

## Installation Manual

1074000D

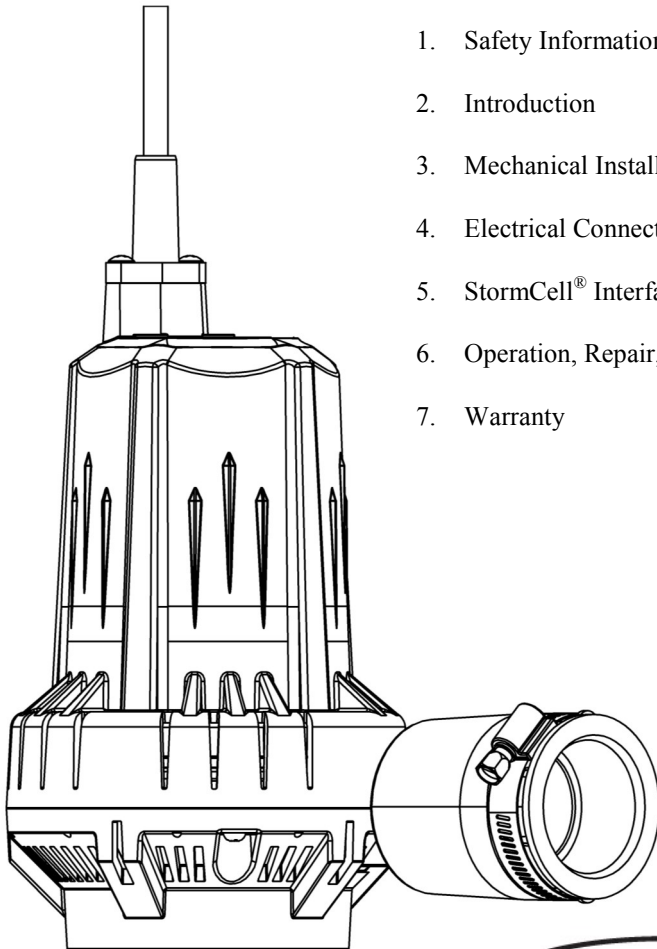
# 442 Series Battery Backup System

### Table of Contents:

1. Safety Information
2. Introduction
3. Mechanical Installation
4. Electrical Connection
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### Models:

- 442-10A
- 442-10A-EYE (Wireless Enabled)
- 442-25A
- 442-25A-EYE (Wireless Enabled)



**Liberty Pumps®**

7000 Apple Tree Avenue

Bergen, NY, USA 14416

Phone: (800) 543-2550

Fax: (585) 494-1839

www.libertypumps.com

### NOTICE

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

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

Model #:

Serial #:

Date Code:









Installation Date:

### ⚠ WARNING

**Read manual before using pump. Follow all safety instructions in manual and on the pump. Failure to do so could result in serious injury or death.**

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

# 1. Safety Information

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

## **WARNING**



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

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

**! WARNING**



**RISK OF ELECTRIC SHOCK - continued**

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

**! WARNING**



**RISK OF FIRE**

- DO NOT use an extension cord to power the product. Extension cords can overload both the product and extension cord supply wires. Overloaded wires will get very hot and can catch on fire.
- This product requires a separate, properly fused and grounded branch circuit, sized for the voltage and amperage requirements of the pump, as noted on the nameplate. Overloaded branch circuit wires will get very hot and can catch on fire.
- NEVER use this product with or near flammable liquids. If the rotating elements inside this pump strike any foreign object, sparks may occur. Sparks could ignite flammable liquids.
- DO NOT install this product in locations classified as hazardous or in explosive atmospheres as defined by any applicable safety code.
- Keep battery in a well ventilated area, away from sparks and open flames. Batteries generate flammable gasses both charging and discharging, which can explode or catch fire if ignited.

**! WARNING**



**RISK OF SERIOUS INJURY OR DEATH**

- The pump must be installed in accordance with all applicable codes and ordinances.
- DO NOT allow children to play with the pump.
- DO NOT allow children, or any person who is unqualified to use the pump. Any person who is unaware of the dangers of this pump, or whom has not read this manual, can easily be injured by the pump.
- Wear adequate PPE when working on pumps or piping that have been exposed to wastewater. Sump and sewage pumps often handle materials which can transmit illness or disease upon contact with your skin and other tissues.
- DO NOT remove any tags or labels from the pump or its cord.
- ALWAYS, keep clear of the pump's suction and discharge openings. The rotating elements of this pump are designed to draw in and pass foreign objects.
- NEVER, insert fingers into pump while it is energized. A stopped, energized pump may start without warning, via external test features built into the control system.
- Wear adequate PPE when working with batteries. Batteries contain strong acids that can cause severe burns to skin and soft tissues, if spilled. Prior to servicing your battery, refer to the battery manufacturers instruction manual or Safety Data Sheet (SDS) for a listing of proper PPE, proper handling techniques, and proper spill response, to minimize your risk of injury.
- DO NOT touch the finned top surface of the charging unit. This surface becomes hot during normal battery charging may burn exposed skin. Unplug the charger and allow it to cool prior to servicing.

## NOTICE

- This pump and its floats have been evaluated for use with water only. Keep sump clear of debris. Debris can jam the pump and/or its floats, resulting in flooding.
- DO NOT use this pump as your primary sump pump.
- This pump should be placed on a separate, properly fused and grounded branch circuit, from the primary sump pump. This allows your backup to continue to function and charge your battery, in the event your primary pump trips an electrical breaker under normal operating conditions
- DO NOT use this product to pump corrosive liquids. Pump components can be damaged from corrosive liquids and cause product malfunction or failure.
- NEVER dispose of materials such as paint thinner or other chemicals down drains. Doing so could chemically attack and damage pump components and cause product malfunction or failure.
- DO NOT use pumps with fluid over 40°C. Operating the pump in fluid above this temperature can overheat the pump, resulting in pump failure.
- DO NOT use pumps with mud, sand, cement, oil or chemicals. Pump components can be damaged from these items causing product malfunction or failure. Additionally, flooding can occur if these items jam the impeller or piping.
- DO NOT modify the pump in any way. Modifications may affect seals, change the electrical loading of the pump, or damage the pump and its components. Modifications can void your warranty on this product.
- DO NOT run this pump dry.
- Batteries and their chargers generate Carbon Monoxide (CO) during normal operation. To avoid nuisance alarms, make sure that any CO detectors are a minimum of 15 feet away from this backup product. Please refer to your CO detector manual for more information on installation.

## 2. Introduction

This manual was prepared to assist you in the correct installation, operation, and maintenance of your Liberty Pumps product. Before Installation, read the following instructions carefully. Each Liberty pump is individually factory tested to provide proper performance. Liberty pumps are designed for minimal maintenance. However, regular inspections will ensure longer life and greater operating reliability. Make certain that you understand the chapters on electrical connection and mechanical installation before starting the installation of your Liberty pump. By closely following these instructions, potential operating problems should be eliminated, providing years of trouble-free service.

### 2-1 INTRODUCTION

**WARRANTY:** Repair work carried out during the warranty period without prior factory approval may render the warranty void.

**SERIAL #:** In all correspondence and reports with the factory, provide the pump serial number to ensure that you receive the proper information and replacement parts.

### 2-2 INSPECTION UPON RECEIPT

The shipping carton should be immediately inspected for damage that may have occurred during shipment. Exercise care in opening the shipping carton to avoid damaging the components of this backup system. Remove packaging from the container ensuring that all components have been accounted for before discarding it. Visually check the pump, cables, and any spare parts for damage. Contact the Liberty Pumps Customer Service Department (toll free phone number located on the front cover) to report any damage or shortage of parts.

Within your shipping carton you should find the following components:

- (1) 12V 442 pump
- (1) StormCell® battery charger
- (1) Charger power cable
- (1) StormCell® user interface (UI) / alarm
- (1) Snap-on float switch assembly
- (1) Bag of pump and charger mounting hardware
- (1) Charger to UI communication cable (RJ45)
- (1) Battery Box
- Instruction manuals

## 2-3 STORAGE BEFORE USE



### WARNING

Only place the pump in a wet pit when it can be operated. Water can wick through the power cord into the pump causing an electrical short from the pump to its surroundings.

- If it is necessary to store this backup pump system for a long period of time, it should be stored indoors in a clean, dry, temperature-stable environment. The pump, charger, and user interface should be covered for protection from dirt and water. All cable ends must be protected against moisture.

## 2-4 PRODUCT DESIGN

- While this pump has been designed to operate for long periods of time, it is not intended to be solely operated as a primary pump.
- This backup pump has a check valve incorporated into the discharge of the volute, and therefore does not require the installation of a check valve in the backup pump discharge line. However, if this backup is connected into the primary pump's discharge line, a check valve must be installed for the primary pump prior to the tee where the backup pump's discharge connection is made. See Section 2-6.
- This pump has been designed to directly accept a 1.5" pipe or street fitting to integrate into the discharge piping.
- You can test your battery backup pump with the push of button. Simply push the pump test button on your StormCell® interface and your pump will run itself to verify that the pump is in working order.
- The float is easily installed: snap the float onto any 1.5" pipe, then adjust it to the desired height. The pipe clamp is made of PVC; if desired, it can be glued in place on the pipe using PVC primer and cement.
- The communication cable between your user interface and battery backup charger is a standard shielded Ethernet cable. If you wish to move your device more than 8 feet away from the charger, you can purchase a longer shielded Ethernet cable. Be sure it is a shielded cable; it should have a metal wrap around the outside of the connector that makes contact with the Ethernet jack. You can use the cable provided with your charger for an example of a shielded connector. DO NOT use a standard non-shielded cable; use of non-shielded cables may cause communication issues between your charger and UI.
- This product has built-in high water level alarm functionality. In addition to sounding an alarm, the high water level float switch will act as a redundant pump switch in the event that the primary 442 backup pump switch has failed. If this occurs (or any other scenario occurs that results in the float switches operating out of order) the user interface and charger will signal a float fault.
- The backup pump interface has audible alerts that signal a low battery condition or that the 442 backup pump is running. If your system is equipped with NightEye® functionality this information (and more) can be viewed from the associated mobile device. Refer to NightEye® quick-start guide for more information.

## 2-5 BATTERY SELECTION



### WARNING

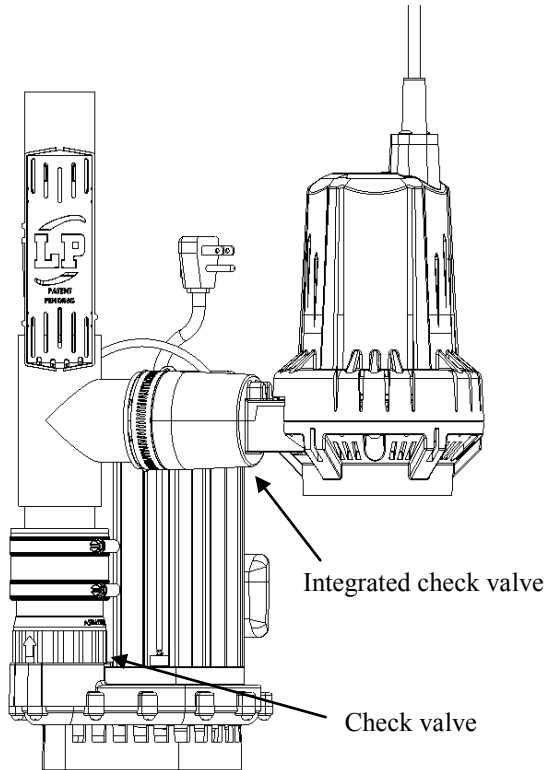
Only use 12 volt lead acid batteries with this backup system. Use of batteries with higher or lower output voltages, can damage your backup up system, leak acid, or explode.

- For the longest battery life, a deep cycle battery must be used with this backup system. Deep cycle batteries are designed to handle multiple long deep discharges. **For best results, install a Liberty Pumps StormCell® Battery with your backup pump.** However, if you choose to supply your own deep cycle battery, any 12V lead-acid battery may be used safely with Liberty's charging system.
- For greatest system capacity, deep cycle group 27 and 31 batteries are recommended. Larger batteries can be used, charged, and maintained with this system, though these batteries will not fit in the Liberty supplied battery box. In the event of an extended power outage, any charged 12 Volt DC car battery can be substituted for your deep cycle battery to prevent flooding. When power returns, be sure to put your deep cycle battery back into service with your backup system.

## 2-6 INSTALLATION TYPES

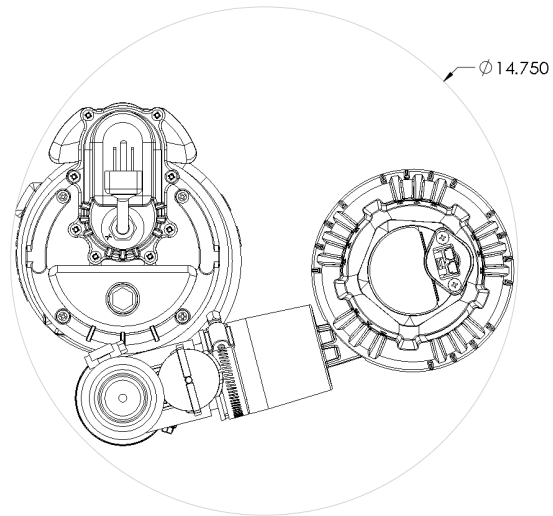
If you have the ability to plumb a complete second discharge piping network for your new backup, this is the best possible installation, as it offers you an added backup solution in the event the primary pump discharge ever becomes blocked. To accomplish this, install a 90° street elbow (included) into the 442 (tightening to 15 in-lb) and plumb a second line. Two alternate methods of installing a 442 into existing primary pump piping are shown below.

**Method A:** Vertical installation is recommended for compact sump pits and sump pits where the buildup of sediment (rocks, sand, mud, etc.) is an issue. The 442 comes with all fittings for this installation (included 90° street elbow is not used in this installation).

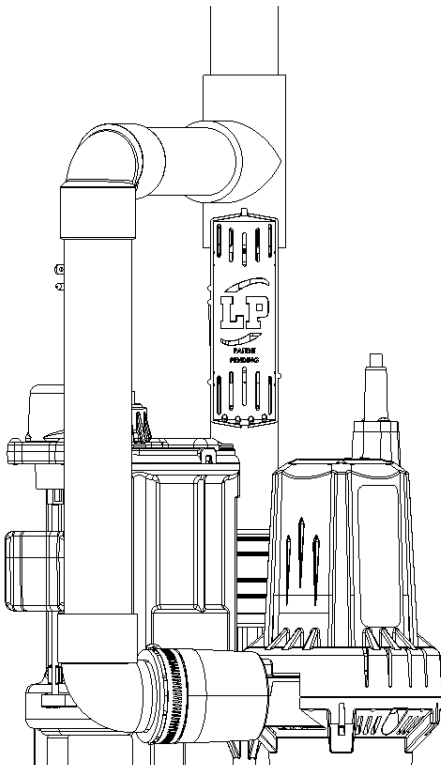


**Left:** Side view of a typical vertical installation. Note the distance between the primary pump and backup pump base.

**Right:** Top-down view of a typical vertical installation.

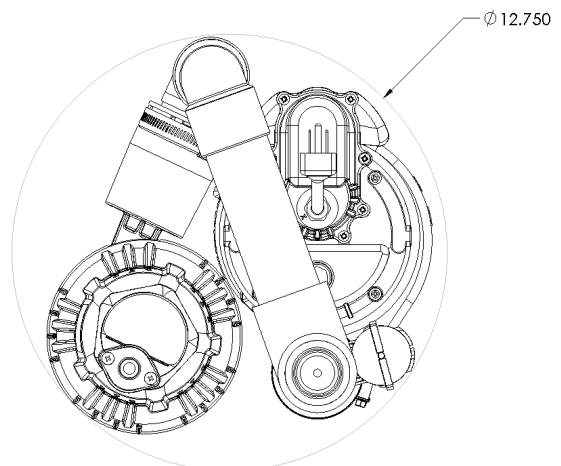


**Method B:** Side-by-side Installation, a popular option in larger sump pits when it is desirable to have the backup pump and primary pump on the same level. This installation will require a tee, a 90° elbow, and two sections of piping. A 90° street elbow is supplied.



**Left:** Side view of a typical side-by-side installation.

**Right:** Top-down view of a typical side-by-side installation.



# 3. Mechanical Installation

## ⚠ WARNING



Never work in a sump pit with energized pumps. Doing so is an electrical shock hazard, and can result in injury or death. Unplug all pumps, including primary pumps, prior to working on or installing this backup

1. Locate the level at which the primary pump activates by watching when the pump turns on and measuring or marking the level in the sump.
2. Look at the supplied snap-on compact float and compare it to the image shown to the right. The bumps on the left side of the LP lettering represent the levels at which the switches inside the housing activate. Before cutting your primary discharge piping, ensure that your float enclosure can be mounted with the “Pump On” bump a minimum of 3” above the turn on level of the primary pump, as measured in step 1.
3. Drain your sump pit to enjoy a clean, easy, and dry installation process. Disconnecting and modifying the primary pump’s discharge piping is required to complete the installation of the 442. Complete this installation during a time when the sump pit will not require pumping.

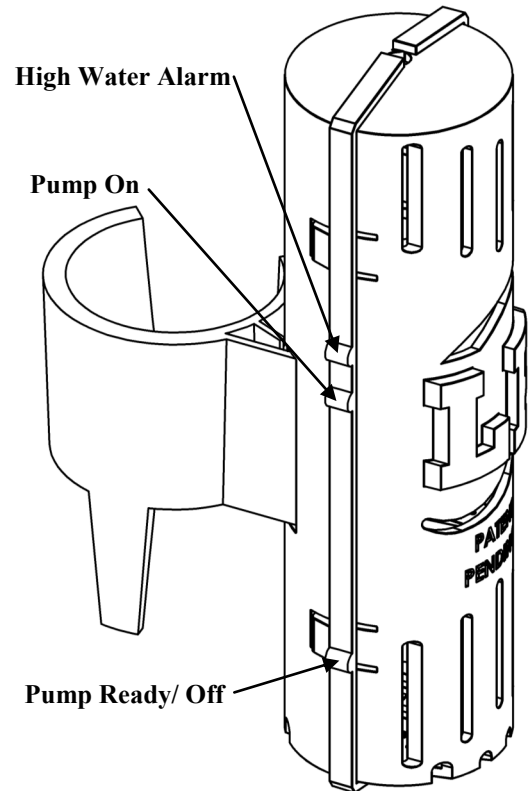
Instructions are continued by specific installation method below, as described in **Section 2-6**. It is always recommended to do a ‘dry fit’ of piping, with no glue, prior to gluing the piping in place. Be sure to not glue check valves closed.

### Method A

4. Make a cut in the primary pump’s discharge piping above the primary pump’s check valve. This cut will locate the tee used to install the 442 pump.
5. Install the tee and pre-glued nipple into the 442 pump discharge. Tighten the hose clamp to 15 in-lbs, and mock up your 442 installation inside the sump pit without glue. Ensure that the 442 will not interfere with the primary pump’s activation float.
6. Using a primer and glue approved for PVC use, glue the tee, nipple, and 442 assembly to the primary pump’s discharge pipe, being careful not to glue the primary pump check valve closed.
7. Reinstall the remaining system discharge piping into the tee using an approved PVC glue and primer.
8. Install the compact snap-on float to the discharge piping, ensuring that the “Pump On” level is a minimum of 3” above the turn on level of the primary pump. Use a small dab of PVC glue to secure the snap-on float to the discharge pipe.

### Method B

4. Make a cut in the primary pump’s discharge piping above the primary pump. This will locate the tee used to install the 442 pump.
5. Install the supplied street elbow into the 442 pump discharge, with the street elbow facing the top of the pump. Tighten the hose clamp to 15 in-lbs.
6. Install the tee, piping, and 90° elbow as depicted in the **Method B** image in **Section 2-6**, using PVC glue and primer and ensuring that there will be no primary pump interference. Measurements for piping will vary by primary pump, system, and sump.
7. Reinstall the remaining system discharge piping into the tee using an approved PVC glue and primer.
8. Install the compact snap-on float to the discharge piping, ensuring that the “Pump On” level is a minimum of 3” above the turn on level of the primary pump. Use a small dab of PVC glue to secure the snap-on float to the discharge pipe.



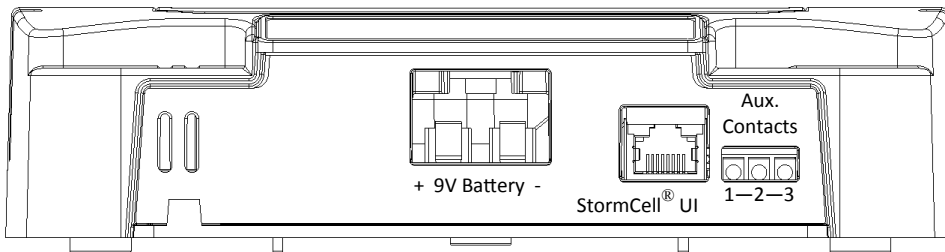
# 4. Electrical Connection

After installing the 442 battery backup pump and float, the StormCell® system setup is quite simple. Images of the user interface and charger are shown below, along with a charger LED indicator reference.

1. Mount the StormCell® charger Liberty PN's (**10 Amp - 1061000 or 25 Amp - 1066000**) using the (2) supplied self tapping screws and, if required, the (2) supplied drywall anchors (3/16" hole required). Ensure that the charger is located in an accessible location, within the range of the 8' pump power and float cords included with your StormCell® system.
2. Mount the StormCell® user interface in an accessible location at eye-level, ensuring that it is within the range of the blue RJ45 cable through which communication between the interface and charger will occur.
3. Locate the battery box within the range of the battery charger cables (pre-installed on the StormCell® charger).
4. Connect your pump power cord and float switch cable to the StormCell® charger. Also, connect the blue RJ45 communication cable into the charger and the user interface.
5. Connect the charger battery leads to the battery (or batteries, in the case of a 442-25A), ensuring that the (-) connection is made first, followed by the (+).
6. Install a 9V battery into the StormCell® user interface, noting polarity as shown on the interface label.

**Note:** A 9V battery must be installed in the device at all times to ensure proper operation.

7. Plug in the StormCell® battery charger. The system should now be operational.
8. If the device is NightEye® enabled, refer to the NightEye® quick-start guide.



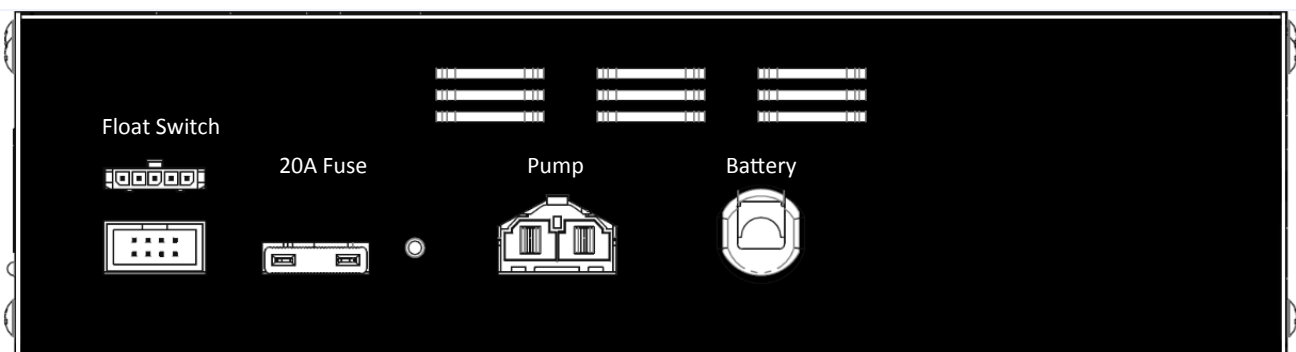
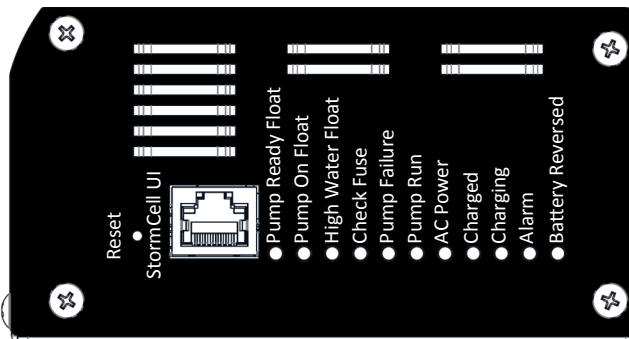
Terminal Connections:

- 1: Normally Open
- 2: Common
- 3: No Connection

**Above:** View of StormCell® user interface, showing connections to be made to the charger

**Left:** View of StormCell® charger, showing reset location, RJ45 connection location, and LED functionality.

**Below:** View of StormCell® 442-10A charger showing float connection, pump power cord connection, battery cable connection (442-25A will have two battery cable connections), and fuse location (which is shielded by a protective cover). 442-25A's use a different fuse, than is shown below, read label to locate the fuse and its size.





# 5. StormCell® Interface Functionality

**If applicable, refer to NightEye® quick-start guide for more information.**

Indicates a low 9V battery.

9V battery should be replaced at least yearly, or as required if this LED is illuminated.

Pump run LED, illuminated when the 442 pump is activated.

Power Indication - indicates user interface has power (Illuminated by charger power through RJ45 communication cable)

Setup LEDs—only present on NightEye® models.

Fault LED—indicates a system fault.

Clear System Notifications



Navigation Buttons, scroll through notifications on UI LCD

StormCell® UI LCD Displays system / fault info

Pump Test—Pump will run for 3 seconds or until the test button is released.

Alarm Silence Button Resets after 6 hours or if 'Silence' button is pressed again.

Alarm Test—Alarm will sound for approximately 5 seconds. NightEye® enabled devices will send notifications as appropriate.

# 6. Operation, Repair, and Troubleshooting

## 6-1 CHARGER AND PUMP OPERATION

The 442 backup pump will activate when the sump water level is high enough to actuate the “Pump On” float switch. The 442 backup pump run time depends on the Amp-hour capacity of the battery, the battery charge level, whether or not the charger has AC power, and the required equivalent vertical pumping distance.

Extended periods of operation (power outage, primary pump failure, etc.) may exhaust the battery. If this occurs, the charger will recharge the battery when the period of extended operation ends. Recharge time from a “dead battery” state will be a minimum of 12 hours.

## 6-2 INTERFACE LCD NOTIFICATIONS & MEANINGS

### INTERFACE LCD NOTIFICATIONS

### TROUBLESHOOTING/EXPLANATION



**Explanation:** Standard LCD home screen, shown when there are no faults or notifications.



**Explanation:** LCD home screen when system has faults and / or notifications. Number of message can be greater than 1.



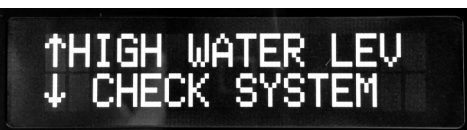
**Explanation:** Standard LCD notification, not directly indicative of a problem. Denotes that 12V battery is being charged.



**Explanation:** Standard LCD notification, will display after successful charging of 12V battery.



**Explanation:** Standard LCD notification, when 442 battery backup pump is running.



**Probable Symptom:** High water condition in sump.

**Check:** Verify high water condition. Check all wiring connections. Potential causes: failed (primary or secondary) pump, float switch hang-up, low or defective battery.



**Probable Symptom:** Pump does not run.

**Check:** All wiring connections and pump power cord. It is possible that the pump motor has failed.



**Check:** Check all wiring connections and breaker for the circuit the battery charger is plugged in to. This notification will also display if the home has a power outage.



**Probable Symptom:** Failed fuse, fuse LED illuminated, pump not running.

**Check:** Check all wiring connections, replace pump control fuse if required. Also, verify that the pump has not jammed causing the fuse to fail. After fuse replacement, test pump to confirm the problem is fixed.



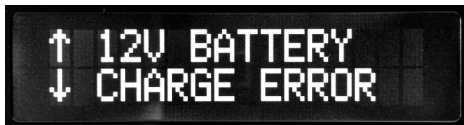
**Probable Symptom:** Low battery alarm.

**Check:** Check all wiring connections. If AC power is out and the battery is exhausted, it will charge upon return of AC power. If problem persists have the 12V battery tested.



**Probable Symptom:** Low battery alarm, pump not running.

**Check:** Check all wiring connections. If AC power is out and the battery is exhausted, it will charge upon return of AC power. If problem persists have the 12V battery tested. If power is out, replace the 12V battery with a charged battery.



**Probable Symptom:** Battery will not charge, eventual low battery alarm.

**Check:** Check all wiring connections. If nothing is disconnected, have 12V battery tested.



**Check:** This notification occurs when floats actuate out of order. Check floats for binding and / or buildup. The 442 battery backup has integrated float redundancy so this error does not necessarily mean the pump will not operate.



**Probable Symptom:** Battery will not charge, pump will not run, alarm sounding.

**Check:** Check all wiring connections, paying particular attention to the battery cable connections.



**NightEye® Enabled Systems Only**, this screen occurs when the Wi-Fi connection to your system has been lost. This can be related to your internet connection, router, or home network.



**Explanation:** This notification occurs when there is an active system message that indicates a problem that requires attention. This error will occur when clearing system messages that have not yet been addressed / fixed.

### 6-3 TROUBLESHOOTING OTHER ISSUES

#### Motor hums but pump does not run:

1. Battery charge has dropped below that which is required to run the pump. This can be temporarily rectified by swapping the dead battery for a charged battery.
2. Check for jammed pump impeller.

#### Pump runs but pumps very little or no water / Pump cycles too frequently:

1. Ensure that check valve is installed and functioning between primary pump discharge and 442 connection tee.
2. Check for obstruction in discharge pipe.
3. Discharge pipe length and / or height exceeds capacity of pump.

## 7. 3 Year Limited Warranty

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

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

The manufacturer shall not be liable under this Warranty if the product has not been properly installed; if it has been disassembled, modified, abused or tampered with; if the electrical cord has been cut, damaged or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating, or in water containing sand, lime, cement, gravel or other abrasives; if the product has been used to pump chemicals or hydrocarbons; if a non-submersible motor has been subjected to excessive moisture; or if the label bearing the serial, model and code number has been removed. Liberty Pumps, Inc. shall not be liable for any loss, damage or expenses resulting from installation or use of its products, or for indirect, incidental, and consequential damages, including costs of removal, reinstallation or transportation.

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