Liberty Pumps®

Engineered Products

XLGV02-Series
XLGH02-Series
Grinder

2.5hp

Hazardous Location

Class 1, Division 1, Groups C and D, T4
Class 1, Zone 1, Groups IIA and IIB, T4

60 Hz



Patent: See
www.LibertyPumps.com/LEP/patents

Features

- Patented V-Slice® Cutter Technology
- High flow and High head models
- 1-1/4" Discharge
- Stainless steel impeller
- Dual mechanical seals with seal fail sensor
- External capacitor (requires panel)

Omnivore® Grinders

Technical Data

Performance Curve

Dimensional Data

Specifications and Construction

Proudly built in the USA with
US and global components

Submersible Wastewater Pump Association SWPA MEMBER

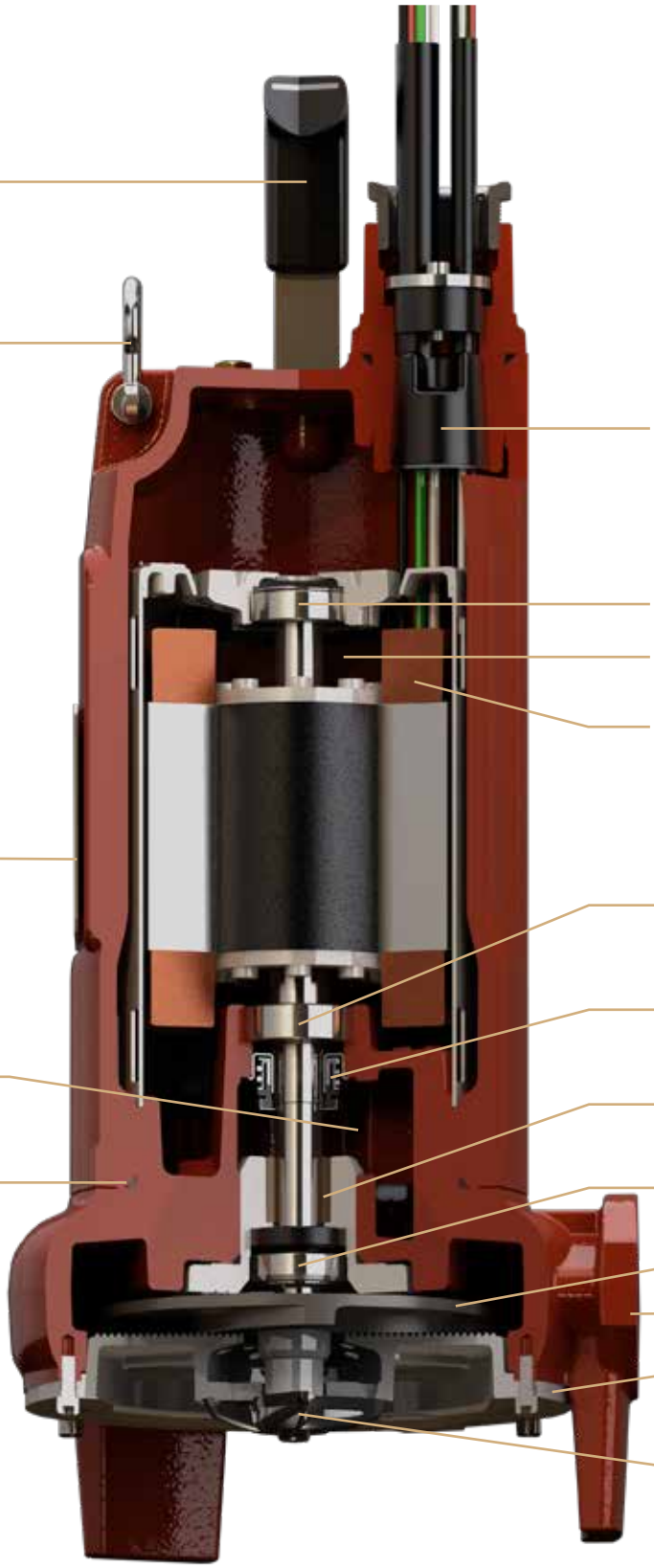
C SP US

Certified to CSA, UL, and FM standards

Technical Data

XLGV02/XLGH02-Series - 60 Hz

LGV High Volume



Heavy-duty stainless steel handle with rubber grip

Stainless steel lifting shackle

Permanent epoxy cord seal prevents wicking

Radial contact ball bearing

Oil-filled motor chamber cools motor and lubricates bearings

Class F insulation

Heavy-duty Class 30 cast iron motor housing

Angular contact ball bearing

Silicon carbide upper mechanical seal

Seal leak sensor

Bronze shaft bushing

Buna-N O-rings seal all joints

Silicon carbide lower mechanical seal

316 stainless steel impellers

1-1/4" FNPT connection

440 stainless steel cutter plate spiraled for solids clearing

440 stainless steel rotary cutter hardened to 58Rc

Patent: See
www.LibertyPumps.com/LEP/patent

Technical Data

XLGV02/XLGH02-Series - 60 Hz

LGH High Head



Heavy-duty stainless steel handle with rubber grip

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Buna-N O-rings seal all joints

316 stainless steel impellers

1-1/4" FNPT connection

Stainless steel crossover plate

440 stainless steel cutter plate spiraled for solids clearing

440 stainless steel rotary cutter hardened to 58Rc

Patent: See
www.LibertyPumps.com/LEP/patents

Liberty Pumps
Engineered Products

Technical Data

XLGV02/XLGH02-Series - 60 Hz

Model Number	XLGH028	XLGH022	XLGH023	XLGH024	XLGH025	XLGV028	XLGV022	XLGV023	XLGV024	XLGV025
HP	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Volts	200	230	200/230*	460	575	200	230	200/230*	460	575
Phase	1**	1**	3	3	3	1**	1**	3	3	3
Hz	60	60	60	60	60	60	60	60	60	60
RPM	3450	3450	3450	3450	3450	3450	3450	3450	3450	3450
FLA	20	20	13.7	6.9	5.5	18.5	17	12.5	6.5	5.2
SFA	20	20	13.7	6.9	5.5	18.5	17	12.5	6.5	5.2
LRA	66.5	64.3	39.2	19.6	16.3	66.5	64.3	39.2	19.6	16.3
Max kW Input	4.2	4.2	4.1	4.1	4.4	3.2	3.6	3.6	3.5	4.6
Service Factor	1	1	1	1	1	1	1	1	1	1
Power Factor (%)	99	97	82	81	83	99	99	77	73	78
KVA Code	G	H	L	L	L	G	H	L	L	L
Std. Impeller Diameter (in)	5.86	5.86	5.86	5.86	5.86	5.95	5.95	5.95	5.95	5.95
Shut-Off Head (ft)	185	185	185	185	185	110	110	110	110	110
Power Cord Type & Diameter	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW	12/4 SOOW

** System voltages: 208 and 240 volts with utilization voltages: 200 and 230 volts.*

*** Single-phase motors require capacitors. Liberty Pumps control panel and capacitor kits are recommended for proper operation and warranty. Refer to "Control Panel" section.*

Motor Insulation Class	F 155°C
Impeller Type	Open
Impeller Material	316 Stainless Steel
Power Cord Length (Options)	25, 35, 50 ft
Upper Seal Material	Silicon Carbide/Silicon Carbide HNBR Elastomers
Lower Seal Material	Silicon Carbide/Silicon Carbide Viton® Elastomers
Max Water Temp for Continuous Duty	40°C
Min Fluid Level for Continuous Operation	Motor Housing Fully Submerged
Fluid pH Range	4–10
Shaft Material	303 Stainless Steel
Fastener Material	Stainless Steel
O-Ring Elastomers	Buna-N
Upper Bearing	Radial Ball
Lower Bearing	Angular Contact Ball
Oil Type	ISO® VG10 Turbine Oil

Max Submersion Depth	23 ft
Discharge	1.25 in FNPT
Protective External Finish	Powder Coat
Seal Fail Detection	Yes
Thermal Protection	1-phase - Direct Acting, 135°C 3-phase - Thermostat, 120°C
Hazardous Location T-Code	T4
Motor Enclosure Material	Class 30 Cast Iron
Volute Material	Class 30 Cast Iron
Cuts Per Minute	372,600
Cutter Material	440 Stainless Steel
Pump Weight	127 lbs (approx)
Certifications	CSA Certified to CSA, UL® and FM Standards CAN/CSA - C22.2 No. 145-11 UL 674 5th Ed FM 3615:2016 Class 1, Div. 1, Group C and D, T4 Class 1, Zone 1, Group IIA, IIB, T4

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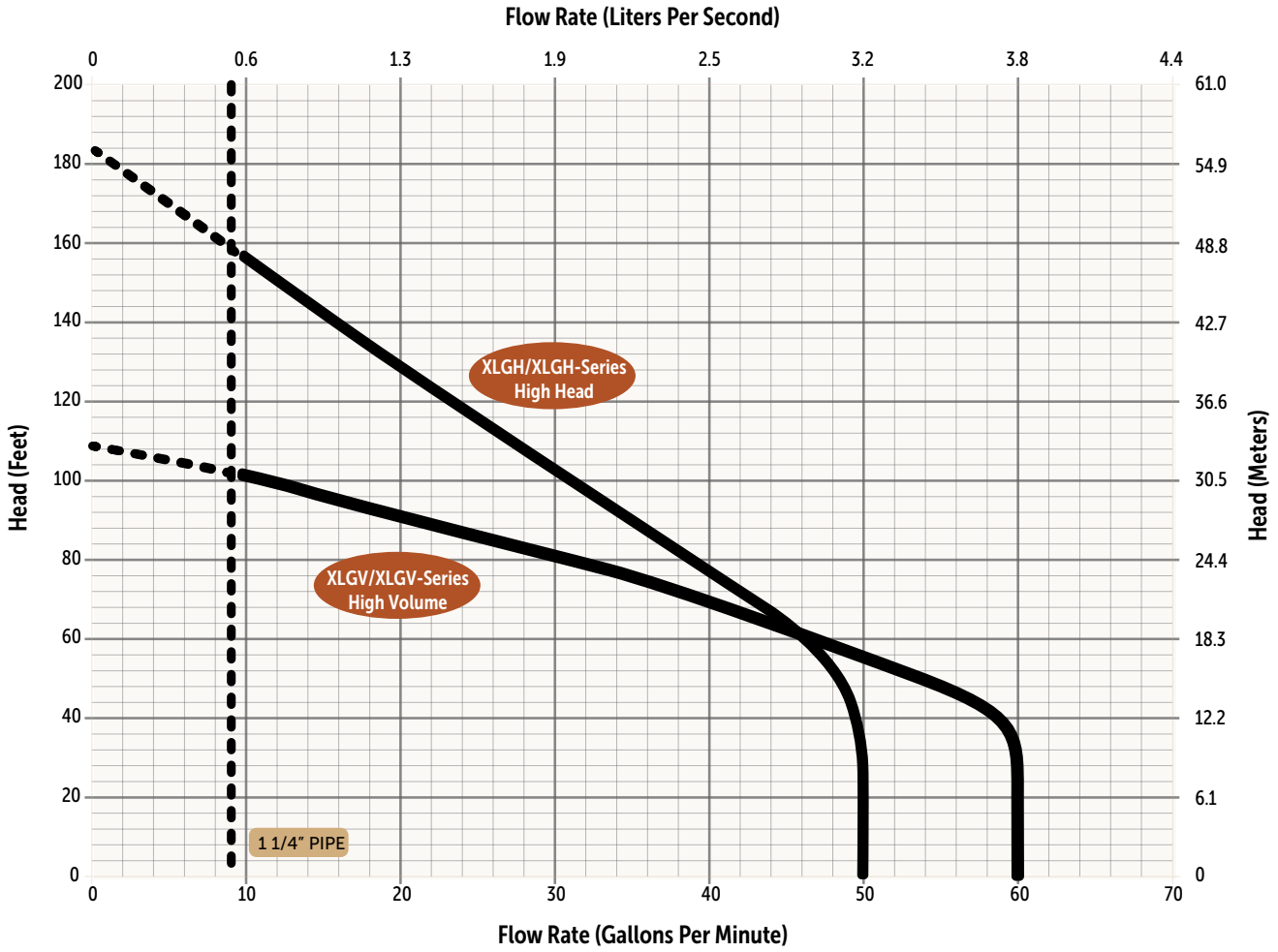
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Performance Curve

XLGV02/XLGH02-Series - 60 Hz



Pumps must operate within the Allowable Operating Range (AOR), which is indicated by the solid performance curve on the chart. Pumps operating outside the AOR can be prone to excessive vibration, cavitation, poor efficiency, and may exceed nameplate amperage ratings.

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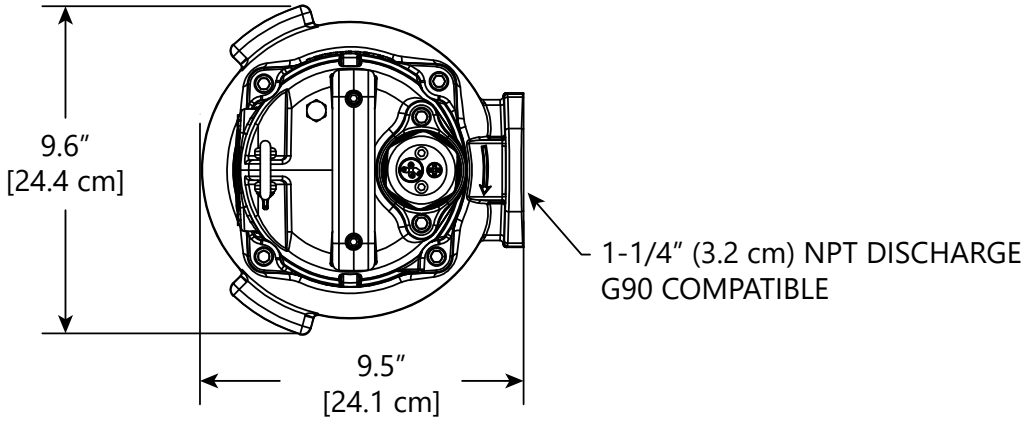
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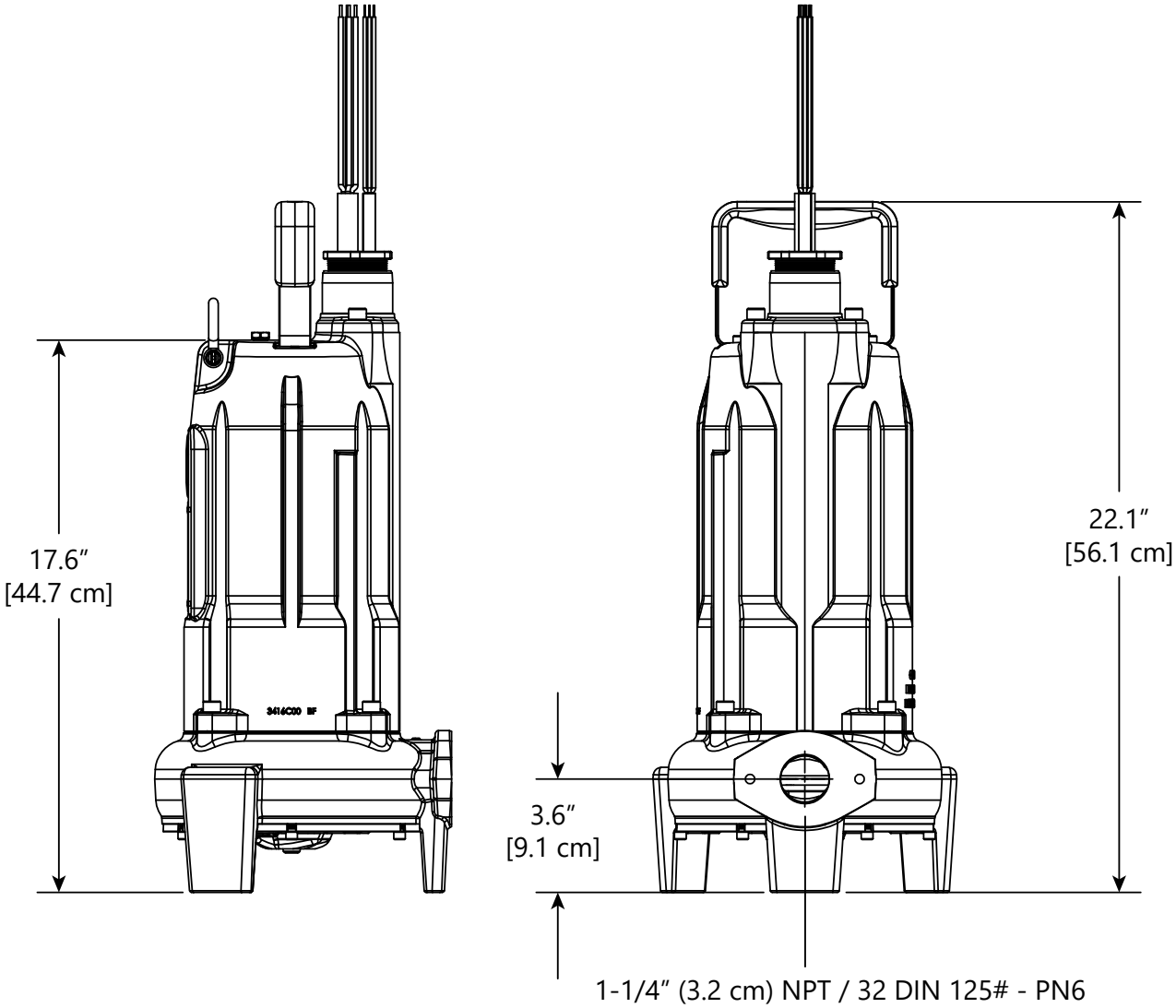
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Dimensional Data

XLGV02/XLGH02-Series - 60 Hz





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Accessories

XLGV02/XLGH02-Series - 60 Hz



ISS/ISD Panel

ISS/ISD PANEL

- Intrinsically safe relays and wiring terminals for float controls
- NEMA 4® X enclosure
- Magnetic motor contactor(s)
- Hands-Off-Auto switch(s)
- Green pump run indicator(s)
- Terminal block for easy wiring
- Red alarm beacon
- Audible horn (83–85 db)
- Auxiliary dry contacts
- Seal fail indicator light(s) and test switch
- Prewired for capacitors (single-phase models)



GR20NS-Series

GR20NS-SERIES

- Single guide pipe design with auto-align feature
- Powder-coated for corrosion resistance
- Heavy nitrile sealing grommet
- Includes: mating flange, upper rail support bracket, stainless steel bolts, and sealing grommet
- Cast iron base with bronze (non-sparking) mating claw
- 1-1/4" guide pipe threads FNPT
- 1-1/4" discharge threads FNPT



G90-Series

G90-SERIES

- Fits 2.5 hp Omnivore® Series grinders
- Provides vertical discharge for non-guide rail installations
- 1-1/4" female threaded outlet
- Heavy cast iron construction
- Powder-coated for corrosion resistance
- Includes sealing grommet and stainless steel bolts

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Specifications and Construction

XLGV02/XLGH02-Series - 60 Hz

GENERAL

The contractor shall provide labor, material, equipment, and incidentals required to provide _____ (QTY) sewage grinder pumps as specified herein. The pump models covered in this specification are XLGH028, XLGH022, XLGH023, XLGH024, and XLGH025 high head and XLGV028, XLGV022, XLGV023, XLGV024, and XLGV025 high volume grinder pumps. Each pump shall be permanently marked on its stainless steel nameplate indicating that the unit has been certified by an accredited NRTL third party to meet CSA, UL, and FM standards for use in NEC® Class 1, Division 1, Groups C & D and Class 1, Zone 1, Groups IIA & IIB hazardous locations. The pump furnished for this application shall be model _____ manufactured by Liberty Pumps.

OPERATING CONDITIONS

Each submersible pump shall be rated at 2.5 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 2 inches in diameter. The XLGH02-Series submersible pump shall have a shut-off head of 185 feet and a max flow of 50 GPM @ 10 feet of total dynamic head. The XLGV02-Series submersible pump shall have a shut-off head of 110 feet and a max flow of 60 GPM @ 10 feet of total dynamic head.

CONSTRUCTION

Each centrifugal sewage grinder pump shall be equal to the certified XLGH02/XLGV02-Series pumps manufactured by Liberty Pumps, Bergen NY. The casting enclosing the motor shall be constructed of Class 30 cast iron. The complete motor enclosure shall be designed and manufactured to meet stringent hazardous location guidelines with performance verified via flame propagation and hydrostatic testing. 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. 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 mechanical seal arrangement and an oil-filled intermediate chamber. The upper seal shall be a unitized mechanical seal with silicon carbide faces. The lower seal shall be a two-piece mechanical seal with silicon carbide faces. The upper and lower bearings shall be sized to withstand radial and thrust loads produced throughout the full operating range of the pump.

POWER AND CONTROL CORD

The submersible pump shall be supplied with 25, 35, or 50 feet of a multi-conductor cord of type SOOW. These type SOOW power cords carry a voltage rating of 600 V, a temperature rating of 90°C, have oil-resistant insulation, are water- and weather-resistant, UL-listed, and CSA-approved.

The power cord shall be sized for the rated full load amps of the pump for continuous duty in accordance with the NEC®. A separate type SOOW control cord of equal length shall also exit the pump. The cord entries to the pump shall be protected via two sealing methods. The cords first pass through a Buna-N compression grommet that seals against the outer jacket of the cord. The Buna-N grommet also doubles as a strain relief. Each individual conductor then continues into a chamber that is filled with epoxy potting compound. The epoxy potting compound seals each individual conductor and protects against any intrusion of liquid into the motor cavity in the event of wicking.

MOTOR

The motor shall be oil-filled, Class F insulated, and rated for continuous duty. Since air-filled motors are not capable of dissipating heat efficiently, they shall not be considered equal. The midchamber design shall allow for oil in the motor chamber to reject heat to the pumped media and provide cooling to the motor. This motor design shall provide significantly reduced operating temperatures. Pumps requiring an auxiliary cooling means shall not be considered equal.

Copper stator windings shall be insulated with moisture-resistant Class F insulation materials, rated for 155°C. The maximum continuous temperature of pumped liquids shall be 40°C. The winding operating temperature at rated horsepower and service factor shall be a maximum of 135°C (1-phase) and 120°C (3-phase) @ 40°C ambient.

Motor shall have UL-approved thermostats mounted directly on the stator windings. Motors shall be equipped with direct acting thermal protectors (1-phase) or thermostats (3-phase) which are mounted directly to the motor windings. The thermostat leads of the control cord (3-phase) shall be connected to a motor control relay in the control panel.

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. The lower bearing shall be positively retained by a threaded bearing retaining nut, which eliminates any axial movement or rotation of the outer bearing race. Both bearings shall be permanently lubricated by the oil that fills the motor housing. Pump designs requiring scheduled bearing maintenance shall not be considered equal. Pumps with single row lower bearings or sleeve bearings shall not be considered equal. The bearing system shall be sized to provide a minimum of 100,000 hours B10 bearing life throughout the operating range of the pump. Pumps that only provide a 50,000 hours B10 bearing life shall not be considered equal.

The motor shaft shall be made of 303 stainless steel. The shaft shall be designed to withstand the maximum torque and radial loads present during startup and normal operation. Shafts of carbon steel or chrome-plated shafts shall not be considered equal.

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SEALS

The pump shall have two shaft seals separated by an oil chamber. Pumps utilizing single seal technology shall not be considered equal. A leak detection probe shall be positioned in the oil chamber and shall allow for continuous monitoring for lower seal failure. The lower seal shall be a two-piece design that is easily serviceable. Shaft seals shall not require scheduled maintenance. The upper seal shall be a unitized design. The upper and lower seals shall be silicon carbide on silicon carbide. Both seals shall include stainless steel housings and HNBR or Viton® elastomers.

CUTTER MECHANISM

The cutter and plate shall consist of hardened 440 stainless steel with a Rockwell C hardness of 58Rc. 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 feature patented V-Slice® Cutter Technology. This superior cutting system consists of V shapes to maximize cutting action and exclusion slots to outwardly eject debris from under the rotary cutter. The rotary cutter shall have four blades and be designed with a recessed area behind the cutting edge to reduce the accumulation and binding of any material between rotary cutter and the stationary cutter plate. The cutter shall be capable of over 300,000 cuts per minute. The cutting system shall incorporate close tolerances for optimum performance. Ring or radial cutters, or those that grind on the outside circumference, shall not be considered equal.

IMPELLER

The impeller shall be 316 stainless steel. The impeller shall be keyed and bolted onto the motor shaft.

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.

QUALITY CONTROL

The pump shall be manufactured in an ISO® 9001 certified facility. Manufactured in the USA with US and global components.

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 pump inlet.

TESTING

The pump shall have a ground continuity check and undergo a hi-pot test for electrical integrity, moisture content, and insulation defects. The motor housing and midchamber shall be pressurized, and an air leak decay test performed to ensure integrity of the assembled unit. The pump shall be run at rated voltage to verify current, performance curve and monitor operation. Certified performance testing is available upon request.

PROTECTIVE FINISH

The exterior of the casting shall be protected with corrosion-resistant baked-on powder coat.

APPLICATIONS

- Municipal Engineered Lift Stations
- Storm Water Removal
- Wastewater Transfer
- Industrial Wastewater
- Treatment Plants

MATERIAL FEATURES PUMP:

- Grinder - High Head or High Volume
- Discharge - Horizontal, 1.25" FNPT
- Seals - Dual Mechanical, Upper - Silicon Carbide/Silicon Carbide with HNBR Elastomers; Lower - Silicon Carbide/Silicon Carbide with Viton® Elastomers
- Construction - Cast Iron ASTM A48, Class 30, 30,000# Tensile Strength, Designed and manufactured to meet CSA, UL, and FM standards for use in NEC® Class 1, Division 1, Groups C & D and Class 1, Zone 1, Groups IIA & IIB hazardous locations; Protected with a Corrosion-Resistant Baked-on Powder Coating
- Hardware - Stainless Steel
- O-ring Seals - Buna-N
- Impeller - 316 Stainless Steel
- Cutter and Cutter Plate - Hardened 440 Stainless Steel
- Cuts per minute -372,600
- Thermal Sensors and Moisture Detection System
- Optional:
  - Cord Length Options (feet) - 25, 35, 50

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MOTOR:

- 1-Phase - 200, 230 Volt, 3450 RPM
- 3-Phase - 200/230, 460, 575 Volt, 3450 RPM
- Oil-filled Motor Housing
- Cast Iron Housing with deep sump design for Improved Heat Dissipation
- Continuous Duty Operation
- Bearings
  - Upper - Radial Ball
  - Lower - Angular Contact Ball

CONTROL PANEL

The control panel shall be equipped with circuit breakers and adjustable overload devices to protect against excess current or electrical problems. This device shall be sized appropriately for the pump model(s) being controlled.

The control panel shall include thermal overload relay(s) that shall shut down the pump in the event the thermostats in the motor open. Thermostats shall be connected in the control panel to maintain temperature classification rating of T4 (135°C).

The control panel shall include a seal fail monitoring device that shall indicate a primary seal failure. The seal fail monitoring device shall be capable of monitoring the resistance of the seal failure probe in the pump. The sensitivity of the seal fail monitoring device shall be adjustable from approximately 1KΩ to at least 250kΩ.

The control panel for 1-phase models shall include a motor start circuit that automatically engages and disengages the start windings of the 1-phase motor. The motor start circuit shall consist of a properly sized relay that engages and disengages the motor start windings. A solid state start switch shall monitor start winding voltage and shall control the relay. The start and run capacitors shall be properly sized per the motor specifications. A bleed resistor shall be used on the start capacitor to avoid unwanted voltage spikes during startup. All XLGH/XGV02-series pumps require a control panel.

The pump model, voltage, and phase will determine the appropriate Liberty Pumps control panel; single-phase pumps will also require a start kit that contains the appropriate capacitors for that pump. See table.

Note: Kit K001640 (200V) and Kit K001641 (230V) are also available for customer who choose control panels not manufactured by Liberty Pumps.

Pump Details			Control Panel Model			Start Kit*
Pump Model	Voltage	Phase	Simplex 3-Float	Duplex 3-Float	Duplex 4-Float	Simplex: 1 kit Duplex: 2 Kits
XLGH028	200	1	ISS24KS1=3-5	ISD24KS2=3-5	ISD24KS2=4-5	K001640
XLGH022	230	1	ISS24KS1=3-5	ISD24KS2=3-5	ISD24KS2=4-5	K001641
XLGH023	200/230	3	ISS34=3-611-5	ISD34=3-611-5	ISD34=4-611-5	N/A
XLGH024	460	3	ISS34=3-191-5	ISD34=3-191-5	ISD34=4-191-5	N/A
XLGH025	575	3	ISS54=3-161-5	ISD54=3-161-5	ISD54=4-161-5	N/A
XLGV028	200	1	ISS24HS1=3-5	ISD24HS2=3-5	ISD24HS2=4-5	K001640
XLGV022	230	1	ISS24HS1=3-5	ISD24HS2=3-5	ISD24HS2=4-5	K001641
XLGV023	200/230	3	ISS34=3-611-5	ISD34=3-611-5	ISD34=4-611-5	N/A
XLGV024	460	3	ISS34=3-191-5	ISD34=3-191-5	ISD34=4-191-5	N/A
XLGV025	575	3	ISS54=3-161-5	ISD54=3-161-5	ISD54=4-161-5	N/A

* Note: Duplex panels require 2 start kits.

Liberty Pumps®

Engineered Products

LIMITED WARRANTY

Liberty Pumps, Inc. warrants that pumps of its Engineered Product line are free from all factory defects in material and workmanship for a period of 18 months from the date of installation or 24 months from the date of manufacture, whichever occurs first, and provided that such products are used in compliance with their intended applications as set forth in the Liberty Engineered Products specifications and technical manuals. The date of installation shall be determined by a completed pump start-up report and warranty registration form.

A pump startup report, filled out by a qualified installer, is required for warranty to take effect. The report must be submitted within 30 days from the installation date and submitted through the Liberty Pumps website. During the warranty period, the manufacturer's obligation, and at its discretion, shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the product is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident:

The manufacturer shall not be liable under this Warranty if the product has not been properly installed or maintained in accordance with the printed instructions provided; if it has been disassembled, modified, abused or tampered with; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above those shown in the specifications; if the thermal overload(s) and seal moisture probe(s) have not been properly connected (where equipped); if the pump has been used in water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if the product has been moved from its original installation location, or if the label bearing the serial and code number has been removed.

Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for consequential damages, including field labor costs, travel expenses, rental equipment, costs of removal, reinstallation or transportation to and from the factory or an authorized Liberty Pumps repair facility.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to 18 months from the date of installation or 24 months from the manufacturing date. This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.

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