Liberty Pumps®
A Family and Employee Owned Company

Liberty Pumps StormCell® Battery Recommended

Installation **Manual**

1298000C

Sump and Sewage Pump Battery Backup

Model LNV75

for pumps up to 1800 W



Features

- Charging system automatically recharges battery after use
- Low battery alarm
- Overload protection
- Works with marine-type deep cycle batteries
  - *StormCell® battery recommended*
  - *Battery not included*

Battery Cell #	Specific Gravity	Voltage	Date

NOTICE Installer: Manual must remain with owner/operator.

Record information:

Model: _____

Serial: _____

Mfg Date: _____

Install Date: _____

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.

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ph: 1-800-543-2550 fax: 1-585-494-1839
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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.
	This safety alert symbol identifies **battery hazards**. It is accompanied with an instruction intended to minimize potential risk from the battery.
⚠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.

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 the battery and AC power source before handling or making any adjustments. Fatal electrical shock could occur.
- 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® (NEC), the Occupational Safety and Health Administration (OSHA), or applicable local codes and ordinances.
- This product 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 product can cause all metal portions and its surroundings to become energized.
- Do not use metal or any other electrical-conducting material to raise the float or contact anything inside an electrically live sump pit.
- Do not install this product outdoors. The battery backup is rated for indoor use only.
- Protect this product from the environment. Do not operate in a wet location, expose to liquid or moisture, or allow any foreign objects to enter the openings.
- Because the battery backup uses batteries to generate 120V of AC power, disconnect the power cord and turn off the power switch to neutralize the unit. Failure to do so could result in electrical shock sufficient to cause injury or death.

⚠WARNING **RISK OF FIRE**

- Do not use this product with or near flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc.
- Do not use this product with or near flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. If rotating elements inside the pump strike any foreign object, sparks may occur. Sparks could ignite flammable liquids.
- This ordinary location product is not to be installed in locations classified as hazardous in accordance with the National Electric Code® (NEC) ANSI/NFPA 70.

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

- Do not allow any unqualified person to have contact with this pump system. Any person who is unaware of the dangers of this pump system or who has not read this manual can get injured.
- Do not allow children to play with this product.
- Not intended for use with other control products.

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⚠WARNING **BATTERY HAZARDS**

- Battery voltage can cause serious or fatal electrical shock. Follow the battery manufacturer's recommendations for maintenance and safe battery usage before using charger.
- Battery acid is corrosive. Wear adequate Personal Protective Equipment (PPE) when working with the battery.
- Never allow the battery DC terminals to touch each other. This can cause severe burns and start a fire. For added safety, secure the battery in a protective battery box.
- Only use 12-volt lead acid batteries with this product. Use of batteries with higher or lower output voltages can damage the pump system, leak acid, or explode.
- Explosive gases develop during normal battery operation. Keep battery in a well-ventilated area and away from sparks and open flames, such as a pilot light. Never smoke in the vicinity of a battery. Batteries generate flammable gases, both charging and discharging, which can explode or catch fire if ignited.

NOTICE

- If a Carbon Monoxide (CO) sensor is installed, it must be at least 15 feet away from the battery backup in order to avoid nuisance CO alarms. Refer to the CO detector's installation guidelines for more information.
- Locate the battery backup as far away from battery as DC cables permit.
- Never place the battery backup directly above battery being charged as gases from battery will corrode and damage the unit.
- Never allow battery acid to drip on the battery backup when reading gravity or filling battery.
- Do not expose the battery backup to rain, snow, or liquids.
- 12-volt marine-type deep cycle battery recommended (Group 31 AGM or Wet Cell compatible).
- Do not operate the battery backup if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified service professional.
- Never charge a frozen battery.
- Never charge lithium ion batteries with the battery backup.
- To protect battery box 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.
- Do not block the fan or exit air ports. Allow adequate ventilation and clearance around the entire unit.

Refer to battery manufacturers' installation manual for additional safety and maintenance instructions.

General Information

Liberty Pumps LNV75 battery backup is a high quality power station designed to operate a sump or sewage pump during a power outage, automatically activating when the AC power to the pump is interrupted. This continues until the issue with the AC power is restored or as long as the charge in the battery lasts.

When electricity is present, it charges/maintains the 12-volt battery and surveys the power line. At the moment a power failure occurs, the battery backup converts the energy stored in the battery to AC power to operate the pump. When AC utility power is restored, it automatically switches the pump back to AC power, recharges/maintains the battery, and monitors the power line.

The LNV75 is designed to operate with an external battery (or battery bank) whose nominal operating voltage is 12-volt and whose single or combined amp hour rating does not exceed 250 Ah. The load on the unit shall not exceed 15A running with a 45A startup surge. A full recharge will take 26 hours or 60 hours for batteries of 100 Ah and 250 Ah, respectively.

> ⚠ While the LNV75 is a sophisticated electronic device, it should not be expected to perform beyond its limitations. Extreme care should be taken to ensure safe operation within specifications. When properly installed and maintained, it will provide many years of reliable service.

Battery Backup Operation

Backup Mode

When both LEDs of the ***BATTERY MONITOR*** are OFF and the battery backup is plugged into an AC wall outlet but not receiving AC utility power, the unit is in *Backup* mode. In this mode, when there is sufficient energy in the battery to operate the system, the ***POWER OUTPUT*** LED is illuminated. Once the battery is depleted, this LED will extinguish, indicating an absence of AC power at the battery backup output.

Standby (Utility Power) Mode

When at least one of the ***BATTERY MONITOR*** LEDs in ON and the battery backup is receiving AC utility power, the unit is in *Standby* mode. In this mode, the ***POWER OUTPUT*** LED remains illuminated.

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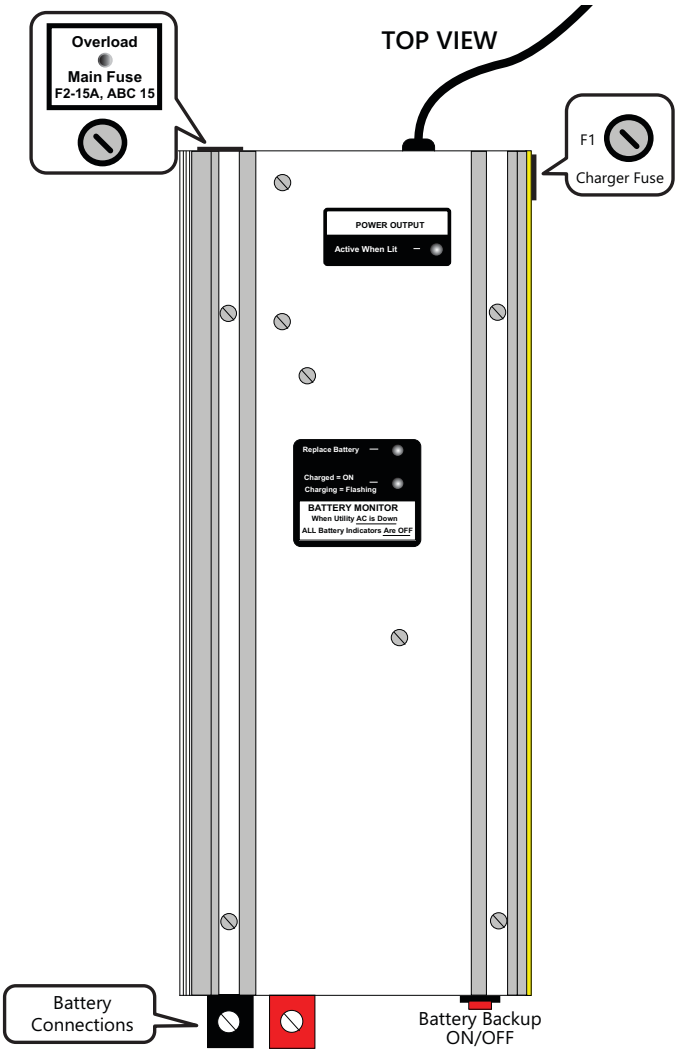
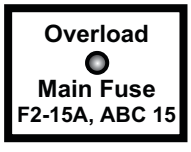


Figure 1. Battery Backup Top View

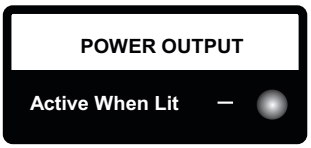
Overload Indicator



The ***OVERLOAD*** LED is ON when:

- Excessive power is being drawn from the unit.

Power Output Indicator



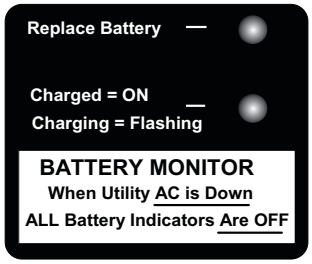
The ***POWER OUTPUT*** LED is ON when:

- AC power is present at the unit's output receptacle providing power to the pump. This LED is applicable to both *Standby* (AC utility power present) and *Backup* (battery power) states to inform the user that the unit is outputting power.

The ***POWER OUTPUT*** LED is OFF when:

- The main fuse, F2, is blown (in *Standby* or *Backup* modes)
- The battery is depleted (in *Standby* mode)

Charger Function



The smart charging system in the battery backup is microprocessor controlled to yield optimum charging rates and long battery life.

When AC utility power is restored allowing the resumption of the charging process, there is a 2 second delay during which the charge state of the battery is assessed. After this delay, the ***BATTERY MONITOR*** LED indicators will illuminate with the state of the battery.

The ***REPLACE BATTERY*** LED is ON steady when:

- The battery needs replacing

  When batteries age to the point where they can only maintain their fully charged state for short periods of time, it is an indication that their capacity has decreased. They no longer have the ability to sustain their loads as they did when they were new. The battery backup detects this degradation causing the ***Replace Battery*** LED to illuminate. When the battery reaches below 50% of its new battery state, this condition is detected by the monitor. Other LEDs may be lit at the same time. Refer to ***Battery Replacement*** procedure on page 7.

The ***CHARGED*** LED is ON steady when:

- The battery is fully charged

The ***CHARGING*** LED is ON flashing when:

- The battery is in the process of recharging

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System Components

Battery (not included)

The total time the battery backup can operate while the AC power is off greatly depends on the battery installed with the system. Liberty Pumps recommends using a Liberty Pumps StormCell® Group 31 Deep Cycle AGM or Wet Cell lead acid battery. StormCell batteries have been specifically designed to maximize reserve capacity time (the time the battery can operate continuously before it needs to be recharged). Additionally, StormCell batteries have been modified to provide the highest resistance to battery plate degradation due to repeated charging and continuous maintenance charging.

Larger BCI group sizes and multiple-battery arrays may also be used to increase backup longevity. The marine-variety is acceptable, but ***do not*** use automotive style or lithium batteries.

Battery Box (not included)

Batteries must be securely installed in a high-quality plastic or nylon battery box that comes with a lid designed for that box, available at the point of battery purchase.

Battery Cables

Use only the cables furnished with the LNV75 as they are equipped with the terminations necessary for reliable and solid connection.

The ends with the BLADE terminals mate with the red and black battery cable connectors on the unit, while the other ends are furnished with RING terminals designed to fit over the wing nut posts of most batteries.

Audible Alarm

While operating on battery backup power and the battery is depleted to below 10.8V, a high-pitched audible alarm is emitted. This is a sign that the battery backup will imminently lose battery power.

For continuation of battery power, replace the depleted battery with a fully charged battery. Follow ***Battery Replacement*** on page 7.

If the audible alarm is active, it may be silenced by turning OFF the ON/OFF switch of the battery backup. *This will not clear the battery error, just silence the alarm!*

IMPORTANT: Turn this switch back ON when the unit's operation is reinstated, such as when AC utility power is restored or after the battery has been replaced. ***Failure to do this will leave the pump without backup protection.***

Fan

The air-intake fan, located adjacent to the red DC cable terminal, is thermostat controlled. It operates only when the internal surface of the unit exceeds 113°F. This eliminates unnecessary fan operation, thereby minimizing battery loading.

Fuses

Figure 1 shows the location of two protective fuses, F1 and F2.

The Charger Fuse, F1, provides protection against unit or battery catastrophic failure. When this fuse is blown, the battery backup will operate on *Standby* power only until the battery is depleted.

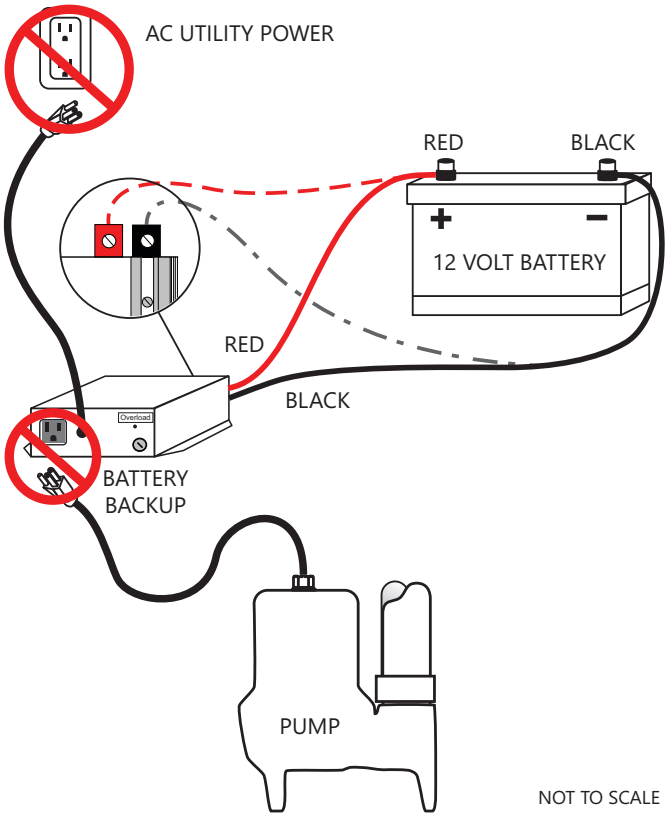
The Main Fuse, F2, provides secondary protection against severe overload. When this fuse is blown, 120 VAC to the output receptacle of the battery backup is cut off. In this state, the ***POWER OUTPUT*** LED will be OFF.

Replace fuses only with the types indicated on the fuse rating label of your unit, found next to the fuse holders on the flat side of the unit to the left of the power cord.

Installation

⚠WARNING **BATTERY HAZARDS**

- Battery voltage can cause serious or fatal electrical shock. Follow the battery manufacturer's recommendations for maintenance and safe battery usage before using charger.
- Battery acid is corrosive. Wear adequate Personal Protective Equipment (PPE) when working with the battery.
- Never allow the battery DC terminals to touch each other. This can cause severe burns and start a fire. For added safety, secure the battery in a protective battery box.



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Battery Backup Placement

In a typical installation, the battery backup should be placed on a shelf or mounted on the wall near the basin, and in accordance with all applicable local electrical codes.

Select a location close to a grounded 15A AC power source, convenient to the pump and within 2–4 feet of the battery location, but not directly over either. Do not block either the fan or the exit air ports of the unit. Allow at least 2 inches of air clearance on all sides. Any room in which the unit is mounted shall have adequate ventilation.

NOTICE

- The battery backup shall never be installed in a confined space.

1. Verify the battery backup ON/OFF switch is OFF and the power cord is ***not*** plugged into an AC wall outlet.
2. Mount the battery backup at desired location. It is recommended to place on a shelf or mounted to a wall.

Battery Connection

Refer to battery manufacturer's recommendations for safe use of the battery.

IMPORTANT: The battery backup does ***not*** have reverse polarity protection. Reversing the battery positive and negative source cables will damage the unit.

1. Verify the battery backup ON/OFF switch is in the OFF position and the battery backup is ***not*** plugged into an AC wall outlet.
2. Install the battery into its protective box and place into its selected location.

   IMPORTANT: Do not use longer cables than those supplied with the battery backup as this may adversely affect the time available for backup operation.
3. 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.
4. Connect the BLADE end of the supplied red battery cable into the battery backup red terminal block located next to the fan air intake port. Tighten the set screw of the block until the cable is secured.
5. Connect the BLADE end of the supplied black battery cable into the battery backup black terminal block. Tighten the set screw of the block until the cable is secured.
6. Connect the RING end of the black battery cable to the Black/ Negative (−) terminal of the battery.
7. Connect the RING end of the red battery cable to the Red/ Positive (+) terminal of the battery.

   IMPORTANT: Do not face battery when making final connection. Expect a small spark at the terminal as some components in the battery backup unit charge up. This is normal.
8. Tighten battery connections securely.
9. Cover battery box and secure lid to prevent unwanted access to the battery.
10. Plug the sump/sewage pump into the unit's power outlet.
11. Plug the battery backup into a 120 volt 15A AC wall outlet.

    IMPORTANT: Do not use a switch-controlled outlet.
12. Mark circuit in main power panel "*Backup power supply; do not turn off*".
13. Turn the battery backup ON/OFF switch to the ON position.

    NOTE: The ON/OFF switch only disables the battery backup function. The unit always allows power from the power outlet to the appliance (or load) regardless of the switch position. Therefore, upon installation completion, ensure the switch is ON or else there will be no backup function. The switch is ON when the red portion of its rocker is visible.
14. Secure the battery in the box with the provided hold-down strap(s) to prevent unwanted access to the battery.
15. Verify ***POWER OUTPUT*** LED is ON and ***BATTERY MONITOR*** LED displays, after slight delay, the current state of the battery.
16. Perform ***System Test***.

System Test

⚠WARNING **RISK OF ELECTRIC SHOCK**

- Do not use metal or any other electrical-conducting material to raise the float or contact anything inside an electrically live sump pit.

Once connections are complete, test the system as follows:

1. Verify unit is OFF.
2. Plug the sump/sewage pump power cord into the LNV75 AC receptacle.

   Verify the pump level switch or water level allows it to be ON.
3. Turn ON the LNV75.
4. Raise the water level float switch (manually or by adding water to basin) controlling the pump causing the pump to turn ON.
5. Disconnect the battery backup plug from the wall outlet, simulating a power outage. *After a slight pause, the pump should continue to operate. If it does not, review installation steps and verify secure connections.*
6. Plug the battery backup AC power cord back into the wall outlet.
7. Allow the pump to cycle.
8. Verify (after 2 seconds) at least one of the ***BATTERY MONITOR*** LEDs has lit.

   This is an indication that the battery backup has recognized the return of AC power. The battery backup is no longer in Backup mode and has returned to its normal state of Standby (charging/monitoring the battery and providing AC power).

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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 the battery and AC power source before handling or making any adjustments. Fatal electrical shock could occur.

Maintenance

Once properly connected, the battery backup requires no maintenance. When AC power fails, it will automatically convert battery power to AC power for operation of the pump and automatically recharge the battery when AC power returns. During all of these events and power transitions, the unit requires no manual interference or adjustments. However, the state of the battery health indicators should be noted in the event that batteries may require replacement.

Battery Replacement

Refer to battery manufacturer's recommendations for safe use of the battery.

IMPORTANT: The battery backup does ***not*** have reverse polarity protection. Reversing the battery positive and negative source cables will damage the unit.

1. Verify the battery backup ON/OFF switch is OFF.
2. Verify the power cord is ***not*** plugged into an AC wall outlet.
3. Unplug the pump from the unit's power outlet.
4. Disconnect the battery cables from the depleted battery.

   IMPORTANT: When disconnecting the battery for replacement, break first battery connection while as far away from battery as practical.
5. Replace the spent battery with a new one.
6. Connect the black battery cable from the unit to the Black/ Negative (−) terminal of the battery.
7. Connect the red battery cable from the unit to the Red/ Positive (+) terminal of the battery.

   IMPORTANT: Do not face battery when making final connection. Expect a small spark at the terminal as some components in the battery backup unit can store an electrical charge. This is normal.
8. Tighten battery connections securely.
9. Cover battery box and secure lid.
10. Plug the pump into the unit's power outlet.
11. Plug the battery backup into the AC wall outlet.
12. Turn the battery backup ON/OFF switch to the ON position.
13. Verify ***POWER OUTPUT*** LED is ON and ***BATTERY MONITOR*** LED displays the current state of the replacement battery.
14. Complete ***System Test*** procedure.

Fuse Replacement

F1, when blown, will indicate Standby power active and rely solely on battery power.

F2, when blown, will not provide 120 VAC to the output receptacle of the battery backup; ***POWER OUTPUT*** LED will be extinguished and the ***Overload*** LED will be lit.

Replace fuses only with the types indicated on the fuse rating label of your unit which can be found next to the fuse holders on the flat side of the unit to the left of the power cord.

Service

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

Do not disassemble the battery backup, cord, or any associated part. Take the unit to a qualified service center when service or repair is required.

Troubleshooting

LABEL	LED	POSSIBLE CAUSE	CORRECTIVE ACTION
POWER OUTPUT	OFF	Main fuse F2 blown.	Replace fuse.
		Battery is depleted.	Replace battery.
POWER OUTPUT and ***BATTERY MONITOR***	OFF	No AC utility power connected.	Reconnect unit to AC utility power.
		Battery is depleted.	Replace battery.

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Warranty

Liberty Pumps Wholesale/Commercial Series 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* and ***Commercial Series**** models). 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 consequential damages, including field labor costs, travel expenses, rental equipment, costs of removal, reinstallation or transportation to and from the factory or an authorized Liberty Pumps repair facility.

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

*Liberty Pumps, Inc. warrants StormCell® batteries for 1 year from date of purchase.

Liberty Pumps, Inc. warrants that pumps of its ***Commercial Series* are free from all factory defects in material and workmanship for a period of 18 months from the date of installation or 24 months from the date of manufacture, whichever occurs first, and provided that such products are used in compliance with their intended applications as set forth in the ***Commercial Series*** technical specifications and manuals. The date of installation shall be determined by a completed pump start-up report and warranty registration form. A pump start-up report, filled out by a qualified installer, is required for warranty to take effect. The report must be submitted within 30 days from the installation date and submitted through the Liberty Pumps website.

www.libertypumps.com/wp/dom/Services/Warranty/Commerical-Series-Startup-Form

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