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Submersible Wastewater Pump Association SWPA Approved Curve and Data Format

X61 HD HAZARDOUS LOCATION SERIES

CLASS I, DIVISION 1, GROUPS C & D
CLASS I, ZONE 1, GROUP IIA &IIB
SOLIDS HANDLING PUMP GUIDE SPECIFICATIONS
1 THRU 7-1/2 BHP / 1750 RPM

FAMILY OWNED AMERICAN PROUD

1.01 GENERAL

Contractor shall furnish all labor, material, equipment and incidentals required to provide _____ (QTY.) cCSAus certified solids handling submersible centrifugal sewage pump (s) rated for Class I, Division 1, Group C or D and Class I, Zone 1, Groups IIA and IIB locations as specified herein.

2.01 OPERATING CONDITIONS

Each pump shall be rated at _____ HP, _____ Volts, _____ Phase, 60 Hz, 1750 RPM. The unit shall produce _____ GPM at _____ feet of TDH.

The pump shall be non-overloading throughout the length of the curve and be capable of operating continuously unsubmerged without damaging the pump. The reserve service factor shall be a minimum of 1.20. The submitted performance curve shall show in addition to the head and capacity performance, the efficiency and the motor rating curve. The curve data shall be per the SWPA (Submersible Wastewater Pump Association) approved curve format.

The pump housing configuration shall have a
____ 3" N.P.T. vertical discharge w/ 2.5" solids capacity.
____ 3" flanged horizontal discharge w/ 2.5" solids capacity.
____ 4" flanged horizontal discharge w/ 2.5" solids capacity.
____ 4" flanged horizontal discharge w/ 3" solids capacity.

3.01 CONSTRUCTION

Each pump shall be of the close coupled Model _____ submersible type as manufactured by the Zoeller Engineered Products of Louisville, Ky. (800-928-7867) and cCSAus certified for hazardous location. The castings shall be constructed of baked on epoxy coated class 30 cast iron. The motor housing shall be finned and oil-filled to dissipate heat and enable the unit to operate for continuous duty unsubmerged without damage to the motor. All external-mating parts shall be machined and sealed with a buna-n square ring. All fasteners exposed to the liquid shall be 300 series stainless steel. The motor shall be protected on the topside with sealed junction chamber, which in the event of cord damage will prevent moisture wicking into the motor housing. The motor shall be protected on the lower side with a tandem mechanical seal arrangement with each seal having a separate spring assembly. The motor shall be protected by a moisture detection system, which will activate an alarm circuit if liquid is ever present in the upper junction chamber or lower seal cavity. The upper and lower ball bearings shall be capable of handling all thrust and radial loads. The pump housing shall be of the concentric design thereby equalizing the pressure forces inside the housing, which will extend the service life of the seals and bearings. The top cap shall have cast in lifting lugs and a 2" male NPT conduit connection.

4.01 ELECTRICAL POWER CORD

The pump shall be supplied with 25' (____ 50' optional) of multiconductor power cord. It shall be SO type cord capable of continued exposure to the pumped liquid. Power cord shall be sized for the rated full load amp loading of the pump in accordance with the National Electrical Code. Power cable shall enter into the junction chamber through a compression type-sealing gland. Water sealing and strain relief is separated. Each individual conductor shall be sealed against wicking should the cable become damaged. The entire junction chamber shall be sealed off from the motor housing. The junction chamber shall contain a set of moisture detection probes, activating an alert signal in the case of liquid entry.

5.01 MOTOR

The rated oil-filled motor with Class I, Division 1, Groups C or D and Class I, Zone 1, Groups IIA and IIB construction shall be a Class F insulated NEMA B design rated for continuous duty. At maximum load, the winding temperature will not exceed 250 degrees F unsubmerged. Since air-filled motors are not capable of dissipating heat, they shall not be considered equal. Start capacitors and relay shall be mounted externally from the pump in a panel within 50 feet of the pump location. Thermal sensors located in the oil-filled motor housing shall provide temperature protection.

6.01 BEARINGS AND SHAFT

Upper and lower ball bearings made of high carbon chromium steel shall be provided to prevent shaft deflection by withstanding all thrust and radial loads. The motor shaft shall be made of 416 SS and have a minimum diameter of 1.250".

7.01 SEALS
Pump shall have a dual mechanical seal configuration with the seals mounted in tandem. Each seal assembly having Silicon carbide / silicon carbide lower and carbon ceramic upper faces with Buna-N elastomer and 316 SS spring. It shall be equal to a Crane Type 21 configuration. Double seals with a common intermediate spring shall not be considered equal. The seal chamber shall contain a set of moisture detection probes, activating an alert signal in the case of liquid entry.

Optional seal faces shall be
____ Silicon carbide / Silicon carbide ____ Upper.
____ Silicon carbide / silicon carbide Viton ____ Lower / ____ Upper.

8.01 IMPELLER
The impeller shall be a fully balanced semi-open design not requiring wear ring for maintaining efficiency. The impeller shall be made of ductile iron. It shall be capable of passing a solid sphere equal to the solids capacity specified in section 2.01. It shall have pump out vanes located on the back shroud to keep debris away from the seal area. It is to be keyed and bolted to the shaft. Attempts to improve efficiency by painting impeller shall not be acceptable.

Optional impeller design shall be
___ Ductile iron vortex.
___ Impeller trim _____ GPM @ _____ feet of TDH.

9.01 PAINTING
The pump shall have a corrosion resistant baked on epoxy powder coating on all exterior surfaces.

____Optional coating shall be double epoxy finish protecting all castings coming in contact with the liquid.

10.01 SUPPORT
The pump shall have cast in support legs enabling it to be a freestanding unit. The legs will be high enough to allow the solids capacity listed in 2.01 to pass below the housing.

For those situations where a freestanding unit is not desired, the following support components are available.
____ Non-sparking rail system with pump suspended from a base elbow by means of a sealed pump plate attached to the pump. Pump plate and rail guide shall be brass. Rail pipes to be provided by others.
____ SS intermediate stabilizer, required for rail systems where basin depths are greater than 20 feet.

11.01 TESTING
Each pump shall have a 20 - 30 minute operational test before shipment. The test shall be conducted with the pump submerged in a tank thereby duplicating its actual performance. A computer-generated report shall be available following this test. The report will show pump performance, amp draws, efficiencies and power consumption at various performance points for each pump supplied at various heads.

____ An optional certified test based on the Hydraulic Institute's standard or SWPA Test Standard for submersible pumps.

____ Start-up services at the job site by an authorized representative of Zoeller Engineered Products shall be required. Start-up report form ZM1074 should be completed in the presence of the installers and returned to the Project Engineer or Zoeller Engineered Products.

12.01 WARRANTY
Standard warranty shall be 18 months from date of manufacture, 12 months from date of installation or 12 months from the date of start up with a start up report on file with Zoeller. Additionally, upon receipt and approval of a start up report, a prorated warranty for permanent municipal wastewater lift station installations shall be in effect for up to 60 months or 10,000 hours of operation, whichever comes first.

ZOELLER® ENGINEERED PRODUCTS

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