GOULDS WATER TECHNOLOGY

a xylem brand

SPECIFICATIONS

1GDSPEC

1GD SUBMERSIBLE GRINDER PUMPS

GENERAL

- Furnish and install ____ Goulds Water Technology, Series 1GD, dual seal submersible grinder pump(s), ____ HP, ____ phase, ____ volts, ____ Hz, pump(s) rated for ____ GPM, at ____ Ft. Total Dynamic Head.
- Pump(s) shall be Goulds Water Technology, Order No: _____ .

QUALIFICATIONS

All pump manufacturers must be pre-qualified by the engineer in order to qualify as acceptable manufacturers. Pre-qualification shall be no later than two (2) weeks prior to published bid date for this project. Failure to pre-qualify will be grounds for disqualification after the bid opening date. All decisions of qualification shall reside with the engineer of record at time of bidding.

PUMP DESIGN

Pump(s) shall have 1¼ inch NPT vertical discharge and utilize a two bolt companion flange. The pump shall be capable of grinding domestic and commercial raw sewage.

GRINDER ASSEMBLY

The grinder assembly shall consist of two hardened components mounted directly below the impeller. The two components shall be the rotating cutter ring and cutter which shall be constructed of type 440C stainless steel hardened to 55-60 Rockwell "C" scale value. The rotating cutter shall be key driven and bolted to the pump shaft. The cutter ring shall be pressed into the casing directly below the suction opening of the pump. The cutter ring shall then be secured by three type 300 series stainless steel screws for corrosion resistance. The stationary cutter ring shall be reversible such that once wear has occurred the ring can be turned over and unused surfaces exposed. Each component shall be designed for long life and ease of service. All hardware shall be series 300 stainless steel.

MECHANICAL SHAFT SEALS

The motor shall be protected by two independent sets of mechanical shaft seals mounted in tandem on the pump shaft. Pump designs with one or two springs acting between rotating faces shall not be allowed as this design would allow effluent to force the seal faces apart during periods of upset or high discharge pressure. Each mechanical seal set shall be constructed of a carbon-ceramic upper seal and silicon carbide/silicon carbide lower sealing faces.

Each set (upper and lower) shall be tensioned by an independent spring system constructed of series 300 stainless steel metal components and BUNA-N elastomers. The mechanical seals shall be located in a completely isolated seal oil chamber which will provide lubrication for the seal faces while simultaneously acting as an isolation zone for the stator chamber. As an option, this seal oil chamber shall be provided with an internally mounted moisture sensing probe to detect moisture intrusion into this lower chamber of the pump. The moisture sensing probe must be connected to an "optional" seal fail circuit (moisture detection circuit) in the control panel. The seal fail circuit option should have an alarm light, audible alarm or both. This seal fail alarm signals that service is required.

IMPELLER

The impeller shall be semi-open with ejector (pump out) vanes on the top of the impeller for protection of the lower mechanical seal and hydraulic balance. Due to design, only single plane spin balancing shall be required for smooth operation. The impeller shall be key driven and bolted to the solid series 300 stainless steel shaft.

CASING

The casing shall be cast from ASTM class 30 gray cast iron of sufficient thickness to withstand 1.5 times the shut off pressure generated by the largest impeller available for this model in accordance with current revision of the Hydraulic Institute Standards. The discharge connection shall be a standard 1¼ inch NPT removable flange suitable for direct

connection to the station piping, without the use of any external fittings or adapters for vertical orientation of the discharge direction.

MAJOR CASTING MATERIALS

The casing, bearing/seal housing and motor cover shall be of ASTM A48 class 30 high quality cast iron for strength and long life. Bronze impeller shall be cast from ASTM C87600 as standard.

CORROSION PROTECTION

The pump/motor shaft wetted-end shall be series 300 stainless steel. Both inner and outer surfaces of cast iron shall be electrocoat-painted with thermo-painted with thermo-setting Acrylic Enamel baked at 400° F., after castings are completely machined.

MOTOR

The integral motor shall be completely sealed from the environment by use of circular cross section o-rings accurately fitted into machined grooves which shall provide designed compression of metal fits. Designs which require a specific torque on the casing bolts or which require rectangular gaskets or sealing rings shall not be allowed. The motor shall be rated for continuous duty under full nameplate load while at partial submergence in the station. The motor shall be provided at the specified site conditions of 208 or 230 single-phase or 200, 230, 460 or 575 volt, three-phase as required, all shall be 2 hp at 60 hertz.

Single-phase motors are equipped with an on-winding, automatic reset overload. They are capacitor start, capacitor run type motors and the capacitors and starting relay are external, they are mounted in a control panel which must be ordered separate from the pump/motor. Three-phase motors require ambient compensated, quick trip, Class 10 overload protection in their control panel.

Optional pilot duty high temperature thermal sensors may be installed in the single-phase and three-phase units and require a high temperature sensor circuit with indicators in the control. The thermal sensor opens the circuit at 275° F (135°C) and stops the pumps. As motor temperature drops to 112° F (78°C) the motor automatically restarts.

The stator winding shall be open type with class F insulation suitable for operation in clean dielectric oil for efficient heat transfer and lubrication of the ball bearings. The stator shall be a register fit into the bearing housing to ensure positive alignment, and bolted for ease of serviceability. The motor shall be provided with ball type anti-friction bearings which shall support the heavy duty rotor shaft and handle all radial and axial loads imposed by the impeller while limiting shaft deflection at the mechanical seal faces. Sleeve type bearings shall not be considered equal and shall not be allowed. The ball bearings shall be designed for a B-10 life of 30,000 hours minimum. The motor shall be designed and tested to withstand an 18 day locked-rotor operation without damage.

POWER CABLE

The power cable shall be sealed at the motor end as it enters the motor casing by a two part barrier to moisture intrusion. The first line of defense shall be the compression of the oil and chemical resistant grommet which shall seal the outer jacket of the power cord. In the event that the outer jacket of the power cord should become damaged, then the second line of defense shall be the epoxy poured isolated conductors within the jacketed cable itself. The insulation shall be removed from the individual conductors and the epoxy shall be allowed to form a leak-proof seal against wicking of the power cable between the outer jacket and the insulation of the individual conductors. The outer jacket of the power cord shall be oil resistant and water resistant. The power cable shall be rated for NEC severe service "S", type "STOW". The heat and seal sensor cable shall be NEC severe service "S", type "SJTOW".

PUMP OPTIONS

1. Seal sensor probe
2. Lower mechanical seal faces of silicon carbide and tungsten carbide material
3. Power cable and seal sensor cable of various lengths
4. Refer to the factory for items not listed.

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