

# Single-Phase Simplex SX-Series Control Panel

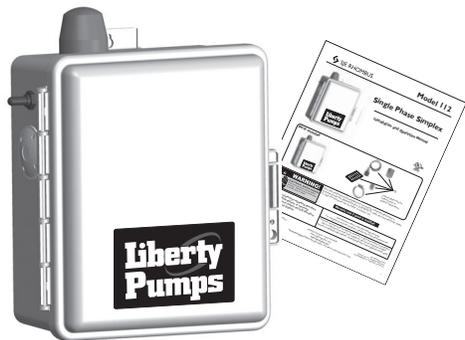
**SXL21=3, SXL24=3, SXH21=3,  
and SXH24=3**

Manufactured by SJE Rhombus®

**Installation Instructions  
and Operation Manual/Troubleshooting**



## Parts Included



Float label sheet

Three each of the following:

- Floats
- Worm Clamps
- Pipe Mount Clamps



## WARNING!



### ELECTRICAL SHOCK HAZARD

Disconnect all power sources before servicing. Failure to do so could result in serious injury or death.

This control panel must be installed and serviced by a licensed electrician in accordance with the National Electric Code NFPA-70, state and local electrical codes. UL Type 4X enclosures are for indoor or outdoor use.

**Warranty void if panel is modified.**



Call factory with servicing questions:

**1-800-543-2550**

Liberty Pumps, Inc. offers a three-year limited warranty.  
For complete terms and conditions, please visit [www.libertypumps.com](http://www.libertypumps.com).

Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment to ensure that employees will not be exposed to health hazards in handling said material. All applicable laws and regulations shall apply.

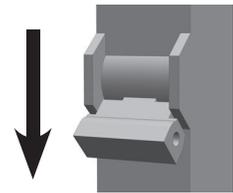
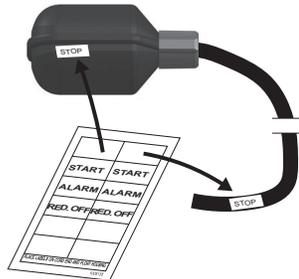
## Installing the Float Switches

The standard single phase simplex control panel operates with 3 float switches to activate pump STOP, START, and high-level ALARM functions.

### 1 **⚠ WARNING!**

Ensure all power is turned OFF before installing floats in tank. Failure to do so could result in serious or fatal shock.

2 Label each float and cord end with the provided pairs of STOP, START, and ALARM stickers.



3 Determine your normal operating level as illustrated in Figure 1.

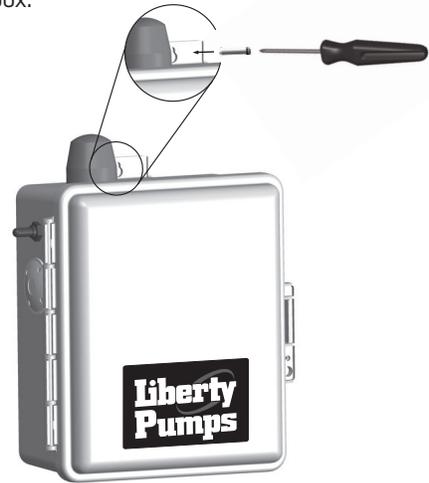
### **⚠ CAUTION!**

If the floats are not properly mounted and connected in the correct order, the pump will not function properly.

## Mounting the Control Panel

### **NOTE**

If the distance to the control panel exceeds the length of the float switch cords or the pump power cord, splicing in a liquid-tight junction box will be required. For outdoor or wet installation, we recommend an outdoor Type 4X junction box.

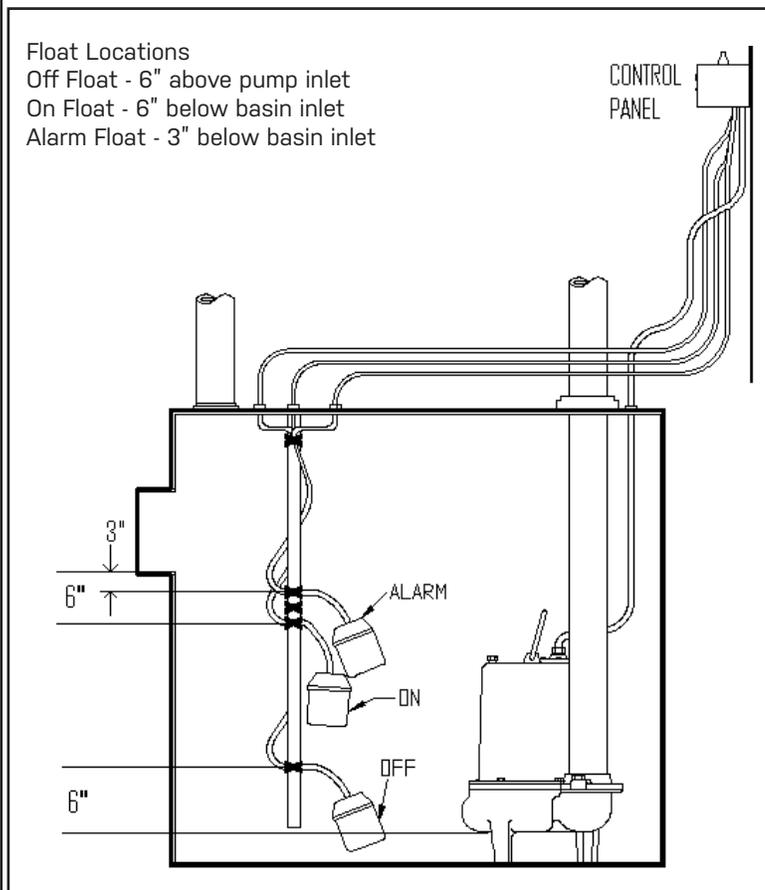


Floats require free range of motion.

They must not touch each other or any equipment in the pump chamber.

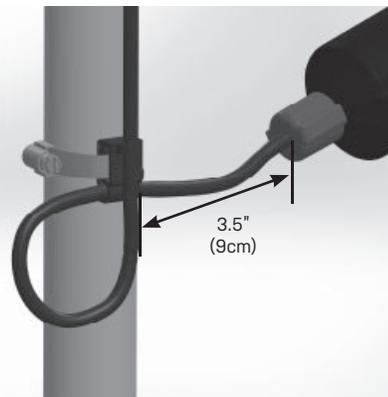
FIGURE 1: Float Locations

Clamp detail, mounting to Liberty Pumps QuickTree®  
Pipe Clamp Mounting - Float Operation



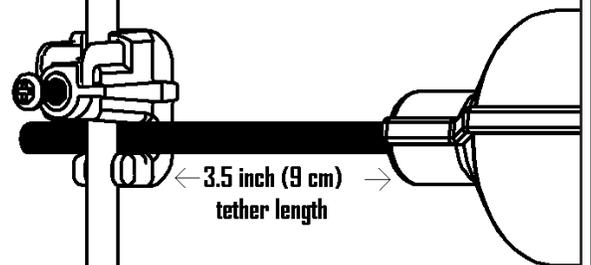
Tighten the clamp.

Make sure hose clamp band does not interfere with float operation.



Hose clamp is 18-8 stainless steel.

Do not install cord under hose clamp.



← 3.5 inch (9 cm) tether length →

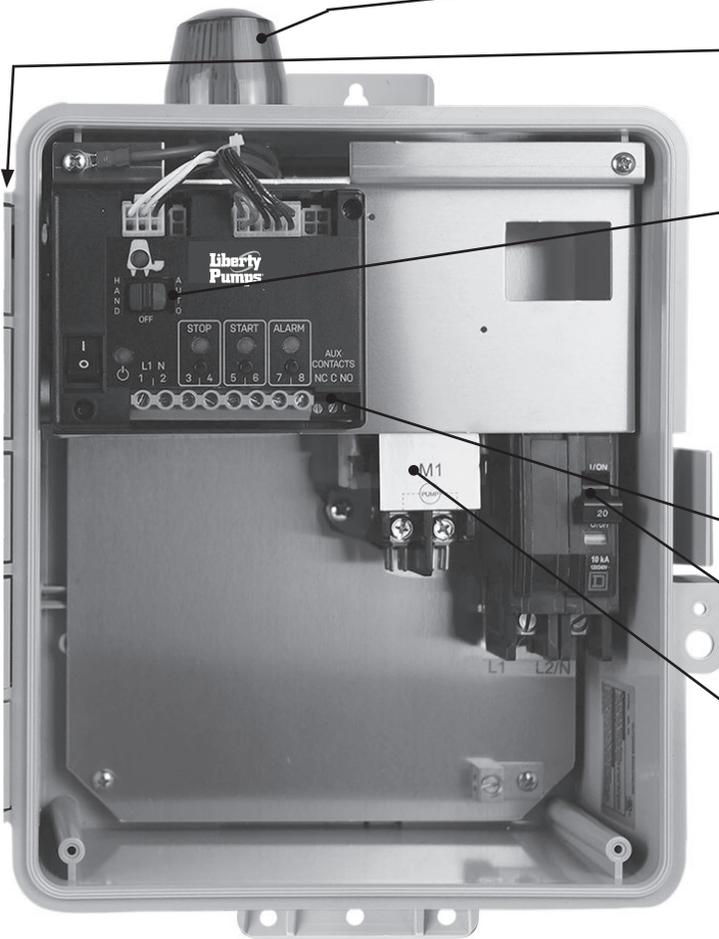
## Wiring the Control Panel

- Determine conduit entrance locations on control panel as shown. Check local codes and schematic inside the panel for the number of power circuits required.

### ⚠ CAUTION!

Be sure the pump power voltage and phase are the same as the pump motor being installed.

- Connect the following wires to the proper terminal positions:
  - incoming power
  - pump
  - float switches
 See schematic inside control panel for details.



Typical Layout (May vary with options ordered).

**⚠ CAUTION!** You must use conduit sealant to prevent moisture or gases from entering the panel.

Type 4X conduit must be used to maintain a Type 4X rating of the control panel.

- Verify correct operation of control panel after installation is complete.

## Operation

This single phase simplex control panel is designed to operate in a three float system as standard. When all floats are in the open or OFF position, the panel is inactive. As the liquid level changes and closes the stop float, the panel remains inactive until the start float closes. At this point the pump will start, providing the HOA switch is in the AUTOMATIC mode and the power is ON. The pump will remain ON until both the stop and start floats open (return to the OFF position). If the liquid level travels beyond both the stop and start floats and reaches the alarm float, the alarm will be activated. The alarm horn can be silenced by pressing and releasing the test/silence switch.

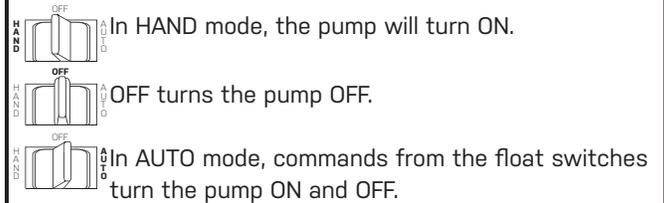
### Alarm System (Indicator Light and Horn)

When an alarm condition occurs, the red light and horn will be activated.

If the **TEST/NORMAL/SILENCE** switch is moved to the SILENCE position and released, the horn will be silenced. When the alarm condition is cleared, the alarm system is reset.

### Hand-Off-Auto (HOA) Switch

The HOA 3-way switch controls pump functions.



### Auxiliary Contact

Form C - Can be wired normally open or normally closed.

### Circuit Breaker (optional)

The circuit breaker provides pump disconnect and branch circuit protection.

### Motor Contactors

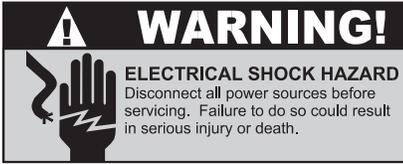
The motor contactor controls the pump by switching electrical lines.



**Technical support,  
service questions:**

1-800-543-2550

# Troubleshooting



## Alarm Horn

Moving the test/normal/silence switch to the test position or activating the alarm float should turn on the alarm horn. If the horn does not sound, replace horn with same type.

## Alarm Light

Moving the test/normal/silence switch to the test position or activating the alarm float should turn on the alarm light. If the light does not activate, replace light with same type.

## Circuit Breaker (optional)

Check each pole of the circuit breaker for proper resistance reading using the following procedure.

### **WARNING: Disconnect incoming power to panel.**

1. Isolate the circuit breaker by disconnecting either line side or load side wires.
2. Place the ohmmeter leads across the corresponding line and load terminals of each pole.
3. With the ohmmeter on the RX1 scale and the breaker in the OFF position, the reading should be infinity (very high resistance). With the breaker in the ON position, the reading should be nearly zero ohms (very low resistance). If the readings are not as stated, replace the circuit breaker with one of the same ratings.

NOTE: Readings may vary slightly depending on the accuracy of the measuring device.

## Float Controls

Check the floats during their entire range of operation. Clean, adjust, or replace damaged floats.

Checking the float resistance - The float resistance can be measured to determine if the float is operating correctly or is defective. Use the following procedure to measure the float resistance.

### **WARNING: Disconnect incoming power to panel.**

1. Isolate the float by disconnecting one or both of the float leads from the float terminals.
2. Place one ohmmeter lead on one of the float wires, and the other ohmmeter lead on the other float wire.
3. Place the ohmmeter dial to read ohms and place on the RX1 scale. With the float in the "off" position, the scale should read infinity (high resistance). Replace the float if you do not get this reading. With the float in the ON position, the scale should read nearly zero (very low resistance). Replace the float if you do not get this reading.

NOTE: Readings may vary depending on the length of wire and accuracy of the measuring device.

## Fuses

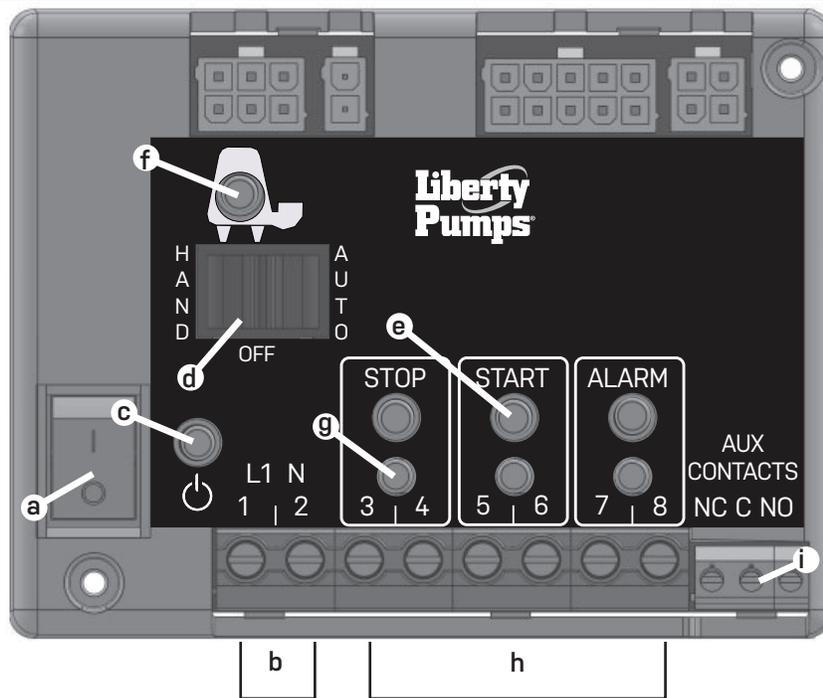
Check the continuity of the fuse. With power OFF, pull the fuse out of the fuse block. With the ohmmeter on the RX1 scale, measure resistance. A reading of infinity indicates a blown fuse and must be replaced. Replace fuse with same type, voltage and amp rating.

## Magnetic Contactor Coil

### **WARNING: Disconnect incoming power to panel.**

Check the coil by disconnecting one of the coil leads. Measure the coil resistance by setting the ohmmeter on the RX1 scale. A defective coil will read zero or infinity, indicating a short or opened coil respectively. Replace defective contactor with same type.

NOTE: Readings may vary depending on the accuracy of the measuring device.



## COMPONENTS

- a. ON/OFF Switch - Control/Alarm Power
- b. 120V Incoming Power Terminals
- c. Power LED - (Green)
- d. Pump HOA Switch
- e. Float LEDs - (Red) x3
- f. Pump LED
  - Pump Run - (Green)
  - Pump Fail - (Red)
- g. Simulate Float Buttons x3
- h. Float Terminals x6
- i. Auxiliary Alarm Terminals

## PROGRAMMING INSTRUCTIONS

WITH POWER ON, HOA OFF, FLOATS OFF OR DISCONNECTED, PRESS DESIRED FLOAT BUTTON RAPIDLY 4 TIMES AND HOLD

\*\*PUMP LED WILL FLASH UPON SUCCESSFUL PROGRAMMING\*\*

OPTIONS	FLOAT BUTTON	DEFAULT	OPERATION
MANUAL ALARM RESET	STOP	OFF	LATCHES HIGH ALARM: CLEAR WITH EXTERNAL TEST SWITCH
ALARM FLASHER	ALARM	OFF	FLASHES BEACON UPON HIGH ALARM

## ALARM CONDITIONS

ALARM	BEACON	CONTROLLER LED	HORN
PUMP POWER FAIL	FLASHING	RED PUMP LIGHT	NO
FLOAT FAIL	FLASHING	BAD FLOAT NOT LIT	NO
HIGH ALARM	SOLID	ALARM FLOAT	YES

# Standard Field Wiring Diagram

Identify panel configuration before wiring.

Use wiring diagram in conjunction with schematic for panel installation.

**NOTE:** It is the recommendation of the factory to use separate pump and control/alarm power sources.

## **! WARNING!**



### **ELECTRICAL SHOCK HAZARD**

Disconnect all power sources before servicing. Failure to do so could result in serious injury or death. Must be installed by a licensed electrician and in accordance with the National Electric Code NFPA-70, state and local electrical codes.

## **1 Wire Floats**

- Connect float switches to TB1 (on circuit board) as shown. (Pump down application is shown)

## **2 Wire pump power cable**

- Connect pump power cable to motor contactor.
- Connect pump ground wire to ground lug.

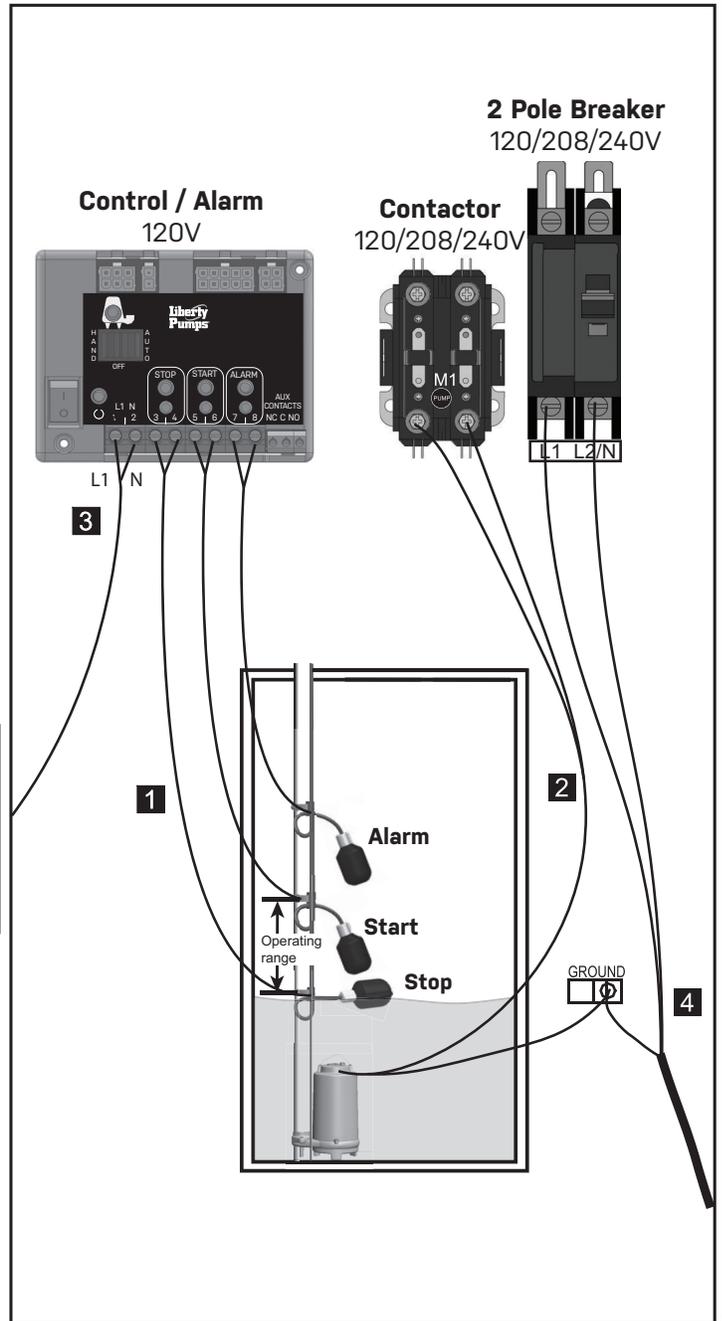
## **3 Wire incoming control/alarm power to circuit board (120V only)**

- Connect L1 to TB1-1.
- Connect Neutral to TB1-2.
- Connect incoming ground line to ground lug.

## **4 Wiring incoming pump power 120/208/240V to Two Pole Breaker**

- Connect L1 to breaker L1.
- Connect L2 or N to breaker L2/N.
- Connect ground line to ground lug.

## **5 Field wire options according to schematic (if applicable)**



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