAINT

- 9.1 All mixer surfaces, other than stainless steel, will be coated with two (2) coats Tnemec Series 66 systems for 6 mils thickness.

10. MIXER MOUNTING

- 10.1 The mixer mast shall be 304 stainless steel.

11. QUALITY

- 11.1 All mixers will be tested and verified for electrical and mechanical integrity.
- 11.2 A statement by the mixer manufacturer attesting to the test results shall be furnished to the owner at his request.

12. OPERATION & MAINTENANCE MANUALS

- 12.1 Operation & maintenance manuals shall be furnished to the owner on a timely basis before start-up of the equipment.