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## **X6282 & X6284 HAZARDOUS LOCATION SERIES**

### **CLASS I GAS / CLASS II DUST**

### **GUIDE SPECIFICATION**

### *Commercial Duty Sewage Pumps*

#### **1.01 GENERAL**

Contractor shall furnish all labor, material, equipment and incidentals required to provide \_\_\_\_ (QTY.) submersible centrifugal sewage / dewatering pump(s) with 2" solids passing vortex impeller; certified by CSA for Hazardous Gas (Class I) or Dust (Class II) locations and tested to FM standards.

Complying to the CSA certifications, the nametag on the pump shall read:

\_\_\_\_ For Hazardous Gas Locations ... Class I, Division 1, Groups C & D and Class I, Zone 1, Groups IIA & IIB, tested to FM Standard 3600 & 3615

Or  
\_\_\_\_ For Hazardous Dust Locations ... Class II, Division 1, Groups E, F, & G, Zone 20, and tested to FM Standard 3600 & 3616

#### **2.01 OPERATING CONDITIONS**

Each submersible pump shall be rated at \_\_\_\_ H.P., \_\_\_\_ volts, \_\_\_\_ phase, \_\_\_\_ HZ., 1750 R.P.M.

The unit shall produce \_\_\_\_ G.P.M. at \_\_\_\_ feet of T.D.H.

The submersible pump shall be non-overloading throughout the length of the curve with a motor that can operate unsubmerged. The submersible pump shall pass a 2" spherical solid. The pump shall be cCSAus rated for Class I or Class II hazardous locations. The submitted performance curve shall show the flow and head capacity of the pump.

The pump-housing configuration shall have a

\_\_\_\_ 2.0" N.P.T. vertical discharge.

Or

\_\_\_\_ 3.0" N.P.T. vertical discharge.

#### **3.01 CONSTRUCTION**

Each pump shall be of the close coupled Model \_\_\_\_\_ submersible pump as manufactured by Zoeller Engineered Products of Louisville, Ky. (800-928-7867). The pump, certified by CSA and tested to FM Standards, shall be rated for hazardous Class I gas or Class II dust locations. The castings shall be constructed of class 30 cast iron with corrosion resistant powder coated epoxy finish. The motor housing shall be finned and oil-filled to dissipate heat. All external mating parts shall be machined and sealed with Viton Square Rings. All fasteners exposed to the liquid shall be 300 series stainless steel. The motor shall be protected on the top upper side with a sealed terminal box, 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. A moisture detection system shall sense the presence of moisture in the motor assembly. The upper and lower ball bearings shall be capable of handling all thrust loads. The pump housing shall be concentric, thereby equalizing the pressure forces inside the housing, which will extend the service life seals and bearings. The top cap shall have a SS rigid lifting bail and a 1-1/2" male NPT conduit connection. Inlet screens or strainers are prohibited.

#### **4.01 ELECTRICAL POWER CORD**

The pump shall be supplied with 25' (optional 35' \_\_\_\_ or 50' \_\_\_\_ ) multiconductor electrical cable. It shall be Type SOOW cordage, capable of continued exposure to the pumped liquid and sized for the rated amperage load of the pump in accordance with the National Electric Code. The pump's electrical cable shall enter the terminal box through a compressed sealing gland. Each conductor inside the cable shall be individually sealed in epoxy, preventing the wicking of moisture. The housing shall be sealed off from the motor by through the wall terminals.

**5.01 MOTOR**

The oil-filled motor shall be a Class B insulated NEMA B design and CSA rated for hazardous Class I gas or Class II locations. At maximum load, the winding temperature will not exceed 220 degrees F submerged. Since air-filled motors are not capable of dissipating heat, they shall not be considered equal. Single-phase motors shall include a integrated thermal protector and a capacitor circuit. Three phase motors shall incorporate a thermal sensor, which is wired into the control panel’s motor contactor and overload circuit.

**6.01 BEARINGS AND SHAFT**

An upper radial bearing and lower thrust bearing shall be required. The bearings shall be a heavy-duty single ball bearing which are permanently lubricated by the oil which fills the motor housing. The motor shaft shall be made of 416 SS and have a minimum diameter of 0.625”.

**7.01 MECHANICAL SHAFT SEALS**

Pump shall have a dual mechanical seal configuration with the seals mounted in tandem. The pump shall have a silicon carbide / carbon lower seal and carbon / ceramic upper seal, each with Buna-N elastomer and 316 SS spring. It shall be equal to a Crane Type 6a configuration. Double seals with a common intermediate spring shall not be considered equal.

Optional seal faces shall be:

\_\_\_\_ Silicon carbide / carbon \_\_\_\_ Upper

or

\_\_\_\_ Silicon carbide / silicon carbide \_\_\_\_ Lower / \_\_\_\_ Upper

**8.01 IMPELLER**

The impeller shall be of a fully balanced cast iron vortex design. It shall be capable of passing a solid sphere of 2”. It shall have pump out vanes located on the back shroud to keep debris away from the seal area. Attempts to improve efficiency by coating impeller shall not be acceptable.

**9.01 PAINTING**

The pump shall have a corrosion resistant powder coated epoxy finish.

\_\_\_\_ Optional coating shall be double epoxy finish coating of all casting components coming in contact with the liquid

**10.01 SERVICEABILITY**

Components required for the repair of the pump shall be readily available within 24 hours. Components such as mechanical seals and bearings shall not be of a proprietary design and be available from local industrial supply houses. Special tools shall not be required to service the pump. A network and listing of approved service stations shall be available.

**11.01 RAIL SYSTEM**

The pump shall have cast iron support legs enabling it to be installed as a free-standing unit, connected directly to the discharge piping. But, for access and safety concerns, a rail system shall be installed. Provide a non-sparking rail system, which suspends the pump from a stationary base and equipped with a sealing plate that automatically engages onto the system. A sufficient length of SS lifting cable, fastened to the pump’s lifting bail will be provided. The two \_\_\_\_ SS / \_\_\_\_ Galvanized rail pipes, providing positive alignment and stability while servicing the pump, are provided by the installing contractor.

\_\_\_\_ A SS intermediate stabilizer(s) is required on the rail system when its basin depth is greater than 12 feet.

**12.01 TESTING**

Each pump shall operate while submerged in liquid after being assembled. It shall be tested at its maximum running point for performance, amps, grounding, winding insulation, and water tightness.

\_\_\_\_ Provide a certified performance test based on the Hydraulic Institute’s test standard for submersible pumps.

\_\_\_\_ A start-up at the job site shall be provided as coordinated through the authorized local representative of Zoeller Engineered Products.

**13.01 WARRANTY**

Standard warranty shall be 18 months from date of manufacture, 12 months from date of purchase (proof of purchase required) or 12 months from date of start-up when a start-up report is on file at Zoeller Company.