Liberty Pumps®

A Family and Employee Owned Company

Installation **Manual**

7035000P

Submersible Dewatering/Effluent Pumps

Models

250-Series	*1/3 hp*
280-Series	*1/2 hp*
290-Series	*3/4 hp*
FL30-Series	*1/3 hp*
FL50-Series	*1/2 hp*
FL60-Series	*6/10 hp*
FLH60-Series	*6/10 hp*
FL70-Series	*3/4 hp*
FL100-Series	*1 hp*
FL150-Series	*1-1/2 hp*
FL200-Series	*2 hp*



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Safety Guidelines

	This safety alert symbol is used in the manual and on the pump to alert of potential risk for serious injury or death.
	This safety alert symbol identifies **risk of electric shock**. It is accompanied with an instruction intended to minimize potential risk of electric shock.
	This safety alert symbol identifies **risk of fire**. It is accompanied with an instruction intended to minimize potential risk of fire.
	This safety alert symbol identifies **risk of serious injury or death**. It is accompanied with an instruction intended to minimize potential risk of injury or death.
⚠DANGER	Warns of hazards which, if not avoided, **will** result in serious injury or death.
⚠WARNING	Warns of hazards which, if not avoided, **could** result in serious injury or death.
⚠CAUTION	Warns of hazards which, if not avoided, **could** result in minor or moderate injury.
NOTICE	Signals an important instruction related to the pump. Failure to follow these instructions could result in pump failure or property damage.

⚠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.**
NOTICE	**Installer: manual must remain with owner or system operator/maintainer.**

Keep this manual handy for future reference.

For replacement manual, visit LibertyPumps.com, or contact Liberty Pumps at 1-800-543-2550.

Retain dated sales receipt for warranty.

Record information from pump nameplate:

Pump Model #: _____

Pump Serial #: _____

Manufacture Date: _____

Install Date: _____

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Safety Precautions

WARNING **RISK OF ELECTRIC SHOCK**

- Accidental contact with electrically live parts, items, fluid, or water can cause serious injury or death.
- Always disconnect pump(s) from power source(s) before handling or making any adjustments to either the pump(s), the pump system, or the control panel.
- All installation and maintenance of pumps, controls, protection devices, and general wiring shall be done by qualified personnel.
- All electrical and safety practices shall be in accordance with the National Electrical Code®, the Occupational Safety and Health Administration, or applicable local codes and ordinances.
- Do not remove cord and strain relief, and do not connect conduit to pump.
- Pump shall be properly grounded using its supplied grounding conductor. Do not bypass grounding wires or remove ground prong from attachment plugs. Failure to properly ground the pump system can cause all metal portions of the pump and its surroundings to become energized.
- Do not handle or unplug the pump with wet hands, when standing on damp surface, or in water unless wearing Personal Protective Equipment.
- Always wear dielectric rubber boots and other applicable Personal Protective Equipment (PPE) when water is on the floor and an energized pump system must be serviced, as submerged electrical connections can energize the water. Do not enter the water if the water level is higher than the PPE protection or if the PPE is not watertight.
- Do not 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.
- 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 4 ft (1.22 m) above floor level.
- Do not use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, marine areas, etc.).
- Protect the power and control cords from the environment. Unprotected power and control (switch) cords can allow water to wick through ends into pump or switch housings, causing surroundings to become energized.
- Single-phase 208/230V pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

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. When used, electrical outlets shall be simplex of the appropriate rating.
- For cord replacement: power cord must be of the same length and type as originally installed on the Liberty Pumps product. Use of incorrect cord may lead to exceeding the electrical rating of the cord and could result in death, serious injury, or other significant failure.
- Do not use this product with or near flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. If rotating elements inside pump strike any foreign object, sparks may occur. Sparks could ignite flammable liquids.
- Sewage and effluent systems produce and may contain flammable and explosive gases. Prevent introduction of foreign objects into basin as sparks could ignite these gases. Exercise caution using tools and do not use electronic devices or have live, exposed electrical circuits in or around basins, open covers and vents.
- Manual pumps that have been factory constructed with a power cord with no male attachment plug must use an approved motor control panel. Do not wire a switch in series with the pump power cord as this can overload the wires. Overloaded wires get very hot and can catch on fire.
- These pumps are not to be installed in locations classified as hazardous in accordance with the National Electric Code®, ANSI/NFPA 70.

WARNING **RISK OF SERIOUS INJURY OR DEATH**

- Do not modify the pump/pump system in any way. Modifications may affect seals, change the electrical loading of the pump, or damage the pump and its components.
- All pump/pump system installations shall be in compliance with all applicable Federal, State, and Local codes and ordinances.
- Do not allow children to play with the pump system.
- Do not allow any person who is unqualified to have contact with this pump system. Any person who is unaware of the dangers of this pump system, or has not read this manual, can easily be injured by the pump system.
- In 208/230V installations, one side of the line going to the pump is always “hot”, whether the float switch is on or off. To avoid hazards, install a double pole disconnect near the pump installation.
- Vent basin in accordance with local code. Proper venting of sewer and effluent gases alleviates poisonous gas buildup and reduces the risk of explosion and fire from these flammable gases.
- Wear adequate Personal Protective Equipment when working on pumps or piping that have been exposed to wastewater. Sump and sewage pumps often handle materials that can transmit illness or disease upon contact with skin and other tissues.
- Do not enter a pump basin after it has been used. Sewage and effluent can emit several gases that are poisonous.

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- Do not remove any tags or labels from the pump or its cord.
- Keep clear of suction and discharge openings. To prevent injury, never insert fingers into pump while it is connected to a power source.
- Do not use this product with flammable, explosive, or corrosive fluids. Do not use in a flammable and/or explosive atmosphere as serious injury or death could result.
- This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. www.p65warnings.ca.gov.

NOTICE

- Verify 3-phase pumps for correct rotation prior to installing pump(s) in basin. To change rotation, reverse any two of the three power leads to the pump (not the ground). Code the wires for reconnection after installation.
- Do not 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 140°F (60°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, hydrocarbons, grease, 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 introduce any consumer item that is not toilet paper into a non-grinder (dewatering/effluent or sewage) pump/ pump system. This includes, but is not limited to the following: feminine products, wipes, towels, towelettes, dental floss, swabs, pads, etc. Items such as these put the pump under undo strain and can result in pump/pump system failure. Additionally, it creates conditions for discharge line blockage.
- Do not run dry.
- Do not exert heavy pressure or run heavy equipment on the backfill material as this could cause the tank to collapse.
- Do not position the pump float directly under the inlet from drain tile or in the direct path of any incoming water.
- Keep pump upright.
- Do not allow pump to freeze.
- At no time shall the pump be stored within an incomplete wet basin. The pump shall not be placed into the basin until it can be fully operational.
- Effluent pumps need to be totally submerged below the water line to prevent pump corrosion.

General Information

Before installation, read these instructions carefully. Each pump is individually factory tested to ensure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

These pumps are to be used for handling septic tank effluent and drain (storm) water.

Provide pump serial number in all correspondence.

Pumps are certified to CSA® and UL® standards.

Pumps must be serviced at a qualified repair facility approved by Liberty Pumps. No repair work should be carried out during the warranty period without prior factory approval. Any unauthorized field repairs void warranty. Contact Liberty Pumps at 1-800-543-2550 to locate the closest authorized service center.

Operating Constraints

It is extremely important to verify that the pump has been sized correctly for the intended installation. The operating point of the pump must lie within the acceptable range as outlined by the applicable Liberty Pumps performance chart. Operating the pump outside of the recommended range can invalidate the CSA Certification of the pump and can also cause damage and premature failure. Operating outside of the recommended range can cause the pump to exceed its rated nameplate amp draw, which will void the pump certification. It can also cause motor overheating, cavitation, excessive vibration, clogging, and poor energy efficiency.

Model Specifications

For complete listing of pump models and their specifications, refer to http://www.LibertyPumps.com/About/Engineering-Specs. Pump nameplate provides a record of specific pump information.

Inspection and Storage

Initial Inspection

Inspect pump immediately for damage that may have occurred in shipment.

1. Visually check the pump and any spare parts for damage.
2. Check for damaged electrical wires, especially where they exit the motor housing.

Contact Liberty Pumps customer service to report any damage or shortage of parts.

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Storage Before Use

⚠WARNING ⚠ **RISK OF ELECTRIC SHOCK**

- Protect the power and control cords from the environment. Unprotected power and control (switch) cords can allow water to wick through ends into pump or switch housings, causing surroundings to become energized.

NOTICE

- At no time shall the pump be stored within an incomplete wet basin. The pump shall not be placed into the basin until it can be fully operational.
- Do not allow the pump to freeze.

Pumps are shipped from the factory ready for installation and use. Hold the pump in storage if the pump station is not complete.

If storage is necessary, the pump should remain in its shipping container. It should be stored in a warehouse or storage shed that has a clean, dry temperature-stable environment where the pump and its container are covered to protect it from water, dirt, vibration, etc. The cord ends must be protected against moisture.

Uninstalled pumps that are idle for greater than three months should have impellers manually rotated once a month to lubricate the seals.

Installed pumps that are idle for greater than one month should have impellers manually operated through the breaker panel once a month to lubricate the seals. For **automatic models**, turn off the breaker, unplug the piggyback switch, and plug the pump directly into the wall socket. Turn the breaker on for 30 seconds, then turn the breaker off. Plug the piggyback switch back in. Refer to ***Piggyback Switch Operation*** on page 7.

Pump Design

All Liberty Pumps dewatering/effluent pumps come equipped with an air bleed hole in the base of the pump to help prevent airlock. A small spray of water from this hole is normal while pump is running.

For added protection, consider the addition of a back-up pump, as well as an alarm in applications where loss of pump function could result in property damage. If an alarm is used, it must be connected to a separate electrical circuit.

Pump System Components

Control Panel

Manual models ("***M***" suffix) and 3-phase models require a separate, approved pump control device or panel for automatic operation. Operation will be according to the control panel selected. Refer to separate manufacturer's instructions supplied with the unit. Verify the electrical specifications for the control panel properly match those of the pump. 3-phase models require overload elements selected or adjusted in accordance with the control or panel instructions.

Mounting, installation, and wiring connections are specific to the control panel used. Refer to the manufacturer's instructions supplied with the unit.

IMPORTANT: When connecting a new pump to an existing control panel, verify the panel is correctly sized and equipped for the pump.

Control panels designed for use with specific pumps available from Liberty Pumps can be found at http://www.LibertyPumps.com/Portals/0/Files/panel_selection_guide.pdf or contact Liberty Pumps.

Float Switches

⚠WARNING ⚠ **RISK OF ELECTRIC SHOCK**

- Single-phase 208/230V pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

Automatic Models

All FL-Series automatic models ("***A***" suffix) and Models 253, 283 and 293 come factory-equipped with a float switch mounted to the pump. These models come with two cords—one to the float switch and the other to the pump motor. The switch cord has a series (piggyback) plug enabling the pump motor cord to be plugged into the back of it. The purpose of this design is to allow temporary manual operation of the pump.

For manual operation, or in the event of float switch failure, the pump cord can be separated and plugged into the electrical outlet, directly bypassing the switch. Refer to ***Piggyback Switch Operation*** on page 7.

If using a differential other than the factory setting, verify that when the pump turns off, the minimum fluid level left in the basin is per Table 1 so the impeller remains submerged. A minimum cord length of 3-1/2" from the tether point to the top surface of the float is required for proper switch operation.

Models 251, 257, 281, 287, 291, and 297 have factory-preset float switches that are not adjustable. Other pumping differentials may be obtained by tethering the switch cord to the discharge pipe.

Switchless (Manual) Models

Manual pumps with no float switch are intended to be run using an approved liquid level control or approved motor control with correct rating that matches motor input in full load amperes. Regardless of the control type, verify that when the pump shuts off, the minimum fluid level left in the basin is per Table 1 so the impeller remains submerged.

IMPORTANT: Manual pumps factory constructed with a power cord with no male attachment plug must use an approved motor control panel. ***Do not wire a switch in series with the pump power cord.***

Automatic operation with optional control devices: if the pump(s) are to be operated by either a simplex or duplex control panel or other optional control device, follow the manufacturer's instructions provided with the control panel for power connections.

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Float Switch Settings

Table 1 includes factory set float levels for automatic models. The turn OFF level must be maintained as it is the ***minimum*** water depth to ensure proper cooling. Manual pumps have user-set turn ON levels.

Table 1. Factory Set Float Switch Settings

Model	Turn OFF Level	Turn ON Level
250	4″	*user-set*
251, 253	4″	11″
257	4″	7″
280	4″	*user-set*
281, 283	7″	13″
287	4″	9.5″
290	4″	*user-set*
291, 293	7″	13″
297	4″	9.5″
FL30	5″	12″
FL50	6″	13″
FL60	6″	13″
FL70	6″	13″
FLH60	6″	13″
FL100	8″	15″
FL150	8″	15″
FL200	8″	15″

Preparation

⚠WARNING **RISK OF ELECTRIC SHOCK**

- Always disconnect pump(s) from power source(s) before handling or making any adjustments to either the pump(s), the pump system, or the control panel.

The basin required for effluent applications must be sealed and vented to meet health and plumbing code requirements. Proper basin size and materials for effluent applications vary depending on the type of effluent system and local codes. Check local codes prior to purchasing and installing the basin. Follow the manufacturer's recommended guidelines for installation of the basin. A minimum diameter of 18" and depth of 24" is required for proper pump operation, but larger basins are preferred for longer pump cycles and increased float switch life. Installation should be at a sufficient depth to ensure that all plumbing is below the frost line. If this is not feasible, size the basin and/or adjust the pump differential to accommodate the additional backflow.

For ordinary ground water pumping applications, it is recommended that the sump basin diameter be a ***minimum*** of 14″. Vertical Magnetic Float (VMF) models 257, 287, and 297 may be used in a ***minimum*** 10″ diameter sump; however, a larger diameter basin is preferred as it allows for a longer pump cycle and reduced float switch cycling. The depth of the basin should be a ***minimum*** of 18″.

Prepare Existing Sump [Basin]

If replacing a previously installed pump, prepare the basin by removing the old pump and cleaning any debris from the basin. Inspect all remaining equipment in the basin including piping, valves, and electrical junction boxes (if present) and repair or replace as appropriate.

If the basin is not already enclosed on the bottom, provide a hard level bottom of bricks or concrete. Do not place the pump directly on earth, gravel, or debris since this can cause excessive wear of the impeller and possible jamming.

"The Brick" (Liberty Pumps #4445000) is a pre-molded stable platform designed to fit the 250, 280, and 290-Series submersible pumps. It raises the pump 2-1/2″ off the bottom of the basin, reducing the potential for jamming from rocks and debris. Contact a local distributor to order.

Prepare New Sump [Basin]

Excavation

⚠WARNING **RISK OF SERIOUS INJURY OR DEATH**

- Locate all overhead and underground utilities before excavating.

Excavate the hole as small as possible, with a minimum recommended 8″ diametrical clearance around the tank. Never place the basin directly in contact with rocks or other sharp objects. Place only fine, 1/8″ to 3/4″ pea gravel or 1/8″ to 1/2″ washed, crushed stone as bedding between the basin and the hole walls. Do not use sand or native soil as backfill. Properly compact underneath the basin to provide a solid, level base that can support the weight of the filled basin.

Inlet Connection & Initial Backfill

Use only fine, 1/8″ to 3/4″ pea gravel or 1/8″ to 1/2″ washed, crushed stone around the bottom of the basin to hold it in place. Do not use sand or native soil as backfill.

Make the inlet connection as required per basin.

Final Backfill

NOTICE

- Do not exert heavy pressure or run heavy equipment on the backfill material as this could cause the tank to collapse.

Keep large rocks, clods, and foreign objects out of the backfill material. Only fine, 1/4″ to 3/4″ pea gravel, or 1/8″ to 1/2″ washed, crushed stone is recommended. Do not use sand or native soil as backfill. Mound the backfill slightly and allow for natural settling. Provide access to the basin cover for maintenance and service.

Compaction of backfill materials must be adequate to ensure the support of the tank, and to prevent movement or settlement.

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Installation

⚠WARNING **RISK OF ELECTRIC SHOCK**

- All installation and maintenance of pumps, controls, protection devices, and general wiring shall be done by qualified personnel.
- All electrical and safety practices shall be in accordance with the National Electrical Code®, the Occupational Safety and Health Administration, or applicable local codes and ordinances.

Electrical Connections

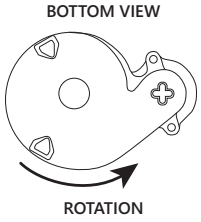
With main power disconnected, complete pump and control wiring connections per manufacturer's wiring diagrams included with the control panel as applicable. Once connections are made, all wires should be checked for unintentional grounds.

3-Phase Pump Rotation Verification

NOTICE

- Check 3-phase pumps for correct rotation prior to installing pump(s) in basin. To change rotation, reverse any two of the three power leads to the pump (not the ground). Code the wires for reconnection after installation.

3-phase power uses three separate alternating currents that peak at different integrals. With pumps that are powered by three phase electric, the phase sequence of the motor must match the phase sequence of the power source. When the phase sequences match, the pump operates properly.



However, when the phases are out of order, the pump runs backward (i.e., the impeller rotates in the wrong direction). This causes an extreme loss of performance and could raise the current draw, which could result in tripping an overload or circuit breaker.

To ensure that the power to the pump is installed correctly, always verify proper rotation ***before*** lowering it into the basin. If the pump is rotating in the wrong direction, turn off the power and reverse any two leads to the pump (not ground). This reverses the phase sequence and corrects the pump rotation. For 3-phase pumps, rotation must be counterclockwise when looking from the bottom of the pump. Label the wires for reconnection after installation.

Guide Rail System

If guide rails are used, refer to the separate instructions supplied with the unit for proper installation and operation, making sure all gaskets and components are present. Liberty Pumps Guide Rail System features a self-aligning mounting bracket. Contact Liberty Pumps for available models, such as GR22 and GR30 for FL-Series models.

If guide rails are not used, complete all pump-mounted plumbing at this time, being sure all gaskets and components are present.

Pump

Record information from pump nameplate onto inside cover of these instructions. Complete a visual inspection before lowering into basin.

Discharge

A check valve is required 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 reduce the discharge to below that which is provided on the pump.*** Larger pipe sizes may be required to eliminate friction head loss over long runs. Contact Liberty Pumps or other qualified person if questions arise regarding proper pipe size and flow rates.

Vent

Vent basin in accordance with applicable plumbing codes.

Piggyback Switch Operation

⚠WARNING **RISK OF ELECTRIC SHOCK**

- Single-phase 208/230V pumps shall only be operated without the float switch by using the circuit breaker or panel disconnect.

IMPORTANT: Verify breaker is turned off before plugging in the switch.

Plug the piggyback switch into the receptacle. The receptacle must be wired to an appropriately sized breaker. Plug the pump into the piggyback receptacle. Install the cable clamp (if supplied) for strain relief.

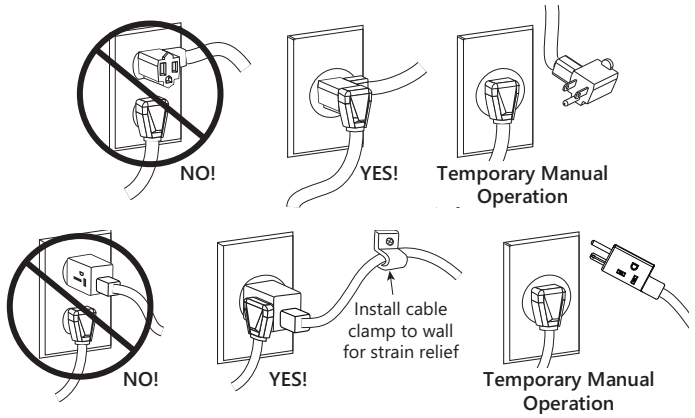


Figure 1. Piggyback Switch Operation

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Automatic Pump Direct Wiring

⚠WARNING **RISK OF SERIOUS INJURY OR DEATH**

- In 208/230V installations, one side of the line going to the pump is always "hot", whether the float switch is on or off. To avoid hazards, install a double pole disconnect near the pump installation.

If a 1-phase pump will be wired directly into a junction box, and it is necessary to remove the plug, a certified electrician shall complete the wiring in accordance with the National Electric Code and applicable local codes. A disconnecting means for the pump shall be located in sight from the pump/basin location. See Figure 2 for direct wire installation of 1-phase, automatic pumps.

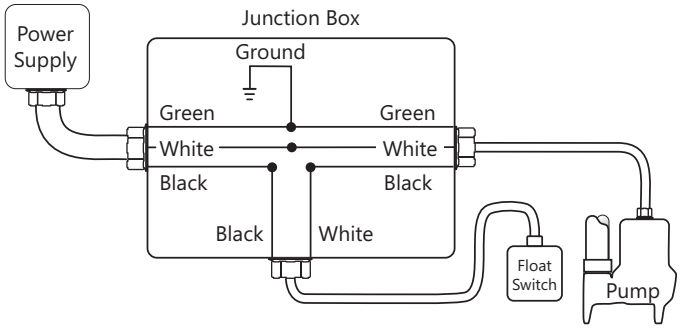


Figure 2. Direct Wiring of 115 V or 208/230 V, 1-Phase, Automatic

Dewatering/Sump System Application

A securable sump basin cover is required for safety and to prevent foreign objects from entering the basin.

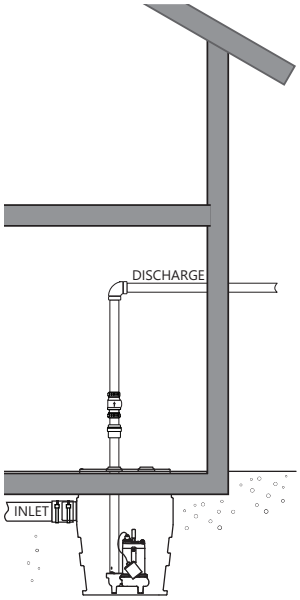
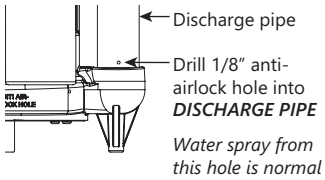


Figure 3. Typical Sump Installation (variations may apply)

1. Place pump in basin making certain the mounting interface (i.e., guide rail, torque stop) is engaged correctly. Float switch must have adequate clearance to side wall of basin and free, unobstructed movement throughout its complete travel and must not contact the pump, piping, or other objects.

   A 1-1/2" threaded discharge is provided for connection of the discharge pipe. **Do not restrict the discharge to below that which is provided on the pump.** Schedule 40 PVC pressure pipe is recommended.
2. Connect discharge pipe to the discharge of the pump. Hand-tighten only. Over-tightening may cause the pump housing to crack.
3. Install a union or other means of separating the discharge line just above the floor to facilitate removal of the pump when necessary. A check valve is ***required*** just above or in place of the union to prevent the backflow of water after each pump cycle.
4. Connect additional piping as needed to direct the discharge to the desired location. Discharge should be kept as short as possible with a minimum number of turns.
5. Check all connections.
6. Check valve usage requires drilling an 1/8" anti-airlock hole in the discharge pipe just above the pump's discharge outlet to prevent pump airlock.



Effluent System Application

VMF models (257, 287, and 297) are <u>not</u> recommended for effluent applications due to their short ON/OFF cycle. Wide-angle float models are better suited for effluent applications and are easily adjustable for different ON/OFF levels.

A securable basin cover is required for safety and to prevent foreign objects from entering the basin.

Simplex (One Pump) Systems

NOTICE

- Effluent pumps need to be totally submerged below the water line to prevent pump corrosion.

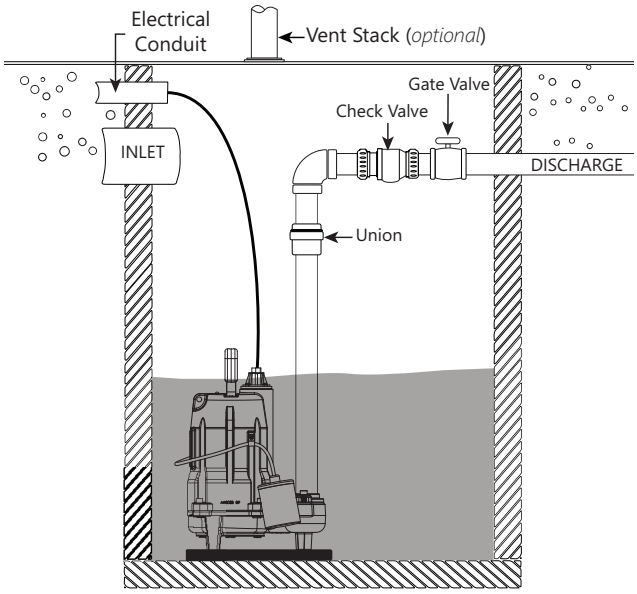


Figure 4. Typical Simplex System Installation (variations may apply)

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1. Place pump in basin making certain the mounting interface (i.e., guide rail, torque stop) is engaged correctly. Float switch must have adequate clearance to side wall of basin and free, unobstructed movement throughout its complete travel and must not contact the pump, piping, or other objects.
2. If an optional control device or float is used, follow the separate manufacturer's directions for mounting. Minimum pump turn OFF level must not be set below Table 1 values.
3. Connect the discharge pipe to the pump's threaded discharge. **Do not reduce the discharge pipe size below that which is provided on the pump.**
4. Install the remaining discharge line.
5. Install a union to facilitate pump removal when necessary.
6. Install a check valve after the union to prevent the backflow of liquid after each pumping cycle.
7. Install a gate valve after the check valve to allow periodic cleaning of the check valve or removal of the pump.
8. Install the remainder of the discharge line as short as possible with a minimum number of turns to minimize friction head loss. 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.
9. Mount and properly seal the basin cover.
10. Vent basin in accordance with applicable plumbing codes.

Duplex (Two Pump) Systems

NOTICE

- Effluent pumps need to be totally submerged below the water line to prevent pump corrosion.

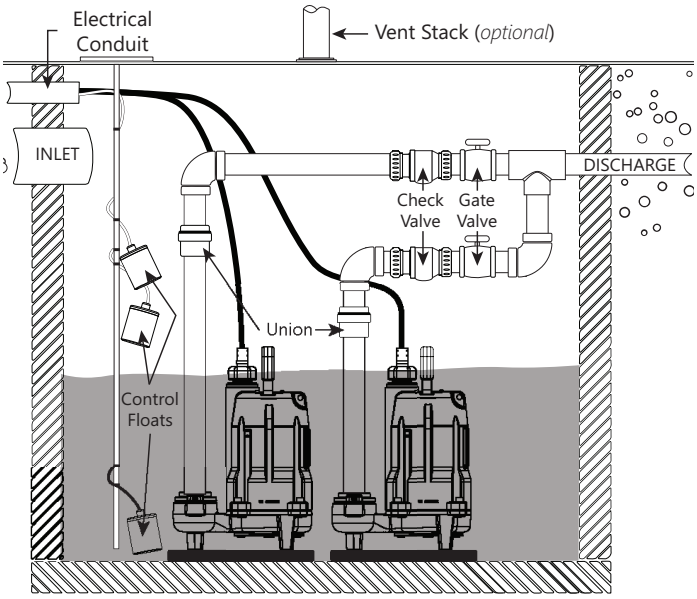


Figure 5. Typical Duplex System Installation (variations may apply)

1. Place both pumps in basin, making certain the mounting interface (i.e., guide rail, torque stop) is engaged correctly.

   The duplex control used will include 3 or 4 floats that will either be tethered to one of the discharge pipes or to an independent rod or bracket. Follow the duplex control manufacturer's instructions provided with the device. Each float switch must have adequate clearance to side wall of basin and free, unobstructed movement throughout its complete travel and must not contact the pump, piping, or other objects. Minimum pump turn OFF level must not be set below Table 1 values.
2. Connect an individual discharge pipe to each pump. **Do not reduce the discharge pipe size below that which is provided on the pump.** Larger pipe sizes may be required in some applications to reduce friction head loss over long runs. Contact Liberty Pumps or other qualified person if there are questions regarding proper pipe size and flow rates.
3. Install unions or flexible connectors to facilitate removal of the pump if necessary.
4. Install check valves on each discharge after the union and prior to the gate valve to prevent the back flow of liquid or gas. **A check valve on each discharge line, prior to tying into one common line, is necessary to prevent the recycling of fluid from one pump to the other.** A gate valve is recommended after the check valve to allow for periodic cleaning of the check valve or removal of the pump.

   Depending on the height of the basin, the check valves may either be installed inside the basin or outside the basin.
5. Install the remainder of the discharge line as short as possible with a minimum number of turns to minimize friction head loss. 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.
6. Mount and properly seal the basin cover.
7. Vent basin in accordance with applicable plumbing codes.

Operation

Starting System

1. Verify all plumbing components are installed correctly and functional. Verify all valves are open and ready for pump use.
2. Double check all wire connections. Re-tighten all factory and field connections.
3. Ensure pump has no obstructions.
4. With all electrical and mechanical connections complete and secure, turn on power to pump and control panel, if applicable.
5. Verify operation of the pump, floats, and alarm circuits.
6. Run several cycles of water through the system to verify correct control operation for the installation.

Be certain to complete adequate testing, especially on systems with multiple pumps or custom control configurations.

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Maintenance and Troubleshooting

⚠WARNING **RISK OF ELECTRIC SHOCK**

- Accidental contact with electrically live parts, items, fluid, or water can cause serious injury or death.
- Always disconnect pump(s) from power source(s) before handling or making any adjustments to either the pump(s), the pump system, or the control panel.

⚠WARNING **RISK OF SERIOUS INJURY OR DEATH**

- Wear adequate Personal Protective Equipment when working on pumps or piping that have been exposed to wastewater. Sump and sewage pumps often handle materials that can transmit illness or disease upon contact with skin and other tissues.
- Do not enter a pump basin after it has been used. Sewage and effluent can emit several gases that are poisonous.

NOTICE

- Verify correct 3-phase pump rotation before retuning to service.

Maintenance

Check pump frequently for debris and/or build up that may interfere with pump or float switch operation. As the motor is oil-filled, no lubrication or other maintenance is required.

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

Troubleshooting

No repair work shall be carried out during the warranty period without prior factory approval. To do so may void the warranty.

Liberty Pumps, Inc. assumes no responsibility for damage or injury due to disassembly in the field. Disassembly, other than an authorized repair facility approved by Liberty Pumps or its authorized service centers, automatically voids warranty.

Table 2. Troubleshooting Matrix

Problem	Possible Cause	Corrective Action
Pump does not start.	Damaged power or control cord.	Replace as needed.
	Control panel selector switch in OFF position.	Set selector switch to Hand or Auto position.
	Blown control circuit transformer fuse.	Replace fuse.
	Tripped circuit breaker, tripped GFCI, blown fuse, or other interruption of power.	Reset tripped circuit breaker, reset GFCI, replace blown fuse with properly sized fuse, check that the unit is securely plugged in, investigate power interruption.
	Improper voltage.	Have an electrician check all wiring for proper connections and adequate voltage and capacity.
	Float switch unable to move to PUMP ON position due to interference in basin or other obstruction.	Position pump or float switch so that it has adequate clearance for free movement.
	Insufficient liquid level.	Verify liquid level is allowed to rise enough to activate float switch.
	Defective float switch.	Replace float switch.
	Obstructed impeller or volute.	Remove obstruction.
	Loose wiring connections.	Check and tighten all connections.
Pump runs, but does not turn off.	Pump is airlocked.	Turn pump off and let set for several minutes, then restart.
	Control panel selector switch in Hand position.	Set selector switch to Auto position.
	Float switch unable to move to PUMP OFF position due to interference with the side of basin or other obstruction.	Position pump or float switch so that it has adequate clearance for free movement.
	Control panel failure.	Check control panel.
	Defective float switch.	Replace float switch.

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Table 2. Troubleshooting Matrix (continued)

Problem	Possible Cause	Corrective Action
Pump runs or hums, but does not pump.	Discharge line blocked or restricted.	Check discharge line for foreign material, including ice if discharge line passes through or into cold areas.
	Check valve is stuck closed or installed backward.	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 head (lift height) is beyond pump's capability.	Route piping to a lower level. If not possible, a larger pump may be required. Consult Liberty Pumps.
	Obstructed impeller or volute.	Remove obstruction.
	Pump is airlocked.	Turn pump off and let set for several minutes, then restart.
		Add baffle to reduce trapped air bubbles.
Pump cycles too frequently.	Improper float switch setting.	Adjust float switch setting.
	Check valve not installed, stuck open, or leaking.	Install check valve(s); remove check valve and examine for freedom of operation and proper installation.
Pump runs periodically when fixtures are not in use.	Check valve not installed, stuck open, or leaking.	Install check valve(s); remove check valve and examine for freedom of operation and proper installation.
	Fixtures are leaking.	Repair fixtures as required to eliminate leakage.
Pump does not deliver proper capacity.	Discharge valve(s) partially closed or clogged.	Check the discharge line for foreign material, including ice if the discharge line passes through or into cold areas.
	Check valve partially clogged.	Raise liquid level up and down to clear; remove check valve to remove obstruction.
	Incorrect 3-phase motor rotation.	Correct 3-phase pump rotation direction.
	Total head (lift height) is beyond pump's capability.	Route discharge piping to a lower level. If not possible, a larger pump may be required. Consult Liberty Pumps.
	Low liquid level.	Check liquid level.
	Obstruction in pump or piping.	Remove obstruction.
Pump operates noisily.	Piping attachments to building are too rigid.	Replace a portion of the discharge line with rubber hose or connector.
	Incorrect 3-phase motor rotation.	Correct 3-phase pump rotation direction.
	Foreign objects in the impeller cavity.	Clean the impeller cavity.
	Broken impeller.	Consult Liberty Pumps for information regarding impeller replacement.
Repeated tripping.	Circuit protection underrated.	Check rating and replace with proper size.
	Other appliance on same circuit.	Pump requires separate circuit.
	Pump is connected to an extension cord or wiring is inadequate or compromised.	Have an electrician check for proper wiring.
	Improper voltage.	Have an electrician check all wiring for proper connections and adequate voltage and capacity.
	Obstruction in pump.	Remove obstruction.
	Incorrect 3-phase motor rotation.	Correct 3-phase pump rotation direction.
	Foreign matter buildup.	Clean motor housing.

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Warranty

Liberty Pumps Wholesale Products Limited Warranty

Liberty Pumps, Inc. warrants that Liberty Pumps wholesale products are free from all factory defects in material and workmanship for a period of three (3) years from the date of purchase (excluding batteries). 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 three years from the date of manufacture 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 characteristics are evident:

The manufacturer shall not be liable under this Warranty if the product has not been properly installed, operated, or maintained per manufacturer instructions; 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; 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, grease, or hydrocarbons; if a non-submersible motor has been subjected to moisture; or if the label bearing the model and serial 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.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase. 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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