

# BLD

QUICKSTART BATTERY  
LOWERING DEVICE

VERSION 1.1



SMARTRISE

## Document History

Date	Version	Summary of Changes
April 5, 2024	1.1	Update document presentation.
October 1, 2022	1.0h	Added NO/NC Jumper settings. Replaced EGS002 board by SR-3089A2 Board. Changed battery connector.
October 21, 2021	1.0g	Updated switch description. Added figure to show how to connect the battery wires to the BLD.
February 1, 2021	1.0f	Changed cover page. New document format. Added the EGS002 board and LED warning status. Added Safety and Disposal sections. Added Power Switch.
March 11, 2019	1.0e	Expanded description of Battery Lowering Device. Updated warning message. Added component descriptions. Added wiring descriptions. Added Battery Replacement section.
April 8, 2015	1.0	Initial Release.

# Table of Contents

<b>1</b>	<b>Smart Battery Lowering Device .....</b>	<b>1</b>
<b>2</b>	<b>Components .....</b>	<b>2</b>
2.1	Terminals.....	3
2.2	LEDs .....	3
2.3	DIP SWITCHES.....	4
2.4	PUSH BUTTON .....	5
2.5	J35 NO/NC BLD CONFIGURATION .....	5
2.6	Wiring .....	6
<b>3</b>	<b>Trimpots Adjustment .....</b>	<b>7</b>
<b>4</b>	<b>Battery Lowering Device Wiring.....</b>	<b>8</b>
<b>5</b>	<b>Safety .....</b>	<b>9</b>
5.1	Disposal .....	9
<b>6</b>	<b>Battery Removal and Replacement .....</b>	<b>10</b>
<b>7</b>	<b>Troubleshooting Tips.....</b>	<b>13</b>

# List of Figures

- Figure 1: Battery Lowering Device ..... 1
- Figure 2: Power Switch ..... 2
- Figure 3: Battery Connector..... 2
- Figure 4: SR-3089A Board ..... 4
- Figure 5: Red LED Warning Display ..... 4
- Figure 6: J35 O2 output settings ..... 5
- Figure 7: 208 VAC Wiring ..... 6
- Figure 8: 240 VAC Wiring ..... 6
- Figure 9: 480 VAC Wiring ..... 6
- Figure 10: Smart Battery Lowering Device Wiring..... 8
- Figure 11: Removing Screws ..... 11
- Figure 12: Removing Cables ..... 12

*Page intentionally left blank.*

# 1 Smart Battery Lowering Device

In case of loss of power to the elevator, the Smart Battery Lowering Device (BLD) moves the elevator to the nearest floor and opens the doors.

**WARNING**

**DO NOT TOUCH THE BOARD WHILE BATTERY LOWERING IS OPERATION DUE TO HIGH VOLTAGE. ONCE UNIT HAS SHUTDOWN, WAIT 2 MINUTES FOR CAPACITORS TO DISCHARGE.**

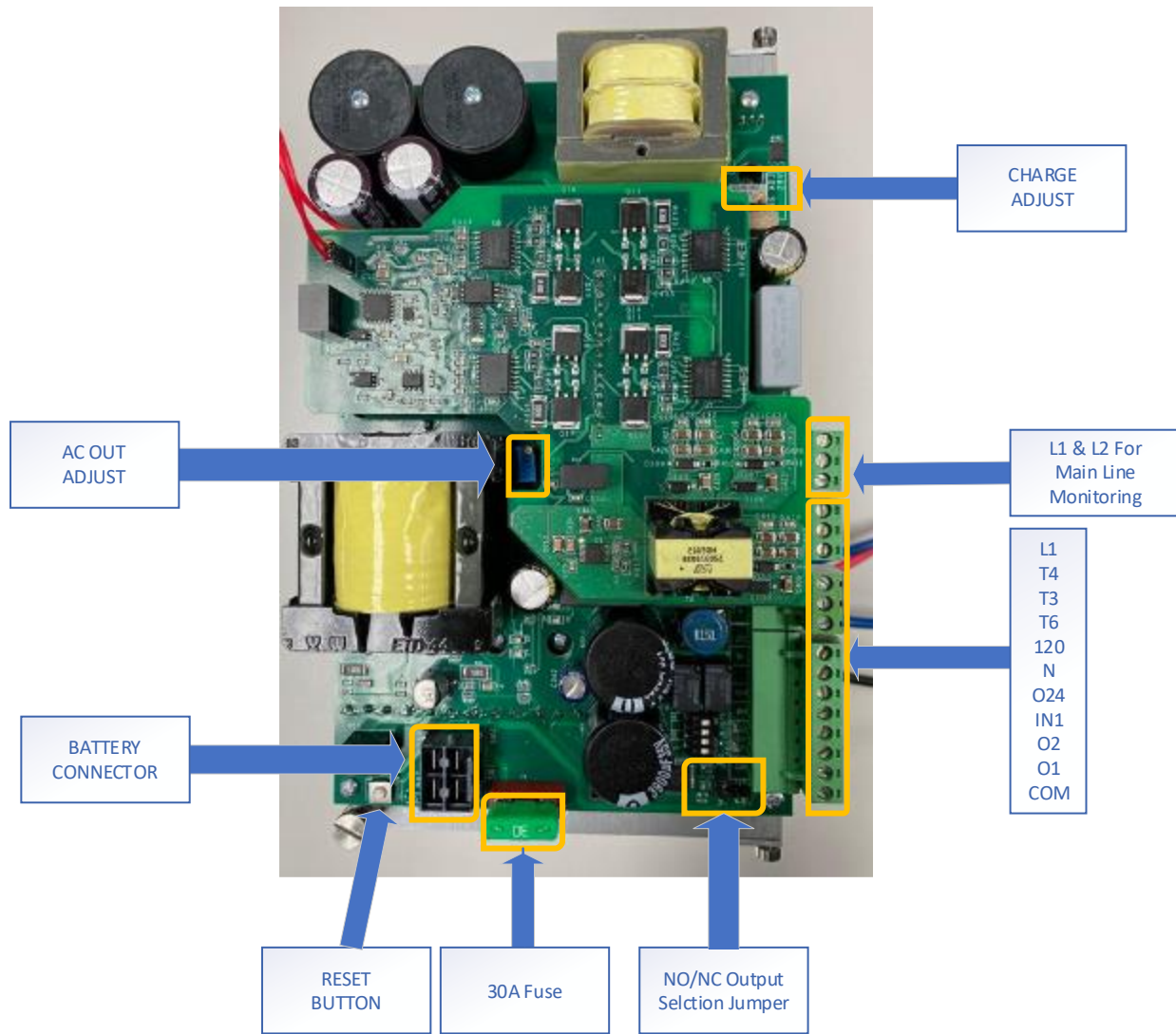


Figure 1: Battery Lowering Device

The batteries within the BLD must be charged and the switch must be in the ON position as shown in Figure 2 below. The Battery Connector cable must be plugged in as shown in Figure 3. The batteries will continue charging while 120 and N are connected to 120VAC and BLD is not outputting.

**NOTE:** if the Power Switch is OFF or the battery voltage is low, the FLT output will become active.

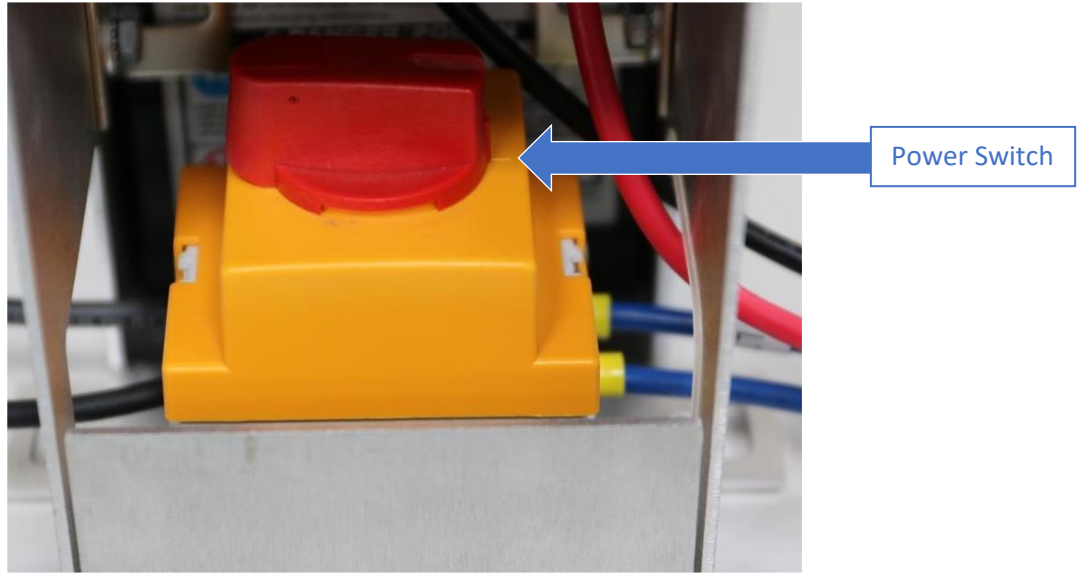


Figure 2: Power Switch

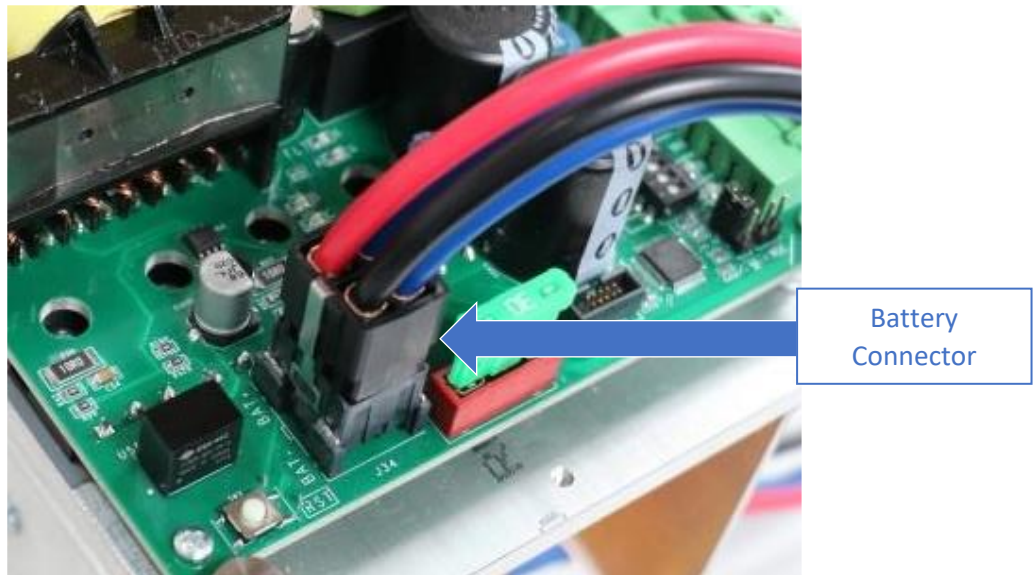


Figure 3: Battery Connector

## 2 Components

The Battery Lowering Device consists of the following:

## 2.1 Terminals

- **Battery Connector** – Battery Connection (Black [BAT-], Red [BAT+]) and Switch Connections (Blue [SW1], Blue [SW2]). See Figure 3.
- **L1, L2 – L1, L2 from Main Line** – Detects main line power loss.
- **L1, T4, T3, T6** – External connections based on incoming main line power. See Figure 7, Figure 8, Figure 9.
- **120, N: 120 VAC** – Charges batteries
- **O24, IN1** – Main line aux switch.
- **O2** – Battery lowering input to controller.
- **O1** – Battery lowering fault input to controller.
- **COM** – 24 VDC from controller
- **NC/NO Jumper**. See Figure 6.

## 2.2 LEDs

- **FLT** – Indicates fault (Battery low).
- **A** – HB LED indicating power on and BLD working.
- **B** – Blinking indicates battery is charging.
- **C** – Indicates test with use of DIP 3 turned ON.
- **Red LED** – The LED flashes in cycles to display the state and fault of the BLD, See Figure 5.
- **Yellow LED** – turns on by IGBT driver in case of output short circuit, See Figure 4.
- **O1 LED** – Indicates BLD Faulty.
- **O2 LED** – Indicates BLD is outputting and in rescue mode.



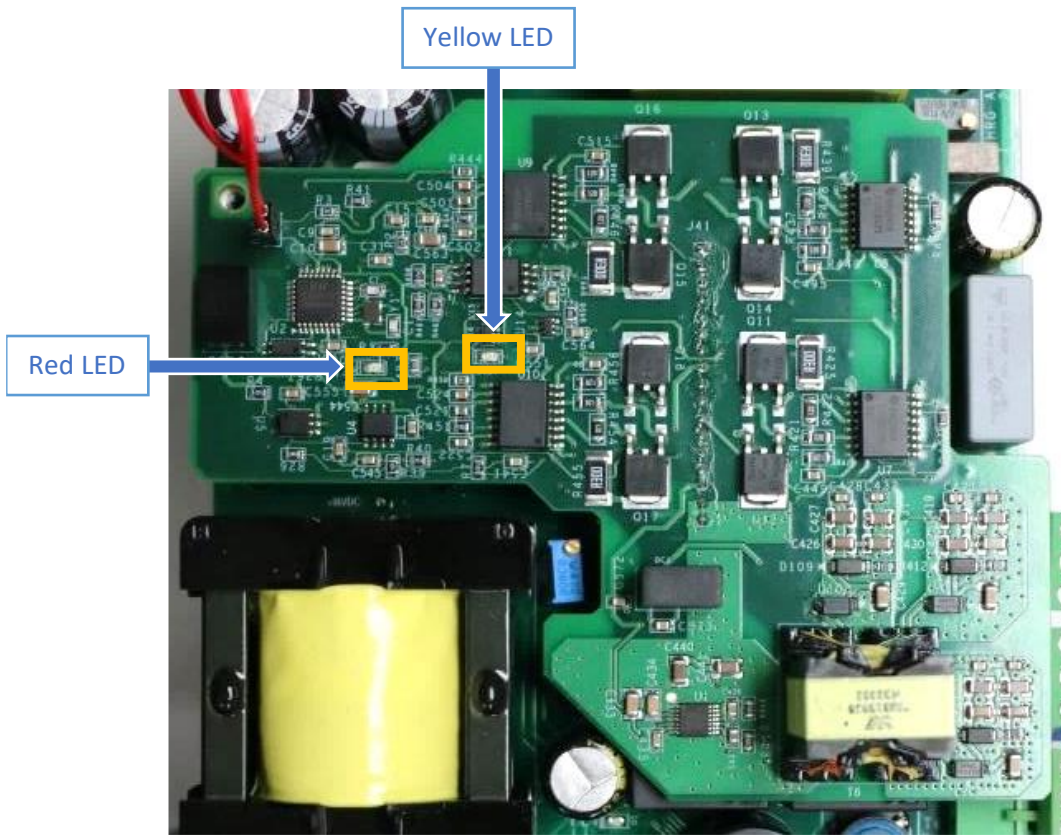


Figure 4: SR-3089A Board

LED warning display:

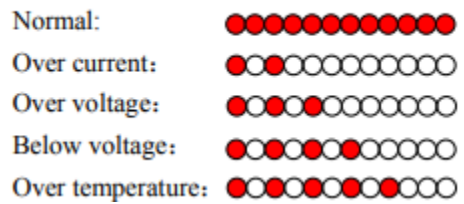


Figure 5: Red LED Warning Display

### 2.3 DIP SWITCHES

**NOTE:** (By default, all 4 DIP switches are OFF)

1. Manual battery output (5 seconds)
2. Not used
3. Manual Battery test (LED C indicates test)
4. Not used

## 2.4 PUSH BUTTON

- **Reset** – Resets the board.

## 2.5 J35 NO/NC BLD CONFIGURATION

- **NO:** for C4 and Hydro: Evolved.
- **NC:** for V2 Traction and V2 Hydro.

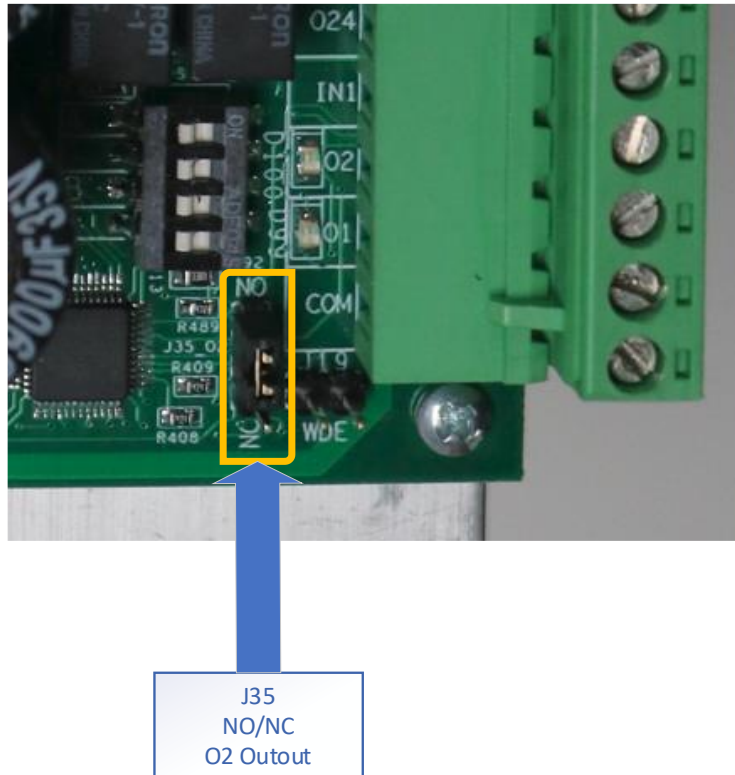


Figure 6: J35 O2 output settings

## 2.6 Wiring

The Battery Lowering Device can be wired for 208 VAC, 240 VAC, and 480 VAC main line power.

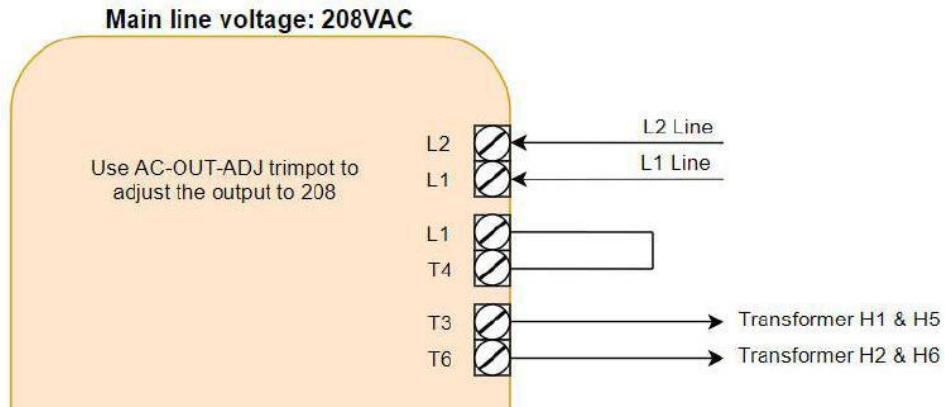


Figure 7: 208 VAC Wiring

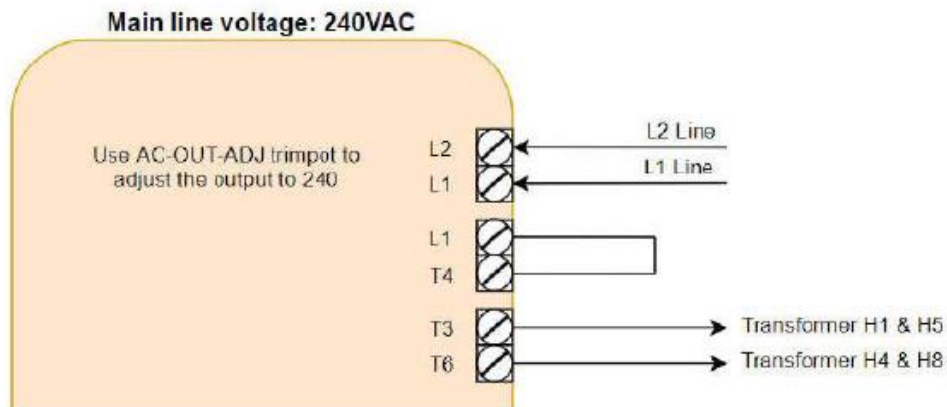


Figure 8: 240 VAC Wiring

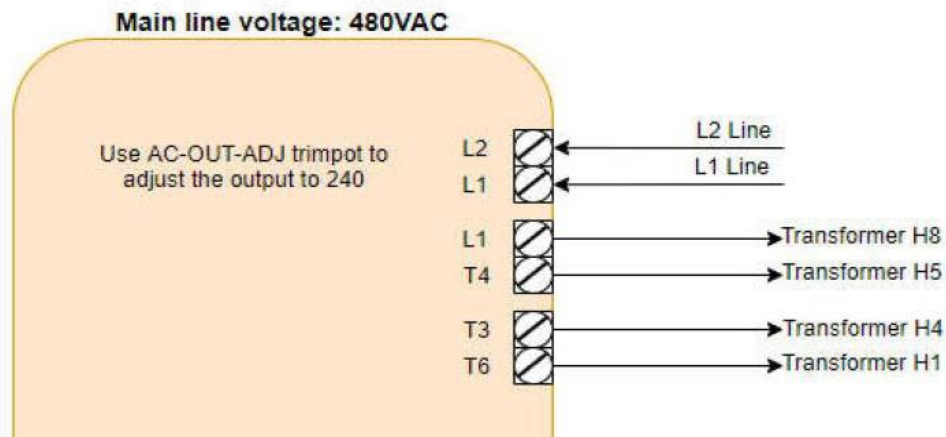


Figure 9: 480 VAC Wiring

### 3 Trimpots Adjustment

Adjust trimpot as follows:

1. “AC OUT ADJ” and measure the voltage coming out of T3 and T6.
2. Measured voltage will need to be main line voltage (for example, 208VAC, 240VAC).
3. Remove the Battery Connector and measure the voltage on BAT- & BAT+ connector J34. Adjust the trimpot “CHRG ADJ” voltage to ~28VDC. Note: this is the voltage that will charge both 12V batteries together in series.

## 4 Battery Lowering Device Wiring

The following is an example of the Smart Battery Lowering Device wiring.

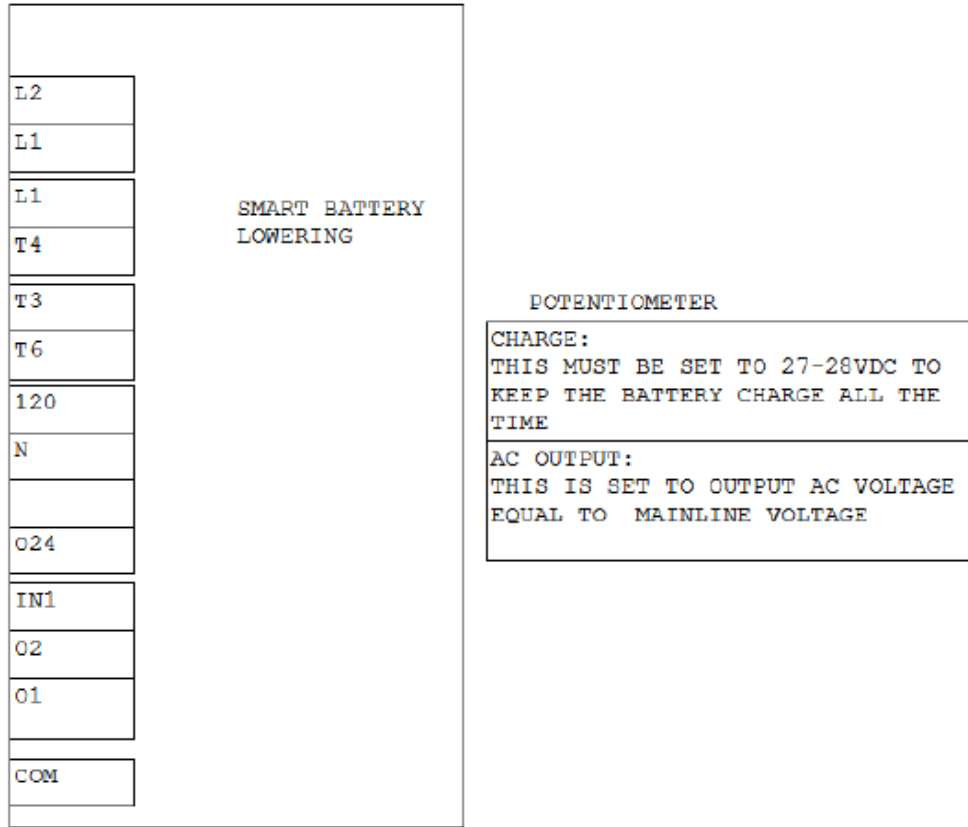


Figure 10: Smart Battery Lowering Device Wiring

## 5 Safety

Safety precautions must be taken when removing and replacing batteries.

**CAUTION:** Risk of explosion if a battery is replaced by an incorrect type.

**CAUTION:** A battery can present a risk of electrical shock and high short-circuit current.

**CAUTION:** Do not disconnect the battery when the battery is under a load condition.

1. SAVE THESE INSTRUCTIONS - This manual contains important instructions that shall be followed during installation and maintenance of the inverter.
2. Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
3. Remove watches, rings, or other metal objects.
4. Use tools with insulated handles.
5. Wear rubber gloves and boots.
6. Do not lay tools or metal parts on top of batteries.
7. Disconnect charging source prior to connecting or disconnecting battery terminals.
8. Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance.
9. When replacing batteries, replace with a sealed lead acid battery, rated at 12 VDC 5AH each.
10. Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.

Maximum ambient temperature rating: **104°F or 40°C. Intended for a controlled environment.**

For use in restricted access locations only.

A 4-pole main line disconnect switch or auxiliary dry contact must be provided and installed.

### 5.1 Disposal

Dispose used batteries according to the instructions of your local codes.

**CAUTION:** Do not dispose of batteries in a fire. The batteries may explode.

## 6 Battery Removal and Replacement

This section contains important instructions that shall be followed during installation and maintenance of the BLD unit.

**NOTE:** Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.

The batteries used in the BLD are rechargeable but eventually, a battery needs to be replaced.

Batteries must be replaced with **Yuasa Genesis NPX-25** or equivalent.

**NOTE:** Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.

**CAUTION:** Risk of explosion if battery is replaced by an incorrect type.

**CAUTION:** Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.

The following procedure describes how to remove and replace a battery.

1. Disconnect main power to the BLD.
2. Open the BLD cabinet.
3. Turn off the battery disconnect switch.
4. Remove screws from top left and bottom left corners to access batteries.



Figure 11: Removing Screws

1. Pull the left side of plate and open it showing the 2 batteries.
2. Remove screws, lock washers, washers, and nuts from the power and ground cables.

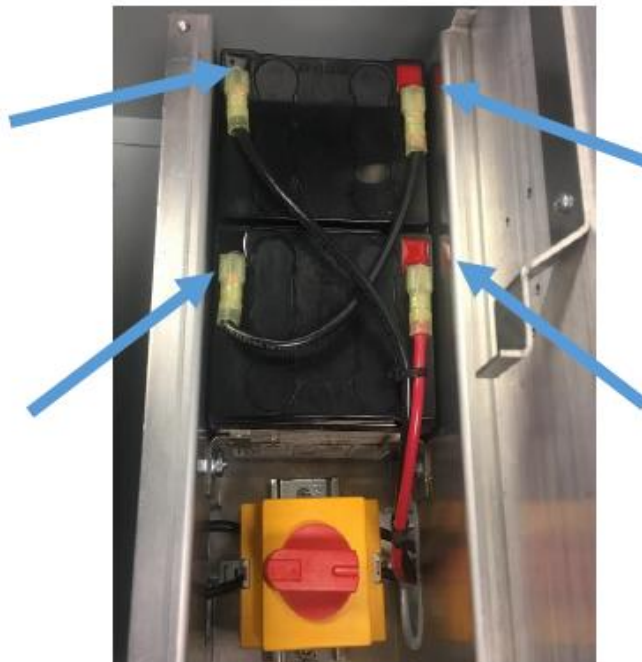




Figure 12: Removing Cables

1. Move the battery power and ground cables up and away from the set of batteries and side of cabinet.

**CAUTION:** Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

2. Remove and replace the bad batteries.
3. Install nuts, washers, lock washers, and screws and secure the battery power and ground cables.
4. Turn on the battery disconnect switch.
5. Close the BLD cabinet.
6. Restore power to the BLD.
7. Dispose bad battery according to local code.

## 7 Troubleshooting Tips

Perform the following If the BLD is not powering on **when the main line is disconnected**:

- Check BLD disconnect switch is put to ON position (SW1 and SW2 should measure short on battery connector see Figure 3.
- Check continuity between O24 & IN1.
- BAT+ and BAT-'s measured value for fully charged batteries should be 25 - 26VDC with battery connector connected to the board.
- T3 and T6's measured value needs to be the same as the main line.
- Check that 120 VAC is between the terminals 120 and N. This is what is used to charge the batteries. The batteries will charge regardless of the BLD disconnect position.
- Check that the 30A fuse has not blown.
- Check for proper incoming main line voltage.
- Check for proper outgoing wiring to control transformer.
- Check for controller 24 VDC on terminal COM.
- Check for proper battery connection.
- Monitor the flashing red LED code on the SR3089A2 board. See Figure 5.