Liberty Pumps®

A Family and Employee Owned Company

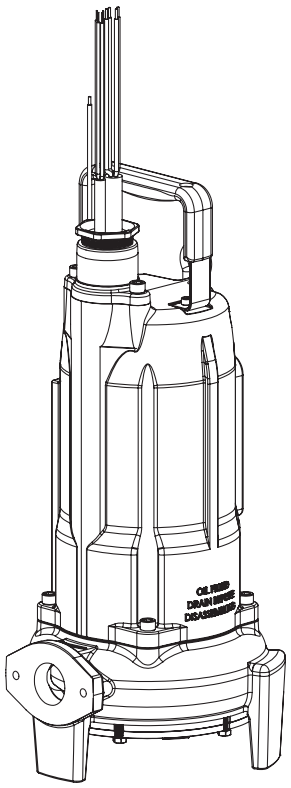
Pump **Specification**

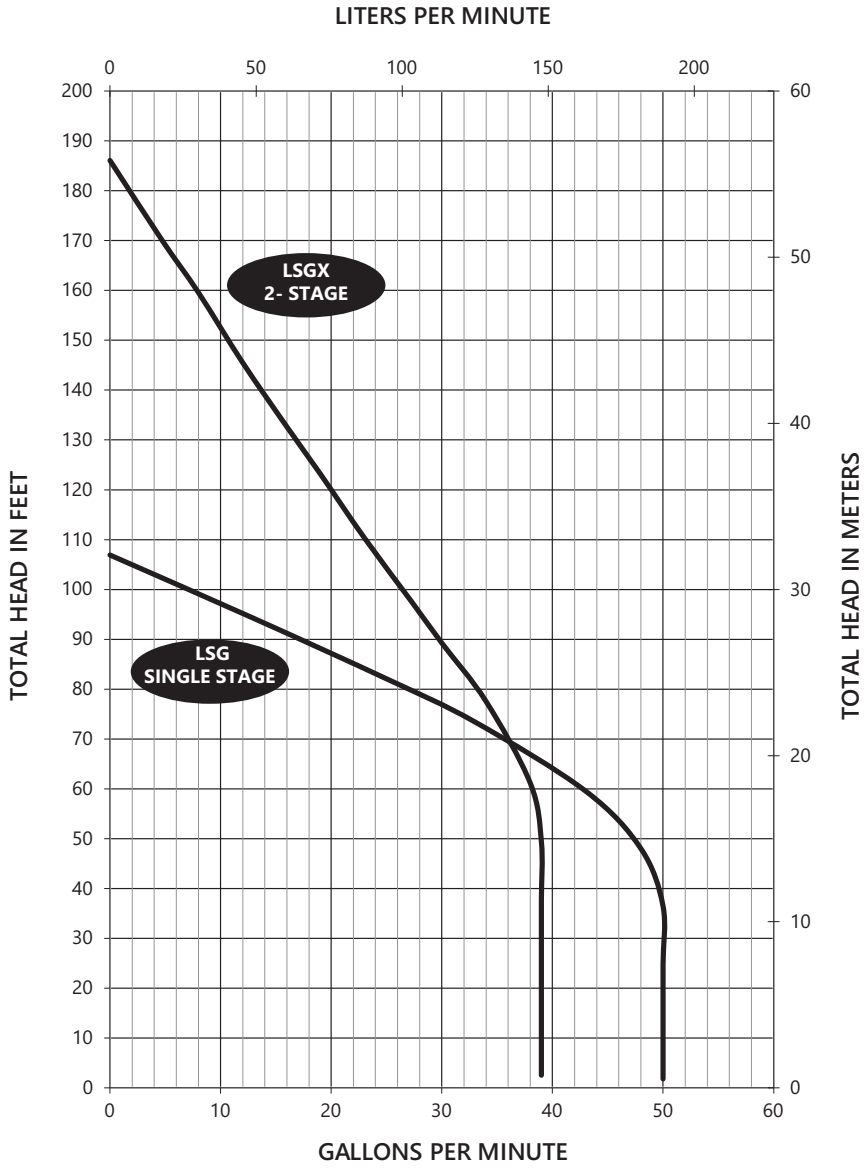
XLSG200-Series *(Single Stage)*
XLSGX200-Series *(2-Stage)*

2 hp Submersible Grinder Pump for Hazardous Locations

Class 1, Division 1, Groups C & D, T4

Class 1, Zone 1, Groups IIA & IIB, T4

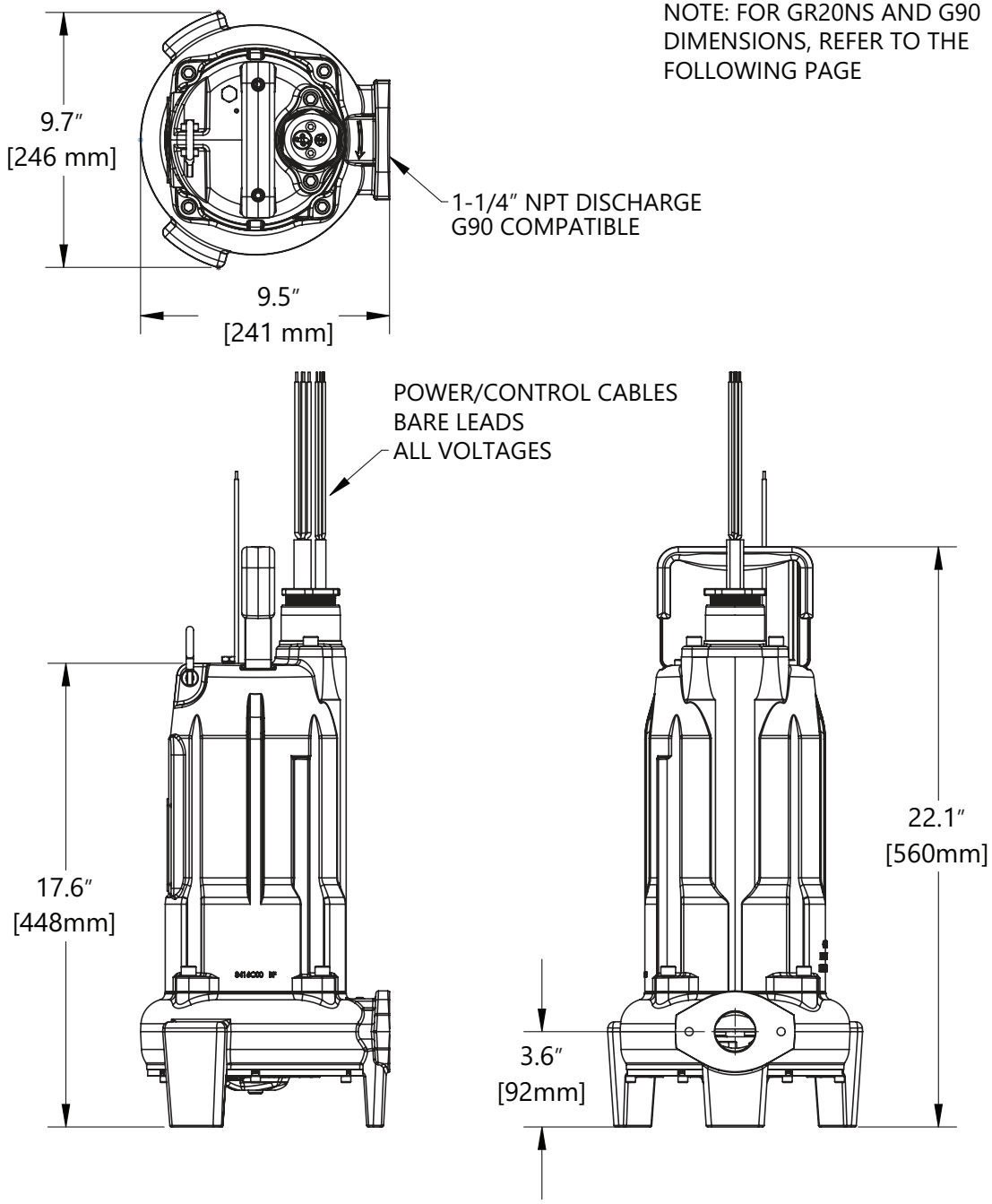




ATTENTION

For pressure sewer applications, verify a ***Redundant Check Valve Assembly*** (curb stop and check valve) is installed between the pump discharge and the street main, as close to the public right-of-way as possible, on all installations to protect from system pressures.

7000 Apple Tree Avenue Bergen NY 14416 ■ ***Phone*** *1-800-543-2550* ■ ***Fax*** *1-585-494-1839* ■ ***Email*** *Liberty@LibertyPumps.com* ■ ***Web*** *www.LibertyPumps.com*



Liberty Pumps

APPLICATION	DO NOT SCALE DRAWING

DWG. NO.	XLSG SERIES DIMENSIONAL	
SIZE A		REV. A
SCALE:1:4		SHEET 1 OF 1

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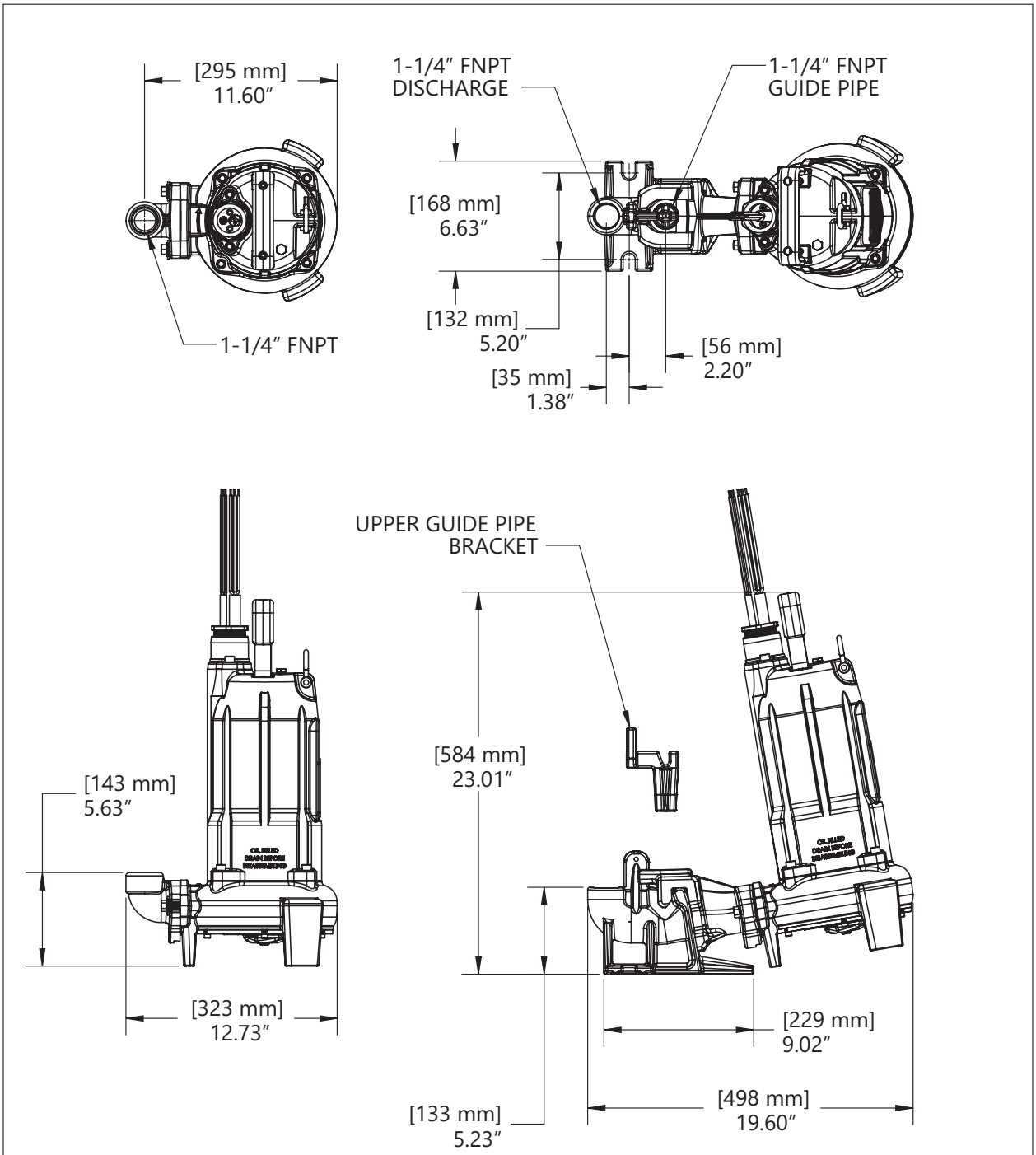
XLSG/XLSGX-Series Dimensional Data



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XLSG/XLSGX-Series Electrical Data

Model	HP	Voltage	Phase	Full Load Amps	Locked Rotor Amps	Thermal Overload Temp.	Discharge
XLSG208M	2	200	1	18.1	66.5	135°C	1-1/4"
XLSG202M	2	230	1	15	64.3	135°C	1-1/4"
XLSG203M	2	200/230	3	12	39.2	120°C	1-1/4"
XLSG204M	2	460	3	6.2	19.6	120°C	1-1/4"
XLSG205M	2	575	3	5	16.3	120°C	1-1/4"
XLSGX208M	2	200	1	20	66.5	135°C	1-1/4"
XLSGX202M	2	230	1	20	64.3	135°C	1-1/4"
XLSGX203M	2	200/230	3	13.5	39.2	120°C	1-1/4"
XLSGX204M	2	460	3	6.7	19.6	120°C	1-1/4"
XLSGX205M	2	575	3	5.3	16.3	120°C	1-1/4"

- All models require the use of properly equipped control panels, which utilize intrinsically safe floats, seal leak detection, and thermal overload circuits (as required). Consult Liberty Pumps for assistance.
- Model number suffix designates cord length; -2, -3, and -5 indicate 25 ft, 35 ft, and 50 ft respectively, e.g., XLSG203M-3.
- All power and signal cables are provided with bare leads.
- Single-phase models require a start capacitor, a run capacitor, and a start relay. Kits are available from Liberty Pumps.

Liberty Pumps Control Panel Information					
Pump Models	Start Capacitor	Run Capacitor	Cap Kit	Simplex Panel[1]	Duplex[1]
XLSG208M	325 µF	65 µF	K001640	ISS24HS1=3-5	ISD24HS2=3-5
XLSG202M	275 µF	50 µF	K001641	ISS24HS1=3-5	ISD24HS2=3-5
XLSG203M	n/a	n/a	n/a	ISS34=3-511-5	ISD34=3-511-5
XLSG204M	n/a	n/a	n/a	ISS34=3-191-5	ISD34=3-191-5
XLSG205M	n/a	n/a	n/a	ISS54=3-161-5	ISD54=3-161-5
XLSGX208M	325 µF	65 µF	K001640	ISS24HS1=3-5	ISD24HS2=3-5
XLSGX202M	275 µF	50 µF	K001641	ISS24HS1=3-5	ISD24HS2=3-5
XLSGX203M	n/a	n/a	n/a	ISS34=3-511-5	ISD34=3-511-5
XLSGX204M	n/a	n/a	n/a	ISS34=3-191-5	ISD34=3-191-5
XLSGX205M	n/a	n/a	n/a	ISS54=3-161-5	ISD54=3-161-5

1 Liberty Pumps ISS and ISD panels include intrinsically safe float circuits for use in hazardous locations.

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IMPELLER	300 SERIES STAINLESS STEEL
PAINT	POWDER COAT
MAX LIQUID TEMP (CONTINUOUS DUTY)	40°C / 104°F
MOTOR WINDING INSULATION	CLASS F (155°C MAX)
THERMAL OVERLOAD	1-PHASE: 135°C, DIRECT ACTING
	3-PHASE: 120°C, INDIRECT ACTING[1]
POWER CORD TYPE	SOOW 12 GA
SIGNAL CORD TYPE	SOOW 18 GA
MOTOR HOUSING	CLASS 30 CAST IRON
VOLUTE	CLASS 30 CAST IRON
SHAFT	300 SERIES STAINLESS STEEL
HARDWARE	STAINLESS
O-RINGS	BUNA-N
UPPER MECHANICAL SEAL	UNITIZED - SILICON CARBIDE/SILICON CARBIDE
LOWER MECHANICAL SEAL	2-PIECE - SILICON CARBIDE/SILICON CARBIDE
MIN BEARING LIFE	50,000 HRS
PUMP WEIGHT	SINGLE STAGE: 123 LBS / 56 KG
	2-STAGE: 127 LBS / 58 KG
CERTIFICATIONS	SSPMA, cCSAus

1 Pumps using indirect acting thermal protectors must be used in conjunction with Liberty Pumps ISS/ISD control panels or a circuit designed to shut off power to the pump in a fault condition. Failure to utilize thermal protection in this way will reduce the temperature class rating of the pump from T4 to T3.

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XLSG/XLSGX-Series Specifications

1.01 GENERAL

The contractor shall provide labor, material, equipment, and incidentals required to provide _____ (QTY) centrifugal grinder pumps as specified herein. The pump models covered in this specification are XLSG200/XLSGX200-Series single/three-phase grinder pumps. The pump furnished for this application shall be model _____ as manufactured by Liberty Pumps.

2.01 OPERATING CONDITIONS

Each submersible pump shall be rated at 2 hp, _____ volts, _____ phase, 60 Hz, 3450 RPM. The unit shall produce _____ GPM at _____ feet of total dynamic head.

The submersible pump shall be capable of handling residential and commercial sewage and grinding it to a fine slurry enabling it to be pumped over long distances in pipelines as small as 1.25" in diameter. The XLSG-Series single stage submersible pump shall have a shut-off head of 110 feet and a maximum flow of 50 GPM @ 10 feet of total dynamic head. The XLSGX-Series 2-stage submersible pump shall have a shut-off head of 185 feet and a maximum flow of 38 GPM @ 10 feet of total dynamic head.

Note: Single-phase pumps shall have capacitors and start relay mounted in the panel.
Note: Control panels must include intrinsically safe float circuits when pumps are installed in hazardous locations.
The pump shall be controlled with:

_____ NEMA 4X outdoor simplex control panel with three float switches including a high water alarm

_____ NEMA 1 indoor simplex control panel with three float switches including a high water alarm

_____ NEMA 4X outdoor duplex control panel with three float switches including a high water alarm

_____ NEMA 1 indoor duplex control panel with three float switches including a high water alarm

_____ NEMA 4X outdoor duplex control panel with four float switches including a high water alarm

_____ NEMA 1 indoor duplex control panel with four float switches including a high water alarm

3.01 CONSTRUCTION

Each centrifugal grinder pump shall be equal to the $_{C}$SP$_{US}$ Certified XLSG/XLSGX-Series grinder pumps as manufactured by Liberty Pumps, Bergen NY. The castings shall be constructed of Class 30 cast iron. The motor housing shall be oil filled to dissipate heat. Air-filled motors shall not be considered equal since they do not properly dissipate heat from the motor. All mating parts shall be machined and sealed with a Buna-N O-ring. All fasteners exposed to the process fluid shall be stainless steel. The motor shall be protected on the top side with a sealed cast iron cord entry plate, which is potted to prevent water from entering through the cord. The motor shall be protected on the lower side with a dual seal arrangement and an oil-filled intermediate chamber. The upper seal shall be a unitized graphite impregnated silicon carbide hard face seal, and the lower seal shall be a two-piece mechanical seal with silicon carbide faces.

The upper and lower bearings shall be capable of handling all radial and thrust loads. The lower bearing shall be able handle the downward axial thrust produced by the impeller and cutters by design of angular contact roller races. The pump housing shall be of concentric design thereby equalizing the pressure forces inside the housing, which will extend the service life of the seals and bearings. Additionally, there shall be no cutwater in the housing volute in order to discourage entrapment of flowing debris. The pump shall be furnished with a stainless steel handle having a nitrile grip.

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4.01 ELECTRICAL POWER CORD

The submersible pump shall be supplied with 25, 35, or 50 feet of multi-conductor cord of type SOOW. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code®. A separate SOOW control cord of equal length will also exit the pump. Both cords shall be secured within a casting configured for 1-1/2" conduit if the application requires. The cords shall be captured with a rubber seal ring and potted thus preventing any wicking through the conductors.

5.01 MOTORS

All motors shall be oil-filled, Class F insulated NEMA B design, rated for continuous duty. Since air-filled motors are not capable of dissipating heat, they shall not be considered equal. Single-phase pump motors shall be capacitor start/capacitor run and have an integral thermal/current overload switch in the windings protecting the motor. A start capacitor, run capacitor, and motor start relay are required and shall be mounted in the control panel. Three-phase motors shall have a thermal overload device mounted on the windings which is connected to a motor control relay located in the control panel.

6.01 BEARINGS AND SHAFT

The shaft shall be supported by two ball bearings. The top bearing shall be a radial contact ball bearing and the lower bearing shall be an angular contact ball bearing designed to handle the radial and axial forces incurred by pumping/grinding. Both bearings shall be permanently lubricated by the oil that fills the motor housing. The bearing system shall be designed to enable proper cutter alignment from shut off head to maximum load at 10 feet of TDH. The motor shaft shall be made of 300 series stainless steel and have a minimum diameter of 0.670".

7.01 SEALS

The pump shall have two shaft seals with an oil chamber between them. A leak detection probe is positioned in the oil chamber and continuously monitors for water that would indicate the lower seal has failed. The lower seal is a two-piece design and can be serviced in the field. The upper seal is a unitized design. Both upper and lower seals are silicon carbide/silicon carbide seal faces with stainless steel housings and springs. All other seals are of an O-ring design of Buna-N material.

8.01 IMPELLER

The impeller(s) shall be an investment cast stainless steel impeller, with pump out vanes on the back shroud to keep debris away from the seal area. The impeller(s) shall be keyed and bolted to the motor shaft.

9.01 CUTTER MECHANISM

The cutter and plate shall consist of 440 stainless steel with a Rockwell C hardness of 55–60. The stationary cutter plate shall have specially designed orifices through it, which enable the slurry to flow through the pump housing at an equalized pressure and velocity. The stationary cutter plate shall consist of V shapes to maximize cutting action and arc shape exclusion slots to outwardly eject debris from under the rotary cutter. The rotary cutter shall have four (4) blades and be designed with a recessed area behind the cutting edge to prevent the accumulation and binding of any material between rotary cutter and the stationary cutter plate. The cutting system must incorporate close tolerances for optimum performance. Ring or radial cutters, or those that grind on the outside circumference, shall not be considered equal.

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10.01 PRESSURE SEWER APPLICATIONS

A redundant check valve assembly consisting of a curb stop and check valve must be installed between the pump discharge and the street main, as close to the public right-of-way as possible, on all pressure (force main) sewer installations to protect from system pressures. The curb stop valve is necessary to isolate the site from the pressure sewer while the check valve provides redundant protection against potentially detrimental backflow. All valves and fittings should be rated for at least 200 PSI service. See Liberty Pumps line of CSV-Series Curb Stop/Swing Check Valve Assemblies and CK-Series Connection Kit.

11.01 CONTROLS

All XLSG/XLSGX-Series pumps require a control panel. Control panels shall be equipped with breakers to protect against current overloads or electrical problems. These breakers shall be sized appropriately for the pump model(s) being controlled. Single-phase units utilize a capacitor start/capacitor run type motor and require specific start and run capacitors as well as a motor start relay. Control panels for three-phase models shall include thermal overload relays, which will shut down the pump upon the opening of thermal protectors in the motor. If the thermal protectors are not connected, the temperature class of the product will be modified from T4 to T3. Float switches for pump control shall interface with the control panel via an intrinsically safe barrier. Panels themselves shall be located outside of the hazardous location, and installed according to all state, local, and federal codes.

12.01 PAINT

The exterior of the casting shall be protected with powder coat paint.

13.01 SUPPORT

The pump shall have cast iron support legs, enabling it to be a freestanding unit. The legs shall be high enough to allow solids and long stringy debris to enter the cutter assembly.

14.01 SERVICEABILITY

Components required for the repair of the pump shall be shipped within a period of 24 hours.

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15.01 FACTORY ASSEMBLED TANK SYSTEMS WITH GUIDE RAIL AND QUICK DISCONNECT DISCHARGE

_____ Factory mounted guide rail system with pump suspended by bolt-on quick disconnect, sealed by means of nitrile grommets. The discharge piping shall be Schedule 80 PVC and furnished with a PVC shut-off ball valve. The tank shall be wound fiberglass or roto-molded plastic. A cast iron inlet hub shall be provided with the fiberglass systems.

_____ Stainless steel guide rail

_____ Zinc plated steel guide rail

_____ Non-sparking guide rail

_____ " diameter of basin size

_____ " height of basin size

_____ " distance from top of tank to discharge pipe outlet

_____ Fiberglass cover

_____ Structural foam polymer cover

_____ Steel cover

_____ Simplex system with outdoor panel and alarm

_____ Duplex system with outdoor panel and alarm

_____ Separate outdoor alarm

_____ Remote outdoor alarm

16.01 TESTING

The pump shall have a ground continuity check and the motor chamber shall be hi-potted to test for electrical integrity, moisture content, and insulation defects. The motor and volute housing shall be pressurized and an air leak decay test performed to ensure integrity of the motor housing. The pump shall be run, voltage and current monitored, and checked for noise or other malfunction.

17.01 QUALITY CONTROL

The pump shall be manufactured in an ISO 9001 certified facility.

18.01 WARRANTY

Standard limited warranty shall be 3 years.

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