Installation Manual

3493000A

XLE100/150 Series

Explosion-proof Submersible Sewage Pumps

Models:

- XLE100 Series 1 hp
- XLE150 Series 1-1/2 hp

Approved Hazardous Locations:

- Class 1, Div. 1, Groups C & D
- Class 1, Zone 1, Groups IIA & IIB

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NOTICE **Installer: Please leave this manual with the owner/operator for future reference.**

Prior to installation, duplicate the information from pump nameplate below and keep nearby for future reference.

Model #: _____ Serial #: _____

Manufacture (MFG) Date: _____ Installation Date: _____

⚠ WARNING **Read every supplied manual before using pump system. Follow all the safety instructions in manual(s) and on the pump. Failure to do so could result in serious injury or death.**

Keep manual nearby for future reference. If manual becomes lost or damaged, get a replacement at http://www.libertypumps.com/ under installation manuals, or contact Liberty Pumps.

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1. Safety Information

	This safety alert symbol in your manual and on the pump is intended to alert you to a potential risk for injury or death.
	This is a safety alert symbol identifying **risk of electric shock**. It will be accompanied with an instruction intended to minimize your potential risk of electric shock.
	This is a safety alert symbol identifying **risk of fire**. It will be accompanied with an instruction intended to minimize your potential risk of fire.
	This is a safety alert symbol identifying **risk of injury or death**. It will be accompanied with an instruction intended to minimize your potential risk of injury or death.
⚠ DANGER	Warns of hazards that **will** cause serious injury or death.
⚠ WARNING	Warns of hazards that **can or will** cause minor or moderate injury.
⚠ CAUTION	Warns of hazards that **can** cause personal injury, death, or property damage.
NOTICE	Signals an important instruction related to the pump. Failure to follow these instructions could result in pump component failure, or improper operation of the unit, possibly resulting in property damage .

⚠ WARNING

RISK OF ELECTRIC SHOCK - Accidental contact with electrically live parts, items, fluid, or water can cause serious injury or death.

- ALWAYS disconnect the supplied pump(s) from their power sources before handling or making any adjustments to either the pump(s), the pump system, or the control panel.
- Only qualified personnel should complete fixed wiring and electrical connections, according to all local and national electrical codes, during a pump system installation.
- After installation, be certain that the pump is properly grounded, using its supplied grounding conductor. Failure to properly ground the pump system can cause all metal portions of the pump and its surroundings to become energized.
- During flood conditions, submerged electrical connections can energize the water. Always wear dielectric rubber boots and other applicable Personal Protective Equipment (PPE) when water is on the floor and you must service an energized pump system. DO NOT ENTER THE WATER if the water level is higher than that of the protection your PPE offers or if your PPE is not watertight.
- NEVER lift or carry a pump or a float assembly by its power cord. This will damage the power cord, and could expose the electrically live wires inside the power cord.
- DO NOT bypass grounding wires.
- The electrical power supply shall be located within the length limitations of the pump power cord, and for below grade installations it shall be at least 1.22 m (4 ft) above the floor level.
- NEVER use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, marine areas, etc.).

WARNING

RISK OF ELECTRIC SHOCK - continued

- During construction, if the pump system is installed before its power cord can be plugged in or direct wired, all power cords must be protected from the environment to prevent water from wicking through the cord end into the pump or switch housings. If water enters these housings an electrical short can occur from the pump or switch to its surroundings, which will energize the surroundings.

WARNING

RISK OF FIRE

- DO NOT use an extension cord to power the product. Extension cords can overload both the product and extension cord supply wires. Overloaded wires will get very hot and can catch on fire.
- This product requires a separate, properly fused and grounded branch circuit, sized for the voltage and amperage requirements of the pump, as noted on the nameplate. Overloaded branch circuit wires will get very hot and can catch on fire.
- NEVER use this product with or near flammable liquids. If the rotating elements inside this pump strike any foreign object, sparks may occur. Sparks could ignite flammable liquids.

WARNING

RISK OF SERIOUS INJURY OR DEATH

- This pump system must be installed in accordance with all applicable codes and ordinances.
- DO NOT allow children to play with the pump system.
- DO NOT allow children, or any person who is unqualified, to use this pump system. Any person who is unaware of the dangers of this pump system, or whom has not read this manual, can easily be injured by the pump system.
- Wear adequate PPE when working on pumps or piping that have been exposed to wastewater. Sump and sewage pumps often handle materials which can transmit illness or disease upon contact with your skin and other tissues.
- DO NOT remove any tags or labels from the pump or its cord.

NOTICE

- NEVER dispose of materials such as paint thinner or other chemicals down drains. Doing so could chemically attack and damage pump system components and cause product malfunction or failure.
- DO NOT use pumps with fluid over 40°C. Operating the pump in fluid above this temperature can overheat the pump, resulting in pump failure.
- DO NOT use pump system with mud, sand, cement, oil or chemicals. Pump and system components can be damaged from these items causing product malfunction or failure. Additionally, flooding can occur if these items jam the impeller or piping.
- DO NOT modify the pump system in any way. Modifications may affect seals, change the electrical loading of the pump, or damage the pump and its components. Modifications can void your warranty on this product.

2. General Information

MODEL SPECIFICATIONS									
Model	HP	Voltage	PH	Full Load Current (A)	Shut off Head (FT)	Locked Rotor Current (A)	Solids Handling	FNPT Discharge	KVA Code
XLE102M-2	1	208/230	1	13.4	43	35.3	2"	2" & 3"	M
XLE103M-2	1	208/230	3	9	43	30.6	2"	2" & 3"	S
XLE104M-2	1	440-480	3	4.2	43	17.6	2"	2" & 3"	S
XLE105M-2	1	575	3	3.2	43	13.2	2"	2" & 3"	S
XLE152M-2	1-1/2	208/230	1	14	50	35.3	2"	2" & 3"	M
XLE153M-2	1-1/2	208/230	3	9	50	30.6	2"	2" & 3"	S
XLE154M-2	1-1/2	440-480	3	4.5	50	17.6	2"	2" & 3"	S
XLE155M-2	1-1/2	575	3	3.5	50	13.2	2"	2" & 3"	S

NOTE: Information is applicable to all cord lengths (-3, -5) as well as both cast iron and bronze impeller materials, e.g. XLE103BM-5.

Note: All XLE-Series pumps require a separate approved pump control device or panel for automatic operation. Operation of these models will be according to the control selected. Make sure the electrical specifications of the control selected properly match the electrical specifications of the pump. 3 phase models require overload elements selected and adjusted in accordance with the control panel instructions. The panel must have provisions for the thermostat that open the motor contactors. Do not exceed voltage / current combinations for the thermostat: 16 VDC / 20 Amps, 115 VAC / 22 Amps, 277 VAC / 8 Amps, and 600 VAC / 4 Amps. All models have a surface temperature (T) class rating of T4; if thermostat is not connected on three phase units, the temperature rating drops to T3. The float switches must be connected to an intrinsically safe circuit in the control panel. The minimum water depth for proper motor cooling shall be set at 9" for XLE100 and 14" for XLE150. Single phase (1ph) pumps require a special run capacitor in the panel. See table below for proper specifications.

MODEL	RUN CAPACITOR	CAPACITOR KIT
XLE102M-2	40 µF / 370 VAC	K001585
XLE103M-2	N/A	N/A
XLE104M-2	N/A	N/A
XLE105M-2	N/A	N/A
XLE152M-2	40 µF / 370 VAC	K001585
XLE153M-2	N/A	N/A
XLE154M-2	N/A	N/A
XLE155M-2	N/A	N/A

NOTE: Cap kits are common for all cord length and impeller material configurations.

These pumps are to be used for handling septic tank effluent, sewage, and drain (storm) water. X-Series pumps are CSA Certified to UL778 and CSA C22.2 no. 108, and tested to FM standards for Hazardous (Classified) Locations.

The pump must be serviced at a qualified hazardous motor enclosure repair facility approved by Liberty Pumps. Any unauthorized field repairs voids warranty and hazardous location ratings. Contact Liberty Pumps at 1-800-543-2550 to locate the closest repair facility.

The XLE-Series pumps are protected from overheating and the motors are equipped with a thermal switch. For single phase (1ph) a hermetically sealed thermal overload device is mounted on the motor windings and wired directly in series with the motor's winding. On three phase (3ph) motors, two thermostats mounted in series directly on the windings control the pump's internal temperatures. The thermostat must be connected in such a way to open the motor contactors in the panel cutting power to the pump in an over heat condition. Both single and three phase (1ph & 3ph) pumps are designed to operate under class B insulation with a maximum temperature of 266°F or 130°C internal temperatures, even though the motors are constructed with class F materials. Failure to connect and use the thermostat will reduce the temperature rating to T3 on three phase units.

Note: when connecting a XLE-Series pump to an existing control panel, make certain the panel is correctly sized for the pump. Many panels have a manual reset button for the thermostats on three phase units; this button must be pressed to reset the system after the pump has cooled. Single phase units automatically reset after the pump has cooled.

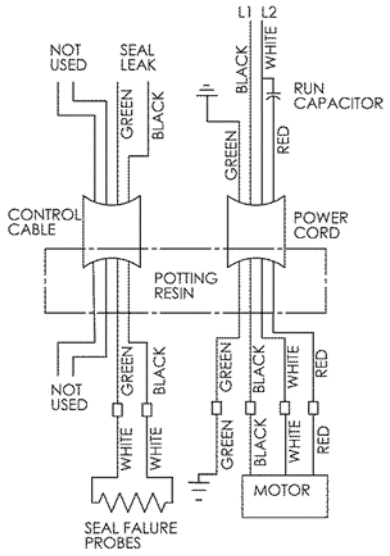
WARNING

RISK OF ELECTRIC SHOCK - Accidental contact with electrically live parts, items, fluid, or water can cause serious injury or death.

Pump Wiring Instructions:

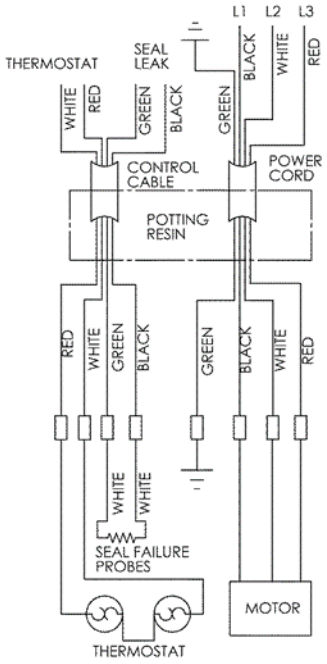
- Always disconnect the pump from its power source before handling.
- All electrical connections must be wired and grounded in accordance with the National Electrical Code and all applicable local codes and ordinances.
- Risk of electrical shock – Do not remove the power supply cord. All repairs and service must be performed by a repair facility approved by Liberty Pumps and certified to work on explosion proof motor enclosures.
- If power or control cord are damaged, or in need of replacement, contact Liberty Pumps for closest approved repair facility.
- All installations of pumps, controls, protection devices and general wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed for the National Electrical Code (NEC), the Occupational Safety and Health Administration (OSHA) and applicable local codes.

XLE-SERIES PUMPS
SINGLE PHASE (1 PH)

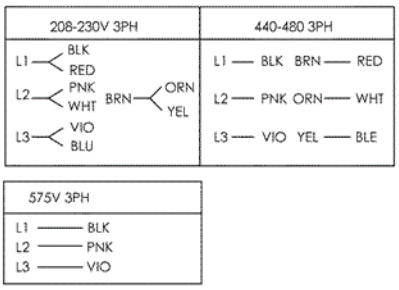


NOTE: The white and red leads of the control cord are not used when wiring single phase pumps.

XLE-SERIES PUMPS
THREE PHASE (3 PH)



WIRE DIAGRAMS FOR MOTOR CONNECTIONS



For hazardous locations the control panel must be installed outside the hazardous area. Only approved controls that have intrinsically safe float switch connections may be used for XLE-Series pumps. The control and power cables cannot be spliced; a junction box may be used providing it is rated for hazardous locations and has approved cord connectors.

Seal Leak Detection:

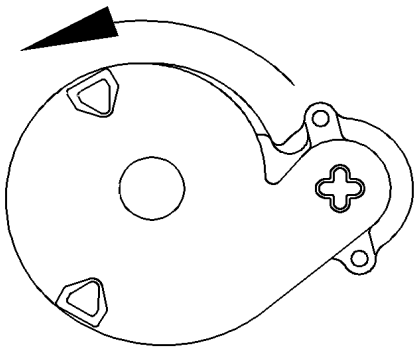
All XLE-Series pumps are equipped with two mechanical face seals with an intermediate oil chamber between them. This ensures lubrication for the seals, flame path and as a barrier to the motor chamber in the event the lower seal should become compromised. A seal fail or moisture sensing device is located in the mid oil chamber and continuously monitors for leakage. Should moisture mix with the oil, the sensor will illuminate an indicator light on the control panel indicating a shaft seal failure has occurred. If a leak should occur, the pump will continue to run; service should be scheduled as soon as possible.

The ISS and ISD panels by Liberty Pumps have a seal leak test button that tests the integrity of the seal leak circuit continuity. When pressed, the light should illuminate. If it does not, either the light is burned out or the circuitry is open. The seal leak module is located Inside the panel and requires adjustment upon installation. The dial should be set to 75, for best results turn the dial until the light turns on around 125 then turn it back to 75.

⚠ CAUTION

CAUTION - Check 3-phase pumps for proper rotation prior to installing pump(s) in basin. To change rotation, reverse any two of the three power leads to the pump. Code the wires for reconnection after installation.

For 3-Phase pumps, rotation should be counter-clockwise as looking from the bottom of the pump (shown below).



Bottom View

Pump Installation:

The water level in the sump is determined by the placement of the control floats and should be positioned such that the pump is completely submerged; if submersion isn't possible, the minimum water depth shall be no less than the depth defined from the bottom of the pump legs. The upper water level should be positioned to minimize pump starts. The alarm float shall be above the turn on float switch but below any inlets. No control should be set above the inlet to the sump.

Pump Model	Minimum Fluid Depth (from bottom of legs)
XLE100	9"
XLE150	14"

WARNING

RISK OF FIRE - When working in a hazardous location, all precautions to minimize ignition sources such as spark and flame should be minimized to limit the potential for fire or explosion.

When connecting an explosion - proof pump in hazardous locations using a rail system, it should be of a non-sparking type design. Contact Liberty Pumps for available models such as GR22NS-LE and GR30NS.

After the pump(s) have been mounted and the cover sealed, install the remaining discharge line. A union should be installed just above the cover to facilitate pump removal if necessary. A check valve is recommended after the union to prevent the backflow of liquid after each pumping cycle. A gate valve should follow the check valve to allow periodic cleaning of the check valve or removal of the pump. The remainder of the discharge line should be as short as possible with a minimum number of turns, to minimize friction head loss. Do not restrict the discharge to below 2". Larger pipe sizes may be required to eliminate friction head loss over long runs. Contact Liberty Pumps or other qualified person if there are questions regarding proper pipe size and flow rates.

Vent: A connection may be provided on top of the cover which must be piped to the existing building vent, or extended outside on its own standpipe. The vent size should be in accordance with applicable codes, but not less than the discharge size. Some XLE-Series pumps come equipped with an air bleed hole to help prevent air lock. A small spray of water from this hole is normal while pump is running.

WARNING

RISK OF ELECTRIC SHOCK - Always disconnect the pump from power source prior to handling, set-up, or maintenance.

3. Maintenance and Troubleshooting

Troubleshooting:

Many common operation issues are outlined in the troubleshooting matrix at the end of this section. Use this resource to diagnose and solve common problems which may occur with the pump or system. If problems persist, please contact your Liberty Pumps authorized representative.

Maintenance:

The pump must be serviced at a qualified hazardous motor enclosure repair facility approved by Liberty Pumps. Any unauthorized field repairs voids warranty and hazardous location ratings. Contact Liberty Pumps at 1-800-543-2550 to locate the closest repair facility.

The pump must be pulled from the sump; prior to any service - disengage electrical power to the pump prior to performing any work.

⚠ CAUTION

CAUTION - Sewage water gives off methane and hydrogen sulfide gases which are poisonous. Proper personal protection equipment should be worn.

In the event the pump becomes clogged, the inlet screen can be removed to gain access to the pump's impeller. Once the obstruction is removed the anti air lock hole should be cleaned.

The lower shaft seal is field serviceable; a certified repair shop should perform this task because they have the capability to clean and flush the mid oil chamber.

This is the only work or maintenance that can be performed. All other maintenance or service such as cord replacement requires a certified repair shop. Contact Liberty Pumps at 1-800-543-2550 to locate the closest authorized hazardous duty motor repair shop.

*__NOTE:__ Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than at Liberty Pumps or its authorized service centers, automatically voids warranty.

Power cord and control cord replacement:

⚠ WARNING

RISK OF ELECTRIC SHOCK - Accidental contact with electrically live parts, items, fluid, or water can cause serious injury or death.

The power cord and control cord are not field replaceable. If either cord is compromised the entire pump must be brought to a qualified hazardous motor enclosure repair facility approved by Liberty Pumps. Any unauthorized field repairs voids warranty and hazardous location ratings. Contact Liberty Pumps at 1-800-543-2550 to locate the closest repair facility.

Problem	Cause	Correction
Pump will not run.	• Tripped breaker or other interruption of power; improper voltage.	• Reset breaker by pushing completely down on the handle then back to the on
		• Have an electrician check all wiring for proper connections and adequate voltage
	• Switch is unable to move to the “turn on” position due to interference with the side	• Position the pump or switch so that it has adequate clearance for free operation.
	• Insufficient liquid level.	• Make sure the liquid level is allowed to rise enough to activate switch(s).
	• Defective switch.	• Remove and replace switch.
	• Internal motor short.	• Requires an authorized service center.
Pump will not turn off.	• Switch(s) unable to move to the “turn off” position due to interference with the side of basin or other obstacle.	• Position the pump or switch so that it has adequate clearance for free operation.
	• Defective switch.	• Remove and replace switch.
Pump runs or hums, but does not pump.	• Stuck / defective motor contactor	• Replace motor contactor in panel.
	• Discharge is blocked or restricted.	• Check the discharge line for foreign material, including ice if the discharge line
	• Check valve is stuck closed or installed backwards.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Gate or ball valve is closed.	• Open gate or ball valve.
	• Total lift is beyond pump's capability.	• Try to route piping to a lower level. If not possible, a larger pump may be required.
	• Pump impeller is jammed or volute casing is plugged.	• Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and
	• Pump is air locked.	• Clear anti-air lock hole.
		• Add baffle to reduce entrained air bub-
	• Capacitor failure.	• Check caps and replace if needed.
Pump runs periodically when fixtures are not in use.	• Check valve was not installed, is stuck open or is leaking.	• Remove check valve(s) and examine for freedom of operation and proper installation.
	• Fixtures are leaking.	• Repair fixtures as required to eliminate
Pump operates noisily.	• Foreign objects in the impeller cavity.	• Remove the pump from the basin. Detach the pump base and clean the area around the impeller. Reassemble and
	• Broken impeller.	• Consult the factory for information regard-
	• Worn bearings.	• Return pump to the factory or authorized
	• Piping attachments to building are too	• Replace a portion of the discharge line
Seal fail light is illuminated.	• Lower seal has been compromised.	• Replace lower seal.
	• Relay sensitivity is incorrect.	• Decrease sensitivity by turning the dial. Proper range is 75 to 125.

4. 3-Year Limited Warranty

Liberty Pumps, Inc. warrants that its products are free from all factory defects in material and workmanship for a period of 3 years from the date of purchase. The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than 3 years from the "CODE" (date of manufacture) number noted on the pump nameplate.

The manufacturer's sole obligation under this warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding events have taken place.

The manufacturer shall not be liable under this warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or in water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model 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 indirect, incidental, and consequential damages, including costs of removal, reinstallation or transportation.

THE WARRANTIES SET FORTH ABOVE ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ALL SUCH OTHER WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY LIBERTY PUMPS, INC.

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