

Liberty Pumps®

Installation Manual

441400C

Model 441 Battery Backup System

*Do not throw away or lose this manual.



IMPORTANT:

Prior to installation, record Model, Serial Number, and Code Number from pump nameplate for future reference.

MODEL _____

SERIAL _____

CODE _____

INSTALLATION
DATE _____

Liberty Pumps®

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1. General Information – All Models

The battery back-up sump pump system is not a substitute for your primary sump pump. It is designed to temporarily back up your primary sump pump during a power outage or other problem which prevents normal operation of the primary pump. Do not use this system to pump flammable liquids or chemicals. Pump clear water only with this pump.

Keep battery charger dry and protected from damage.

In an emergency (such as an extended power outage) which depletes the system's deep cycle battery, your automobile battery may be temporarily substituted. Be sure to replace the system deep cycle battery as soon as possible. Use of an automobile battery instead of a deep cycle battery in this system will significantly reduce system total performance. Automobile batteries are not designed for this type of application and will be quickly ruined by the repeated charge/discharge cycling.

WARNING

- Please read this manual and follow the instructions carefully before using the charger.
- Hazardous Voltage. Can cause severe or fatal electrical shock. Do not plug in or unplug the battery charger while standing on a wet floor or in water. Be sure one hand is free when plugging in or unplugging the charger. If basement floor is wet, disconnect power to basement before walking on floor.
- RISK OF EXPLOSIVE GASES. WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. EXPLOSIVE GASES DEVELOP DURING NORMAL BATTERY OPERATION. IT IS IMPORTANT THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.
- DO NOT bypass grounding wires or remove ground prong from attachment plugs.
- Risk of electric shock. Always disconnect the pump from the power source before handling or making adjustments.
- Battery acid is corrosive. Do not spill on skin, clothing, or battery charger. Wear eye and head protection when working with the battery. Connect and disconnect DC output terminals only after removing the charger from the AC outlet. Never allow the DC terminals to touch each other.
- To avoid danger of fire or explosion, keep sparks and flame (pilot light) away from battery.
- The electrical connections and wiring for a pump installation should only be made by qualified personnel.
- This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type 15 Amp receptacle. A ground fault circuit interrupter (GFCI) is recommended for use on any electrical appliance submerged in water.
- DO NOT use an extension cord.
- The electrical outlet shall be within the length limitations of the power leads, and at least 4 feet above floor level to minimize possible hazards from flood conditions.
- The installation must be in accordance with the National Electric Code, Uniform Plumbing Code, International Plumbing Code, as well as all other applicable local codes and ordinances.
- Sump and sewage pumps often handle materials which could cause illness or disease. Wear adequate protective clothing when working on a used pump or piping.
- Keep clear of suction and discharge openings. To prevent injury, never insert fingers into a pump while it is plugged in.
- DO NOT use this product for flammable or corrosive liquid.
- DO NOT use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, etc.)
- NEVER dispose of materials such as paint thinner or other chemicals down drains, as they can chemically attack and damage pump components, potentially causing product malfunction or failure.

⚠ CAUTION

- Use this system only for backup sump pump duty in a residential application. It is not designed as a primary sump pump.
- Risk of flooding. DO NOT run pump dry. To do so will damage seals and can cause leaking and property damage.
- DO NOT use pumps in water over 140°F (60°C).
- DO NOT use pumps in mud, sand, cement, oil or chemicals.
- DO NOT modify the pump in any way.
- DO NOT lift or carry pump by power cord.
- DO NOT remove any tags from pump or cords.
- If pump is installed during construction before power is available, it must be protected from the environment to prevent water from entering through the cord plug end, etc.
- Keep battery charger and battery box off of the floor and in a dry, cool, well ventilated area.
- Make sure sump is clear of debris. Debris can damage the pump which can result in flooding
- Maximum vertical pumping distance is 18 feet (5.5M)
- The pump should be checked frequently for debris and/or build-up which may interfere with pump or float switch operation. The float must be free to move freely through its complete travel without any restrictions. Periodically (at least every three months), the pump should be tested to ensure proper function. This may be done by disconnecting power to the primary pump so that the water level rises to activate the back-up unit. Be sure to follow all safety precautions and remember to reconnect power to the primary pump and verify proper operation after conclusion of the test.

NOTICE: If a Carbon Monoxide (CO) sensor is installed, it must be at least 15 feet away from battery charger in order to avoid nuisance CO alarms. Please refer to your CO detector's installation guidelines for more information.

2. Installation of Pump

BATTERY BACKUP SYSTEM INSTALLATION AND OPERATION

NOTICE:

- Install this system during a time when the primary pump will not be needed. Gather all supplies before starting. Read all warnings and installation steps before you start.
- Be prepared for water to leak from the coupling or piping when disassembling or cutting the discharge pipe. Protect system components, tools and supplies from getting wet. Dry any work areas that get wet immediately.

BASIC TOOLS AND MATERIALS NEEDED

- | | | |
|-------------------------------------|-----------------------------|--|
| • Channel locks or large pliers | • Hacksaw (to cut PVC pipe) | • PVC pipe cleaner |
| • Tape measure | • Medium size pliers | • Cloth towel |
| • Socket wrench or 5/16" Nut driver | • Pencil | • Size 27 or 31 Deep Cycle Battery <i>*Liberty Pumps Stormcell® Batteries are recommended.</i> |
| • Side cutters | • Teflon tape | |
| | • PVC glue (solvent weld) | |

⚠ WARNING

Personal injury and flood hazard. Do not turn the pumps on until all the fittings are glued and the glue has dried. Loose fittings can unexpectedly disconnect from pipes and cause personal injury and flooding.

PREPARATION FOR INSTALLATION

1. Locate the “on” water level of the primary sump pump. Mark this location on the discharge pipe with a pencil. See Figure 1.
2. Drain the sump pit. The water level must be pumped down as low as possible before going on to the next step. To drain the sump pit follow either step “2A” or “2B” (below).
 - 2A. Raise the float on the float switch until the pump turns on. Use a wooden broom handle or a stick to do this.
 - 2B. If the sump pump has a piggy-back type power cord, remove the float switch power cord plug from the outlet and plug the pump power cord plug directly into the outlet. See Figure 2.
3. Confirm sump has been drained and shut-off pump. **NOTICE:** Do not let the pump run dry. This will damage the pump.
4. Unplug the pump

⚠ WARNING

Electrical shock hazard. Shock can burn or kill. Do not use metal or any other electrical conducting material to raise the float. Do not make contact with the water in the sump pit. Failure to follow this warning can result in personal injury or death.

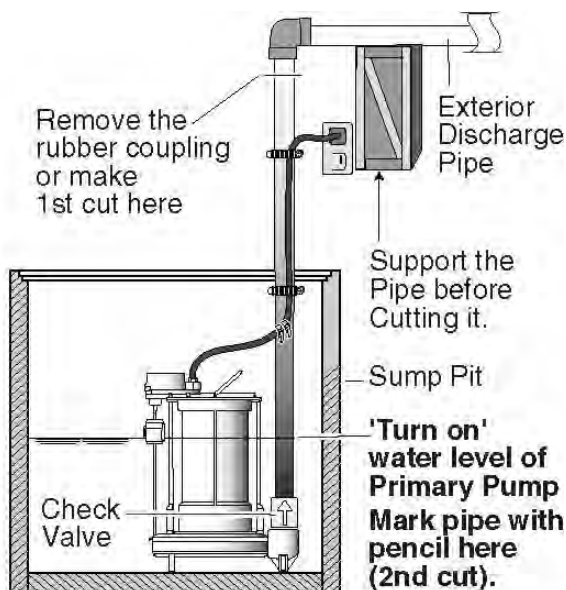
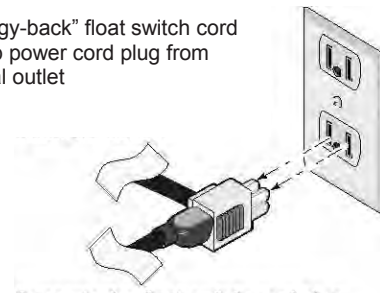
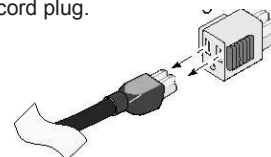


Figure 1 – Mark and cut pipe as shown

1. Unplug the “Piggy-back” float switch cord plug and the pump power cord plug from grounded electrical outlet



2. Separate the float switch cord plug from the sump pump cord plug.



3. Plug the pump power cord plug directly into the outlet

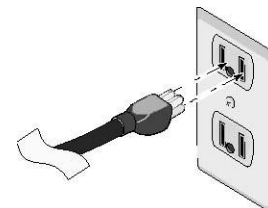


Figure 2 - To bypass the float

INSTALLATION

- 5. To separate the primary pump from the discharge pipe:
 - 5A. For applications with rubber couplings: remove the coupling clamp with a nut driver.
 - 5B. For applications without rubber couplings: cut the PVC discharge pipe with a hacksaw above the basement floor, at a comfortable level. You will need a new rubber coupling for reassembly. See Figure 1 on Page 4. **NOTICE:** The discharge pipe will be filled with water. Drain the water from the discharge pipe assembly. Keep the work area dry.

⚠ WARNING Risk of pinching hands or fingers. To avoid a hand injury from a collapse of plumbing, support the pipe above the separation before cutting or disassembly. See Figure 1.

⚠ WARNING Risk of electrical shock. Do not lift the pump by the electrical cord; lift pump only by the lifting ring, discharge pipe, or handle on the pump. Lifting by the cord can damage the cord.

- 6. Lift the primary pump and discharge pipe assembly out of the sump.

INSTALL BACKUP PUMP

There are two ways to install the Battery Back-up Pump - Method A and Method B. See Figure 3 to determine which method to use. Both methods are acceptable.

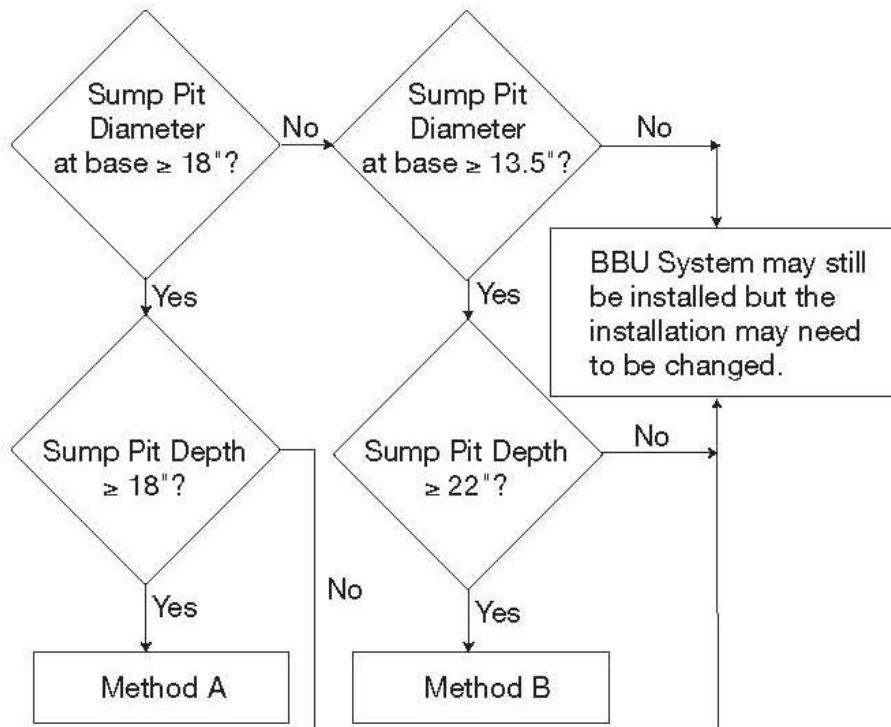


Figure 3 - Choose an installation method

INSTALLATION cont.

Method A

The recommended method suggests installing both of the pumps on the floor of the sump pit. See Figure 4. The minimum required sump basin diameter, at the bottom of the pit and the recommended depth of the sump basin is 18”.

Some additional materials you will need are a rubber coupling with clamps to fit your discharge pipe diameter, (2) 1-1/4” 90° elbows, (2) 1-1/4” close pipe nipples, and a primary pump check valve if not already installed on the pump.

1. Make the second cut in the discharge pipe at the pencil mark as shown in Figure 1 on page 4. Clean the pipe ends with a cloth towel and set the cut-off piece of discharge pipe aside.
2. If already assembled, remove the check valve assembly from the battery back-up pump discharge and set it aside. The check valve assembly will be used later, during re-assembly.
3. Apply (2) wraps of Teflon™ tape to the discharge threads of the pump and thread a 90° elbow (purchased locally) onto the discharge of the back-up pump. Take care not to overtighten and strip threads.
4. Wrap the threads of all 3 of the close pipe nipples with 2 turns of Teflon™ tape and thread one of them into the elbow. Set the other 2 aside.
5. Thread the check valve assembly, removed back in step 2, onto the close pipe nipple.

NOTICE: Make sure the check valve is installed in the correct direction. See the inset drawing in Figure 4.

6. Thread a close pipe nipple into the other end of the check valve.
7. Thread the second 90° elbow onto the pipe nipple.
8. Thread the last pipe nipple into the elbow.
9. Thread the tee onto the pipe nipple and set this assembly aside.
10. Install a short length of pipe into the top of the check valve in the primary pump discharge. See Figure 4.

NOTICE: There must be a check valve installed in the Primary Sump Pump discharge pipe between the tee and the Primary Sump Pump. This will prevent recirculation into the Primary Pump when the Backup Sump Pump comes on.

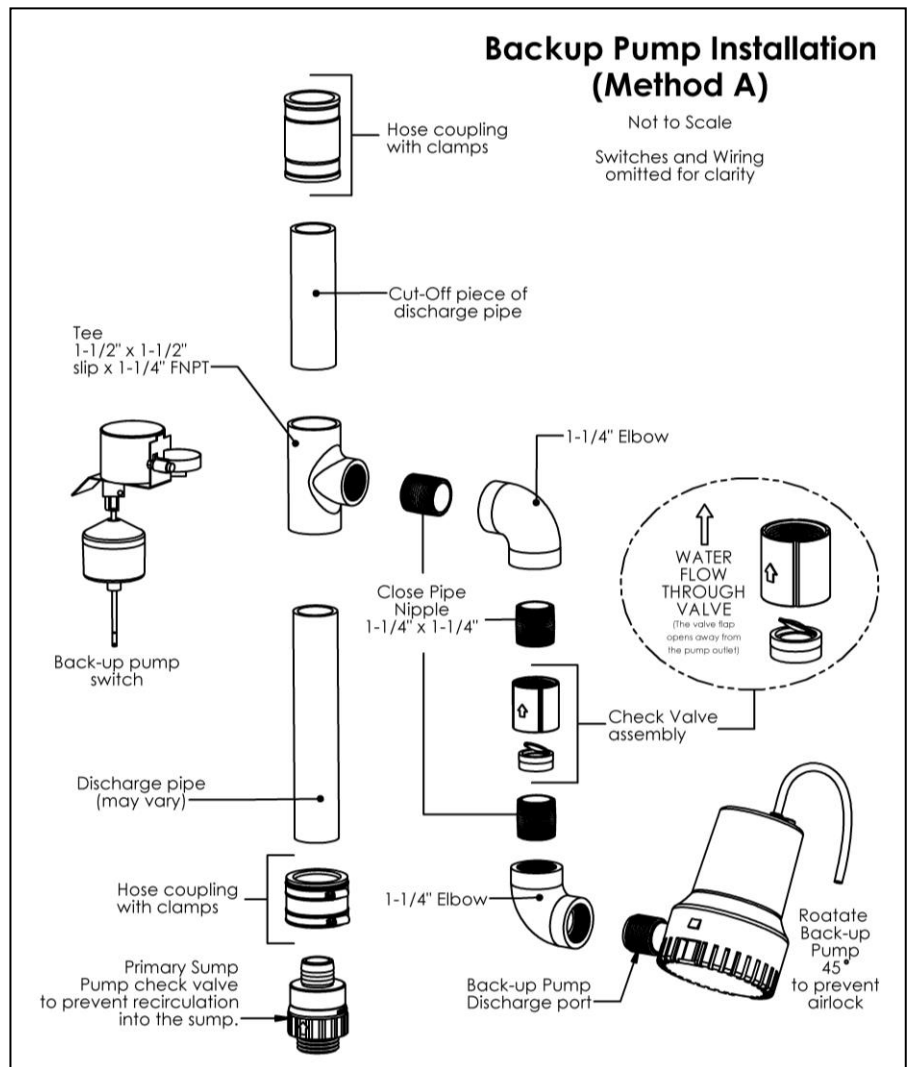


Figure 4 – Method A installation diagram

INSTALLATION cont.

11. If your discharge pipe is 1-1/2", you will not need the reducer bushings. If your discharge pipe diameter is 1-1/4", you will need to glue the reducer bushings into the tee.
12. Slip the tee and the back-up pump subassembly onto the short pipe exiting the primary pump.
13. Glue the cut off piece of pipe into the top of the tee (with reducer bushing if 1-1/4" pipe).
14. Mount the preassembled vertical switch to the discharge pipe above the tee with the provided clamp. Adjustments may be needed later and can be achieved by loosening the clamp and sliding the switch bracket up or down on the discharge pipe to attain the desired activation level.
15. Skip to the section "Cut the Discharge Pipe", Page 8.

Method B

Method B suggests installing the back-up pump above the primary sump pump. See Figure 5. The minimum required sump basin diameter for this type of installation is 13.5" at the bottom of the pit, and the minimum recommended depth of the basin is 22".

1. Make a second cut in the discharge pipe at the pencil mark made in step 1, on Page 4, and set the cut-off piece of discharge pipe aside. See Figures 1.
2. Wrap the threads of the close nipple and backup pump counterclockwise with 2 turns of Teflon™ tape.
3. Thread the check valve onto the backup pump discharge ensuring that the valve housing and inner valve flap are oriented correctly. See Figure 5 detail.
4. Thread the close pipe nipple into the check valve.
5. To thread the tee onto the close nipple. If needed, hold the check valve with the channel locks, insert the screwdriver into the tee for leverage, and tighten the tee with the screwdriver. Finish with the tee in a straight up and down (vertical) position and the pump oriented at an angle as shown to prevent airlock.
6. Clean the pipe ends with the cloth towel.
7. Glue the cut-off piece of discharge pipe into the top of the tee.

NOTICE: There must be a check valve installed in the primary sump pump discharge pipe between the tee and the primary sump pump. This will prevent recirculation into the primary pump when the backup sump pump comes on.

NOTICE: If your pipe is 1-1/4", you will need to glue the reducer bushings into the tee and glue the pipe into the bushing. Place the assembly onto the primary discharge pipe. Do not glue the tee onto the primary pump discharge pipe at this time as it will need to be removed later.

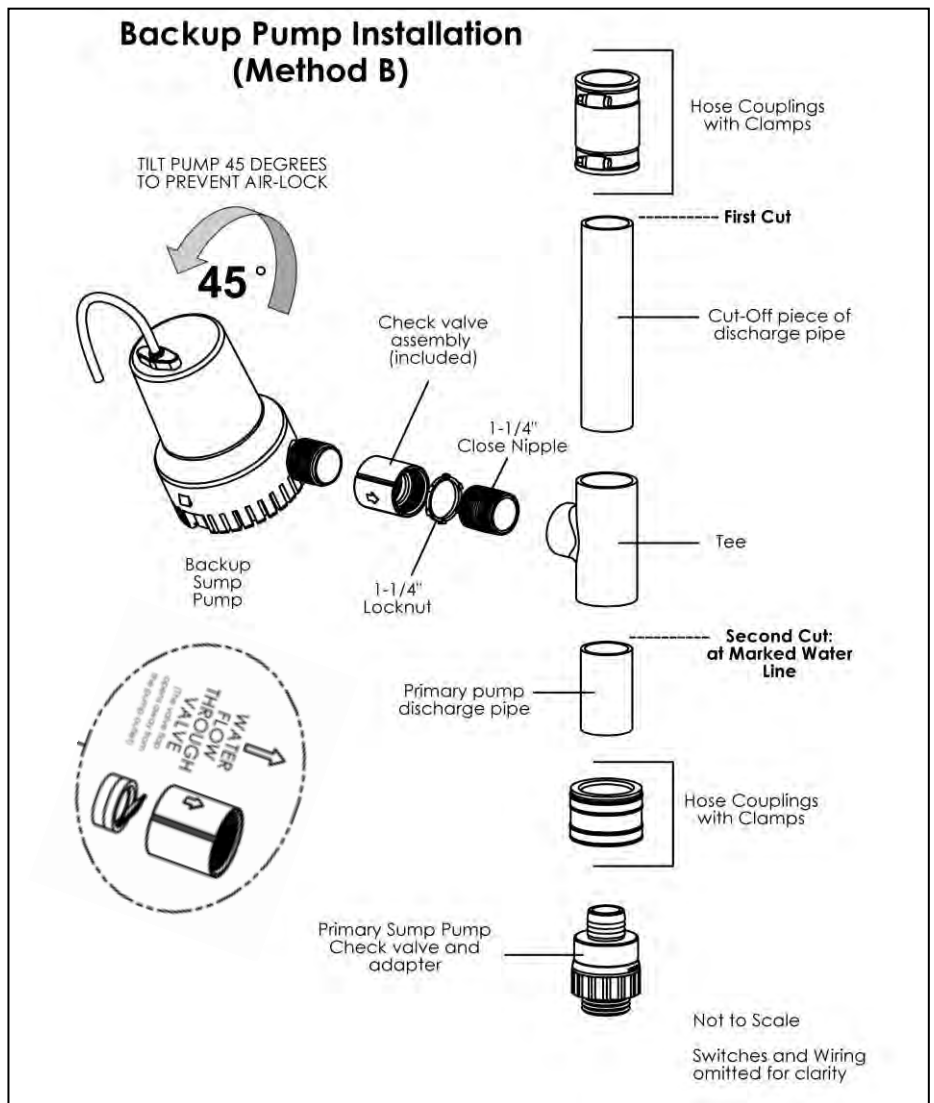


Figure 5 – Method B installation diagram

INSTALLATION cont.

8. Mount the back-up pump float switch assembly loosely to the discharge pipe per figure 7. Do not fully tighten the clamp at this time as adjustments may be needed later.

Cut the Discharge Pipe:

1. Put the double pump assembly into the sump pit.

NOTICE: The discharge pipe now overlaps the discharge pipe that leads outside.

2. Mark the discharge pipe where it should be cut. Be sure to leave a 1/4" air gap between the ends of the pipes. This gap will absorb the noise from vibration and allow for flexibility.
3. Make the third cut. See Figure 6.

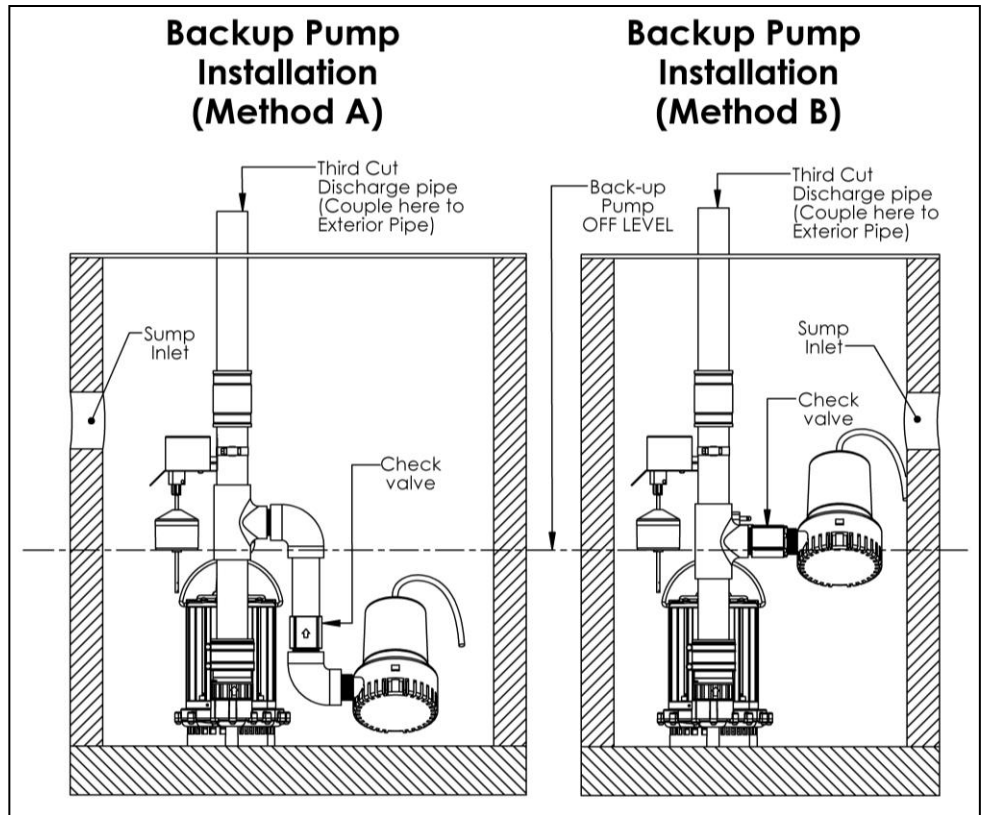


Figure 6 – Make the third cut to remove the excess discharge pipe.

Note: Always install the back-up sump pump as close to the bottom of the sump pit as possible.

TRIAL ASSEMBLY OF DOUBLE PUMP ASSEMBLY IN THE SUMP PIT:

1. Connect the pump discharge pipe to the exterior discharge pipe with a rubber coupling and clamps. Do not tighten the clamps until all the final adjustments are complete.
2. Make the final adjustments. Make sure the pumps and the switches do not interfere with each other. Make sure there is plenty of room for the float switches to either swing or to move up and down from their "off" to their "on" positions.

MARK AND GLUE THE ASSEMBLY:

1. Mark the pipe and the fittings at all the connections with a pencil. These marks will be used as a reassembly guide while gluing to be sure everything is still in the right place and nothing has moved.
2. Loosen the rubber coupling and clamp connection.
3. Carefully pull the double pump assembly back out of the pit.
4. Take the tee assembly off of the primary discharge pipe. **Do Not** unscrew any of the Teflon™ taped fittings.
5. Clean all the PVC pipe ends with the PVC cleaner.

⚠ WARNING Hazardous fumes. Follow the cement and cleaner manufacturer's instructions. Use the PVC cement in a well ventilated area away from fire or flames.

6. Glue the PVC fittings where indicated by the pencil marks. Wait 10 minutes for the glue to cure.

FINAL ASSEMBLY:

1. Put the double pump assembly back into the pit.
2. Install and tighten the rubber coupling and clamps.

Make the final float switch adjustments and tighten the mounting clamp and secure wires as needed.

INSTALLATION cont.

ELECTRICAL CONNECTIONS

⚠ WARNING Hazardous voltage can cause serious or fatal electrical shock. Review safety instructions before operating charger. Do not modify cord or plug.

Connect the	To the Junction Box's
Positive (+) lead from the battery	Positive battery connection
Negative (-) lead from the battery	Negative battery connection
Positive lead from the charger	Positive charger connection
Negative lead from the charger	Negative charger connection
Backup pump float switch (2 wires)	Float switch connection (2 wires)
Positive lead from the pump	Positive pump connection
Negative lead from the pump	Negative pump connection

Table I – Model 441 Wiring Connections



Figure 7 – Wiring Connections for Model 441

CHARGER / BATTERY INSTALLATION

NOTICE: An alarm, located in the junction box, automatically sounds when the system runs if the alarm is enabled. The alarm is silenced for 24hrs when the alarm “Disable” button is pressed.

1. Apply the (2) pcs of two-sided tape to the back of the junction box. Press the junction box onto the battery box where it will be accessible.
2. Connect the charger as shown above in Table I above.
3. Install 20Amp fuse (provided) in junction box.
4. After completely reading and understanding Section 3, plug the charger into a 115/120 Volt AC outlet. **Do not use a switch controlled outlet.** Mark circuit in main power panel “Backup sump pump power supply; do not turn off”.
5. With the charger properly connected and plugged in, the panel on the front of the charger will show the power and battery status.

NOTICE: For more detailed information on charger functionality, see “Charger Operation” starting on page 10.

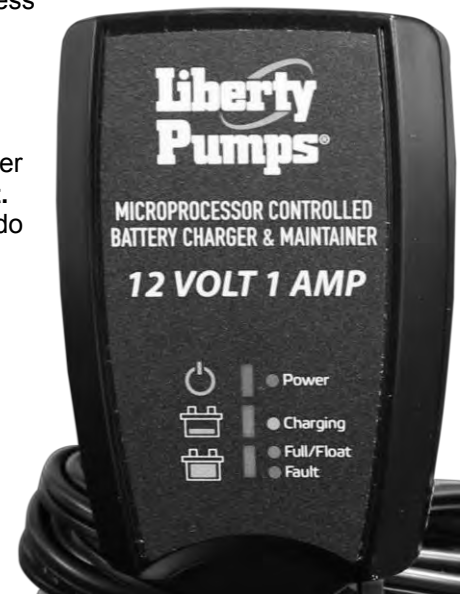


Figure 8 – Model 441 Charger LED Panel

3. Charger Operation

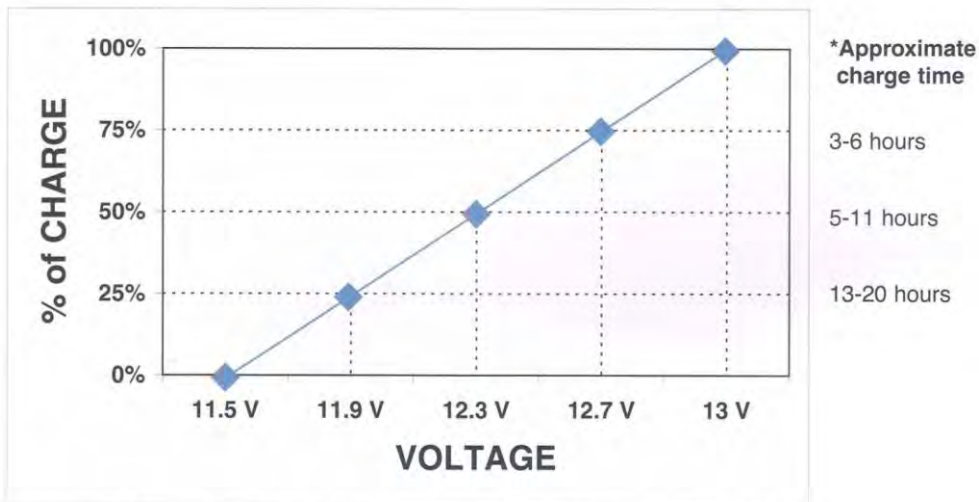
THIS SECTION CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS FOR 12V BATTERY CHARGER
***KEEP IT WITH OR NEAR CHARGER AT ALL TIMES.**

IMPORTANT SAFETY INSTRUCTIONS

Please read this manual and follow the instructions carefully before using the charger.

WARNING - RISK OF EXPLOSIVE GASES. WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. EXPLOSIVE GASES DEVELOP DURING NORMAL BATTERY OPERATION. IT IS IMPORTANT THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.

- The charger is designed to charge 12V lead-acid batteries.
- Never charge lithium ion batteries on this charger.
- The charge time will be dependent on the Ah rating of the individual battery. See chart below.



***Approximate charge time using a constant current charger at standard amps specified on the battery. Charging times may vary depending on the Ah rating of the battery.**

- We always recommend that you check the Battery Manufacturers specifications before using this charger.
- To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary marking on these products and act accordingly.
- Do not expose charger to rain, snow, or liquids.
- Use of an attachment not recommended or sold with charger may result in a risk of fire, electric shock, or injury to persons.
- To reduce risk of electric shock, unplug charger from AC outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
- Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- Do not disassemble charger; take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

PERSONAL PRECAUTIONS

- Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes. Wear complete eye and clothing protection. Avoid touching eyes while working near battery.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flush eye with running cold water for at least 10 minutes and get medical attention immediately.
- NEVER smoke or allow a spark or flame in vicinity of battery.
- Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
- When working with a lead-acid battery, remove personal metal items such as rings, bracelets, necklaces, watches, etc. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- **Use charger for charging a 12V Lead-Acid Battery only.** It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- NEVER charge a frozen battery.

CHARGER LOCATION

- Locate charger as far away from battery as dc cables permit.
- Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- Never allow battery acid to drip on charger when reading gravity or filling battery.
- Do not operate charger in a closed-in area or restrict ventilation in any way.

DC CONNECTION PRECAUTIONS

- Connect and disconnect DC output terminals only after removing charger from AC outlet.
- Never allow DC output terminals to touch each other.

FOLLOW THESE STEPS WHEN MAKING BATTERY CONNECTIONS. A SPARK NEAR THE BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- Check polarity of battery posts. POSITIVE (POS.,P,+) battery post usually has a larger diameter than NEGATIVE (NEG.,N,-) post. Some batteries are equipped with 'Wing- Nut' terminals allowing for easy placement of the terminals to these posts.
- Connect the negative battery lead to **NEGATIVE (NEG.,N,-)** battery post. Tighten nut securely.
- Connect **POSITIVE (RED)** battery lead to POSITIVE (**POS.,P,+**) post of battery. Tighten nut securely.
- Do not face battery when making final connection.
- Plug the charger into a 115/120V electric outlet.
- When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical

SAFETY & FEATURES: Automatic Switching Mode Battery Charger & Maintainer

- **Never overcharge your battery**
- **Easy to Use:** The Battery Charger is easy to operate and requires no technical experience.
- **Charge & Maintain - Automatic Charge:** On power up, the charger will automatically go to charging system, then could be left unattended and never overcharge your batteries.
- **Charge & Maintain - Automatic Maintenance:** When the battery is charged to "full" state, the charger automatically switches to maintain the battery. It will monitor the battery voltage and continue to peak performance to the battery.
- **Short circuit protection:** The charger will automatically turn off when the output short circuit occurred and prevent any damage
- **Reserve Battery Condition:** The charger has reverse battery and short circuit protection. If a reverse battery condition exists (Fault L.E.D. will turn RED, only, while output leads are connected backwards), simply unplug charger from AC power and properly remake the connections as described in this manual.
- **Internal over heat protection:** Chargers have an internal overheat protection. The charger will turn off power till temperature down to a safety level and restart charging again. All LEDs will be off.

BATTERY TYPES:

- Suits all Lead Acid Type Batteries. (Conventional, AGM & Gel)

OPERATING INSTRUCTIONS:

STEP 1 - Pre Charge Check & Electrolyte Level Check

- Check the Battery Electrolyte level (Not required on sealed & Maintenance Free Batteries). If necessary, remove the vent caps and add distilled water so the levels are halfway between the upper and lower fill lines.

STEP 2 - Connecting the Battery charger to your junction box

- Connect the Red lead from the charger to the positive (+) charger terminal.
- Connect the Black lead from the charger to the negative (-) charger terminal.

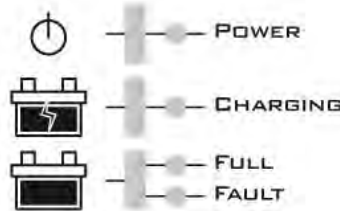
STEP 3 - Connect the battery charger to Mains Power (120Vac)

- Connect the battery charger to a 120VAC Mains Powered socket.
- Turn on the 120VAC Mains Power.
- The Charger will automatically start when AC power is connected and switched on.

(Note: If the Fault Indicator LED illuminates Red, please check your connections as it's likely that the Positive and Negative Leads are reversed. Refer to Trouble Shooting Page for further information)

THE CHARGING PROCESS:

The charging stages are as follows:



- **Bulk Charge:**

Charges using a constant maximum current (1A) until the battery reaches 14.4V - (LED Color - Yellow)

- **Fully / Float:**

Battery is fully charged and is being maintained. (LED Color - GREEN)

LED STATUS INDICATOR TABLE:

	Power (Red)	Charging (Yellow)	Full (Green)	Fault (Red)
A.C. Power connected, battery disconnected	ON	OFF	OFF	OFF
Bulk Charging	ON	ON	OFF	OFF
Level 1 Charging	ON	ON	OFF	OFF
Level 2,3 Charging	ON	OFF	ON	OFF
Battery Reverse polarity connection	ON	OFF	OFF	ON
A.C. Power OFF	OFF	OFF	OFF	OFF

CHARGER SPECIFICATIONS:

- Input voltage: 100-120Vac
- Input Frequency: 50/60Hz
- Output: 1A @ 12V
- Size (L*W*H) in mm: 100*65*36
- Weight: 0.4Kg
- Approvals: UL/cUL, FCC

ENVIRONMENTAL CHARACTERISTICS:

- Operating Temperature: 0 to 45°C
- Storage Temperature: -25 to 85°C
- Operating Humidity Range: 0 to 90% RH
- Cooling: Passive / Natural

TROUBLE SHOOTING

Types of Problems	Indication	Possible Causes	Suggested Solution
<u>Charger does not work?</u>	No Indicator lights ON	- No AC power	- Check AC connections and make sure Power Point is switched ON
<u>Charger has no DC output?</u>	Fault LED is ON.	- Reverse polarity connection to Battery	- Check that the spade terminals haven't fallen off the battery. - Check that the spade terminals are connected to the correct polarity.

CHARGER MAINTENANCE

Store in clean, dry place. Occasionally clean the case and cords with a dry cloth. The charger should be disconnected from the power while cleaning.

Do not disassemble charger, cord or any associated part; take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

4. System Operation / Troubleshooting

CHARGER OPERATION

The backup pump will activate automatically when the sump water level rises far enough to trip the float switch.

If the power to the charger circuit is interrupted, the length of time that the backup pump will run depends on the Ampere-hour capacity of the battery used, the battery charge level, and the required vertical pumping distance.

Extended periods of operation (for example, during an extended power outage) may exhaust the battery. Once AC power is restored, the battery charger will begin charging the battery as long as the battery has a voltage differential of 3Volts or more.

Recharge Time: Approximately 100+ hours to fully recharge a 27 or 31 battery in a "dead battery condition". Industrial standards define a "dead battery condition" as 9 Volts or less.

OPERATION / TROUBLESHOOTING cont.

Back-Up Pump Capacity Information

Gallons Per Hour*	VERTICAL PUMPING DISTANCE				
	8 FEET	10 FEET	12 FEET	16 FEET	18 FEET
	1500	1300	1050	450	0

* These flow rates were obtained with a constant 12.1V supplied at the battery terminals. The actual GPH will vary depending on the battery chosen and due to a reduction in output voltage from battery over the run time.

BATTERY REQUIREMENTS

⚠ WARNING **Hazardous electrical current.** Can cause severe burns and start a fire if battery terminals are short circuited. Install the battery in provided battery box. To prevent accidental shorting across battery terminals, strap cover securely (See Figure 9) on the battery box. Do not leave battery uncovered. Do not allow children to play around the battery backup system installation. Your backup sump pump depends on the battery used with it for power. The better the battery, the better the performance of the pump. We recommend the use of a Liberty Stormcell[®] a size 27 or a size 31 Deep Cycle Battery. They will perform as indicated in in the table above and will stand up well to long periods of little or no use.

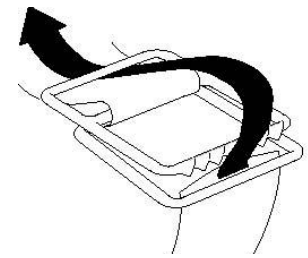


Figure 9 – Battery Hold-down Strap Threading

NOTICE: A size 27 battery will provide the same performance as a size 31 battery, but for a shorter length of time.

Use of a standard automobile battery with this charger is **not recommended**. An automobile battery may require charging after only 1-2 hours of continuous use, and the repeated charging cycles may cause early plate failure in the battery.

BATTERY MAINTENANCE

⚠ WARNING **Severe burn hazard.** A filled battery contains sulfuric acid. Avoid contact with skin, eyes or clothing.

NOTICE: To protect battery case from chipping and gouging, do not let the battery box sit on a concrete floor. Install the battery box on a shelf or a protective pad (plywood, 2x4s, etc.). Always install the battery box in a dry location that is protected from flooding.

Follow the battery manufacturer's recommendations for maintenance and safe use of battery.

TROUBLESHOOTING

Pump won't run.

1. Check all wiring connections.
2. Check for low or defective battery.
3. Confirm that the automatic switch is free to swing up and down.
4. Check for a blown fuse in the junction box.

Motor hums but pump won't run:

1. Check for low or defective battery.

Pump runs but pumps very little or no water:

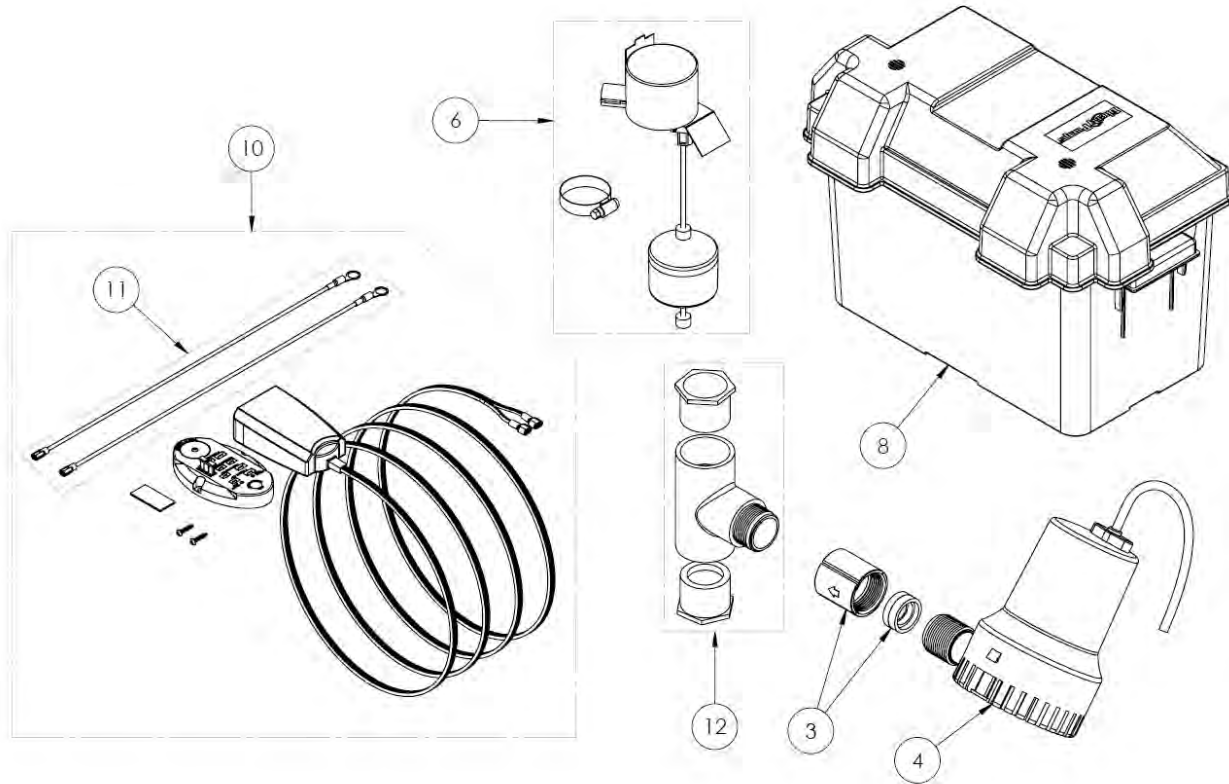
1. Make sure a check valve is installed and functioning between primary pump discharge and Backup Sump Pump tee.
2. Check for obstruction in discharge pipe.
3. Discharge pipe length and/or height exceeds capacity of pump. See Table IV for pump capacity.

4. Check for low or defective battery.
5. Positive (+) and negative (-) wires are reversed.
6. Ensure pump is not air-locked by orienting it at an angle as shown in figure 6.

Pump cycles too frequently:

1. Improper float switch setting. Adjust distance between rubber stoppers on float rod to achieve desired pump cycle.
2. Main check valve located between discharge of primary pump and the Backup Sump Pump tee is not installed or is not working properly. Install or repair as required.

5. Repair Parts



Key No.	Part Description	Kit No.
3	Check Valve	K001096
4	12V DC Backup Pump	K001122
6	Switch kit - 1/2HP, 10', 16 Gauge	K001240
8	Battery Case (Complete)	K001121
10	Charger Kit (includes wires, junction box)	K001098
11	Battery Leads	K001120
12	Fittings Package (Includes K001096)	K001099

6. 3 Year Limited Warranty

Liberty Pumps, Inc. warrants that pumps of its manufacture 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 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; 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 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 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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