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# 4GV PLUS

## Submersible Sewage Pumps

### GENERAL

- Furnish and install \_\_\_\_\_ Goulds Water Technology, Series 4GV, dual seal submersible sewage 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 (4) inch ANSI flanged discharge connection and shall be capable of handling sewage containing non-abrasive (3) inch maximum soft solids.

### IMPELLER

The impeller shall be vortex style, self-cleaning, non-overloading on the published curve with rip vane on the back edge of the impeller for removing stringy solids. The impeller shall be both statically and dynamically balanced in both planes. The impeller shall be slip fitted to the shaft and taper-lock driven. The impeller shall be held in place with a bolt and washer system that shall secure the impeller against all axial loads imposed by the hydraulic conditions of operation.

### CASING

The casing shall be cast from ASTM A48 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 4" flange connection. The discharge connection shall be capable of threading onto a 2" wet pit guide rail. The guide rail system shall support the full weight of the submersible pump without the need for any supports under the pump which would cause solids to build up and starve the pump. Designs which allow for mounting feet in the area of the suction of the pump shall not be allowed, unless the pump is installed using flexible discharge hose such that the rigid guide rail base cannot be used.

### SUBMERSIBLE MOTOR SPECIFICATION

Pump shall be driven by a completely sealed, electric submersible squirrel cage induction motor with a maximum nameplate rating of \_\_\_hp, \_\_\_rpm, \_\_\_volts, \_\_\_-phase, \_\_\_Hz.

All motors shall be an air-filled design having all electrical parts enclosed in an air-filled cast iron, watertight enclosure sealed by means of O-rings and rabbeted joints with extra large overlaps.

The stator windings and leads shall be insulated with moisture-resistant Class H insulation for continuous duty in 40° C ambient. The motor shall be designed for continuous duty capable of a maximum of fifteen (15) starts per hour. Quantity three (3) automatic reset, normally-closed thermal overloads shall be imbedded in the motor windings to provide overheating protection. Motor winding thermostats must be connected to an electric controller per local and state codes and the National Electric Code. The two normally closed, on-winding thermostats (thermal overloads) shall open at 284° F (140° C) and close at 230° F (110° C). Explosion Proof available as option.

The shaft shall rotate on a grease lubricated thrust bearing and a grease lubricated radial bearing with a minimum L10 life of 50,000 hours.

Lower shaft bearing shall be locked in place to prevent shaft movement and to take thrust loads.

All castings are to be ASTM A48 Class 30 Gray Cast Iron.

Motor shaft shall be one piece, 420 stainless steel. For standard models, 431 stainless steel shall be considered standard on Explosion Proof. Carbon steel shafts or shaft sleeves are not acceptable.

#### **CABLE ASSEMBLY**

Cable leads shall enter at the side of the motor and shall allow the cable-to-motor connection to be accomplished in the field without soldering.

A Buna-N power cable grommet shall be provided.

Cable sealing system shall be capable of withstanding an external pressure test of 200 PSI as well as a cable assembly pull test as required by Underwriters Laboratories. Motor shall be supplied with 32' of multi-conductor power cable and control cable. Optional 100' cable lengths are available. Cable sizing shall conform to NEC Specifications. Acceptable cables and materials such as Neoprene, Hypalon and Viton shall be UL listed and CSA certified and listed on the jacket of the cable.

#### **SHAFT SEAL**

For standard pumps, Tungsten Carbide vs. Ceramic seal faces shall be considered standard on outer seals of up to 5 HP. Carbon vs. Ceramic shall be considered standard on inner seals of up to 5 HP.

Tungsten Carbide vs. Tungsten Carbide faces shall be considered standard on outer seals over 5 HP. Tungsten Carbide vs. Carbon shall be considered standard on inner seals over 5 HP.

All elastomers shall be nitrile for explosion proof product.

Tungsten Carbide vs. Ceramic faces shall be considered standard on outer and inner seals. All elastomers shall be viton.

#### **MOISTURE PROTECTION SYSTEM**

Moisture sensing device is provided that extends into the motor chamber located between the outer and inner seal and used to detect the presence of moisture should the outer seal fail.

The moisture protection system shall also be designed to detect water in the motor chamber and provide a warning signal prior to water levels reaching the bearing or wound stator assemblies.

#### **WET PIT INSTALLATION SYSTEM (Optional)**

Each pump shall be provided with a dual pipe type guide rail system consisting of moveable pump connection. There shall be no weight or other forces on the guide rail system which could cause binding of the coupling to the guide rail system. The system shall be designed to allow installation and removal of the pump without the need for any personnel to enter the pit. The guide rails shall be stainless steel pipe. Slide rail part numbers shall be A10-40 or A10-60 CentriPro brand elbows.

#### **MAJOR CASTING MATERIALS**

The impeller, casing, bearing/seal housing and motor housing shall be ASTM A48 Class 30 high quality cast iron for strength and long life.

#### **CORROSION PROTECTION**

Duasolid 50 by Tikkura Coatings 120 microns finish coat over 30 micron primer, semi-gloss black.

#### **PUMP OPTIONS**

1. Power cable/seal sensor cable of 100' length
2. Epoxy paint
3. Explosion proof

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#### **Xylem Inc.**

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