



# NetSure™ 211 SERIES

-48 VDC Battery Cabinet

Installation and User Manual (Section 6023), Revision L

Specification Number: 541434

Model Number: 211BC

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If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

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## ADMONISHMENTS USED IN THIS DOCUMENT



**DANGER!** Warns of a hazard the reader *will* be exposed to that will *likely* result in death or serious injury if not avoided. (ANSI, OSHA)



**WARNING!** Warns of a potential hazard the reader *may* be exposed to that *could* result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)



**CAUTION!** Warns of a potential hazard the reader *may* be exposed to that *could* result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)



**ALERT!** Alerts the reader to an action that *must be avoided* in order to protect equipment, software, data, or service. (ISO)



**ALERT!** Alerts the reader to an action that *must be performed* in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)



**FIRE SAFETY!** Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)



**SAFETY!** Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

# IMPORTANT SAFETY INSTRUCTIONS

## Safety Admonishments Definitions

Definitions of the safety admonishments used in this document are listed under “Admonishments Used in this Document” on page 4.

## General Safety



**DANGER!** YOU MUST FOLLOW APPROVED SAFETY PROCEDURES.

Performing the following procedures may expose you to hazards. These procedures should be performed by qualified technicians familiar with the hazards associated with this type of equipment. These hazards may include shock, energy, and/or burns. To avoid these hazards:

- a) The tasks should be performed in the order indicated.
- b) Remove watches, rings, and other metal objects.
- c) Prior to contacting any uninsulated surface or termination, use a voltmeter to verify that no voltage or the expected voltage is present. Check for voltage with both AC and DC voltmeters prior to making contact.
- d) Wear eye protection.
- e) Use certified and well maintained insulated tools. Use double insulated tools appropriately rated for the work to be performed.

## DC Voltages



**DANGER! THIS SYSTEM CONTAINS BATTERIES**

Although the DC voltage is not hazardously high, the battery can deliver large amounts of current. Exercise extreme caution not to inadvertently contact or have any tool inadvertently contact a battery terminal or exposed wire connected to a battery terminal. NEVER allow a metal object, such as a tool, to contact more than one termination or battery terminal at a time, or to simultaneously contact a termination or battery terminal and a grounded object. Even a momentary short circuit can cause sparking, explosion, and injury.

## Battery

Refer to the battery manufacturer documentation for specific battery safety instructions. The following are general guidelines.



**WARNING!** Correct polarity must be observed when connecting battery leads.



**WARNING!** Special safety precautions are required for procedures involving handling, installing, and servicing batteries. Observe all battery safety precautions in this manual and in the battery instruction manual. These precautions should be followed implicitly at all times.



**WARNING!** A battery can present a risk of electrical shock and high short circuit current. Servicing of batteries should be performed or supervised only by properly trained and qualified personnel knowledgeable about batteries and the required precautions.

The following precautions should be observed when working on batteries:

- Follow the recommended PPE requirements per the SDS for the battery to be used.
- Batteries are an energy source that can produce high amounts of electrical current.
- Remove watches, rings, and other metal objects.
- Eye protection should be worn to prevent injury from accidental electrical arcs.
- Use certified and well maintained insulated tools. Use double insulated tools appropriately rated for the work to be performed. Ensure that wrenches with more than one working end have only one end exposed.
- Do not lay tools or metal parts on top of batteries.
- Verify that no current will flow when the battery is connected or disconnected by opening battery disconnects (if available) or adjusting the system to match battery voltage.
- Risk of explosion if battery is replaced with an incorrect type or if polarity is reversed. Recommended to replace batteries with the same manufacturer and type, or equivalent.
- Dispose of used batteries according to the instructions provided with the batteries. Do not dispose of batteries in a fire. They may explode.
- Batteries may generate explosive gases during normal operation. Systems containing batteries should never be installed in an airtight room or space. Only install in a ventilated environment.
- Batteries may contain sulfuric acid. If battery acid enters your eye, immediately flush your eye with running cold water for at least 15 minutes. Get medical attention immediately. If battery acid contacts skin or clothing, wash immediately with soap and water.
- Do not open or mutilate batteries.
- ALWAYS FOLLOW THE BATTERY MANUFACTURER'S RECOMMENDATIONS AND SAFETY INSTRUCTIONS.

 **ALERT!** Performing maintenance and/or troubleshooting procedures may interrupt power to the loads, if battery reserve is not sufficient.

## Personal Protective Equipment (PPE)

 **DANGER!** ARC FLASH AND SHOCK HAZARD.  
Appropriate PPE and tools required when working on this equipment. An appropriate flash protection boundary analysis should be done determine the “hazard/risk” category, and to select proper PPE.

 This product is intended only for installation in a Restricted Access Location.

Only authorized and properly trained personnel should be allowed to install, inspect, operate, or maintain the equipment.

Do not work on LIVE parts. If required to work or operate live parts, obtain appropriate Energized Work Permits as required by the local authority, per NFPA 70E “Standard for Electrical Safety in the Workplace”.

## Hazardous Voltage

 **DANGER!** HAZARD OF ELECTRICAL SHOCK.  
More than one disconnect may be required to de-energize the system before servicing.

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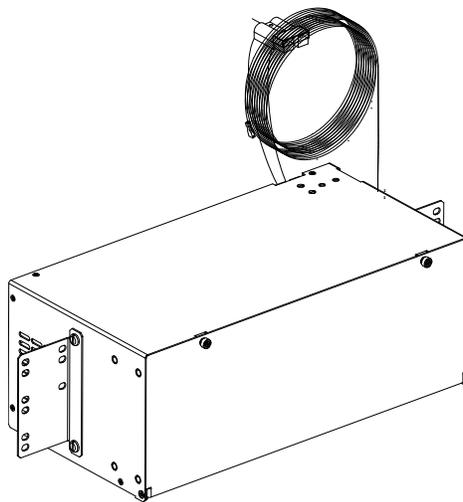
# INTRODUCTION

## Description

The NetSure™ 211 Series -48 VDC battery cabinet can be mounted in a 19” or 23” relay rack or mounted to a wall. The battery cabinet contains one (1) 40 A battery disconnect circuit breaker and provides alarm leads attached to the common contacts of the breaker.

Battery cabinets may be daisy chained as shown in **Figure 7** to increase the reserve time. However, a maximum system current of 30 amps should be maintained regardless of the number of interconnected cabinets.

**Figure 1:** NetSure™ 211 Series -48 VDC Battery Cabinet



## Batteries

The battery cabinet is designed to hold the batteries listed in **Table 1**.

**Table 1:** Batteries

Battery Manufacturer	Manufacturer P/N	Vertiv Co. P/N	Rated 8-Hr. Capacity (Ah)	Weight (lbs.) per Battery
Enersys	SBS15	139091	14	12.50
Fiamm	12SLA12	139092	12	12.35
EaglePicher	HE-12V12.7FR	139093	11.6 *	9.70
EaglePicher	HE-12V7.7FR	139094	6.9	6.40
Enersys	NP18-12FR	139774	16 *	13.60

## Specifications

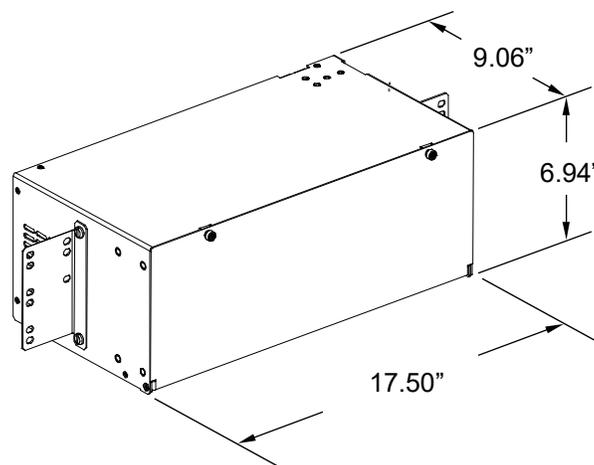
### Environmental Ratings

- Operating Ambient Temperature Range: -40 °C to +65 °C.
- Storage Ambient Temperature Range: -40 °C to +85 °C.
- Humidity: This unit is capable of operating in an ambient relative humidity range of 0% to 95%, non-condensing.
- Altitude: The maximum operating ambient temperature should be derated by 10 °C at an elevation of 10,000 feet above sea level. For elevations between 3,000 feet and 10,000 feet, derate the maximum operating ambient temperature linearly.

### Overall Dimensions

Battery cabinet dimensions are illustrated in **Figure 2**.

**Figure 2:** Battery Cabinet Dimensions



## INSTALLATION

### Important Safety Instructions



**DANGER!** Adhere to the “Important Safety Instructions” starting on page 5.

### General Requirements

The installer should be familiar with the installation requirements and techniques to be used in securing the battery cabinet to a relay rack or wall.

### Mounting the Battery Cabinet

The battery cabinet is designed to mount on a wall or a standard 19” or 23” wide relay rack.

## Relay Rack Method

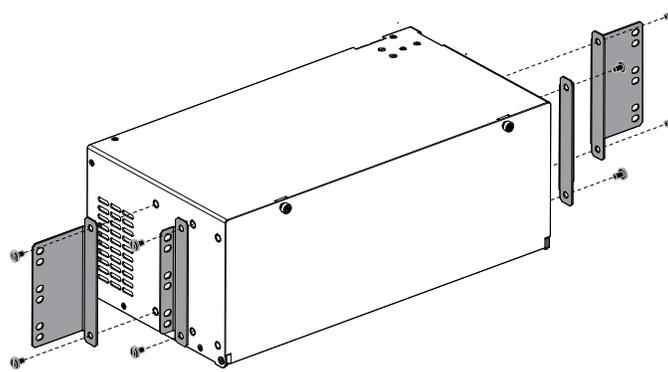
### Procedure

1. Refer to **Figure 3** and install the 19" or 23" relay rack mounting angles to the battery cabinet. Mounting hardware is provided with the battery cabinet. Torque these connections to 46 in-lbs.



**NOTE!** There are three mounting locations for the mounting angles providing different projections in front of the relay rack.

**Figure 3:** Installing Mounting Angles on the Battery Cabinet



2. Install battery retention strap through openings in rear of cabinet. Orient the buckle per **Figure 28**.
3. Secure the battery cabinet to the relay rack with the provided 12-24 x 1/2" hex head thread-forming screws (six per side) (P/N 218710500) and #12 ground washers (three per side) (P/N 215640600). Torque these connections to 35.0 in-lbs.

## Wall Method



**WARNING!** Ensure the technique and hardware used in securing the battery cabinet can support the total weight of the battery cabinet and the four (4) batteries. Refer to "Batteries" on page 9 for a battery weight reference table. If being mounted to a stud wall, the cabinet **must** be fastened to the studs. Failure to mount the cabinet correctly may result in serious personal injury or equipment damage.

### Procedure

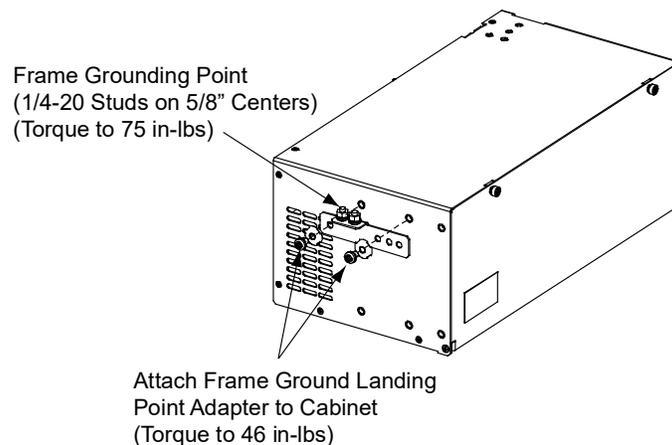
1. Ensure that connector, wires and bushing located at the back are moved to the side, as shown in **Figure 4**, before mounting the cabinet.
2. Install battery retention strap through openings in rear of cabinet. Orient the buckle per **Figure 28**.

**Figure 4:** Connectors and Wires Moved to the Side



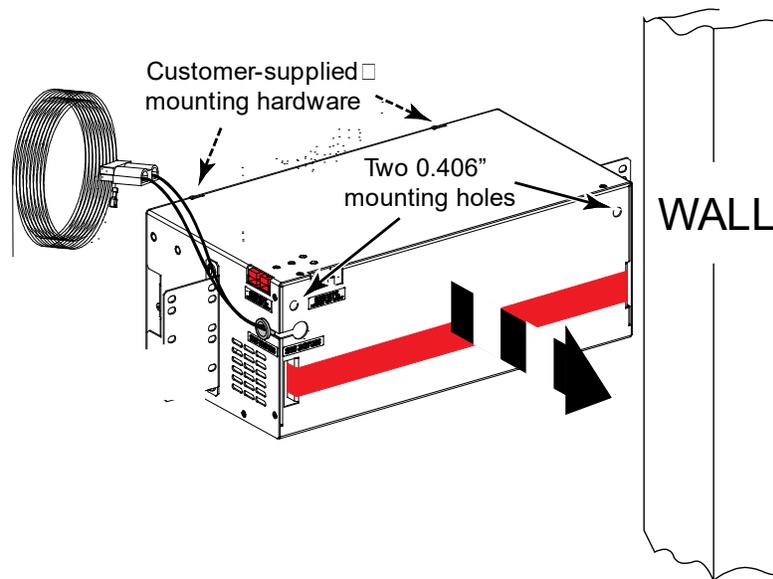
3. Install the frame ground landing point adapter P/N 556872 to the left or right side of the battery cabinet, as shown in **Figure 5**.

**Figure 5:** Installing P/N 556872 Frame Ground Landing Point Adapter



4. Mount the battery cabinet to a wall through the two 0.406" diameter holes on the back of the cabinet, as shown in **Figure 6**. If mounting to a stud wall, secure the battery cabinet to the studs.
5. Ensure the technique and hardware used in securing the cabinet can support the total weight of the cabinet and the batteries. Refer to "Batteries" on page 9 for a battery weight reference table.

**Figure 6:** Mounting the Battery Cabinet to a Wall



## Connecting Battery Cabinet(s) to the Associated Power System

### Battery Leads

Cables with connectors are provided on the associated power system and the battery cabinet to allow simple interconnections between a battery cabinet and the associated power system and between battery cabinets. The battery cabinet is designed to be daisy-chained together with additional battery cabinets. There is no limit to the number of battery cabinets that can be connected together. However, a maximum system current of 30 A should be maintained regardless of the number of interconnected battery cabinets.

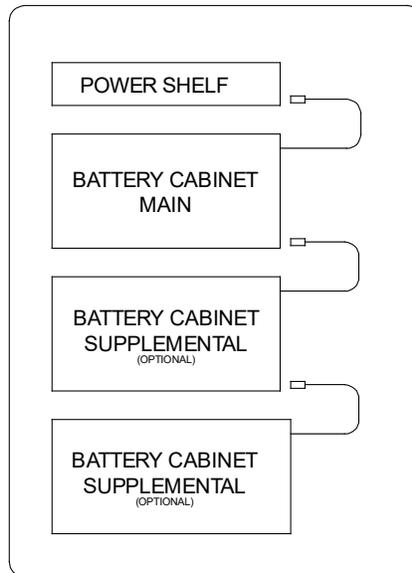
### Procedure



**NOTE!** Refer to **Figure 7** as this procedure is performed.

1. Connect the power system's battery cable terminated in an Anderson connector to the first battery cabinet's battery cable terminated in a mating Anderson connector.
2. Connect the second battery cabinet's battery cable terminated in an Anderson connector to the fixed mating Anderson connector located on the first battery cabinet.
3. Repeat the above step if there are additional battery cabinets.

**Figure 7:** Connecting Multiple Battery Cabinets



### **Battery Disconnect Circuit Breaker Alarm Leads**

#### **Procedure**

1. Furnished with the battery cabinet are battery disconnect circuit breaker alarm lead assemblies. Refer to the power system installation manual to use these alarm leads to connect the battery cabinet battery disconnect circuit breaker alarm into the power system alarm circuits.



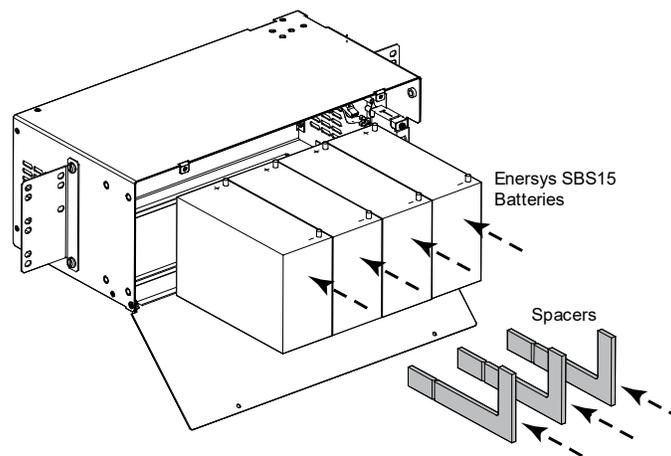
**NOTE!** Supplied with the battery cabinet is a yellow alarm lead assembly P/N 545696 and an orange alarm lead assembly P/N 565513. P/N 545696 is always used. P/N 565513 is used only with power systems containing a 1M831ANA Mini Controller (may be discarded if battery cabinet is used with other systems).

## Installing EnerSys SBS15 Batteries

### Procedure

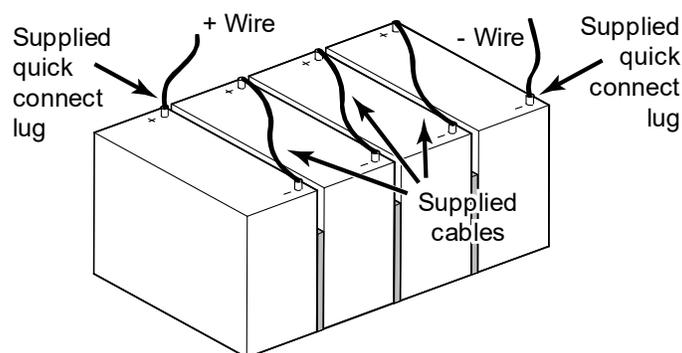
1. Place the batteries inside the cabinet. Refer to **Figure 8**.
2. Insert a spacer between the batteries.

**Figure 8:** Placing EnerSys SBS15 Batteries



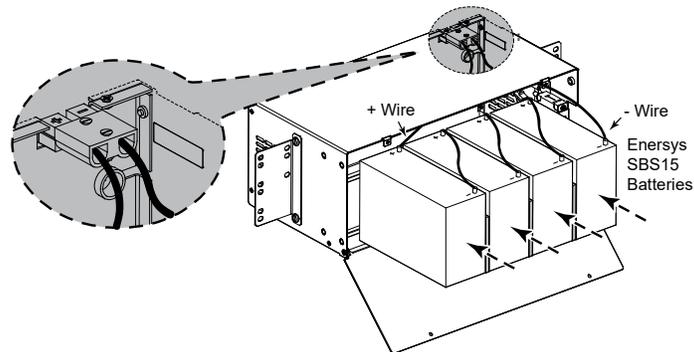
3. Connect all four EnerSys batteries using supplied wires (Part Number 541420) crimped with 12-10 AWG ring lug on each end, as shown in **Figure 9**.

**Figure 9:** Connecting EnerSys SBS15 Batteries



4. Attach the cabinet wires to + and - terminals. Refer to **Figure 10**.

**Figure 10:** Connecting Energys SBS15 Batteries to (+) and (-) Terminals



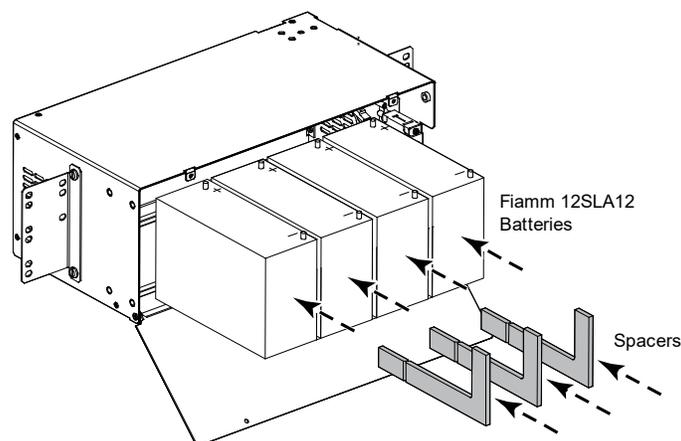
5. Refer to “**Securing the Batteries Using the Strap**” on page 25 for instructions on securing the batteries using the buckle strap that is bundled along with the cabinet.

## Installing Fiamm 12SLA12 Batteries

### Procedure

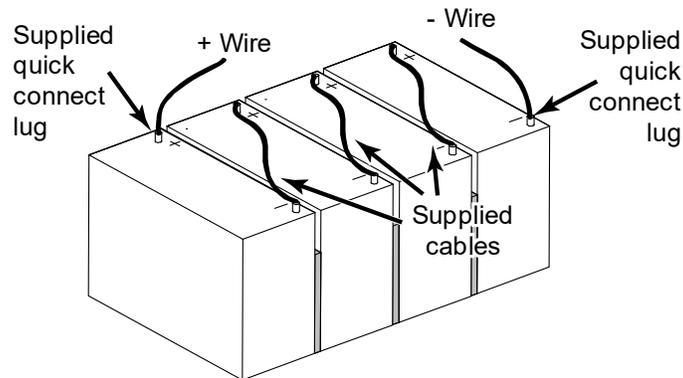
1. Place the batteries inside the cabinet. Refer to **Figure 11**.
2. Insert a spacer between the batteries.

**Figure 11:** Placing Fiamm 12SLA12 Batteries



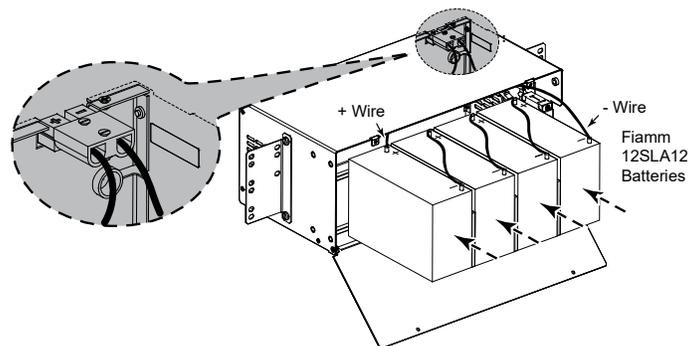
3. Connect all four Fiamm batteries using supplied wires (Part Number 541420) crimped with 12-10 AWG ring lug on each end, as shown in **Figure 12**.

**Figure 12:** Connecting Fiamm 12SLA12 Batteries



4. Attach the cabinet wires to + and - terminals. Refer to **Figure 13**.

**Figure 13:** Connecting Fiamm 12SLA12 Batteries to (+) and (-) Terminals



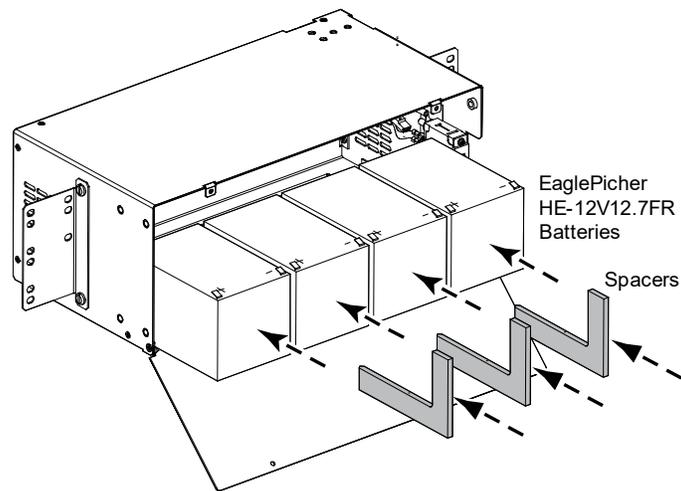
5. Refer to “**Securing the Batteries Using the Strap**” on page 25 for instructions on securing the batteries using the buckle strap that is bundled along with the cabinet.

## Installing EaglePicher HE-12V12.7FR Batteries

### Procedure

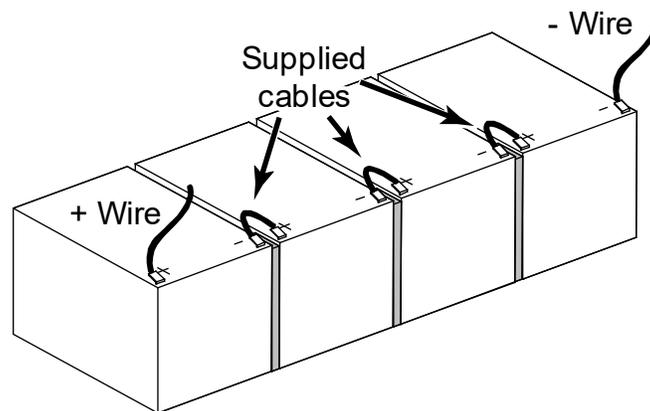
1. Place the batteries inside the cabinet. Refer to **Figure 14**.
2. Break each spacer at its score line and insert between the batteries.

**Figure 14:** Placing EaglePicher 12V12.7FR Batteries



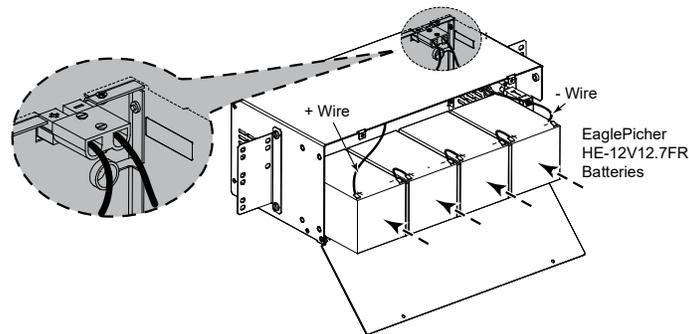
3. Connect all four EaglePicher batteries using supplied wires (Part Number 541424) crimped with 12-10 AWG Faston receptacle on each end, as shown in **Figure 15**.

**Figure 15:** Connecting EaglePicher 12V12.7FR Batteries



4. Attach the cabinet wires to + and - terminals. Refer to **Figure 16**.

**Figure 16:** Connecting EaglePicher HE-12V12.7FR Batteries to (+) and (-) Terminals



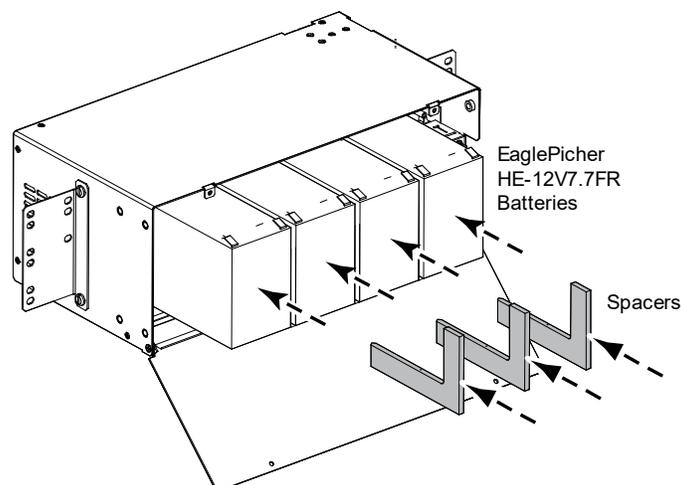
5. Refer to “**Securing the Batteries Using the Strap**” on page 25 for instructions on securing the batteries using the buckle strap that is bundled along with the cabinet.

## Installing EaglePicher HE-12V7.7FR Batteries

### Procedure

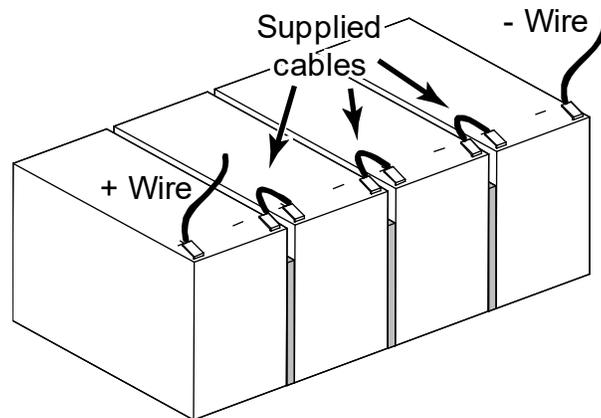
1. Place the batteries inside the cabinet. Refer to **Figure 17**.
2. Break each spacer at its score line and insert between the batteries.

**Figure 17:** Placing EaglePicher 12V7.7FR Batteries



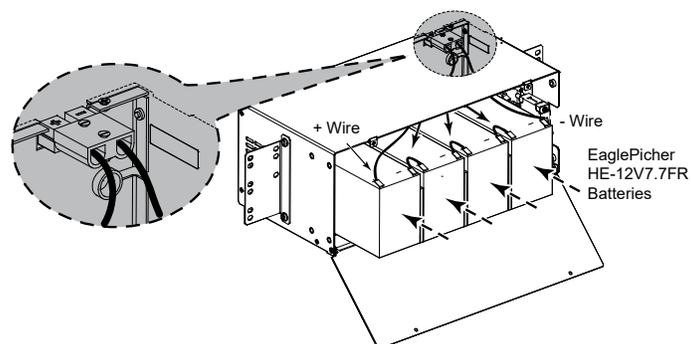
3. Connect all four EaglePicher batteries using wires (Part Number 541424) crimped with 12-10 AWG Faston receptacle on each end, as shown in **Figure 18**.

**Figure 18:** Connecting EaglePicher 12V7.7FR Batteries



4. Attach the cabinet wires to + and - terminals. Refer to **Figure 19**.

**Figure 19:** Connecting EaglePicher 12V7.7FR Batteries to (+) and (-) Terminals



5. Refer to “**Securing the Batteries Using the Strap**” on page 25 for instructions on securing the batteries using the buckle strap that is bundled along with the cabinet.

## Installing EnerSys NP18-12FR Batteries

A parts kit (P/N 545427), which is purchased in addition to the cabinet includes the following pieces:

- (1) Long rear spacer
- (8) Fast-on terminals
- (3) Fast-on lugged cables
- Mounting hardware

**Procedure**

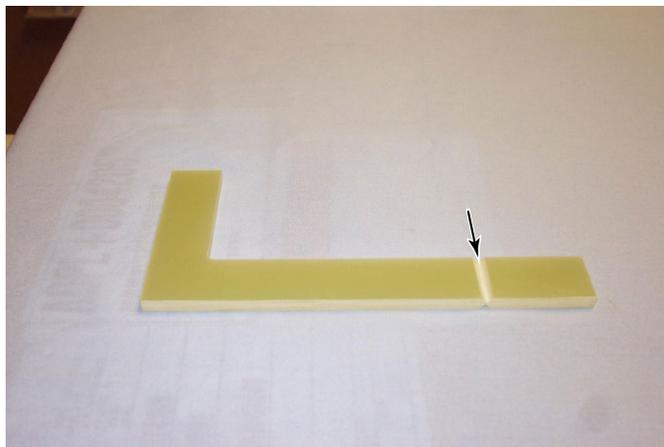
1. Place long rear spacer in the center of the cabinet as shown in **Figure 20**.

**Figure 20:** *Placing the Rear Spacer*



2. Take the (3) Inner Battery Spacers and break off the end portion of the spacer where indicated, as shown in **Figure 21**.

**Figure 21:** *Break off Inner Spacer*



3. Attach fast-on lugs using the provided hardware to the first battery that will be located on the left hand side of the cabinet. See **Figure 22**.

**Figure 22:** Attaching Fast-on lug to First Battery



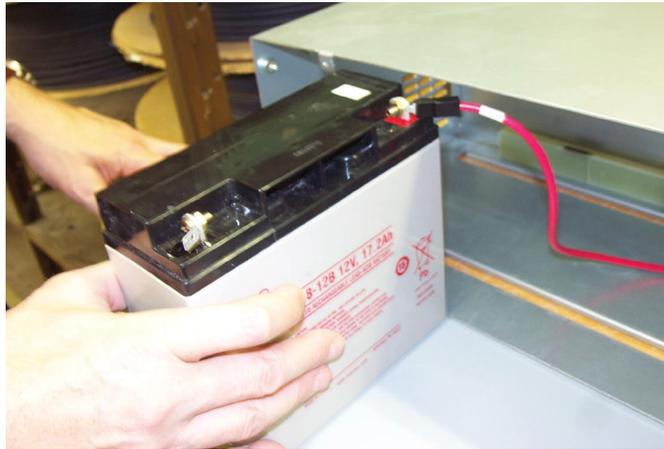
4. Attach a fast-on lug to the negative and positive terminal of the second battery facing left and one of the fast-on lugged cables to the positive terminal off the battery. Repeat for third and fourth batteries in the string. See **Figure 23**.

**Figure 23:** Attaching Fast-on lug to the Remaining Batteries



5. Set first battery in cabinet and attach the long lead (fast-on connector side marked positive) from the cabinet to the fast-on terminal on the positive terminal of the battery. See **Figure 24**.

**Figure 24:** Setting First Battery in Cabinet



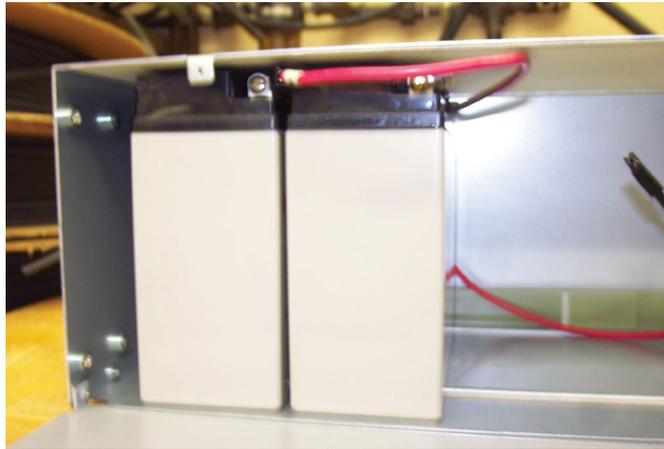
6. Place inner battery spacer next to battery. Make sure that the positive long lead cable is resting on the rear spacer. See **Figure 25**.

**Figure 25:** Placing Battery Spacer



7. Set second battery in cabinet and attach the other end of the fast-on lugged cable to the negative terminal on the first battery (fast-on terminal). See **Figure 26**.

**Figure 26:** Setting Second Battery



8. Repeat steps 6 and 7 for the third battery. Place another inner battery spacer next to the third battery.
9. Set fourth battery in cabinet (being careful of the door fastener tabs hanging down) and attach the other end of the fast-on lugged cable to the negative terminal on the third battery (fast-on terminal). Attach the short wire from the breaker (labeled negative) to the fast-on terminal on the negative terminal on the fourth battery. See **Figure 27**.

**Figure 27:** Setting Fourth Battery



10. Refer to “**Securing the Batteries Using the Strap**” on page 25 for instructions on securing the batteries using the buckle strap that is bundled along with the cabinet.

## Securing the Batteries Using the Strap

### Procedure

1. Pull strap such that enough length is provided to secure the batteries.
2. Hold the buckle such that the strap can slip into inner slot of the buckle. See **Figure 28** for reference.

**Figure 28:** Slipping the Strap into the Buckle



3. Then loop the strap into the outer slot of the buckle. Refer to **Figure 29**.

**Figure 29:** Looping the Strap into the Buckle



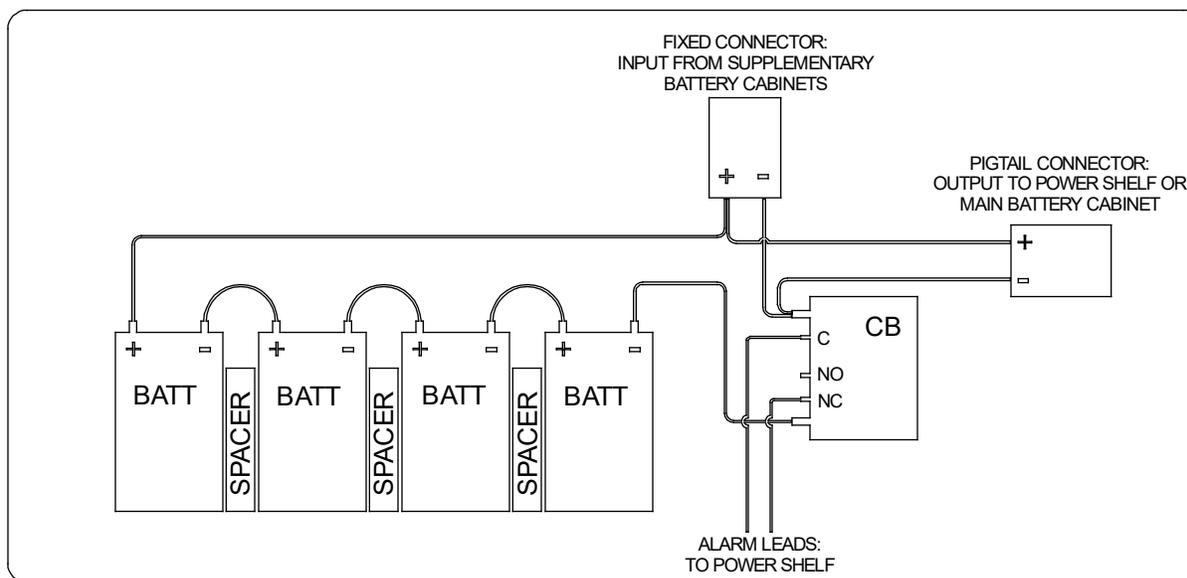
4. Pull again the strap to tighten.
5. Rotate buckle cover to closed position to apply and lock in tension. See **Figure 30**.
6. There should be a gap of 1/4" to 1/2" between the strap and the batteries when the buckle assembly is pulled with light finger pressure. This will ensure the proper tension is applied to the strap.
7. To release buckle, pull outward on free strap end.

**Figure 30:** *Securing the Batteries in the Cabinet*

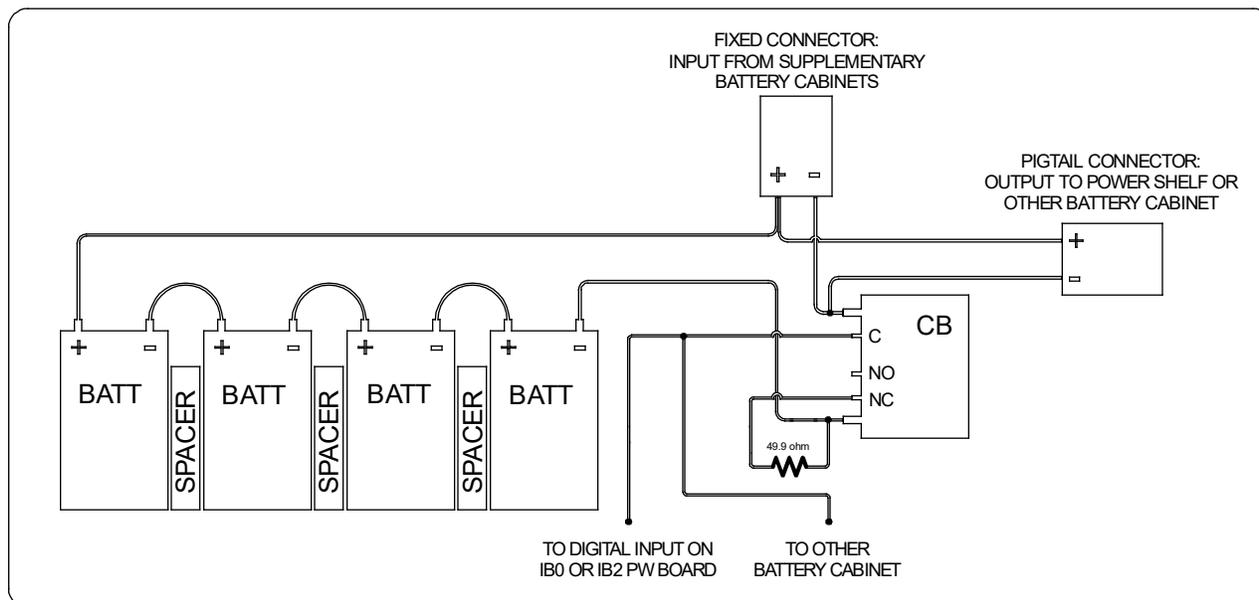


## Typical Internal Wiring Layout

**Figure 31:** Typical Internal Wiring Layout - 582136000 System



**Figure 32:** Typical Internal Wiring Layout - 582136600 System





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