



NetSure™ -48 VDC Battery Rack System

Installation and User Manual

Specification Number: 588820400100, 588820400150, 588820400200, 588820400100D, 588820400150D, 588820400200D

Model Number: 48BA800-23

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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.

Safety and Regulatory Statements

Refer to Section 4154 (provided with your customer documentation) for Safety and Regulatory Statements.

Déclarations de Sécurité et de Réglementation

Reportez-vous à la Section 4154 (fourni avec les documents de votre client) pour les déclarations de sécurité et de réglementation.

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1 Customer Documentation Package

This document (IM588820400100) provides *Installation and User Instructions* for Vertiv™ NetSure™ -48 VDC Battery Rack System Model 48BA800-23; Spec. No. 588820400100, 588820400150, 588820400200, 588820400100D, 588820400150D, and 588820400200D.

The complete Customer Documentation Package consists of...

- Battery Rack System Installation and User Instructions: IM588820400100
- Battery Rack System “System Application Guide”: SAG588820400100, SAG588820400150, SAG588820400200
- Engineering Drawings

2 System Description

Front access battery rack system consisting of a 27.5” wide x 22.8” deep x 84” tall or 27.5” wide x 25.1” deep x 84” tall free-standing box framework, five (5) battery trays, and battery termination busbar assemblies. The battery trays accommodate a variety of front terminal -48V valve regulated lead acid (VRLA) batteries. Includes factory routed and lugged cabling from each battery tray to the battery termination busbar assemblies. Also equipped with left side mounted battery disconnect circuit breakers. Factory circuit breaker alarm wiring is provided to an alarm card. The alarm card provides external relay contacts and resistive battery for connection to customer external alarm circuits.

3 Installation Acceptance Checklist

Provided below is an Installation Acceptance Checklist. This checklist helps ensure proper installation and initial operation of the system. As the procedures presented in this document are completed, check the appropriate box in this list. If the procedure is not required for your installation site, also check the box in this list to indicate that the procedure was read. When installation is done, ensure that each block in this list has been checked.

- ☐ System's Box Framework Mounted to Floor
- ☐ System's Box Framework Properly Grounded
- ☐ Battery Disconnect Circuit Breakers External Alarm Connections Made
- ☐ Battery Connections to Associated Power System Made
- ☐ Batteries Installed
- ☐ System Started

4 Installing the System

4.1 General Requirements

- This product is intended only for installation in a restricted access location on or above a non-combustible surface.
- This product must be located in a controlled environment with access to Crafts persons only.
- This product is intended for installation in network telecommunication facilities (CO, vault, hut, or other environmentally controlled electronic equipment enclosure).
- This product is intended for connection to the common bonding network in a network telecommunication facility (CO, vault, hut, or other environmentally controlled electronic equipment enclosure).
- The DC return connection to this system can remain isolated from system frame and chassis (DC-I).
- This system is suitable for installation as part of the Common Bonding Network (CBN).
- The installer should be familiar with the installation requirements and techniques to be used in securing the box framework to the floor.
- Clearance requirements are:
 - a) Recommended minimum aisle space clearance for the front of the bay is 2' 6".
 - b) The battery rack is front accessed for installation, operation, and maintenance. Refer to your company's standards for recommended minimum aisle space clearance for the rear of each bay.

4.2 Securing the System's Box Framework(s) to the Floor

Secure the box framework to the floor per site requirements. Refer to "General Requirements" on page 2.

Refer to Figure 4.1 for floor mounting hole dimensions.



Note! You must install a Floor Anchor Reinforcing Plate at each floor bolting position. Refer to System Application Guide SAG588820400100 for part number.

Refer to Figure 4.2 when using the Optional Battery Rack Isolation Kit.

Figure 4.1 Box Framework Floor Mounting Hole Dimensions

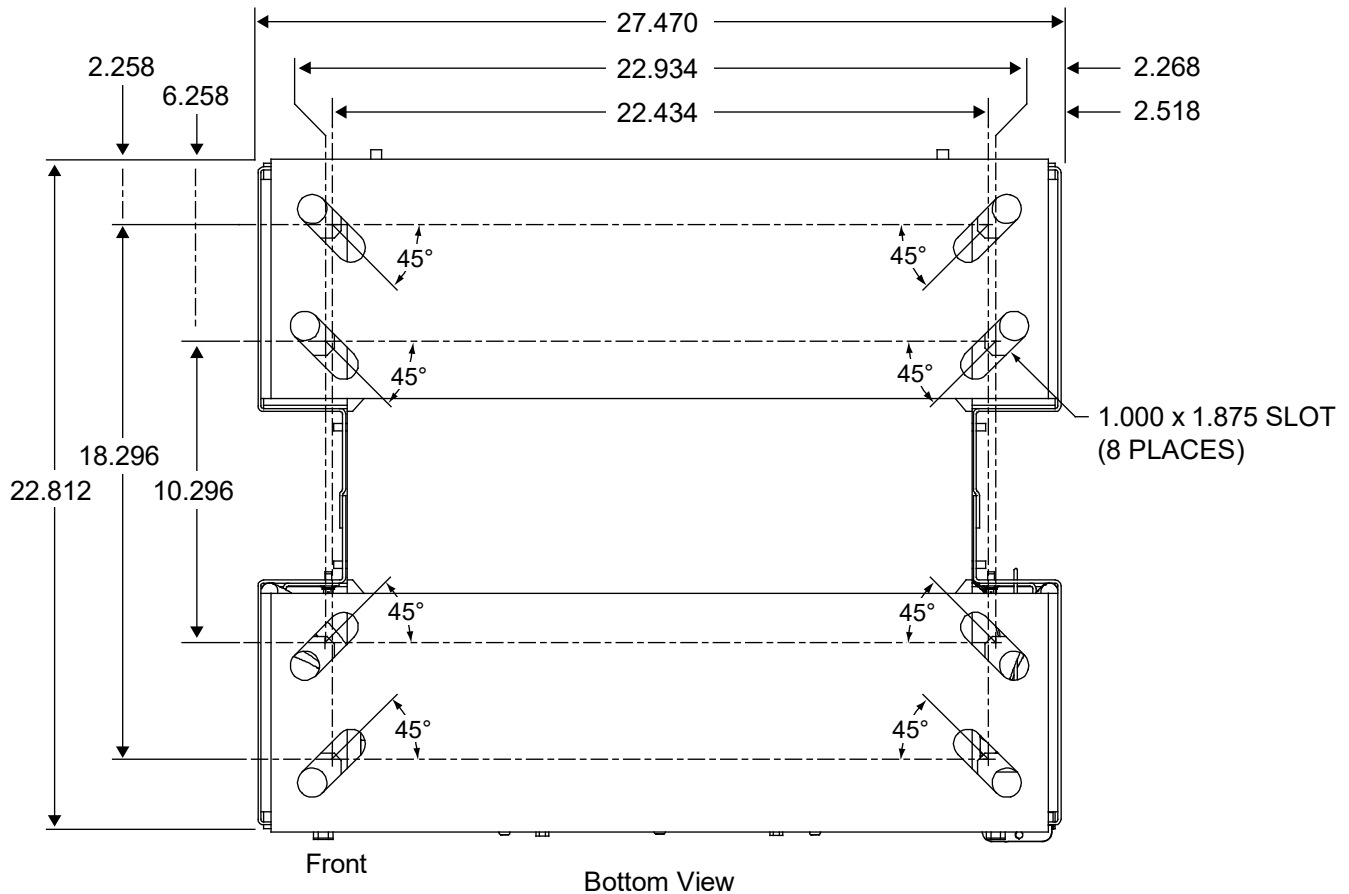
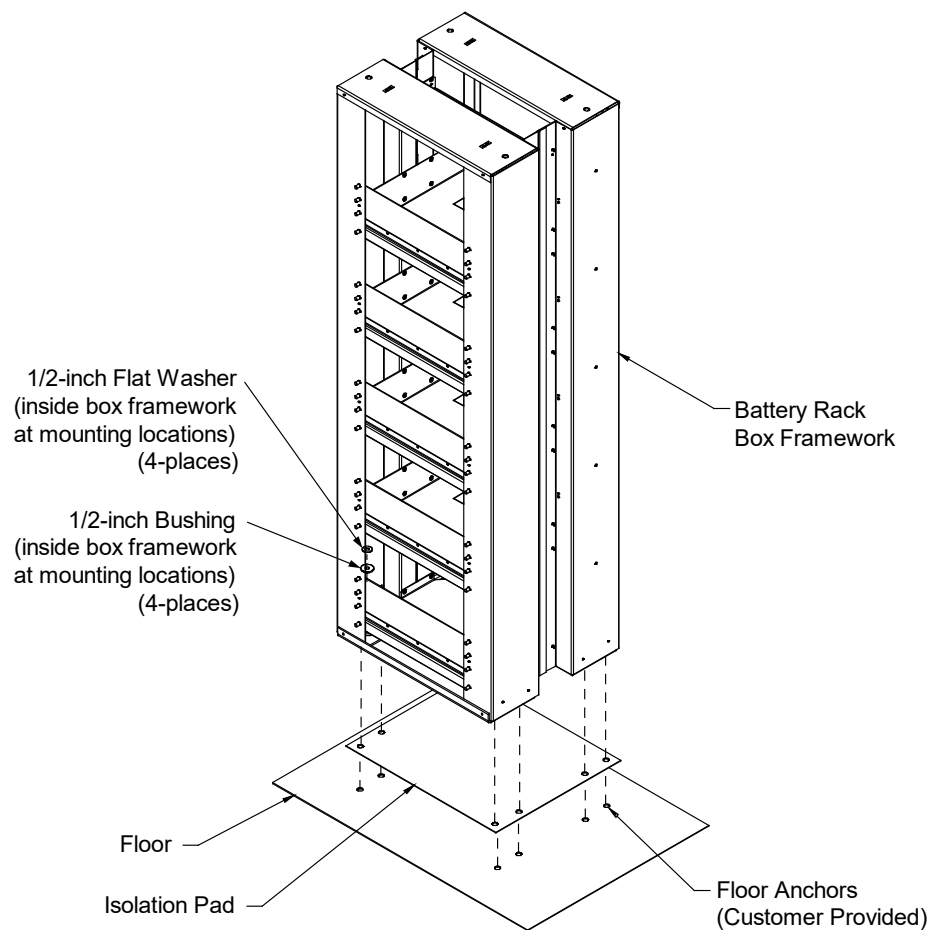


Figure 4.2 Optional Battery Rack Isolation Kit Mounting



5 Making Electrical Connections

5.1 Important Safety Instructions



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

5.2 Wiring Considerations

All wiring should follow the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), and applicable local codes. For operation in countries where the NEC is not recognized, follow applicable codes.

For wire size, crimp lug, and general wiring recommendations; refer to System Application Guide SAG588820400100, SAG588820400150, SAG588820400200.

5.3 Access Covers

You may remove the front access cover(s) from the battery rack system to facilitate wiring and battery installation. When electrical connections and battery installation are complete, reinstall all covers that were removed before operating the battery rack system.

5.4 Battery Rack Box Framework Grounding Connection (Frame Ground)

The battery rack box framework must be properly grounded.

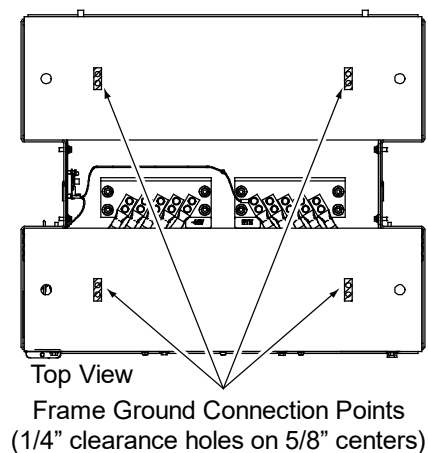
For grounding requirements, refer to the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), applicable local codes, and your specific site requirements.

A customer's grounding network lead can be attached to the top of each battery rack box framework. Provision is made for installing a lead with a two-hole lug that has 1/4" bolt clearance holes on 5/8" centers. Refer to Figure 5.1 for locations. When using 1/4-inch hardware, recommended torque is 84 in-lbs when a standard flat washer and lock washer are used.



Note! Remove any tape from hole locations before installing lug.

Figure 5.1 Battery Rack Box Framework Frame Grounding Connection Points

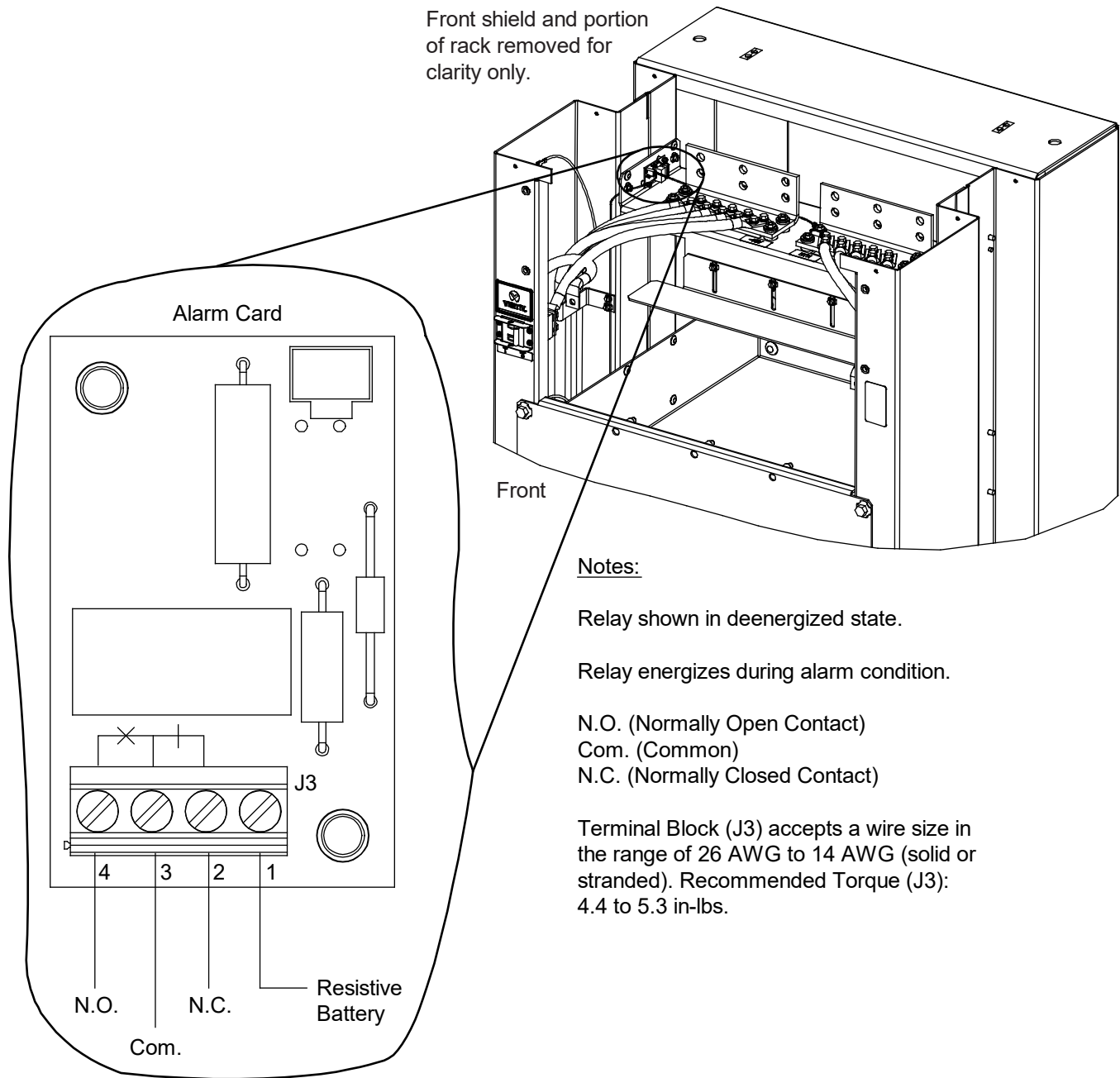


5.5 Battery Disconnect Circuit Breakers External Alarm Connections

The battery disconnect circuit breakers are factory wired to an alarm card located at the top of the box framework. The alarm card provides resistive battery and Form-C relay contacts for connection to external alarm circuits.

If any battery disconnect circuit breaker is in the OFF position, resistive battery is provided at terminal 1 of J3 on the alarm card. Also, relay contacts open between terminals 2 and 3 of J3 and close between terminals 3 and 4 of J3 located on the alarm card. Refer to Figure 5.2.

Figure 5.2 Battery Disconnect Circuit Breaker Alarm Card



5.6 Battery Connections to Associated Power System

Lug-terminated battery leads must extend from the termination busbars located at the top of the battery rack system to the battery busbar and battery return busbar of the associated power system. Refer to the documentation provided with the power system for connections to the power system. The termination busbars in the battery rack system are provided with 3/8" clearance holes for installation of customer provided two-hole lugs with 1" centers. Customer must provide lug mounting bolts, washers, and additional hardware. Refer to Figure 5.3.

Procedure

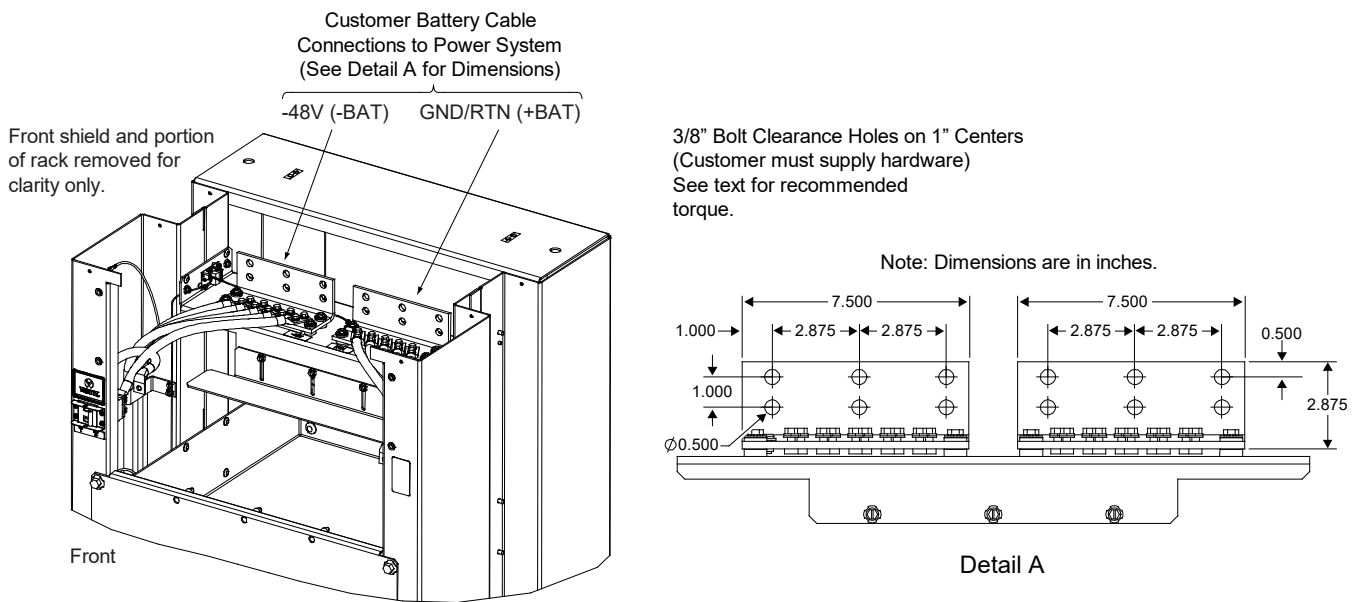
1. Remove front and rear protective covers.



WARNING! Observe correct polarity when making connections. Reversing polarity may result in damage to batteries, power system, and loads.

2. Connect the positive (+) leads to the GROUND/RETURN termination busbar.
3. Connect the negative (-) leads to the -48V Battery (Supply) termination busbar.
4. Torque all connections. Recommended torque is 180 in-lbs when using 3/8" bolts with a Belleville lock washer and 300 in-lbs when using 3/8" bolts with a standard flat washer and lock washer.

Figure 5.3 Customer Battery Cable Connections to Associated Power System



6 Installing Batteries

6.1 Important Safety Instructions



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



DANGER! Batteries are heavy (up to 151 lbs.). Two people are recommended for lifting and placing batteries in lower battery trays (trays below waist height). A battery lift is recommended for lifting and placing batteries in higher battery trays (trays above waist height).

6.2 Battery Manufacturer Information

Refer to System Application Guide SAG588820400100 for specifications and manufacturers of the batteries to be installed in this battery rack system.

6.3 Installing Batteries into the Battery Trays (Spec. Nos. 588820400100, 588820400150, 588820400200)



Note! Spacers are provided on the rear wall and front cover of each tray to ensure separation between the batteries. Ensure batteries are pushed against the rear wall with the spacers between them. For certain batteries of shorter length, shims are required as shown in Figure 6.1. A battery spacer shim kit is available for this application. See SAG588820400100 for ordering information.



Note! A battery retainer kit is required to modify existing 588820400100, 588820400150, and 588820400200 rack systems to accommodate batteries with a taller height or longer length. See SAG588820400100 for batteries that require this kit and for ordering information.

Procedure

1. Turn OFF **all** battery disconnect circuit breakers (located on the front of the box framework, adjacent to each battery tray).
2. Remove the front cover from each battery tray. To do so, remove the four (4) 3/8-16 x 1” bolts and two (2) 1/4-20 x 3/4” bolts with associated washers.
3. Slide batteries into the tray, with the battery terminals toward the front as shown in Figure 6.1. Slide batteries into the tray as far as they will go. Lower the battery retention bracket as required. See Figure 6.1. If a battery retainer kit is required, replace the battery retention bracket with the battery retention bracket supplied in the battery retainer kit. See Figure 6.2.
4. Connect three links supplied by the battery manufacturer between pairs of battery terminals as shown in Figure 6.1. Use hardware furnished by the battery manufacturer. Torque hardware to battery manufacturer’s recommendations.
5. Ensure the battery cable ends **in all trays** are insulated with sleeving before performing the next step.



DANGER! When batteries in one tray are connected, the battery cables in **all** trays will be energized. Remove sleeving from and connect one cable at a time. Do not allow cable end to contact the battery tray or equipment rack.



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

6. Connect the cables found in the battery tray to the respective battery terminals, “+” to “+” and “-” to “-”. Observe correct polarity. Refer to Figure 6.1. Torque battery connections to battery manufacturer’s recommendations.
7. Repeat steps 2 through 6 for any remaining battery trays.

8. Reinstall the front cover for each battery tray. See Figure 6.1. If a battery retainer kit is required, do not reuse the front cover. Replace the front cover with the front cover supplied in the battery retainer kit. See Figure 6.2.

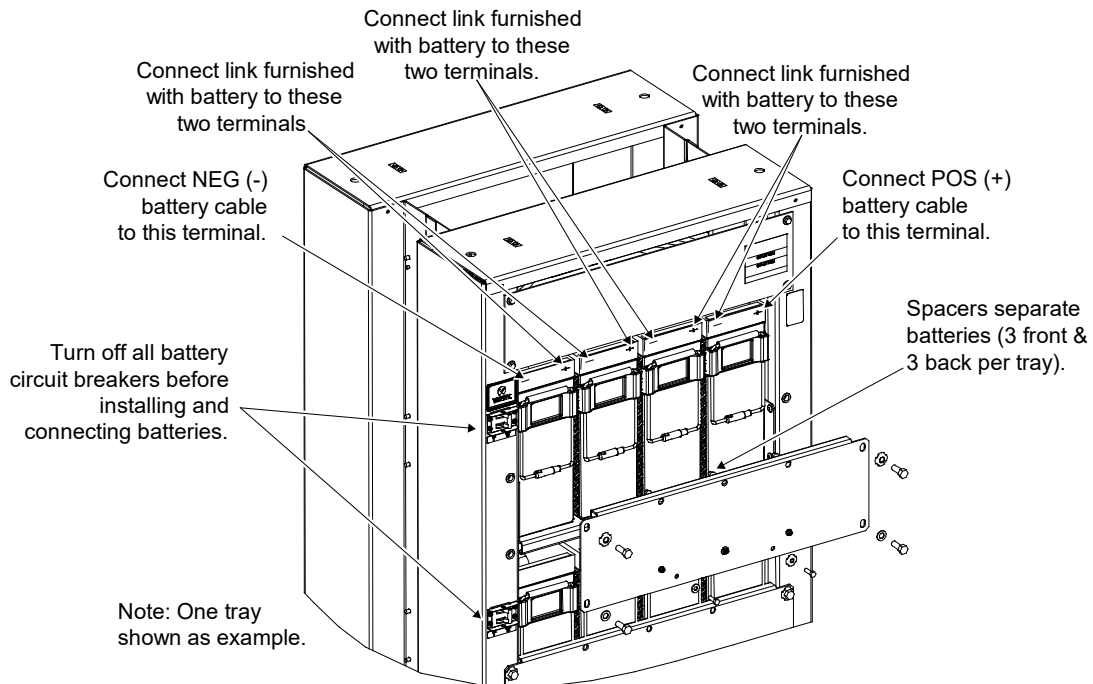


Note! Ensure the spacers provided on each front cover slide between the batteries.

9. To connect the batteries to the power system, turn ON the battery disconnect circuit breakers (located on the front of the box framework, adjacent to each battery tray).

Figure 6.1 Installing Batteries into a Battery Tray (cont'd on next page)

Install and Connect Batteries



See Also Next Page

Lower Battery Retention Bracket as Required

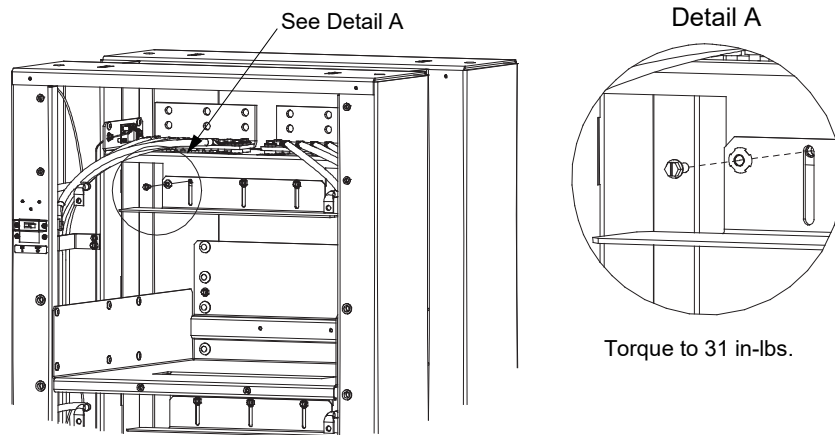


Figure 6.1 Installing Batteries into a Battery Tray (cont'd from previous page)

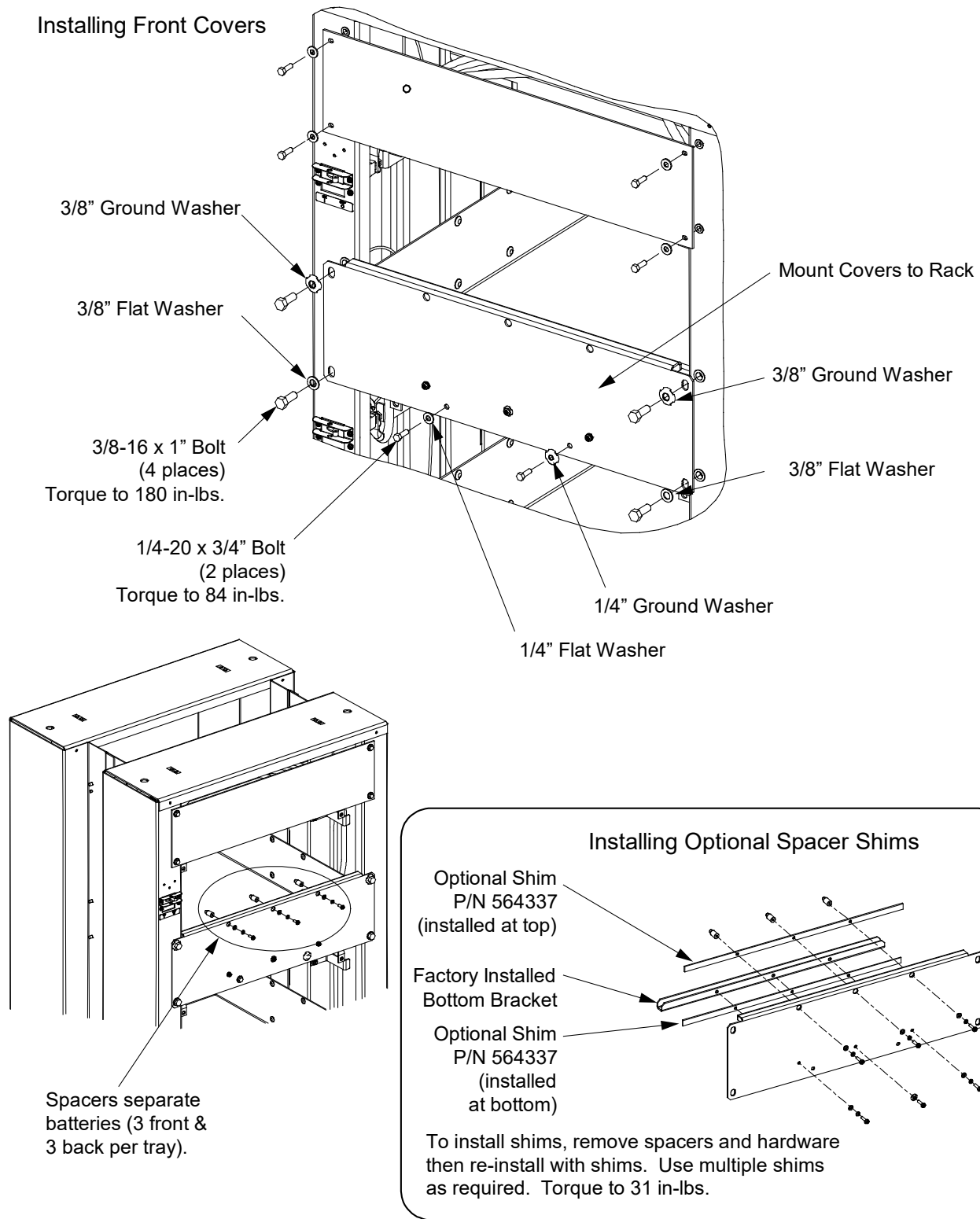


Figure 6.2 Installing Battery Retainer Kit (cont'd on next page)

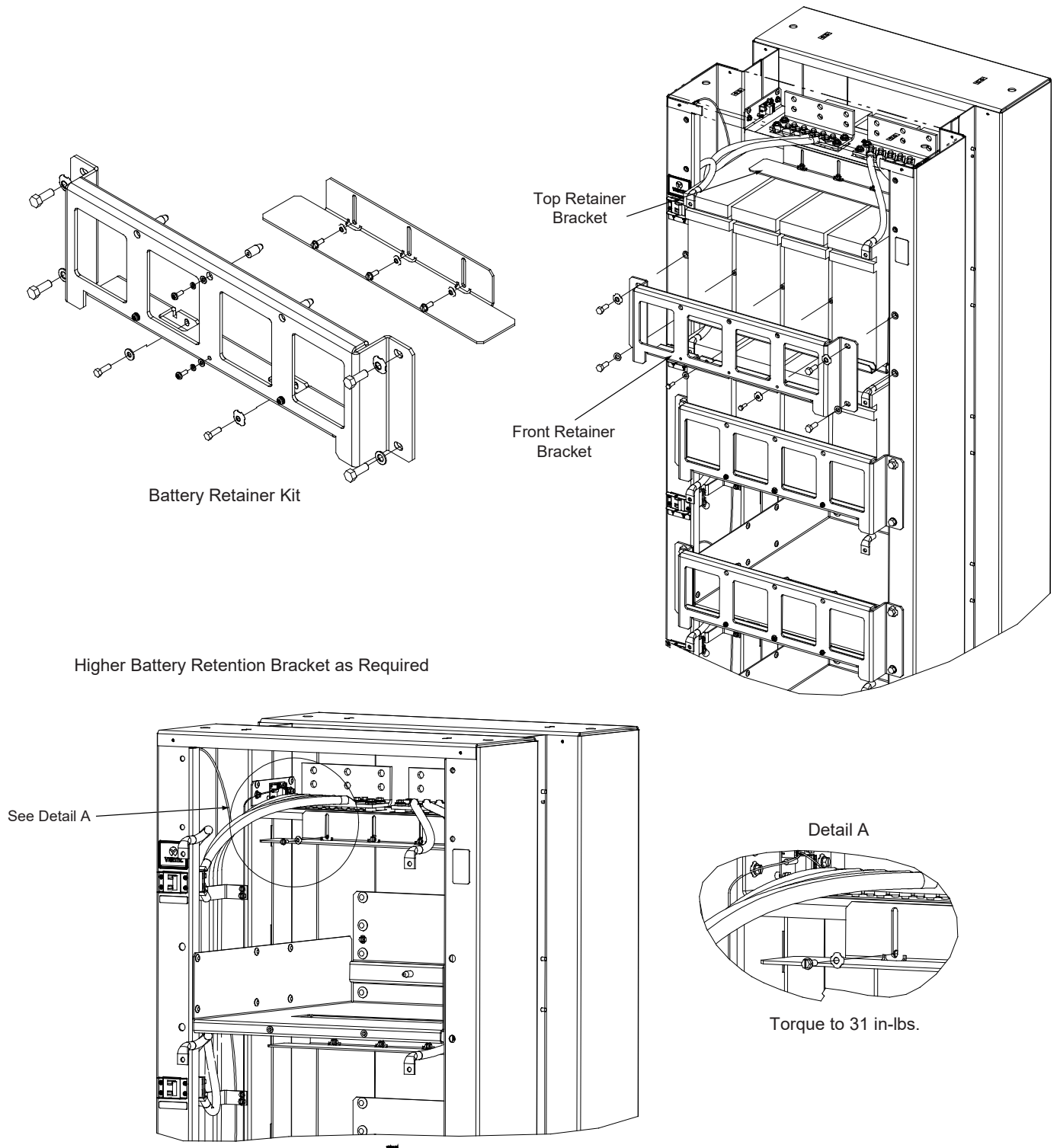
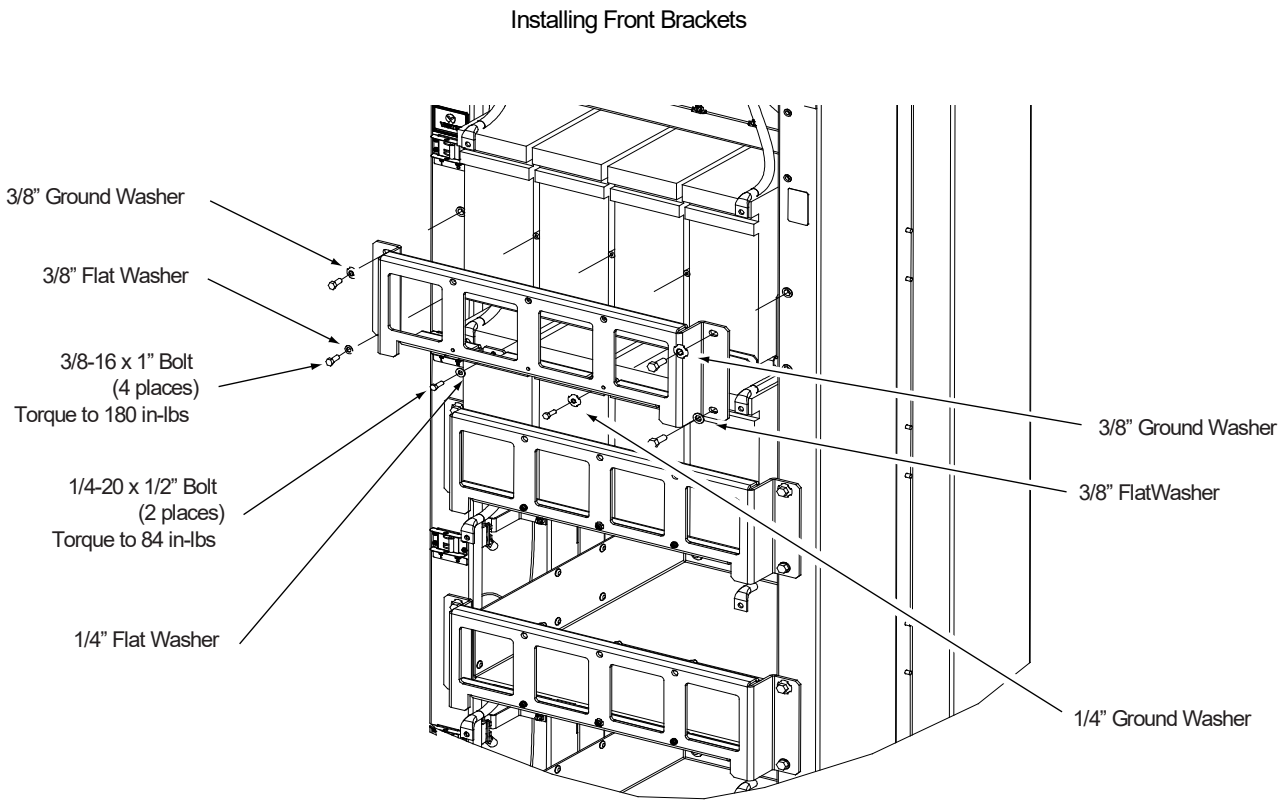


Figure 6.2 Installing Battery Retainer Kit (cont'd from previous page)

6.4 Installing Batteries into the Battery Trays (Spec. Nos. 588820400100D, 588820400150D, 588820400200D)



Note! Spacers are provided on the rear wall and front cover of each tray to ensure separation between the batteries. Ensure batteries are pushed against the rear wall with the spacers between them.

Procedure

1. Turn OFF **all** battery disconnect circuit breakers (located on the front of the box framework, adjacent to each battery tray).
2. Remove the front cover from each battery tray. To do so, remove the four (4) 3/8-16 x 1" bolts and two (2) 1/4-20 x 3/4" bolts with associated washers.
3. Slide batteries into the tray, with the battery terminals toward the front as shown in Figure 6.3. Slide batteries into the tray as far as they will go. Higher the battery retention bracket as required. See Figure 6.3.
4. Connect three links supplied by the battery manufacturer between pairs of battery terminals as shown in Figure 6.3. Use hardware furnished by the battery manufacturer. Torque hardware to battery manufacturer's recommendations.
5. Ensure the battery cable ends **in all trays** are insulated with sleeving before performing the next step.



DANGER! When batteries in one tray are connected, the battery cables in **all** trays will be energized. Remove sleeving from and connect one cable at a time. Do not allow cable end to contact the battery tray or equipment rack.



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

6. Connect the cables found in the battery tray to the respective battery terminals, “+” to “+” and “-” to “-”. Observe correct polarity. Refer to Figure 6.3. Torque battery connections to battery manufacturer’s recommendations.
7. Repeat steps 2 through 6 for any remaining battery trays.
8. Reinstall the front cover for each battery tray. See Figure 6.4.

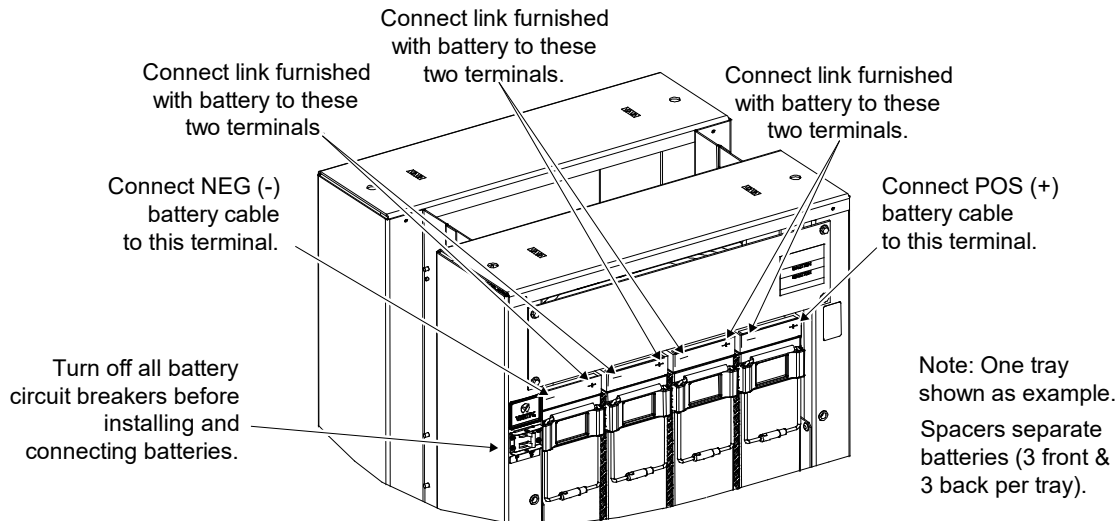


Note! Ensure the spacers provided on each front cover slide between the batteries.

9. To connect the batteries to the power system, turn ON the battery disconnect circuit breakers (located on the front of the box framework, adjacent to each battery tray).

Figure 6.3 Installing Batteries into a Battery Tray

Install and Connect Batteries



Higher Battery Retention Bracket as Required

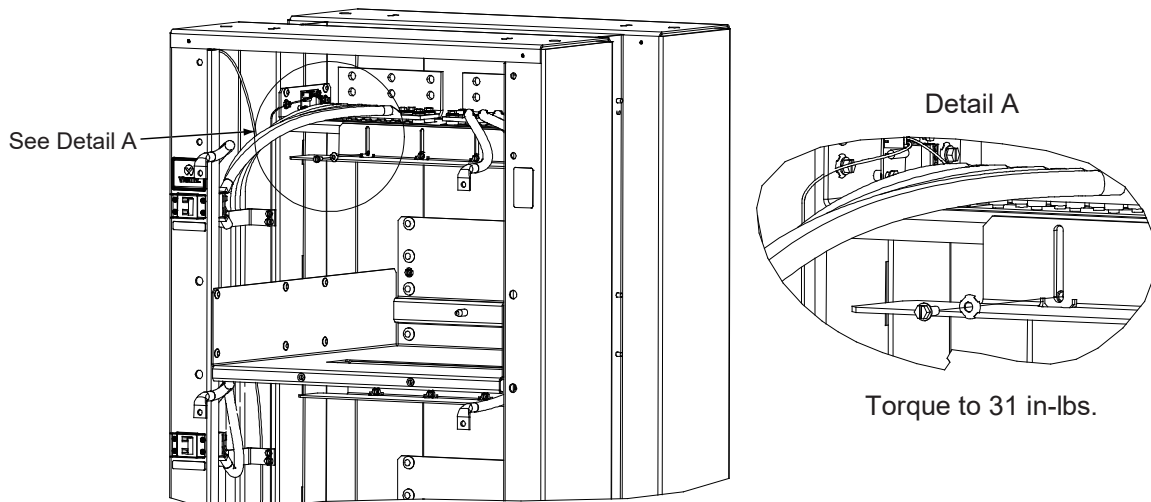
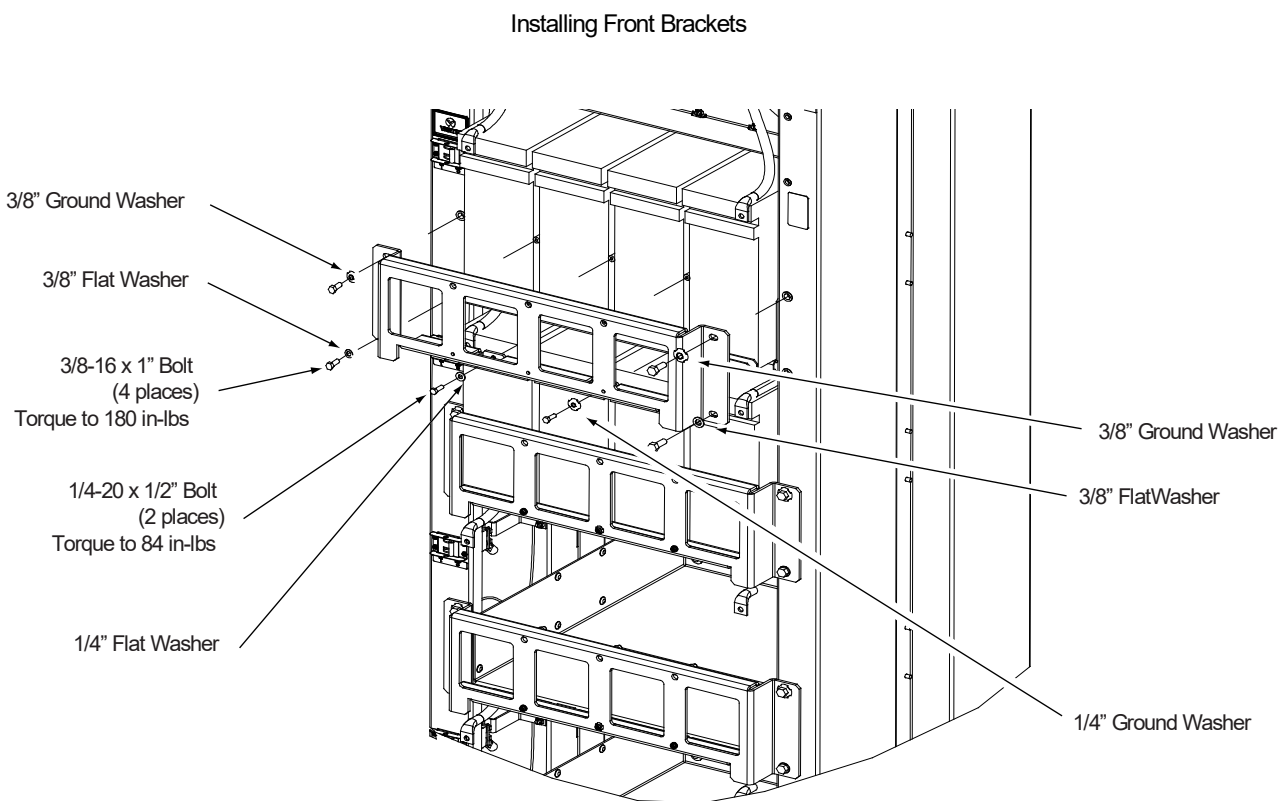


Figure 6.4 Installing the Front Cover



6.5 Installing Optional Front Battery Cover Kit

Procedure

1. To install the optional front battery covers onto the battery rack, perform the procedure in Figure 6.5.



Note! Before installing the front battery covers, make sure that the batteries are installed.

Figure 6.5 Installing Optional Front Battery Cover Kit (cont'd on next page)

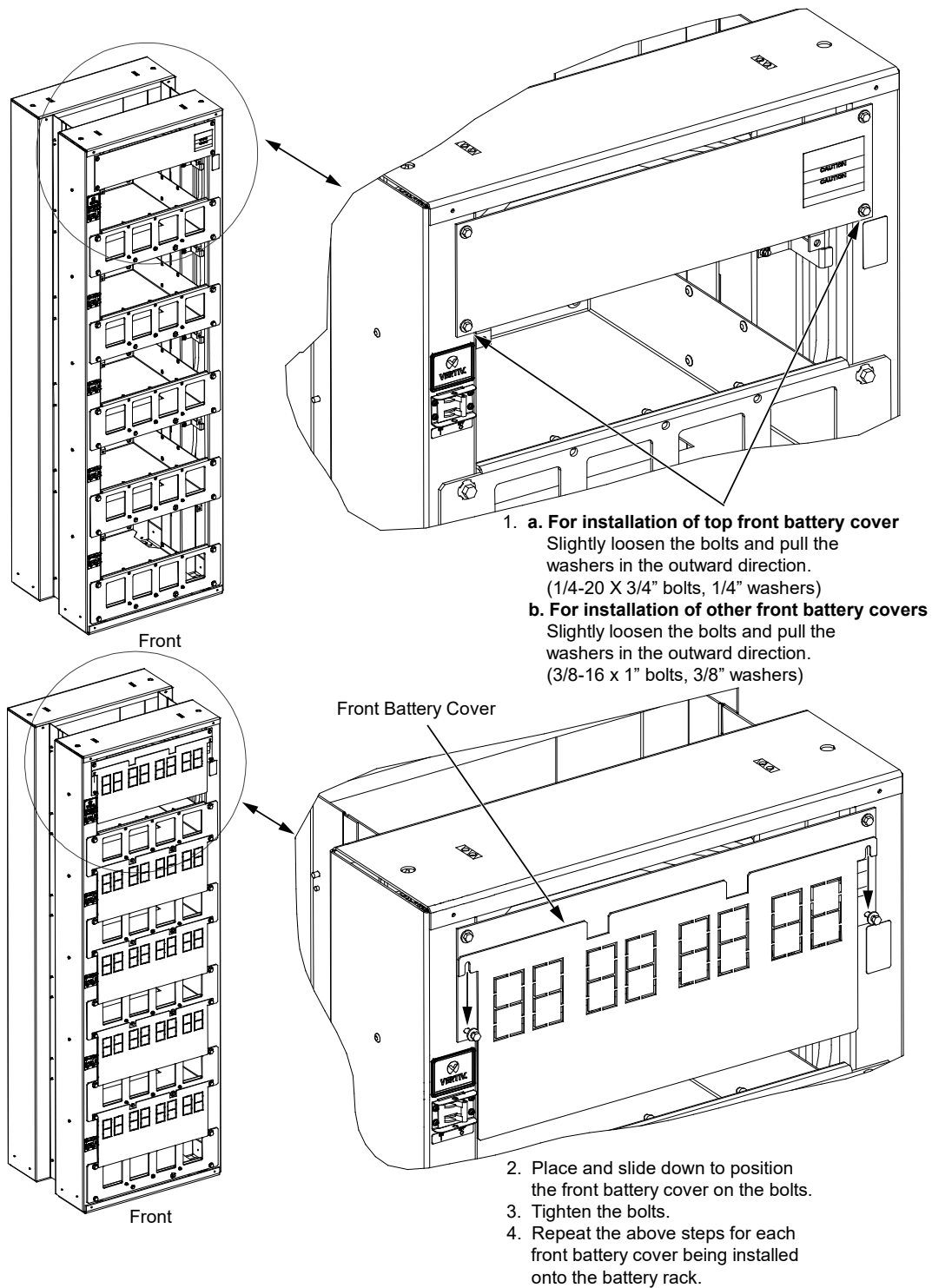
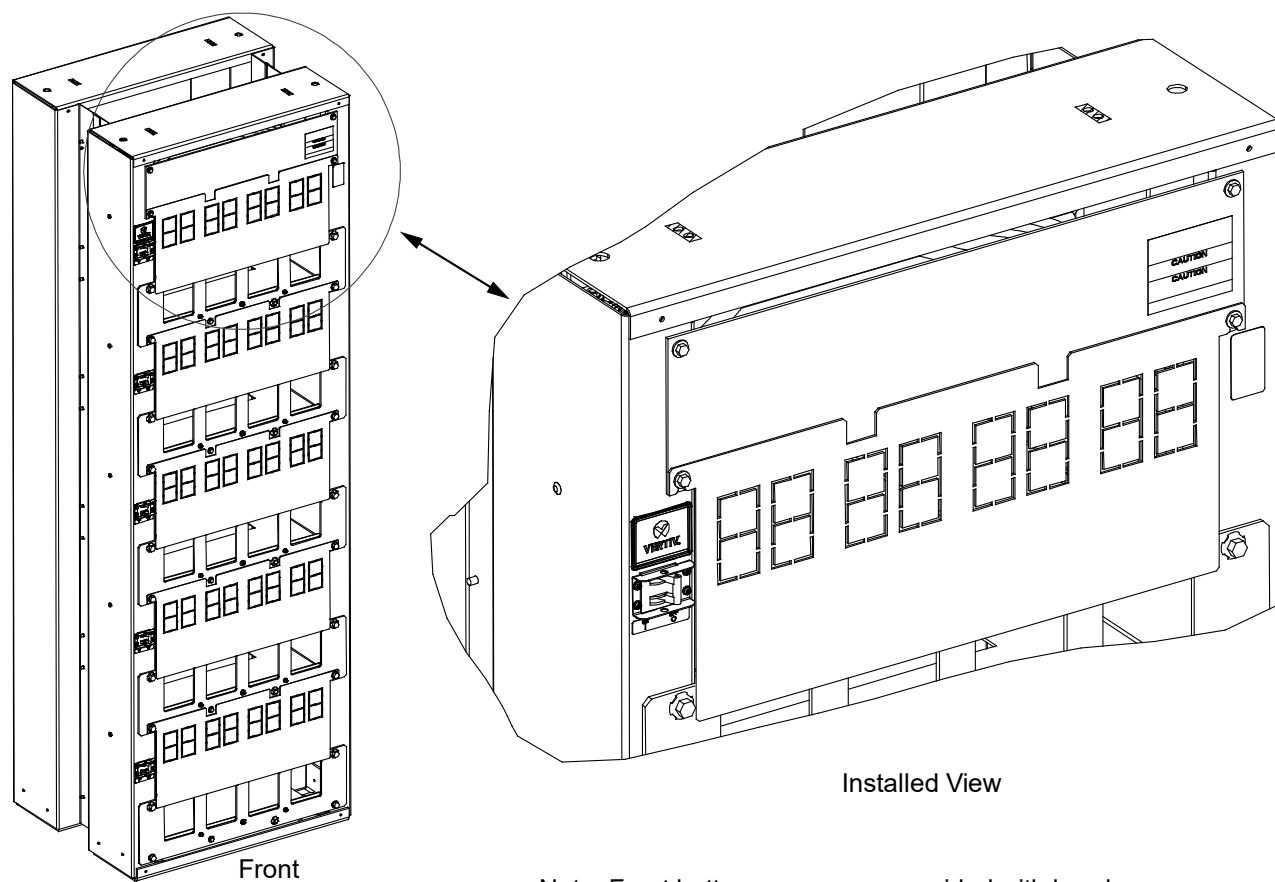


Figure 6.5 Installing Optional Front Battery Cover Kit (cont'd from previous page)



Note: Front battery covers are provided with breakaways to allow access for test probes to the battery terminals.

7 Initially Starting the System

Procedure

1. Ensure all furnished protective covers are installed.
2. Turn ON the battery disconnect circuit breakers (located on the front of the box framework, adjacent to each battery tray).



NOTE! Circuit breakers are provided with lockout/tagout capability.

3. Refer to any initial startup procedure in the documentation supplied with the associated power system.

8 Maintenance

8.1 Batteries

For battery maintenance procedures, refer to the manual provided with the batteries.

8.2 System Maintenance Procedures

It is recommended to perform the maintenance procedures listed in Table 8.1 every 6-months to ensure continual system operation.

Table 8.1 Maintenance Procedures to be performed at 6-Month Intervals

PROCEDURE	REFERENCED IN
Inspect and tighten all installer's connections.	"Making Electrical Connections" section on page 5.

9 Troubleshooting and Repair

9.1 Contact Information

Refer to Section 4154 (provided with your customer documentation) for support contact information.

9.2 Batteries

For battery troubleshooting and repair procedures, refer to the manual provided with the batteries.

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