



NetSure™ -48 VDC Battery Tray Kit

Installation Manual

Kit Specification Number: 588820200SK001, 588820200SK002,
588820200SK003, 588820200SK004,
582136700SK001, 582136700SK002,
582136700SK007, 582136700SK008,
582137100SK001, 60075254, 60075329

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Technical Support Site

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.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

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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 iv.

General Safety



DANGER! Installation of this kit should only be performed by a qualified technician following approved safety procedures. If a qualified technician is not available, arrangements can be made with a Vertiv service facility to have the kit installed.



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.

Voltages

AC Input Voltages



DANGER! This system operates from AC input voltage capable of producing fatal electrical shock.

DC Output and Battery Voltages



DANGER! This system produces DC power and may have a battery source connected to it. Although the DC voltage is not hazardously high, the rectifiers and/or battery can deliver large amounts of current. Exercise extreme caution not to inadvertently contact or have any tool inadvertently contact an output terminal or battery terminal or exposed wire connected to an output terminal or 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:

- 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.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- 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.
- ALWAYS FOLLOW THE BATTERY MANUFACTURER'S RECOMMENDATIONS AND SAFETY INSTRUCTIONS.



DANGER! This equipment may be used in conjunction with lead-acid batteries. Working near lead-acid batteries is dangerous!

In addition to the hazard of electric shock, gas produced by batteries can be explosive and sulfuric acid can cause severe burns.

- Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes, and is toxic.
- Batteries contain sulfuric acid.
- Batteries 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 are an energy source that can produce high amounts of electrical current.

FOR THESE REASONS, IT IS OF CRITICAL IMPORTANCE THAT YOU READ THESE INSTRUCTIONS AND FOLLOW THEM EXACTLY.

WHEN WORKING WITH LEAD-ACID BATTERIES:

- Follow the recommended PPE requirements per the SDS for the battery to be used.
- 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.

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”.

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1 NetSure™ -48V Battery Tray Kit

1.1 Kit Description

This document provides installation instructions for the -48V Battery Tray Kits.

The NetSure™ -48V Battery Tray Kit provides a battery tray for a 19" or 23" wide relay rack. The battery tray holds four (4) 12V front terminal valve regulated lead acid (VRLA) batteries. Battery cabling is provided and shall be connected to the system's battery connection point. Batteries are configured as one (1) -48V string per tray.



NOTE! The battery cabling is not provided in 582136700SK001, 582136700SK002 and 582136700SK007 kits. Only 3' of cabling from the disconnect to the negative terminal of the battery is provided.

It is advisable that the procedure be conducted with the power plant shut down (all AC circuits to the rectifiers turned off and battery disconnected). If this is not possible, extra care must be taken due to working with live DC power.

1.2 Kit Contents

The following items are furnished as a part of this kit. Before starting the procedure, check the items furnished against those listed to ensure that there are no shortages.

Table 1.1 Kit 588820200SK001

Qty.	Description	P/N
1	Battery Tray, 23" Mount, 21" Depth	58882020011
1	Circuit Breaker, 100 Amp 80VDC	256695900
2	Crimp Lug, 2 AWG	245350005
0.666 ft	Heat Shrink Tubing	182778000
1	1-Pole Battery Disconnect Breaker Kit (Left)	559814
1	Kit, Battery lugs, 2 AWG, 90 deg, Short Tongue	528234
2	Bracket, Battery Tray Mounting	SXA2300174/1
2	Bracket, Cable	362736700
1	2 AWG Lug and Cable Kit	528155
1	Jumper for Battery Disconnect Breaker Alarm	524384
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.2 Kit 588820200SK002

Qty.	Description	P/N
1	Battery Tray, 23" Mount, 21" Depth	58882020011
1	Circuit Breaker, 150 Amp 80VDC	100763
1	2-Pole Battery Disconnect Breaker Kit (Left)	559816
1	Kit, Battery lugs, 2 AWG, 90 deg, Short Tongue	528234
2	Bracket, Battery Tray Mounting	SXA2300174/1
2	Bracket, Cable	362736700
1	2 AWG Lug and Cable Kit	528155
1	Jumper for Battery Disconnect Breaker Alarm	524384
2	Crimp Lug, 2 AWG	245350815
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.3 Kit 588820200SK003

Qty.	Description	P/N
1	Battery Tray, 23" Mount, 21" Depth, 5" Deep Rail Mount	565421
1	Circuit Breaker, 150 Amp 80VDC	100763
1	2-Pole Battery Disconnect Breaker Kit, (Left)	559816
1	Kit, Battery lugs, 2 AWG, 90 deg, Short Tongue	528234
2	Bracket, Cable	362736700
1	2 AWG Battery Lugs and Cable Kit	528155
1	Jumper for Battery Disconnect Breaker Alarm	524384
2	Crimp Lug, 2 AWG	245350815
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.4 Kit 588820200SK004

Qty.	Description	P/N
1	Battery Tray, 23" Mount, 21" Depth	58882020011
1	Circuit Breaker, 200 Amp 80VDC	121810
1	2-Pole Battery Disconnect Breaker Kit, (Left)	559816
1	Kit, Battery lugs, 1/0 AWG, 90 deg, Short Tongue	528235
1ft	Heat Shrink Tubing	182778600
2	Bracket, Battery Tray Mounting	SXA2300174/1
2	Bracket, Cable	362736700
1	1/0 AWG Battery Lugs and Cable Kit	528156
1	Jumper for Battery Disconnect Breaker Alarm	524384
1	Kit, Battery Lugs, 1/0AWG, 90 deg, Long Tongue	528237
2	Crimp Lug, 1/0 AWG	245351000
1	Installation Instructions	IM588820200SK001
N/A	Hardware/Miscellaneous	N/A

Table 1.5 Kit 582136700SK001

Qty.	Description	P/N
1	Battery Tray, 19" Mount	541034
1	Circuit Breaker, 100 Amp 80VDC	256695900
1	1-Pole Battery Disconnect Breaker Kit, (Left)	528501
3 ft	2 AWG Wire	104694
1	Jumper for Battery Disconnect Breaker Alarm	524384
2 ft	Heat Shrink Tubing	182778600
1	Installation Instructions	IM588820200SK001
N/A	Hardware/Miscellaneous	N/A

Table 1.6 Kit 582136700SK002

Qty.	Description	P/N
1	Battery Tray, 23" Mount, 21" Depth	528496
1	Circuit Breaker, 100 Amp 80VDC	256695900
1	1-Pole Battery Disconnect Breaker Kit, (Left)	528501
3 ft	2 AWG Wire	104694
1	Jumper for Battery Disconnect Breaker Alarm	524384
2 ft	Heat Shrink Tubing	182778600
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.7 Kit 582136700SK007

Qty.	Description	P/N
1	Battery Tray, 19" Mount, 5" Deep Rail Mount	561974
1	Circuit Breaker, 100 Amp 80VDC	256695900
1	1-Pole Battery Disconnect Breaker Kit, (Left)	528501
3 ft	2 AWG Wire	104694
1	Jumper for Battery Disconnect Breaker Alarm	524384
2 ft	Heat Shrink Tubing	182778600
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.8 Kit 582136700SK008

Qty.	Description	P/N
1	Battery Tray, 19" Mount	559810
1	Circuit Breaker, 100 Amp 80VDC	256695900
1	1-Pole Battery Disconnect Breaker Kit, (Left)	559814
3 ft	2 AWG Wire	104694
1	Jumper for Battery Disconnect Breaker Alarm	524384
2 ft	Heat Shrink Tubing	182778600
4	Crimp Lug, 2 AWG, 1/4"	245350815
1	Battery Cables, 2 AWG, 15ft long	565456
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.9 Kit 582137100SK001

Qty.	Description	P/N
1	Battery Tray, 19" Mount	559812
1	Circuit Breaker, 100 Amp 80VDC	256695900
1	1-Pole Battery Disconnect Breaker Kit, (Left)	559814
1	Kit, Battery Lugs, 2 AWG, 90 deg, Long Tongue	528236
1	Pad, Battery	562834
2	Bracket, Cable	362736700
1	2AWG Battery Lugs and Cable Kit	545623DCP
1	Jumper for Battery Disconnect Breaker Alarm	524384
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.10 Kit 60075254

Qty.	Description	P/N
1	Battery Tray, 19" Mount	559810
2 ft	Heat Shrink Tubing	182778600
1	Battery Cables, 2 AWG, 15ft long	565456
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

Table 1.11 Kit 60075329

Qty.	Description	P/N
1	Battery Tray, 23" Mount	559806
2 ft	Heat Shrink Tubing	182778600
1	Battery Cables, 2 AWG, 15ft long	565456
1	Installation Instructions	IM588820200SK001
N/A	Hardware, Miscellaneous	N/A

1.3 Tools and Material Required

The following items are required to install this kit.

Table 1.12 Tools and Material Required

Description
Adjustable Torque Wrench
Crimp Tool
Wire Stripper
Socket Set
6-32 x 1/2" Screws

1.4 Installation Procedure

THESE INSTRUCTIONS SHOULD BE READ THROUGH COMPLETELY BEFORE INSTALLING THE KIT.

The following is a step-by-step procedure to install the kit. The procedure has been written for ease of use and to minimize the possibility of contact with potentially hazardous energy. This procedure should be performed in the sequence given, and each step should be completely read and fully understood before performing that step. Observe all "Important Safety Instructions" located at the beginning of this document and also those presented in the following procedure. As each step of the procedure is completed, the box adjacent to the respective step should be checked. This will minimize the possibility of inadvertently skipping any steps. If the step is not required to be performed for your site, also check the box to indicate that it was read.



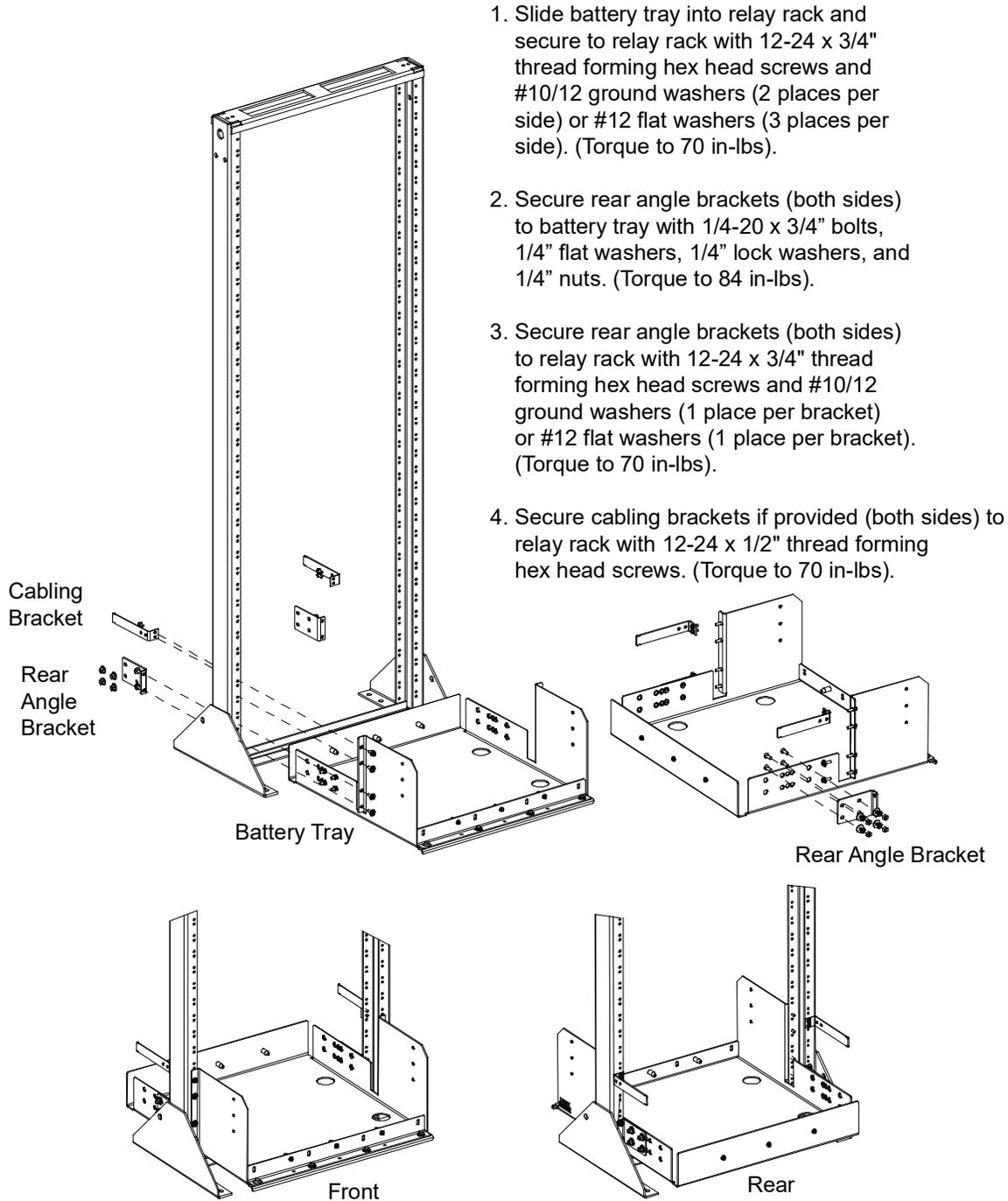
DANGER! Observe the Important Safety Instructions located at the beginning of this document.

1.4.1 Mounting the Battery Tray

Procedure

- [] 1. To install a Battery Tray, perform the procedure in Figure 1.1.

Figure 1.1 Mounting and Securing the Battery Tray onto the Rack

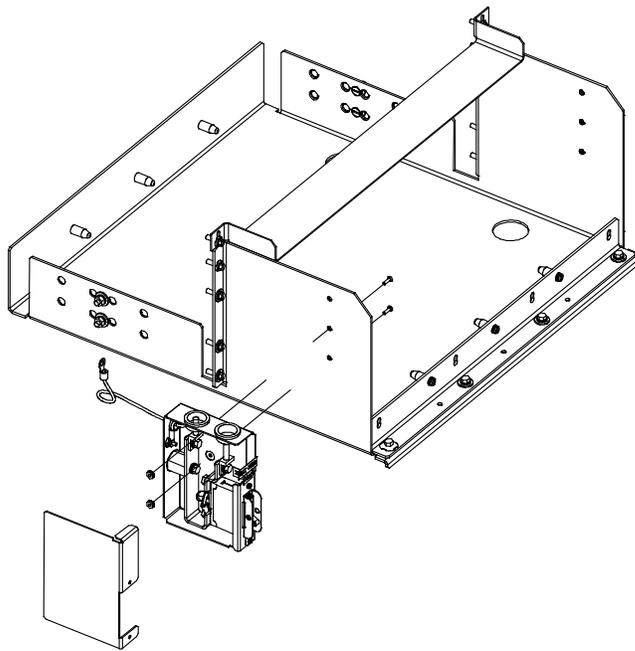


1.4.2 Installing the Battery Disconnect Circuit Breaker Kit (If Equipped)

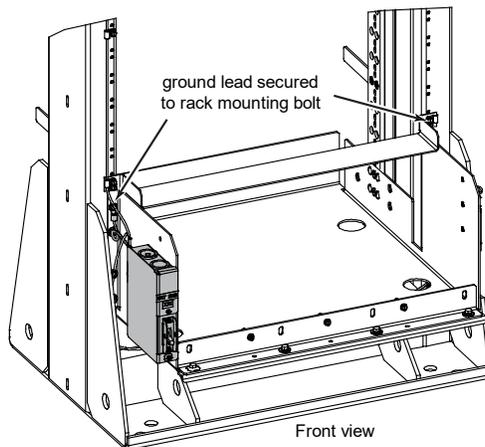
Procedure

- [] 1. Remove the cover from the battery disconnect circuit breaker assembly. Secure the battery disconnect circuit breaker assembly to the battery tray using 6-32 x 1/2" screws and 6-32 KEPS nuts (2-places). Refer to Figure 1.2.
- [] 2. Secure the ground lead under a battery tray relay rack mounting bolt. After wiring to the battery disconnect circuit breaker, replace the cover.

Figure 1.2 Installing Circuit Breaker on Battery Tray



Installed view



The 588820200SK001 provides a 100 A Circuit Breaker and a 1-Pole Battery Disconnect Circuit Breaker Kit (as shown)

The 588820200SK002 provides a 150 A Circuit Breaker and a 2-Pole Battery Disconnect Circuit Breaker Kit (mounts similar 1-Pole Kit)

The 588820200SK003 provides a 150 A Circuit Breaker and a 2-Pole Battery Disconnect Circuit Breaker Kit (mounts similar 1-Pole Kit)

The 588820200SK004 provides a 200 A Circuit Breaker and a 2-Pole Battery Disconnect Circuit Breaker Kit (mounts similar 1-Pole Kit)

The 582136700SK001 provides a 100 A Circuit Breaker and a 1-Pole Battery Disconnect Circuit Breaker Kit (as shown)

The 582136700SK002 provides a 100 A Circuit Breaker and a 1-Pole Battery Disconnect Circuit Breaker Kit (as shown)

The 582136700SK007 provides a 100 A Circuit Breaker and a 1-Pole Battery Disconnect Circuit Breaker Kit (as shown)

The 582136700SK008 provides a 100 A Circuit Breaker and a 1-Pole Battery Disconnect Circuit Breaker Kit (as shown)

The 582137100SK001 provides a 100 A Circuit Breaker and a 1-Pole Battery Disconnect Circuit Breaker Kit (as shown)

1.5 Installing and Connecting Batteries in the Battery Tray

1.5.1 Wiring to the Battery Tray

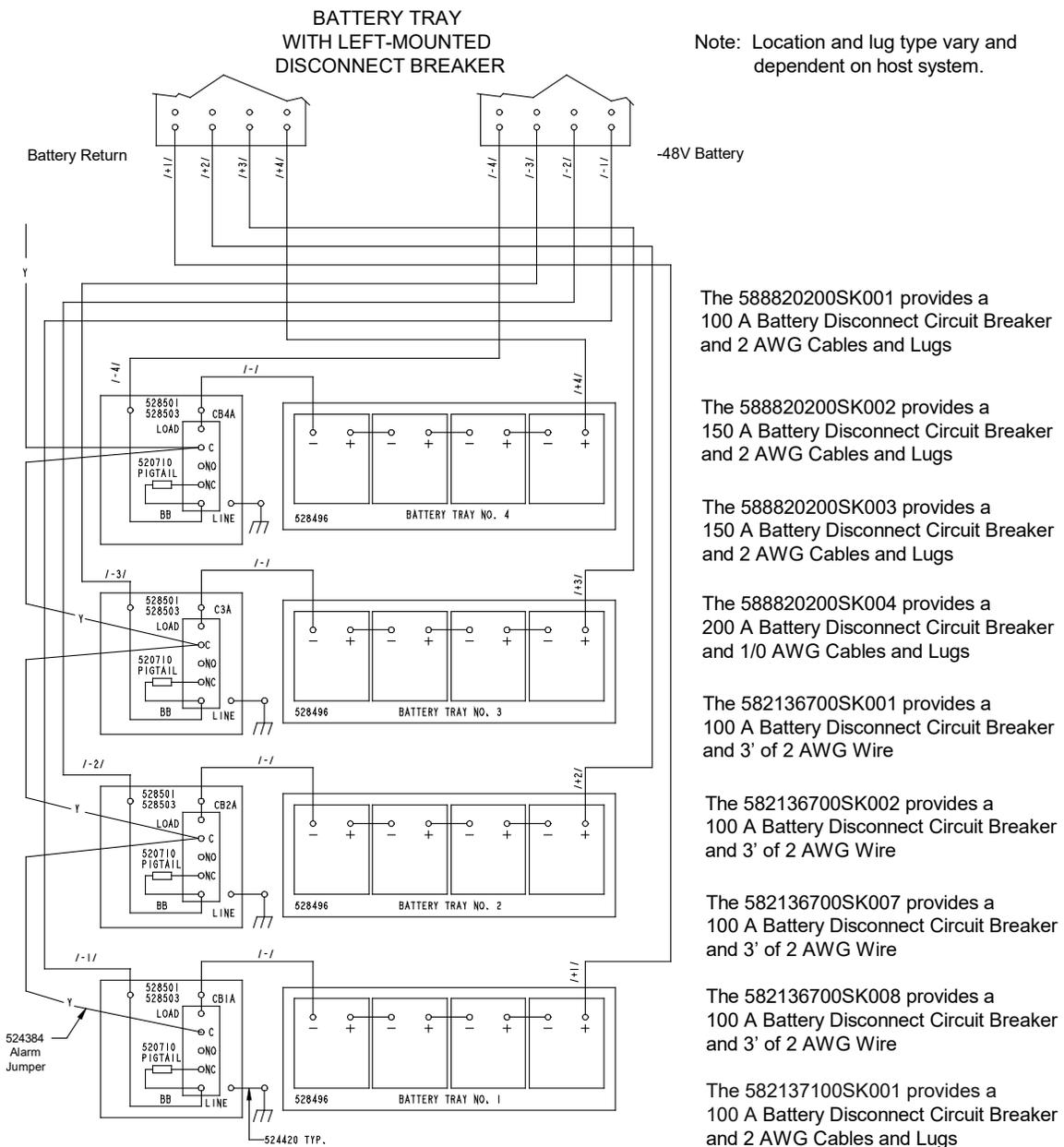


DANGER! Adhere to the “Important Safety Instructions” presented at the front of this document.

Procedure

- [] 1. Refer to the wiring diagram provided in Figure 1.3 and wire the battery tray for your application. Cut the cables to the appropriate length for the installation. Label the ends of each cable with "+1" (bottom), "+2", etc. or "-1" (bottom), "-2", etc. as needed. Apply the appropriate lugs to the ends of each cable as needed.
- [] 2. Lace the cables to the cable lacing brackets mounted on the rear of the relay rack.

Figure 1.3 Wiring Diagram - Battery Tray



1.5.2 Installing and Connecting Batteries



DANGER! Adhere to the “Important Safety Instructions” presented at the front of this document.

Procedure



NOTE! Refer to Figure 1.4 and Figure 1.5 as this procedure is performed.

1. **If Battery Trays are Equipped with Circuit Breakers:** Turn OFF the Battery Disconnect circuit breakers located on all battery trays. Refer to Figure 1.4 for locations.
2. Remove the battery retention bracket as shown in Figure 1.4. To do so, remove the four 1/4-20 x 5/8” bolts and associated washers.
3. Slide batteries into the tray, with the battery terminals toward the front as shown in Figure 1.4. Slide batteries into the tray as far as they will go.



NOTE! The battery retention bracket can be oriented two ways to accommodate batteries of different lengths. A correctly oriented bracket will fit snugly against the batteries. If your batteries require the alternate bracket orientation shown in Detail A of Figure 1.4, remove and reinstall the bullet-shaped spacers as shown in Detail A before performing the next step.

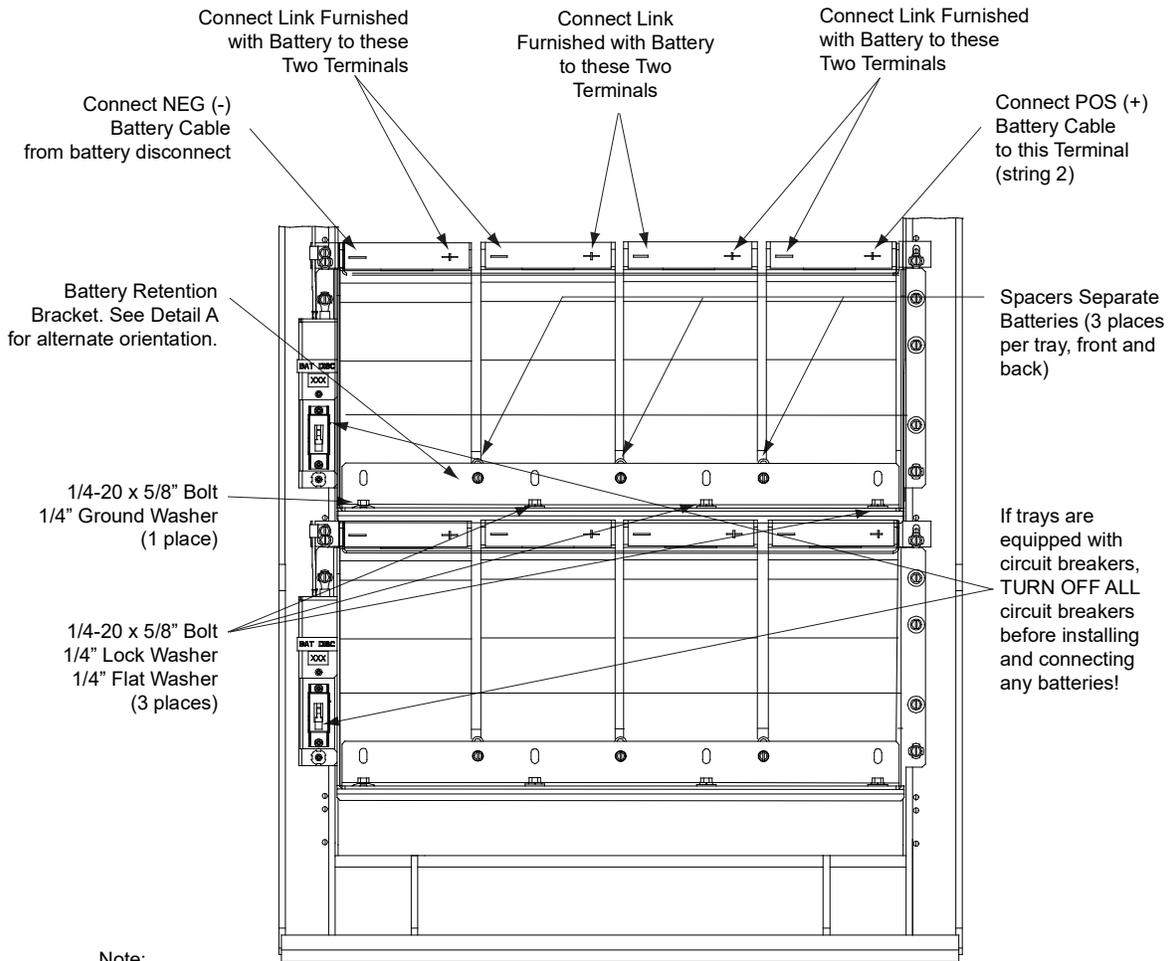
4. Reinstall the battery retention bracket. The spacers on the bracket should separate the batteries from each other. Secure with the hardware removed in a previous step. Refer to Figure 1.4 for washer location.
5. Connect the links supplied by the battery manufacturer between pairs of battery terminals as shown in Figure 1.4. Use hardware furnished by the battery manufacturer. Torque hardware to battery manufacturer’s recommendations.
6. Ensure the battery cable ends in all trays are insulated with sleeving before performing the next step.



WARNING! In the next step, observe correct polarity. Connect only cables labeled “+” to battery terminals labeled “+”. Likewise, connect only cables labeled “-” to battery terminals labeled “-”.

7. Connect the cables found in the battery tray to the battery terminals, “+” to “+” and “-” to “-”. Observe correct polarity. Refer to Figure 1.4. Secure with hardware furnished with the battery. Torque hardware to battery manufacturer’s recommendations.
8. Repeat steps 1 through 7 for any remaining battery trays.
9. **If Battery Trays Are Equipped With Circuit Breakers:** To connect the batteries to the power system, turn ON the Battery Disconnect circuit breakers located on all battery trays.

Figure 1.4 Battery Tray Installation Details



- Note:
1. Two trays shown as example.
 2. Cabling detail omitted.

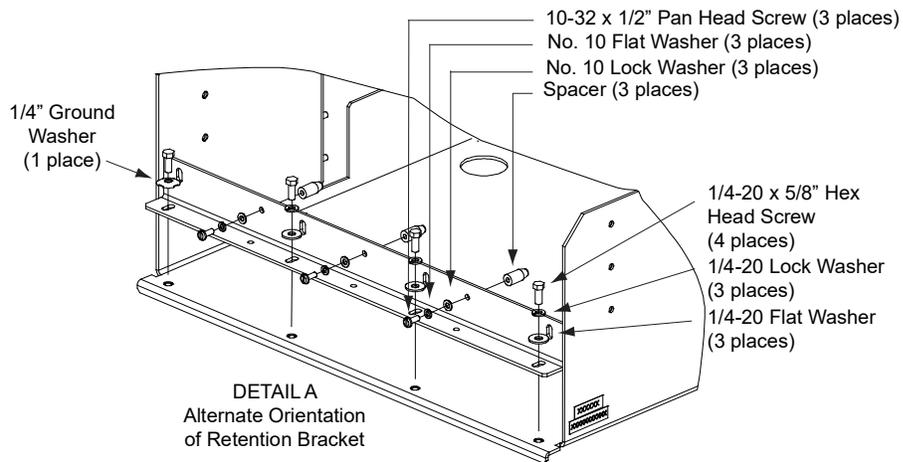
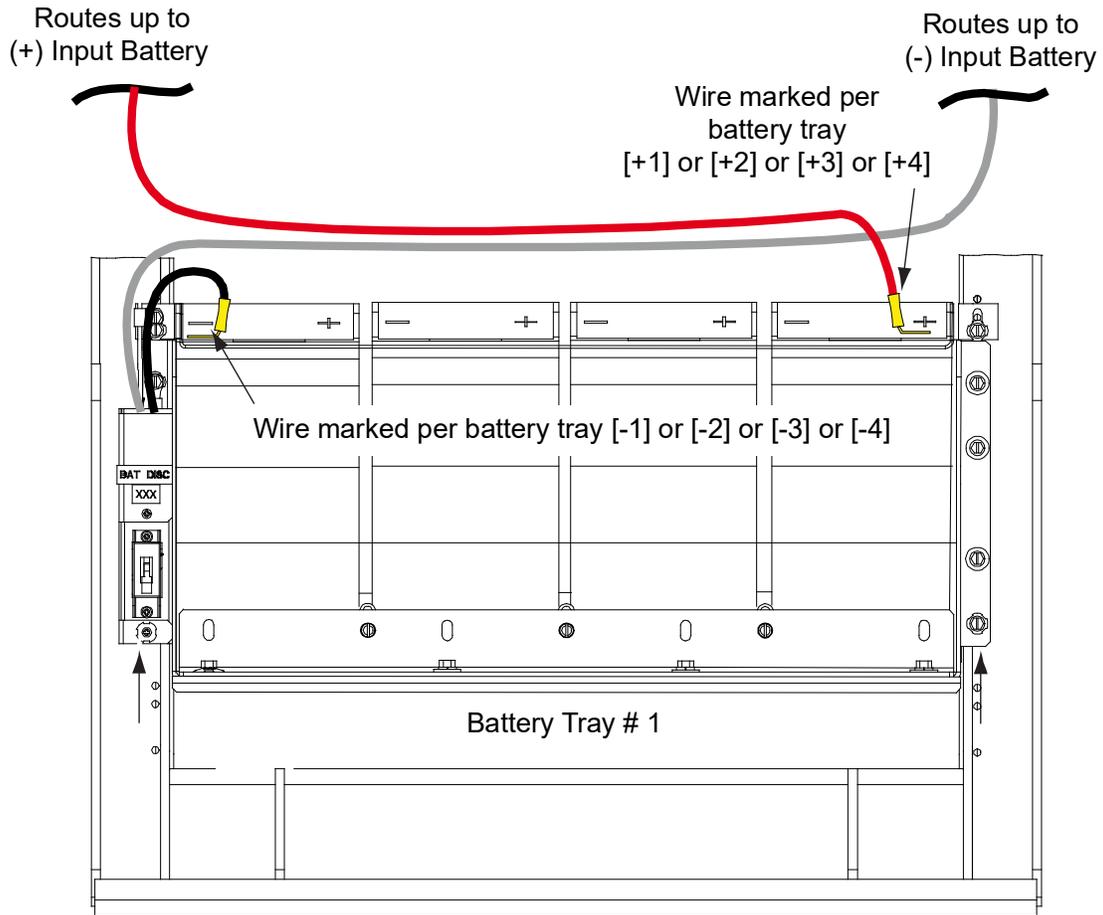


Figure 1.5 Cable Routing - Battery Tray with Circuit Breaker



1.5.3 Alarm Jumper Routing



NOTE! Refer to Figure 1.6 this procedure is performed.

Procedure

1. Connect the YELLOW 22 GA jumper to "COM" terminal of breaker.
2. Route jumper up to the next circuit breaker. Refer to Figure 1.3 and Figure 1.6.



NOTE! If Alarm jumper is not required or there is no battery tray mounted on top, Ty-rap unused jumper back onto the harness.

3. Connect stripped end of alarm jumper into power system's fuse alarm input connection point. Refer to the manual provided with the host system for proper alarm input wiring to the system.

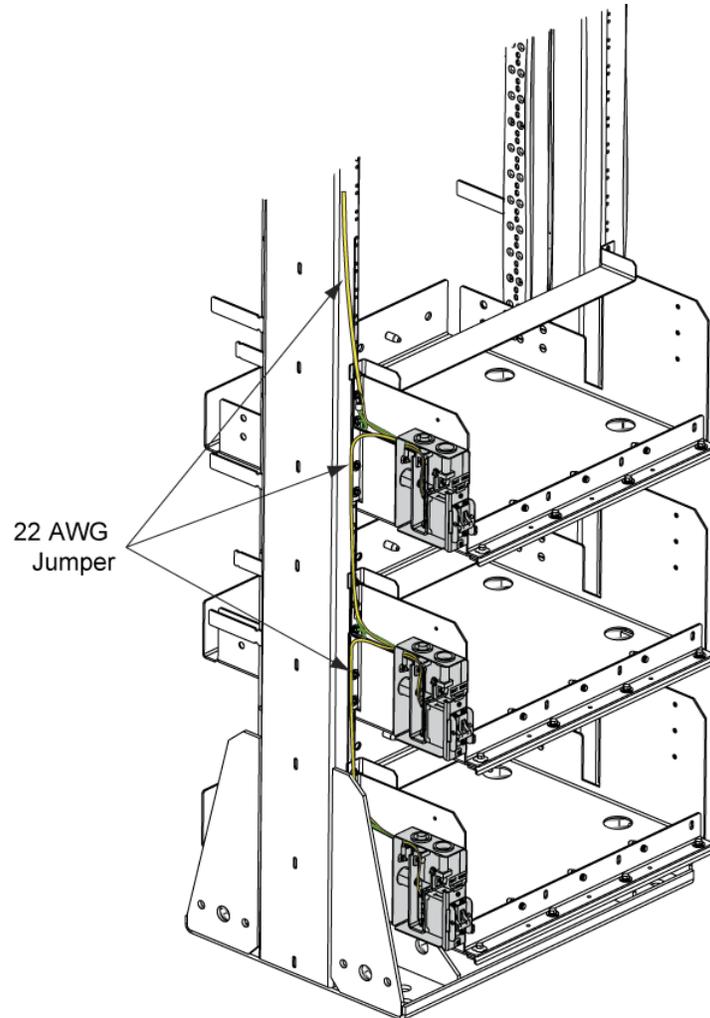


NOTE! For the Vortex or NetSure 701 system, this is PIN 11 of TB1 (System Fuse Alarm Input) on the Interconnect/Inhibit Card on the right side of the base of the power system distribution cabinet. For NetSure 721 system this is PIN 1 of TB1 (Battery Tray FA) on the System Interface circuit card inside the distribution cabinet. Verify that when the battery disconnect breaker is turned off, the controller generates a FA alarm.

For the NetSure 502 system this is normally the negative terminal of the 2nd digital input on the IB2 Interface card PIN 3.

For the 582137100 NetSure 5100 system this is normally the negative terminal on the 3rd digital input on the IB2 Interface card PIN 5.

Figure 1.6 Alarm Jumper Routing



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