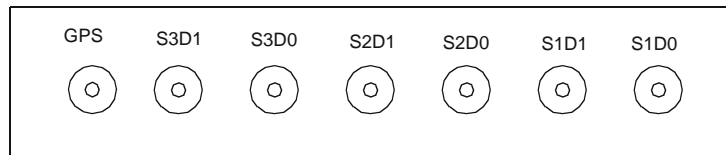
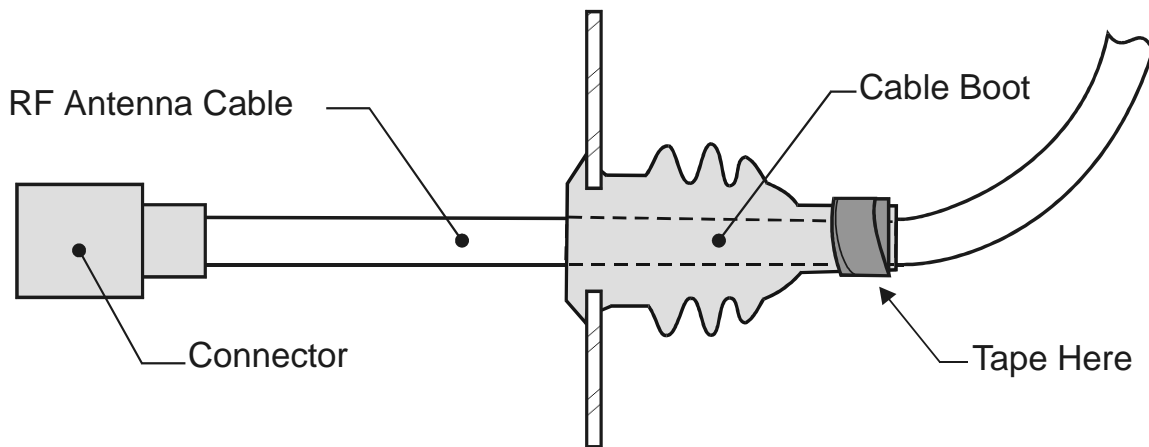


-
- 4 Insert one end of the jumper cable through the applicable opening in the antenna cable cover.
-
- 5 Connect the RF antenna jumper cable to the applicable connector on the Modular Cell 4.0B primary or 4.0B dual band cabinet. Refer to the figure below.



-
- 6** Slide the boot towards the cabinet and install it into the opening on the antenna cover. Refer to the figure below.
-
- 7** Turn the boot so that the split is at the bottom of the cable.
-
- 8** Ensure that the lip of the boot is fully seated in the antenna cable cover.
-
- 9** Tape the small end of the boot as shown in the figure below.



SIDE VIEW

-
- 10** Repeat Steps 2 through 9 for all antenna jumper cables.
-
- 11** Torque the antenna jumper cable connections to 221 in.-lb. (25 Nm). Refer to Step 11 on Page 7 - 11 for the correct method
-
- 12** Replace the top panel on the antenna cable cover. Torque the tamper-proof screws to 15-20 in.-lb. (1.7 - 2.3 Nm).

.....

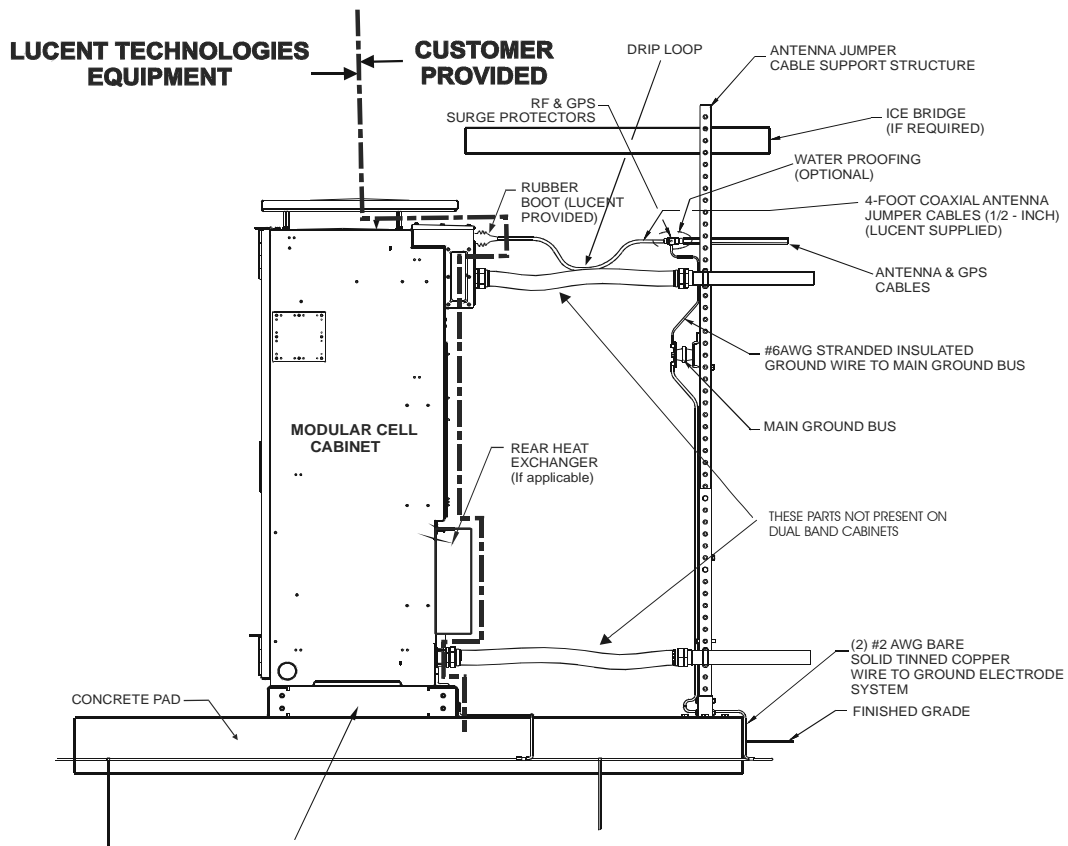
END OF STEPS

.....

Connect RF antenna jumper cables to the antenna cables

Use the following procedure to terminate and connect the RF antenna jumper cables to the applicable antenna cables.

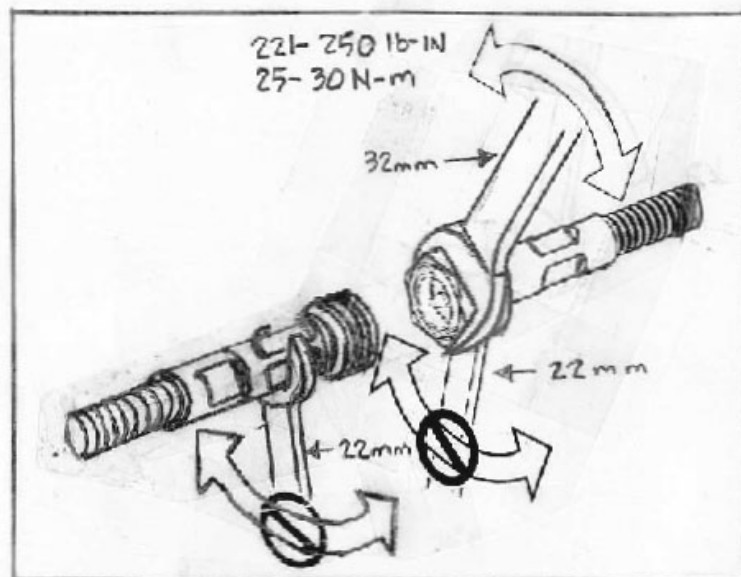
- 1 Route the RF antenna jumper cables from the Modular Cell 4.0B primary or 4.0B dual band cabinet to the RF antenna connections.
- 2 Connect the RF antenna cable to the applicable RF antenna connection at the surge suppressor.



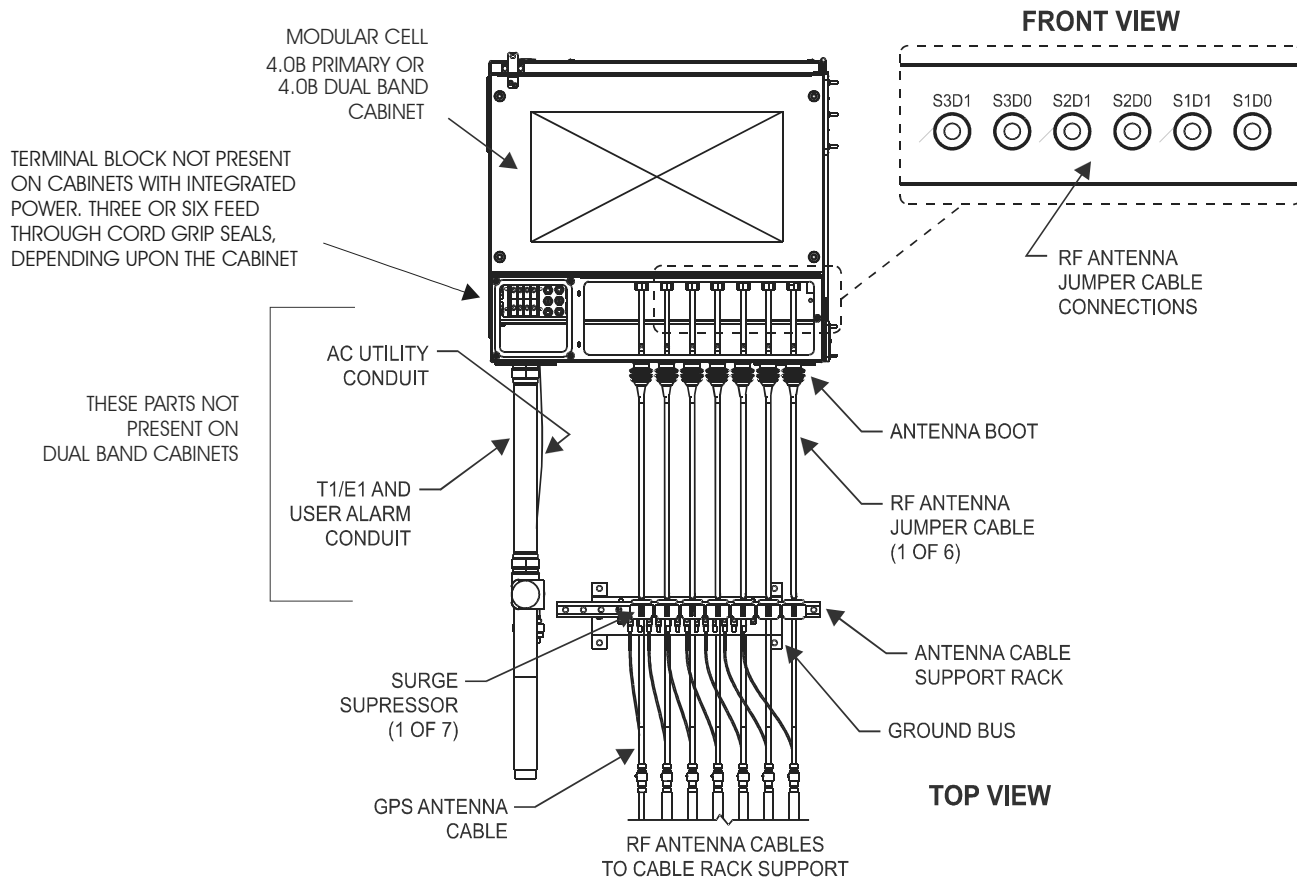
Important! For a profile view of the sound muffler, refer to Chapter 1, Modular Cell 4.0B cabinet side view 1 on Page 1 - 26. For alternate cable routings refer to Chapter 1, Modular Cell 4.0B cabinet side view 2 on Page 1 - 27.

Important! When connecting/disconnecting a Lucent RF coaxial jumper cable assembly to/from any 7-16 DIN female receptacle connector at the antenna, it is highly recommended that the cable assembly be connected/disconnected as shown in the figure above. Please note that the mating receptacle connector requires a wrench for support to hold it in place. Wrenches for connecting/disconnecting the mating RF coaxial jumper cable's 7-16 DIN male plug, which is equipped with a rotating coupling nut, are required.

- 3 Torque the antenna jumper cable connections at the antenna connection to 221 in.-lb. (25 Nm) using the method shown in the figure below.



4 Repeat Steps 1 through 3 for all RF antenna jumper cables.



Important! Antenna jumper cables must be tested. Refer to Lucent Technologies Installation Engineering Handbook, 238, Indoor Installation Antenna Testing (Reference).

Important! Before system operation, the RF antenna cable sections must be tested, and the power output of the amplifiers must be adjusted. Those tasks are a part of system test and integration.

Replace / close all access panels and doors

Use the following procedure to replace or close all access panels and doors.

- 1 Verify that the EFIT and HPDA are closed and secured.
- 2 Inspect for and remove all tools, materials, and parts.
- 3 Check that the cabinet lifting eye bolts have been removed and that the top solar shield has been installed.

Important! If not, refer to Chapter 2 for specific instructions.

- 4 Verify that all power connections are installed and secure.
- 5 Verify that all RF connections between the Modular Cell 4.0B primary cabinet and the Modular Cell 4.0B dual band cabinet are installed and secure.

Important! When performing the next step, the door must be properly aligned. If not, refer to Chapter 2 to re-level the cabinet and/or adjust the door.

- 6 Close and secure the cabinet door and panels.
- Important!** Do not replace any panels or close the door if installing a battery cabinet at this time, since DC and AC cables remain to be attached. Do not replace any panels if using external power, since DC and AC cables remain to be attached.

- 7 Turn the appropriate main panel circuit breakers ON.

END OF STEPS



How to finish the installation of a first or second WNG24-BC battery cabinet

Finish the installation of the first or second WNG24-BC battery cabinet

Following installation of a WNG24-BC battery cabinet, the system should be tested before being put into operation. System test procedures are not covered in this installation document. Information concerning system test and integration is contained in Lucent Technologies Installation Engineering Handbook, 238. Use the following procedure to finish the installation.

- 1 Verify that the AC, DC, alarm and grounding connections in the primary and battery cabinets are installed and secure.

- 2 Verify all battery hardware and connections are installed and secure.

- 3 Inspect for, and remove all tools, packing and installation materials, and parts from the battery and primary cabinets.

- 4 Check that all unused battery cables, if applicable, are properly wrapped and stored on an unpopulated shelf in the battery cabinet.

- 5 Check that the cabinet lifting eye bolts have been removed and replaced with the supplied replacement bolts. If not, refer to Chapter 2 for specific instructions.

- 6 Ensure that the circuit breaker "BATTERY HEATER" in the primary cabinet, is in the ON position

Important! When performing the next step, the doors must be properly aligned. If not, refer to Chapter 2 to re-level the cabinet and/or adjust the doors.

- 7 Replace or close all access panels and doors of both cabinets.
-



Appendix A: EZBFo battery frame installation with Modular Cell 4.0B cabinets (with integrated power)

Overview

Purpose This appendix provides instructions for installing the Lucent Technologies EZBFo battery modules with an outdoor Modular Cell 4.0B cabinet that has *integrated power*.

The procedures provided in this Appendix are for right side EZBFo installation with 4.0B primary cabinets. When EZBFo frames are being installed with a 4.0B dual band cabinet, the frames are installed on the left side of the cabinet. The procedures are all the same except for the routing direction of the cables. Cable routing inside of the dual band cabinet is provided.

Contents This appendix contains the following sections.

<u>Introduction</u>	A - 2
<u>How to perform placement, anchor, and prewire procedures for installation of the first or second EZBFo battery base modules</u>	A - 8
<u>How to identify and route the cables from the Modular Cell cabinet to the first EZBFo battery base module</u>	A - 36
<u>How to route and connect the cables in the first EZBFo battery base module</u>	A - 47
<u>How to identify, route and connect the first EZBFo battery base module cables in the Modular Cell 4.0B cabinet</u>	A - 64
<u>How to install an EZBFo battery add-on module on an existing EZBFo battery module</u>	A - 76
<u>How to install a second EZBFo battery base module</u>	A - 101
<u>How to install the batteries in the EZBFo battery modules</u>	A - 124
<u>How to make final DC connections</u>	A - 140

Introduction

Overview

Purpose This module provides definitions and an overview description of the EZBFo battery modules, as well as its inputs and outputs. Also provided are general safety instructions

Contents The following modules are provided in this section:

<u>EZBFo Definitions</u>	A - 3
<u>EZBFo battery frame description</u>	A - 4
<u>EZBFo battery frame footprint with Modular Cell 4.0B primary and dual band cabinets</u>	A - 5
<u>EZBFo battery frame inputs and outputs</u>	A - 6
<u>Safety instructions</u>	A - 7

EZBFo Definitions

Definitions Refer to the figure on Page D -4.

Battery Module: The entire assembly consisting of the **Battery Module Inner Frame** and the **Battery Module Outer Frame**.

Battery Module Inner Frame: The inside frame containing two battery shelves

Battery Module Outer Frame: The outside frame including a front panel (and a top panel if it is a **Battery Base Module**).

Battery Base Module: The initial (bottom) **Battery Module** installed. Includes a top panel to be moved up as **Battery Add-On Modules** are added above it. It provides all interface connections to the Modular Cell Cabinet

Battery Add-On Module: The same as a Battery Module but shipped without a top cover. Two may be added to a **Battery Base Module** for a total of three **Battery Modules** depending upon seismic zone

Battery Shelf: A shelf on which the batteries are installed. **The Battery Base Module** and the **Add-On Battery Module** both contain two battery shelves. The batteries on these two shelves are configured as follows:

- With four L1-100Ah-12VDC batteries per shelf: Two 12VDC batteries are connected in series to provide two 24VDC strings per shelf, four strings per module, and up to twelve strings per frame. Individual shelves may be populated
- With three 12IR125 batteries per shelf: Each of the two shelves is populated with three 12VDC batteries connected in parallel. to provide two 12VDC shelves. The two shelves connected in series to provide a 24VDC module. Both shelves *must* be populated.

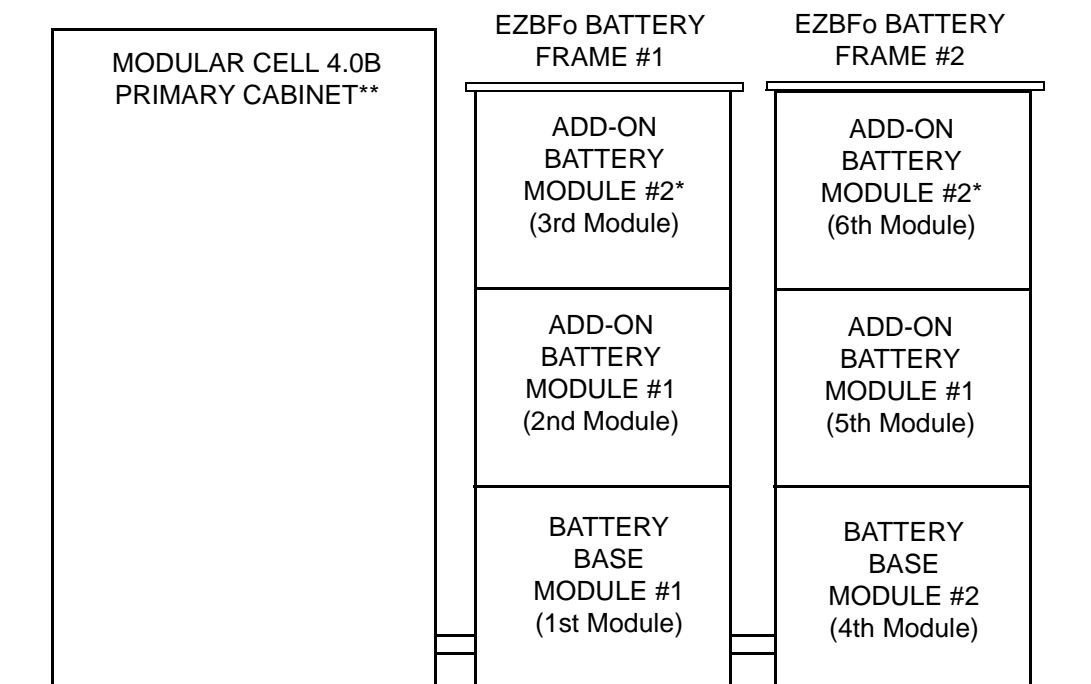
Battery Frame: The assembly of the **Battery Base Module** and one or two **Add-On Battery Modules**. There may be two battery frames, referred to as the “First” or “Second” Battery Frames. The second EZBFo battery frame provides all interface connections to the first Battery Frame.

EZBFo battery frame description

Description The EZBFo battery frame is designed to meet the power backup requirements of the outdoor Modular Cell 4.0B cabinets that has integrated power.

Each of the two possible battery frames has a battery base module and up to two battery add-on modules. Each module has two battery shelves. Module access is gained by removing the front panel of each individual module. Each base module contains termination points for load and return circuits (+24V DC load and 24V Return), as well as various alarms, from the Modular Cell 4.0B cabinet. AC heater pads are added to each battery shelf. Batteries are shipped separately and will be installed later in this Appendix.

Important! Battery module growth may be vertical (with add-on modules) or horizontal (with base modules). *EZBFo frames are installed on the left side of 4.0B Dual Band cabinets.*



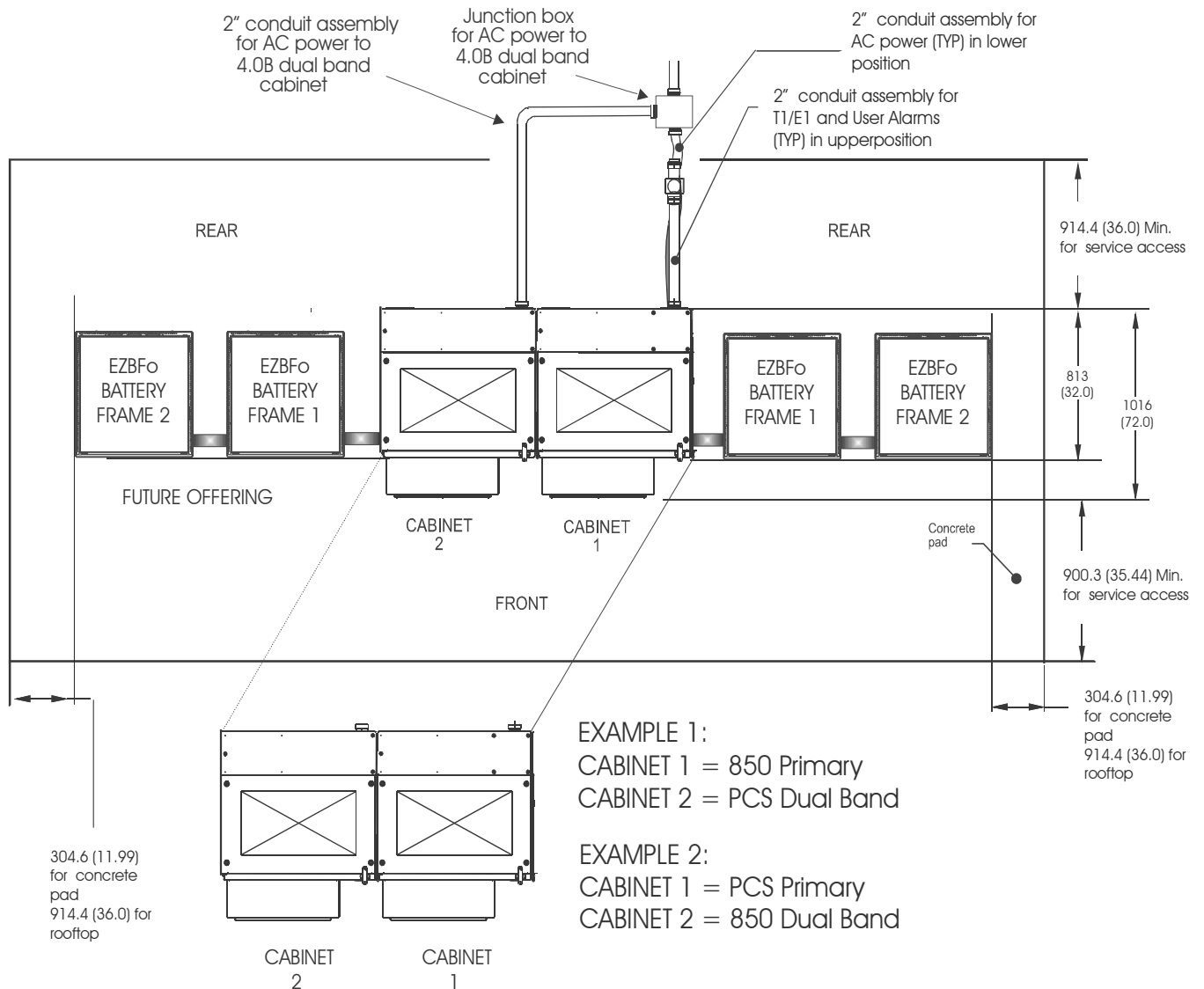
IMPORTANT:

* Only one add-on module may currently be installed in Seismic Zone 4

** For 4.0 Dual Band cabinets, the EZBFo frames are installed on the left side of the cabinet

EZBFo battery frame footprint with Modular Cell 4.0B primary and dual band cabinets

Description The EZBFo battery frames on the right side (viewed from the front) of the 4.0B primary cabinet support the primary cabinet only. WNG battery cabinets (Chapter 4) may alternately be used to support the primary cabinet. The EZBFo battery frames on the left side of the 4.0B dual band cabinet support the 4.0B dual band cabinet only. WNG battery cabinets are not available to support the 4.0B dual band cabinet.



EZBFo battery frame inputs and outputs

- Outputs** The EZBFo battery frame provides the following inputs from, and outputs to, the Modular Cell 4.0B cabinet:
- +24 VDC battery backup output to the Modular Cell cabinet
 - +24 VDC battery charge input to the first battery base module
 - Battery thermal probe signal output to the Modular Cell cabinet
 - Battery module fuse alarm signal output to the Modular Cell cabinet
 - Fan power input to battery base module and fan alarm output to the Modular Cell cabinet
 - Intrusion alarm input to the Modular Cell cabinet
 - AC heater input to the first battery base module

Safety instructions

Instructions Review all safety precautions before beginning the installation of the battery frames. Observe all caution symbols on the equipment and individual safety precautions as they appear in the instruction text.

Safety precautions for power cabinet installation



DANGER

Electrical Shock Hazard

Failure to follow the order of the installation procedure (as written) can result in an energized AC or DC circuit, which creates an electrical shock hazard.

Follow these rules.

- 1. Perform installation steps in the order provided. Do not connect AC power until instructed to do so. Do not make DC connections or interconnect batteries until instructed to do so.*
- 2. Observe and strictly follow all safety precautions.*
- 3. When completing electrical connections, always use tools that are properly insulated.*



WARNING

Personnel injury or equipment damage

When moving the battery base module, use appropriate lifting devices and a sufficient number of personnel. Two persons are required.

How to perform placement, anchor, and prewire procedures for installation of the first or second EZBFo battery base modules

Overview

Purpose **Important!** If installing a EZBFo battery add-on module only, proceed to [How to install an EZBFo battery add-on module on an existing EZBFo battery module](#) on Page A - 76 to continue the installation. If installing an EZBFo battery base module, continue as instructed.

This section describes the procedures for placement, anchoring, and prewiring of the first or second EZBFo battery base modules. *Instructions are given for right-hand (primary cabinet) installation. Left hand installation (4.0B Dual Band cabinet) is the same except for the routing of the cables into and through the 4.0B Dual Band cabinet. This alternate routing is provided.*

Anchor hole size requirements for the EZBFo battery base module	A - 8
How to place and attach the EZBFo battery base module outer frame and mark, drill, and set anchors	A - 9
How to install the battery heater pad kit in an EZBFo battery module	A - 19
How to install the inner battery frame and level, anchor, and ground the first or second EZBFo battery base modules	A - 27

Anchor and hole size requirements

Anchor hole size requirements for the EZBFo battery base module

The following table provides anchor type and hole size requirements for the EZBFo battery base module.

Seismic Zone(s)	Anchor Quantity/Type	Hole Size / Depth
0, 1, and 2	(4) 1/2" dia. drop in	5/8" bit / 2" (50 mm) deep
3 and 4*	(8) 1/2" dia. drop in	5/8" bit / 2" (50 mm) deep

* A EZBFo battery frame installed in Zone 4 can be installed with only one add-on module unless a zone 4 mounting kit is installed at the time of the addition of the second add-on module.

How to place and attach the EZBFo battery base module outer frame and mark, drill, and set anchors

- Overview** In this module the installer will perform the following procedures:
- Unstrap the front panel and place it on the top panel of the outer frame, not detaching the lanyard cable
 - Attach the conduit to the battery base module outer frame
 - Place the battery base module outer frame into position with the conduit into the Modular Cell cabinet and attach conduit
 - Remove the top and filter panels, not detaching the lanyard cable
 - If anchor holes have not been drilled:
 - Mark the anchor holes
 - Detach conduit at Modular Cell cabinet, move the battery base module outer frame aside, and drill the anchor holes
 - Reposition the battery base module outer frame with the conduit into the Modular Cell cabinet and attach the conduit to Modular Cell cabinet
 - Set the 1/2 inch drop in anchors

This module contains the following procedures:

<u>Place and attach a battery base module to the Modular Cell cabinet or the first battery base module using the applicable conduit</u>	A - 10
<u>Remove the top and filter panels from the battery base module</u>	A - 14
<u>Mark and drill the anchor holes</u>	A - 16
<u>Set the 1/2-inch diameter drop-in anchor</u>	A - 18

Before you begin If installing a EZBFo battery add-on module only, proceed to How to install an EZBFo battery add-on module on an existing EZBFo battery module on Page A - 76 to continue the installation. If installing an EZBFo battery base module, continue as instructed.

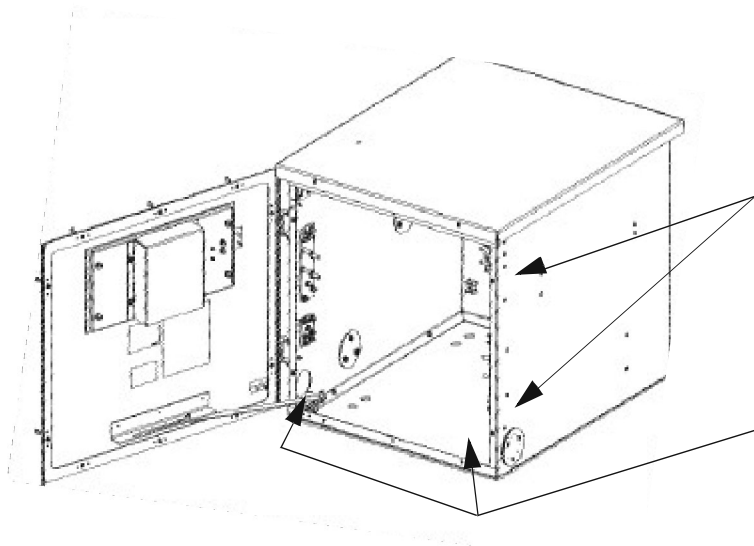
Important! If the Modular Cell cabinet is equipped with internal batteries, disconnect the battery connector or connectors inside of the cabinet before proceeding.

Place and attach a battery base module to the Modular Cell cabinet or the first battery base module using the applicable conduit

Perform the following steps to place and attach the outer frame of a battery base module to the Modular Cell cabinet or the first battery base module using the applicable conduit. The outer frame may have a front panel or a door. The front panel is shipped shrink-wrapped to the front of the outer frame with the lanyard cable attached between them.

Important! Note that the base module may be mounted directly on a concrete pad. Procedures for the preparation of other types of mounting surfaces are the responsibility of the customer.

- 1 Skip the next step if the battery module is equipped with a front door instead of a front panel.
- 2 Unwrap the front panel from the front of the outer frame and place it on the top of the frame. Do not disconnect the lanyard cable between the front panel and the outer frame. Refer to the figure on Page A - 11
- 3 If applicable, loosen the eight quarter-turn screws and open the front door of the module. Refer to the figure below. Refer to the figure on Page A - 11 for screw locations.

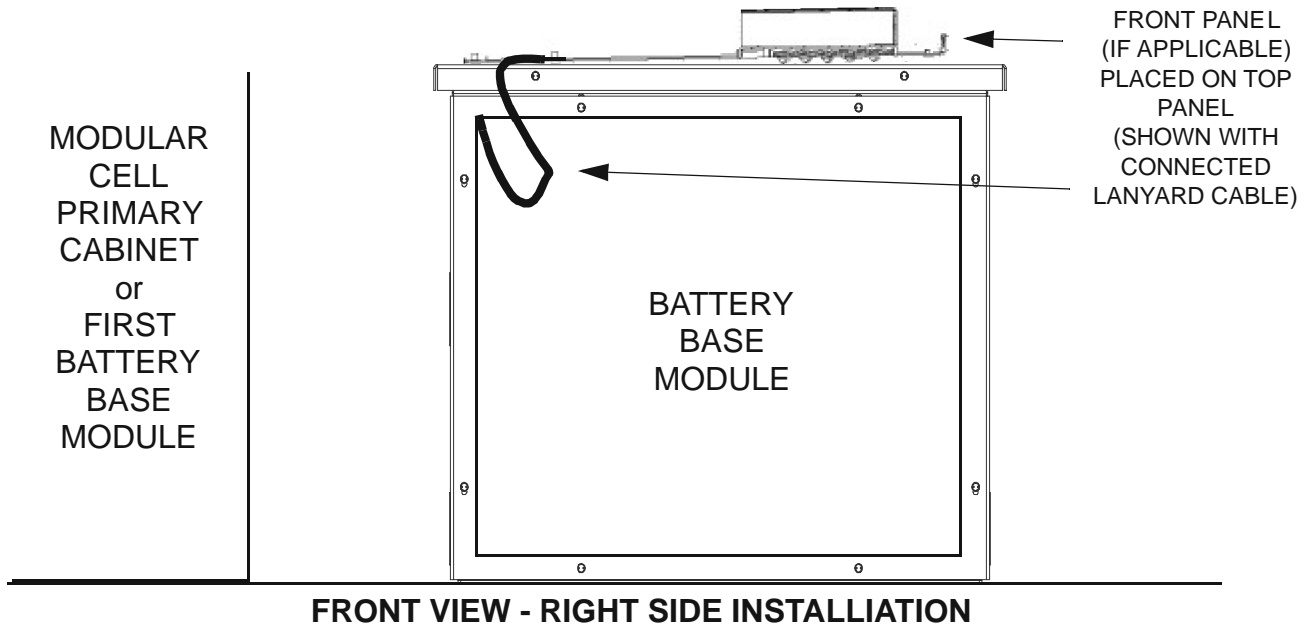


Note that the front door may be mounted with the hinges on the right side, instead of on the left as shown.

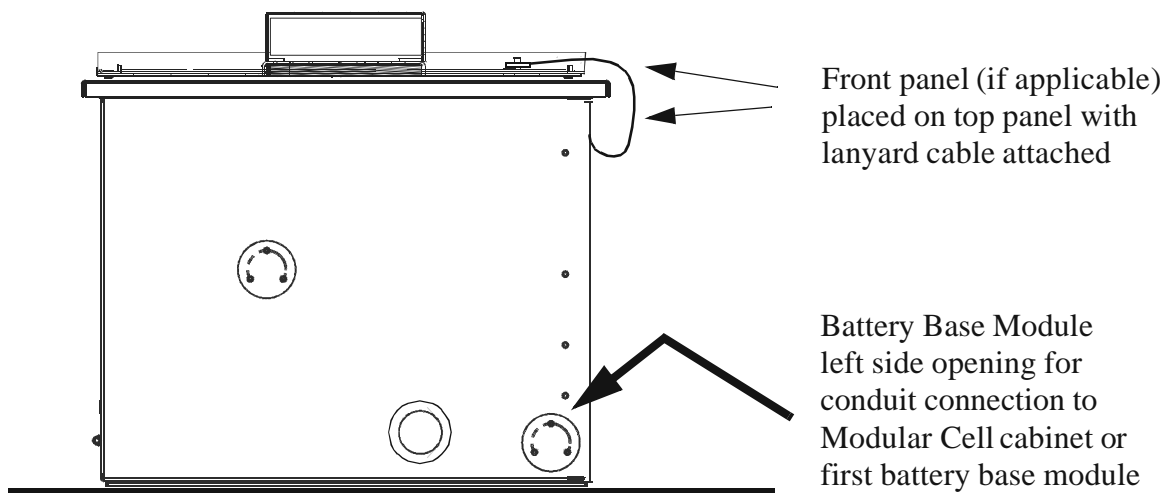
The Intrusion Alarm switch is always mounted on the side opposite the hinges.

- 4 Check the bottom plate for the “F” front orientation marker. If it is not in the correct location the bottom panel must be removed and repositioned correctly. Refer to the figure on Page A - 16

- 5 Move the outer frame of the battery base module into the approximate position next to the Modular Cell cabinet or first battery base module. Refer to the figure below.



- 6 Remove the cover plate shown in the figure below, from the left side of the outer frame of the battery base module.



-
- 7 Locate the conduit and associated parts used for routing of cables to the first battery base module. Refer to the figure on Page A - 12.

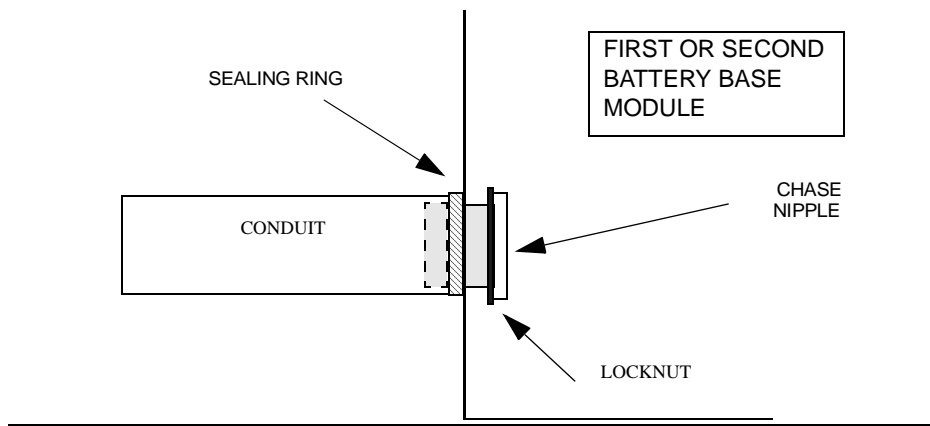
 - 8 Thread a lock nut completely onto one of the two supplied chase nipples. Refer to the figure on Page A - 12.

 - 9 From the inside of the battery base module insert a chase nipple with locknut through the left side frame. Refer to the figure on Page A - 12.

 - 10 From the outside of the battery base module place a sealing ring, “box side” facing right, onto the protruding chase nipple. Refer to the figure on Page A - 12.

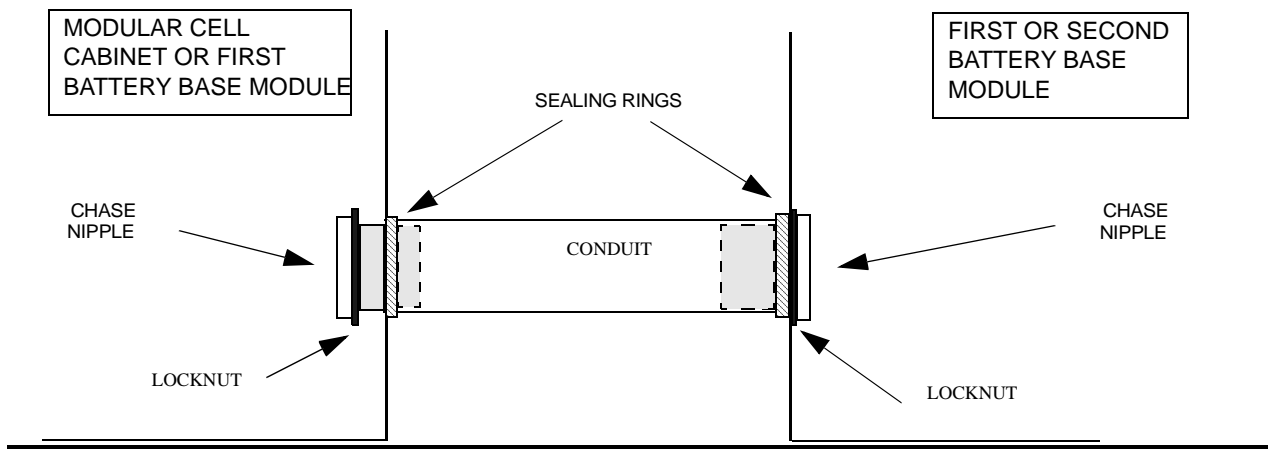
 - 11 Thread the conduit onto the chase nipple and hand tighten. Refer to the figure on Page A - 12.

 - 12 From the inside of the battery base module, tighten the locknut against the side frame. Refer to the figure below.



FRONT VIEW - RIGHT SIDE INSTALLIATION

-
- 13** Place the outer frame with the conduit into position beside the Modular Cell cabinet (or first battery base module) with the conduit against the associated opening. Refer to the figure below.
-
- 14** Place a sealing ring, "box side" facing left, at the left end of the conduit. Refer to the figure below
-
- 15** From the inside of the Modular Cell cabinet or the first battery base module, as applicable, remove the cover plate and insert a chase nipple with locknut through the right side frame and the sealing ring and into the conduit. Hand tighten the chase nipple and lock nut.



FRONT VIEW - RIGHT SIDE INSTALLIATION

Remove the top and filter panels from the battery base module

Perform the following steps to remove the top and filter panels from the battery base module

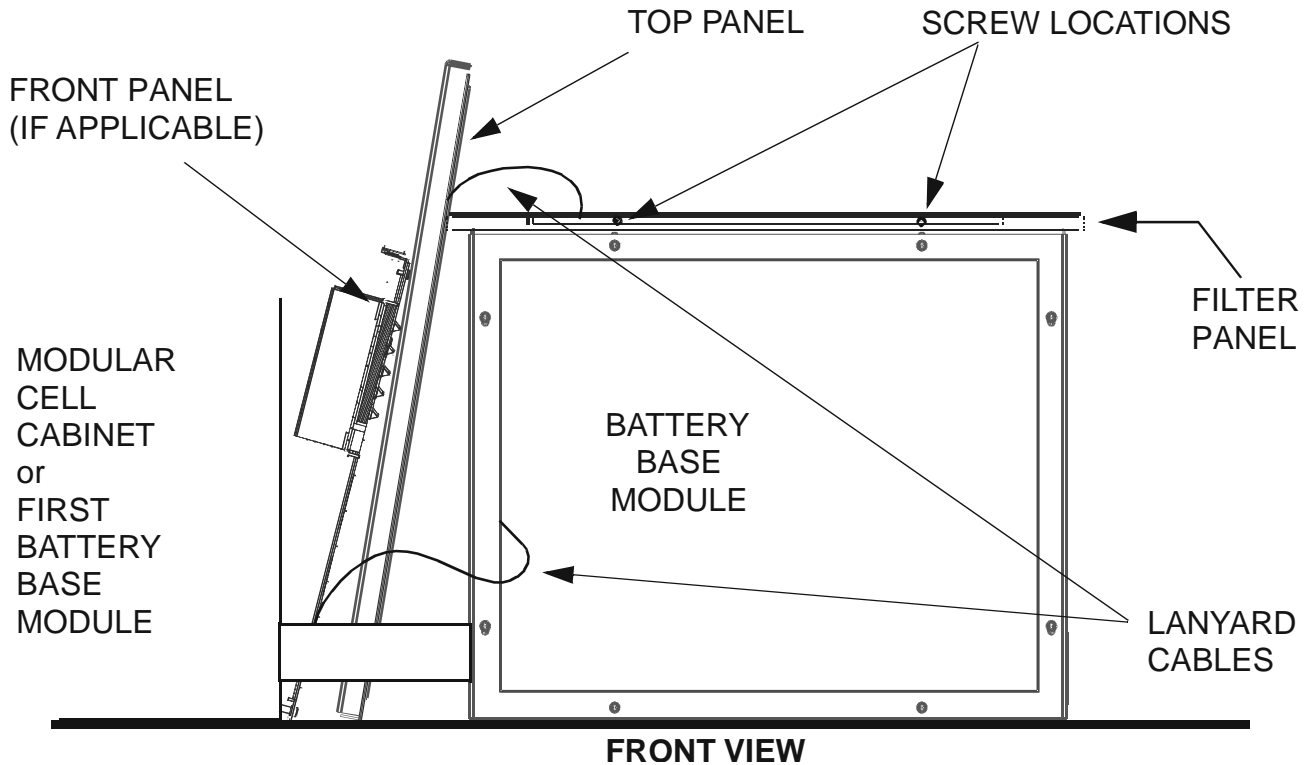
Important! When performing the next two steps do not disconnect the lanyard cable between the front and top panels and the outer frame.

-
- 1 If applicable, move the front panel off of the top panel and place it on the left side of the outer frame. Refer to the figure below.

Important! When performing the next step, use the supplied TR 25 Keytorx bit and a driver.

-
- 2 Remove the two TR 25 Keytorx screws from the front of the top panel. Refer to the figure below.

-
- 3 Slide the top panel slightly to the rear, lift the front of the panel up two to three inches, and lift it off of the outer frame. Place it beside the front panel on the left side of the outer frame as shown in the figure below.



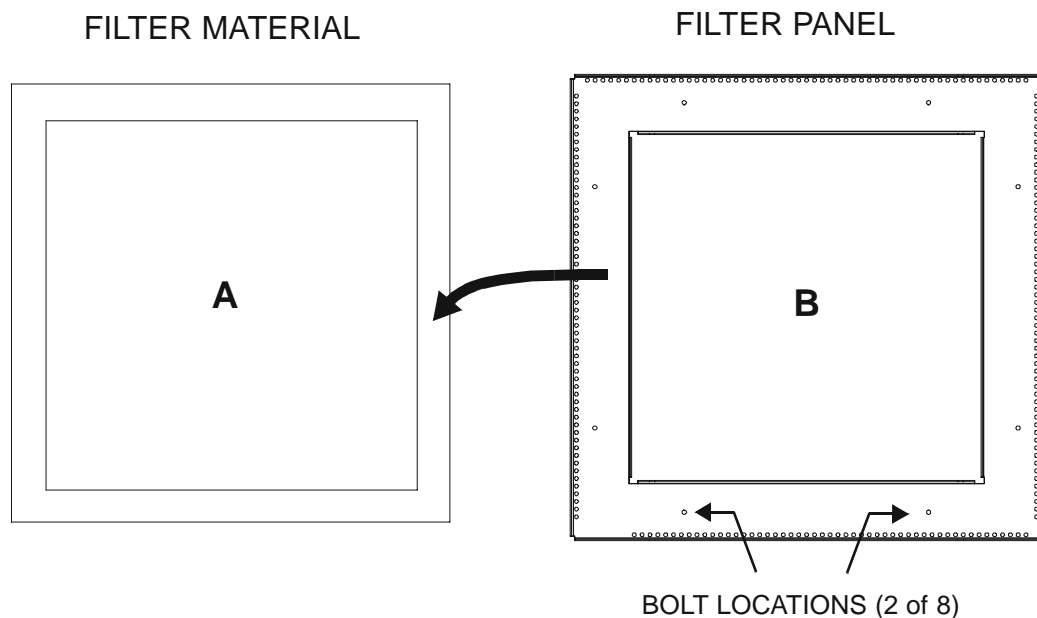
-
- 4 Disconnect the top panel lanyard cable from the outer frame. Refer to the figure on Page A - 14. Ensure that the top panel is in a secure location.

 - 5 Remove the filter material from the filter panel. Refer to "A" in the figure below.

 - 6 Remove eight bolts from the filter panel and remove the panel. Refer to "B" in the figure below.

 - 7 Store the filter material and filter panel in a secure location.

TOP VIEW



Important! If the anchor holes have been drilled during site preparation, skip to [Set the 1/2-inch diameter drop-in anchor](#) on Page A - 18 and follow the instructions to continue the installation from that point. If the anchor holes have not been drilled during site preparation, continue from this point.

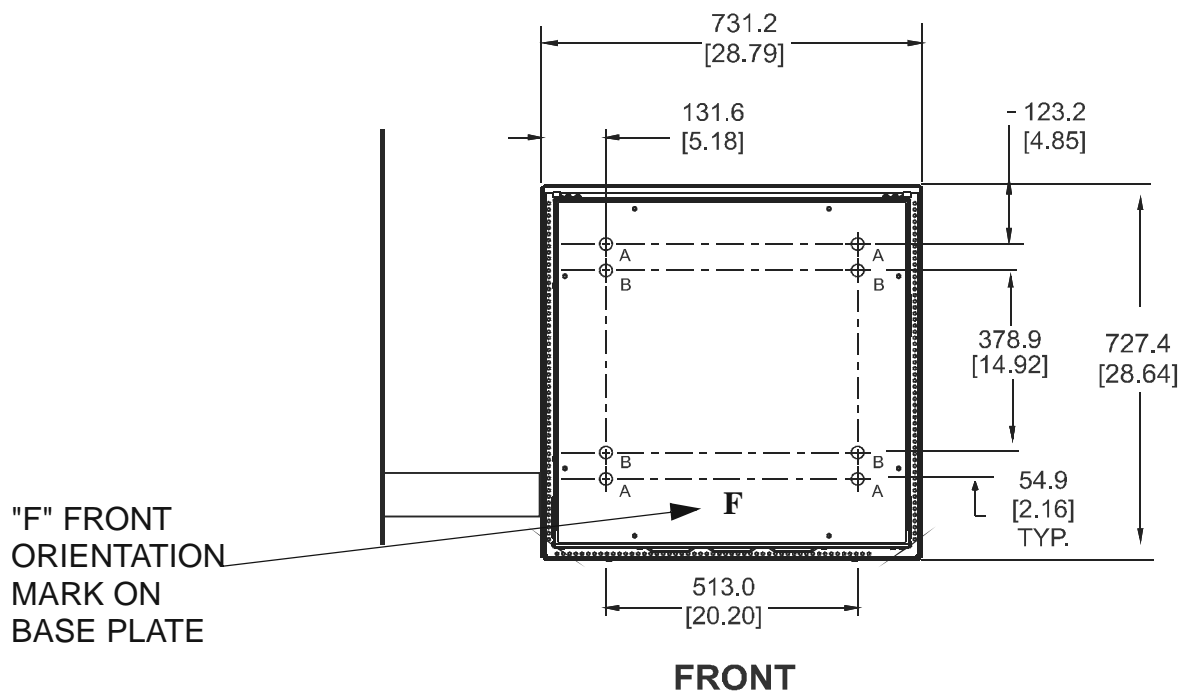
Mark and drill the anchor holes

If not already accomplished during site preparation, use the following procedure to mark and drill the anchor holes in a concrete surface. Consult *Flexent® Modular Cell 4.0/4.0B Outdoor Site Preparation Guidelines*, 401-703-413 for additional details.

- 1 Check the bottom plate for the "F" front orientation marker. If it is not in the correct location the bottom panel must be removed and repositioned correctly. Refer to the figure below.

Important! Note that the base module may be mounted directly on a concrete pad. Procedures for the preparation of other types of mounting surfaces are the responsibility of the customer.

- 2 Using the bottom plate as a marking template only, mark the four holes identified as "A" for Zone 0, 1, and 2, installations. *For Zones 3 and 4 installations, also mark the four holes identified as "B".* Refer to the figure below.

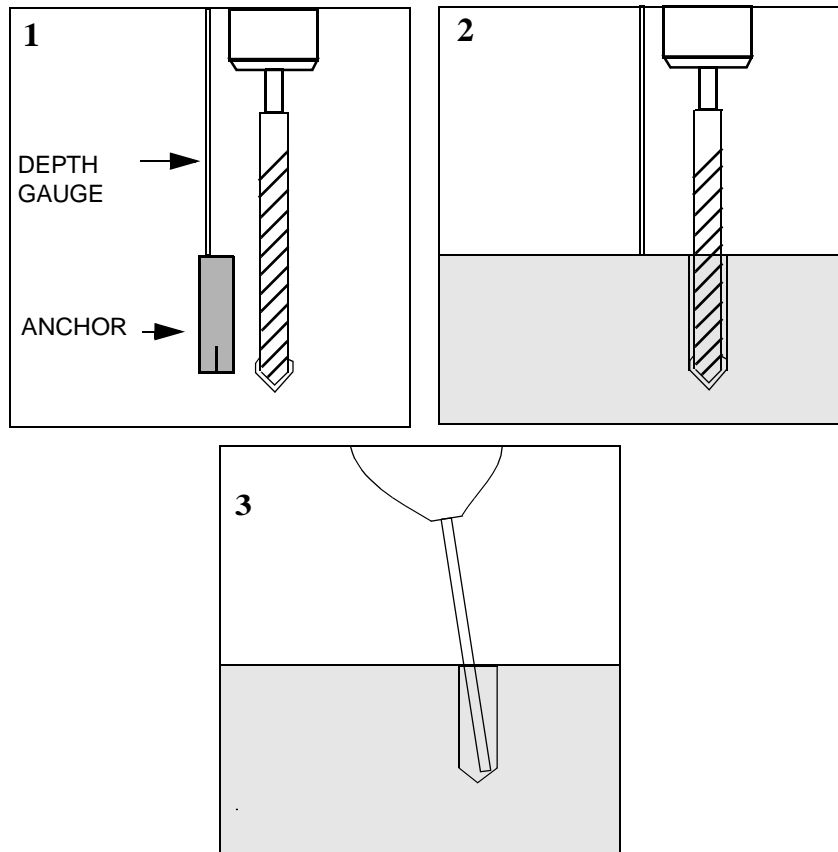


-
- 3 From the inside and outside of the Modular Cell cabinet or the first battery base module, as applicable, remove the chase nipple with locknut and the sealing ring installed previously in Step 15 and Step 14 on Page A - 13. Refer to the figure on Page A - 13

 - 4 Move the battery base module aside (exercise care since the front panel remains placed on the top panel).

 - 5 Drill the anchor holes (four or eight) to the proper size and depth as specified in Anchor and hole size requirements on Page A - 8. Refer to the figure below for the anchor hole drilling method.

 - 6 Vacuum out the holes as shown in the figure below.



-
- 7 Replace the outer frame with the conduit into position beside the Modular Cell cabinet (or first battery base module) with the conduit against the associated opening. Refer to the figure on Page A - 13

 - 8 Place a sealing ring, “box side” facing left, at the left end of the conduit. Refer to the figure on Page A - 13

 - 9 From the inside of the Modular Cell cabinet or the first battery base module, as applicable, insert a chase nipple with locknut through the right side frame and the sealing ring and into the conduit. Tighten the chase nipple and lock nut. Refer to the figure on Page A - 13

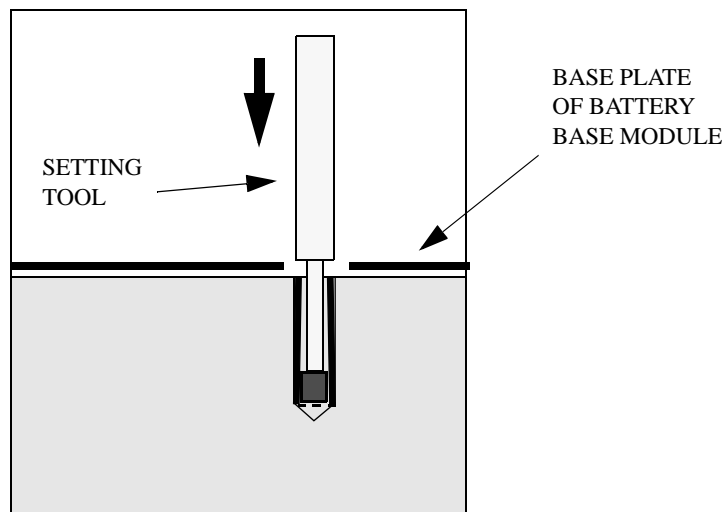
Set the 1/2-inch diameter drop-in anchor

Use the following procedure to install the 1/2-inch diameter drop-in anchor.

-
- 1 Tap in the four or eight anchors.

 - 2 Set the anchors using the setting tool. Refer to the figure below.

 - 3 Do not install the anchor bolts at this time.



How to install the battery heater pad kit in an EZBFo battery module

- Overview** In this module the installer will perform the following procedures:
- Remove the top and filter panels if they have not been removed
 - Remove the battery retaining brackets, separating the two parts, if applicable
 - Install the internal AC wiring for heater pads on the battery module outer frame
 - Install the heater pads on the shelves of the battery module inner frame

This module contains the following procedures:

<u>Remove the top and filter panels from the battery base module (Reference)</u>	A - 20
<u>Remove the two piece battery retaining brackets, separating the two parts if applicable</u>	A - 20
<u>Install the internal AC wiring for the heater pads</u>	A - 21
<u>Install the heater pads on each of the two battery shelves</u>	A - 24

Remove the top and filter panels from the battery base module (Reference)

If the top panels have not been removed, refer to Remove the top and filter panels from the battery base module on Page A - 14 to remove them.

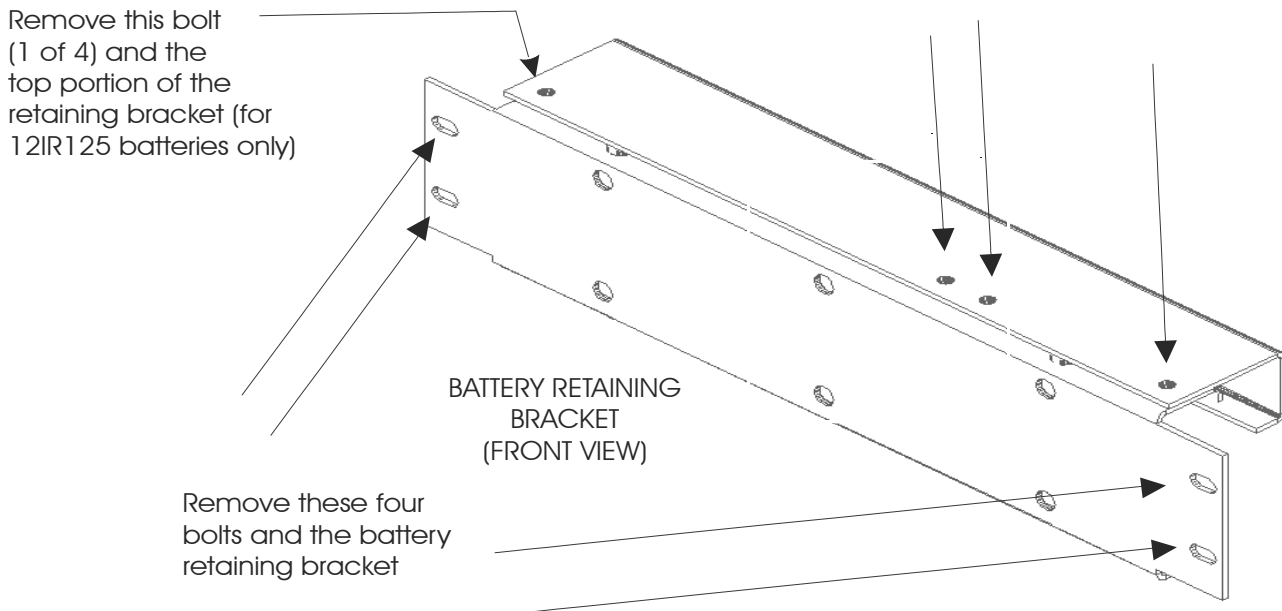
Remove the two piece battery retaining brackets, separating the two parts if applicable

Use the following procedure to remove the two piece battery retaining brackets, separating them, if applicable.

Important! If L1 batteries will subsequently be installed, skip the first step. The two piece battery retaining bracket should not be separated for L1 batteries. Perform the first step only if 12IR125 batteries will be installed.

-
- 1 If 12IR125 batteries will be installed, remove the four bolts that attach the top portion of the battery retaining bracket and remove the top portion on both shelves. They will not be replaced but will be used as battery spacers in a later procedure. Refer to the figure below.
-

- 2 Remove the battery retaining bracket from all shelves to be populated. Refer to the figure below.

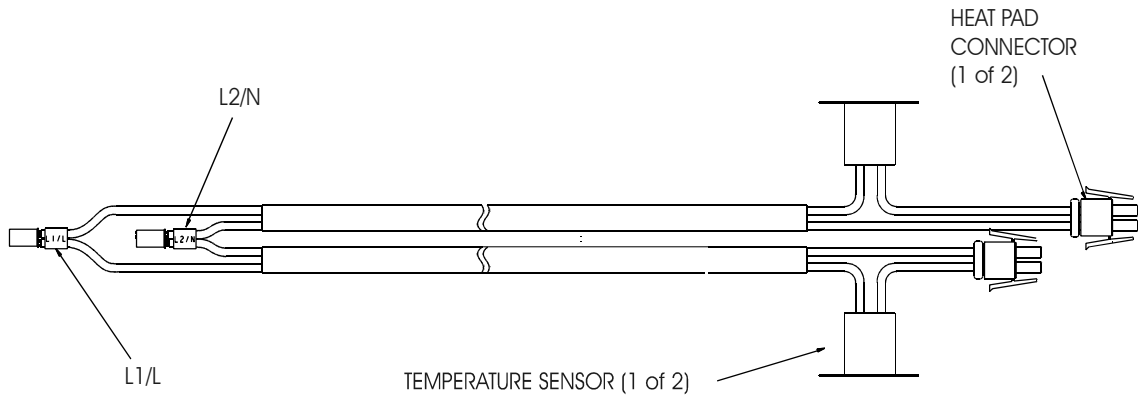


Install the internal AC wiring for the heater pads

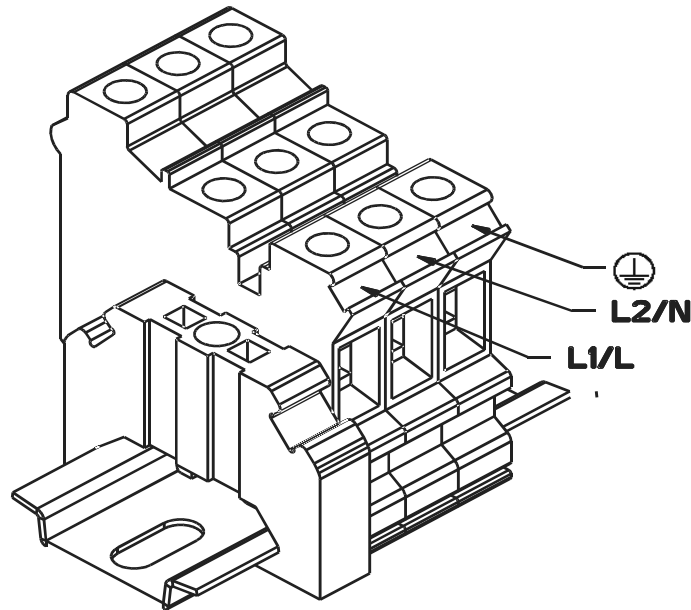
This procedure module provides instructions on how to install the AC wiring for the heater pads the battery module.

Important! The following steps *must* be performed prior to the placement of the inner frame into the outer frame (base module) or outer frame over the inner frame (add-on module).

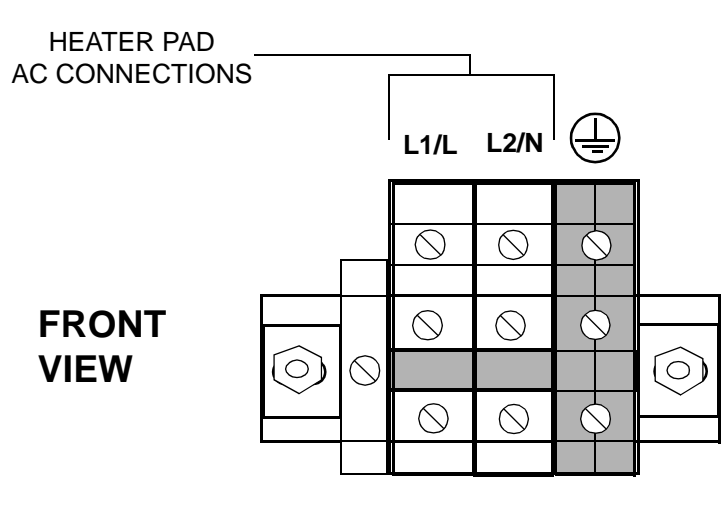
-
- 1** Locate the AC wire harness. Refer to the figure below.



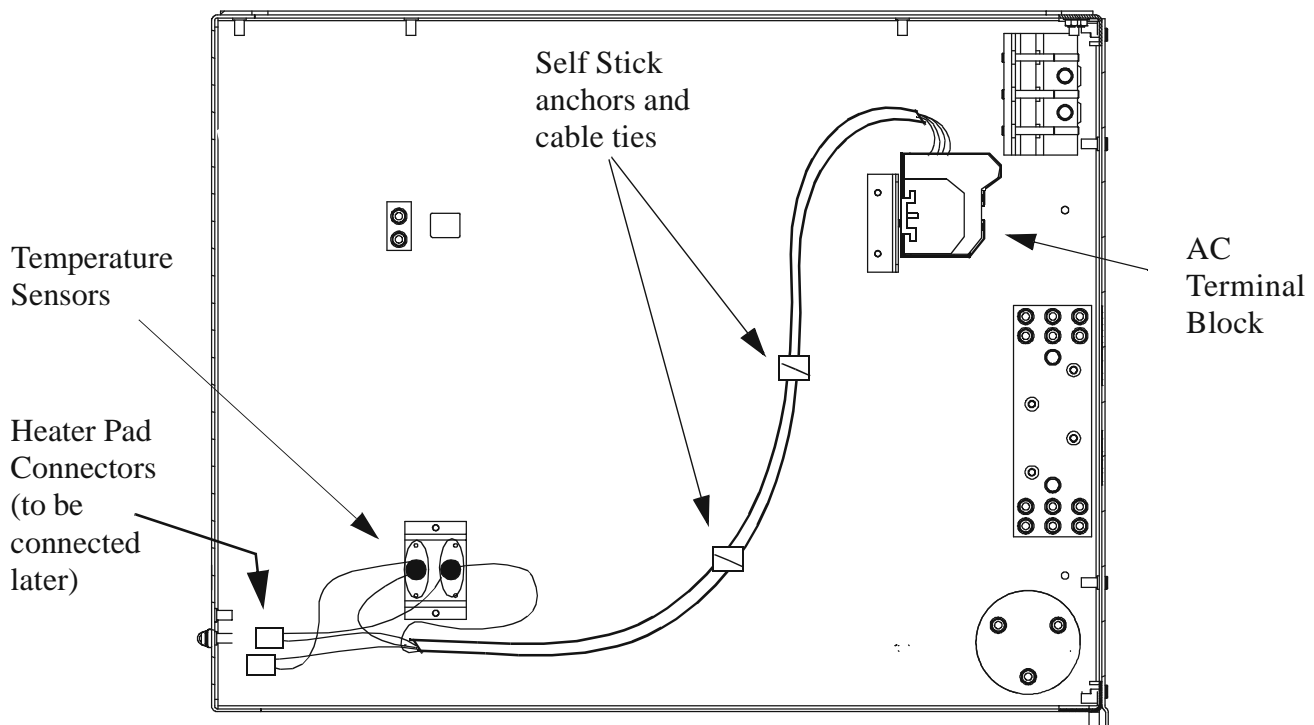
-
- 2** Locate the AC terminal block assembly. Refer to the figure below.



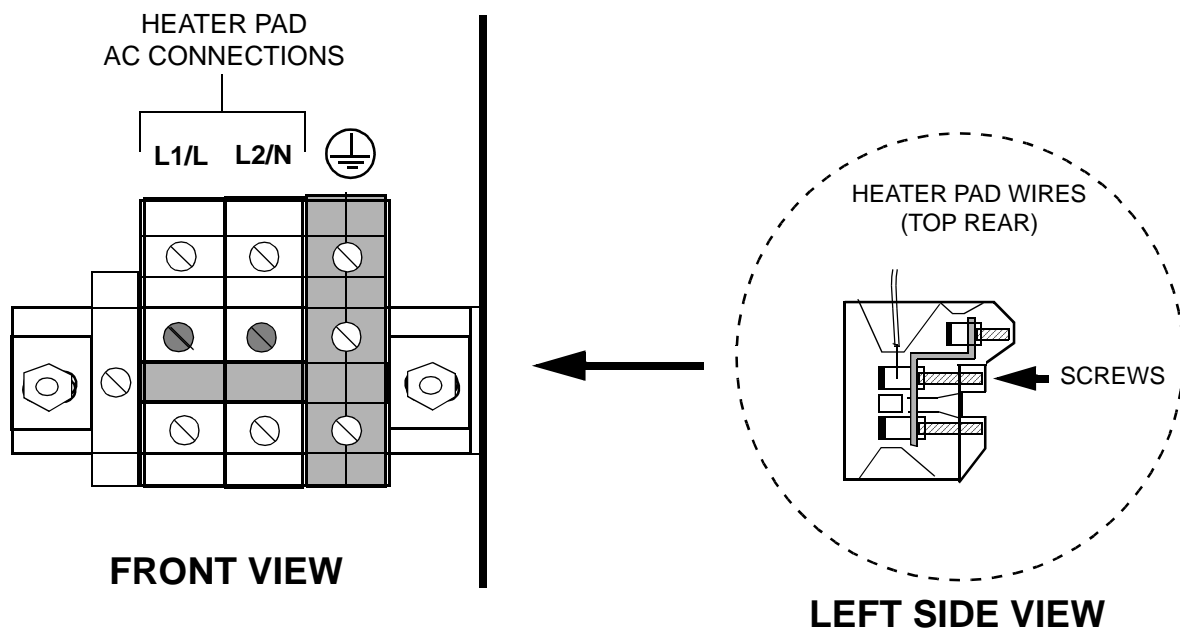
-
- 3 Attach the AC terminal block assembly to the bracket on the inside right panel of the outer frame using the supplied nuts and washers. Refer to the figures below for a front view and left side view.



-
- 4 Route the wire harness to the rear and attach the temperature sensors to the side panel threaded studs with the supplied nuts and washers.



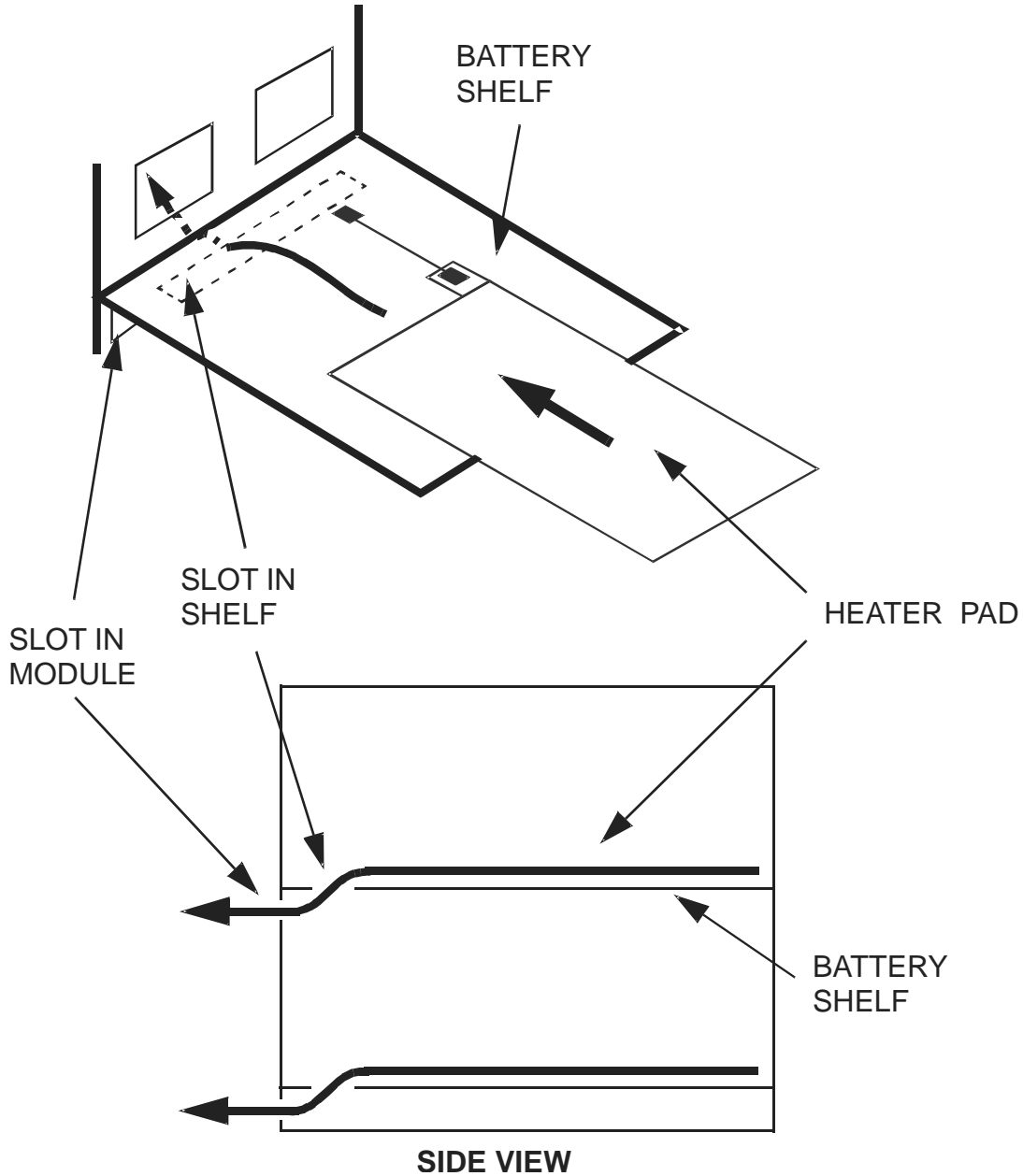
-
- 5 Secure the wire harness to the side panel with the supplied plastic self stick anchors and cable ties.
-
- 6 Loosen the indicated screws and insert the L1 and L2 two wire ferrules into the top rear connections of the AC terminal block as shown in the figure below. Tighten the indicated screws. Torque to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.).



Install the heater pads on each of the two battery shelves

Perform the following steps install the heater pads on each of the two battery shelves.

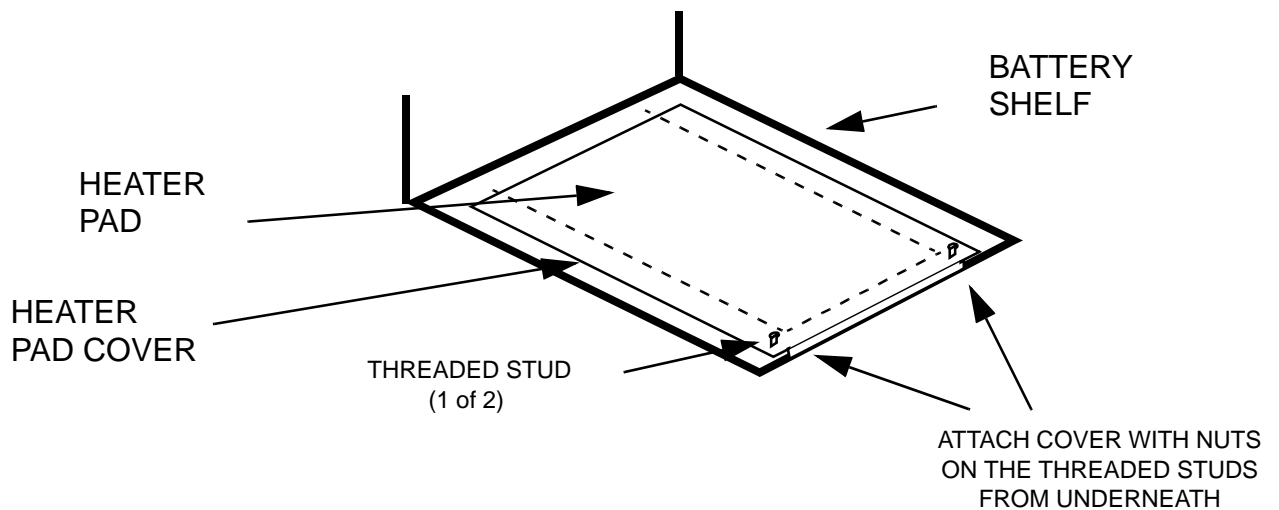
- 1 Slide the heater pad onto the battery shelf while routing the cable and the rear end of the heater pad down through the slot in the shelf and through the slot at the back of the module. Refer to the figures below.



Important! When performing the next step, ensure that the heater pad is correctly positioned inside the cavity of the cover so that no "pinching" of the heater pad occurs.

2 Place the metal cover over the heater pad and insert the two threaded studs through the holes in the battery shelf. Refer to the figure below.

3 Under the battery shelf, attach the cover plate with the nuts and washers provided. When performing this step on the lower battery shelf of a battery base module it is necessary to raise the inner frame somewhat to gain access to the threaded studs.



4 Repeat steps 1 through 3 for the second battery shelf

5 At the rear of the inner battery frame, slide the heater pads rearward and forward to ensure they are not pinched by the previously installed metal heater pad cover. The heater pads must be all the way forward after testing.

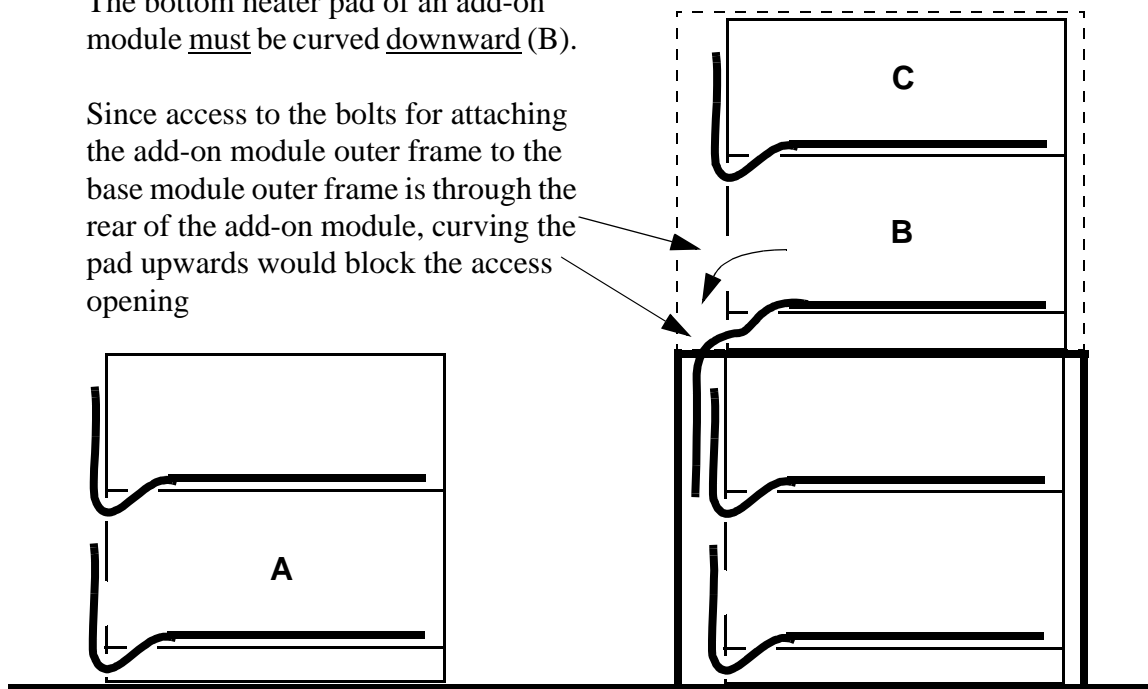
Important! When performing the next step, do not make sharp bends in the heater pad.

6 At the rear of the inner battery frame, curve the rear of the heater pads as shown in the figure below, and tape them to the rear of the module with electrical tape:

- A: For a battery base module curve *both* heater pads upwards and tape
- B: For an add-on battery module curve the bottom heater pad downward into the module below and tape.
- C: For an add-on battery module curve the top heater pad upward and tape.

The bottom heater pad of an add-on module must be curved downward (B).

Since access to the bolts for attaching the add-on module outer frame to the base module outer frame is through the rear of the add-on module, curving the pad upwards would block the access opening



7 If installing a first or second battery base module continue the installation on the next page.

If installing an add-on module with heater pads, skip to Install the battery module outer frame over the inner frame and attach the internal ground cables on Page A - 82 to continue the installation.

How to install the inner battery frame and level, anchor, and ground the first or second EZBFo battery base modules

- Overview** In this module the installer will perform the following procedures:.
- Attach the internal ground cable and install the inner battery frame into the outer battery frame
 - Attach the internal ground cable to the outer battery frame and level and anchor the completed battery base module
 - Attach the site grounding cable to the outer frame of the battery base module.

This module contains the following procedures:

<u>Remove the two piece battery retaining brackets, separating the two parts if applicable (Reference)</u>	A - 27
<u>Prepare the battery module inner frame and place it inside the outer frame and attach the internal ground cable</u>	A - 28
<u>Level and anchor the battery base module</u>	A - 32
<u>Connect the battery base module grounding cables</u>	A - 34

Remove the two piece battery retaining brackets, separating the two parts if applicable (Reference)

If the battery retaining brackets have not been previously removed from the battery shelves, refer to Remove the two piece battery retaining brackets, separating the two parts if applicable on Page A - 20 for instructions, and remove the retaining brackets at this time.

Prepare the battery module inner frame and place it inside the outer frame and attach the internal ground cable

Use the following procedure to prepare and place the battery module inner frame into the outer frame and attach the internal ground cable.

⚠ WARNING

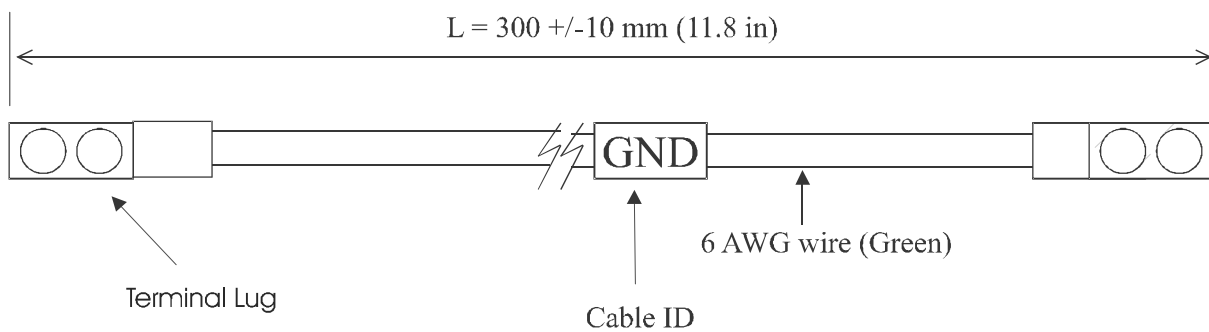
Personnel injury or equipment damage

When moving the battery module, use appropriate lifting devices and a sufficient number of personnel.

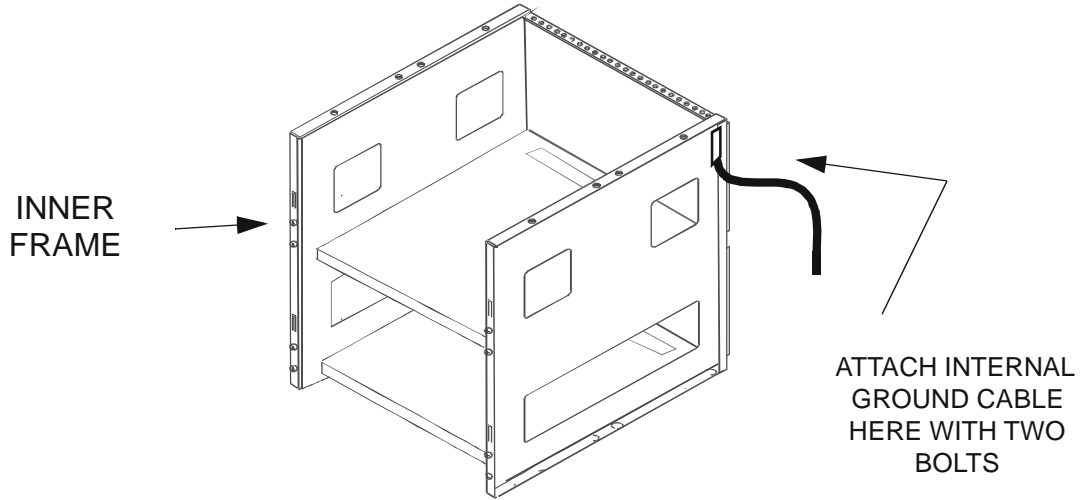
Important! The internal ground cable must be attached to the inner frame prior to installing it inside of the outer frame.

-
- 1 Locate the supplied 300 mm (11.8- inch) internal ground cable. Refer to the figures below.

INTERNAL GROUND CABLE

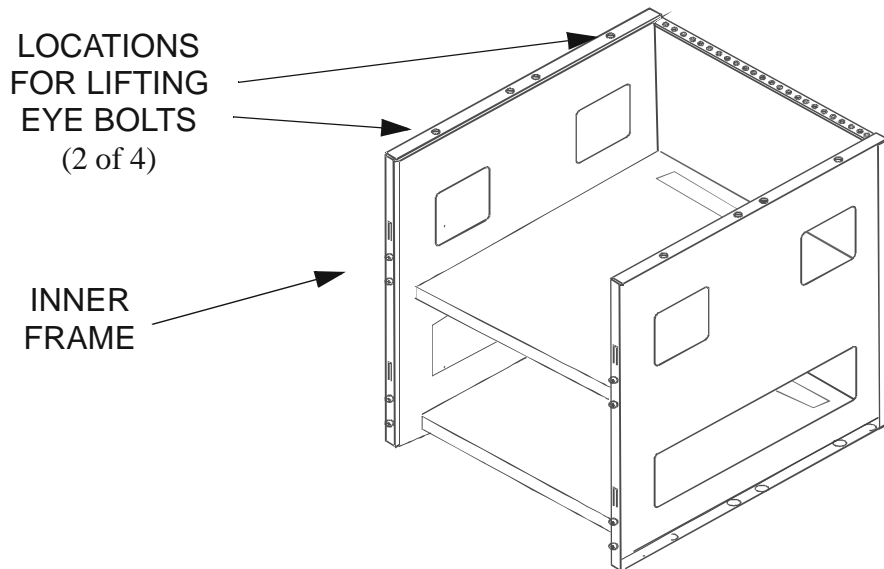


-
- 2 Attach one end of the supplied 300 mm (11.8- inch) internal ground cable to the inner frame using the bolts and washers provided. Refer to the figures below. Torque according to the table in Chapter 1.



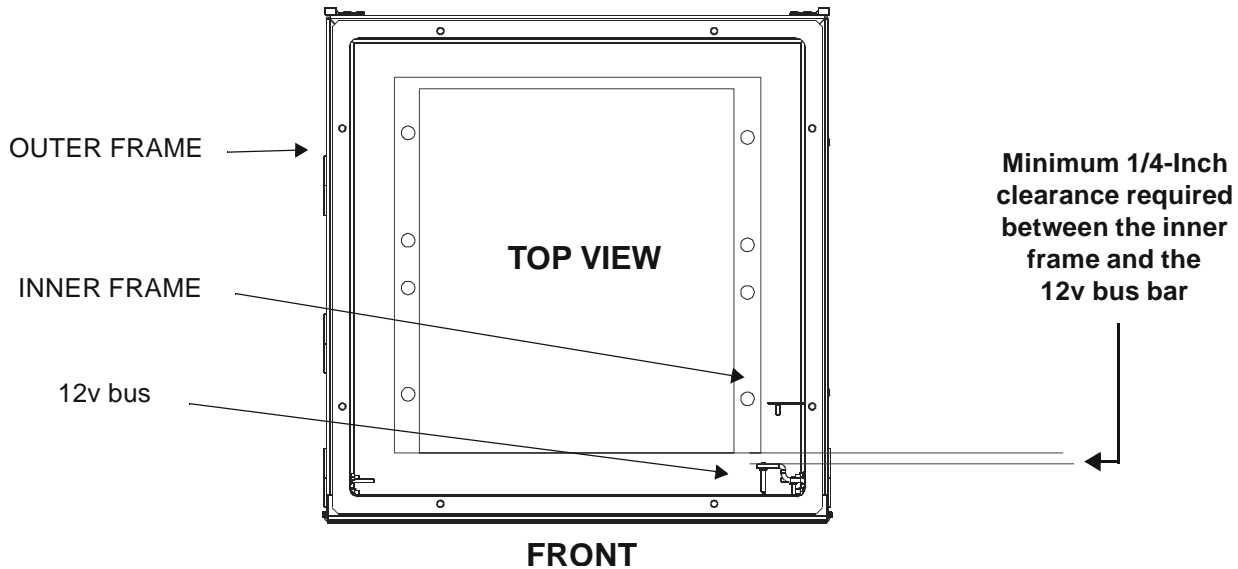
Important! Four lifting eyebolts are provided with the inner frame for use as lifting aids. They may be temporarily screwed into the top of the inner frame in the locations shown in the figure below.

-
- 3 Install the lifting eyebolts in the locations shown in the figure below.



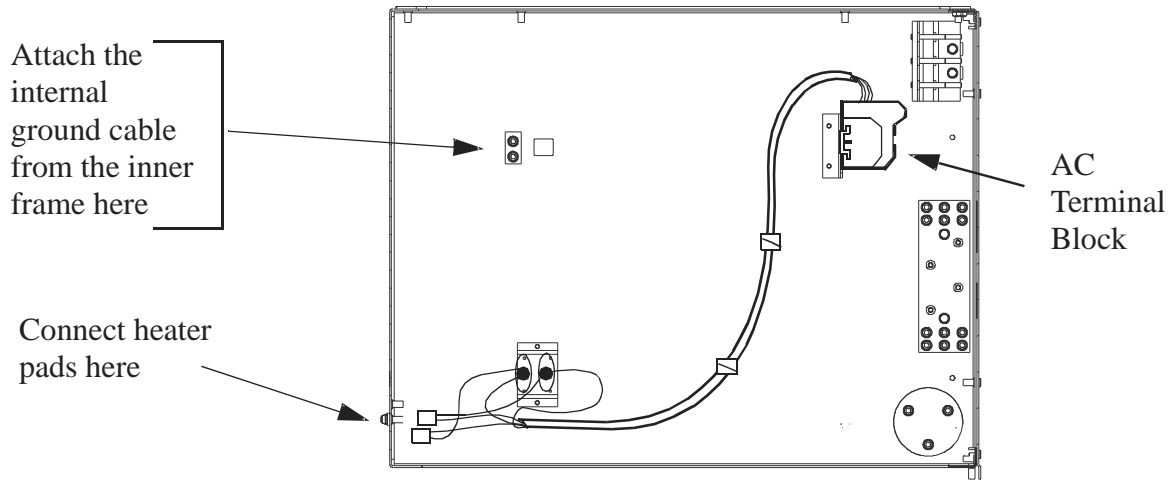
Important! When performing the next step, take great care not to damage the heater pads at the rear of the inner frame as it is lowered into the outer frame.

-
- 4 Place the battery base module inner frame into position inside the outer frame and over the anchor holes. **Observe the 1/4- inch clearance note.** Refer to the figure below.



-
- 5 Remove the lifting eye bolts.
-
- 6 Place the terminal lug of the internal ground cable from the inner frame on the two threaded studs on the inside right side frame of the battery module outer frame. Refer to the figure on Page A - 31.
-
- 7 Using the nuts and washers provided, attach the ground cable to the threaded studs. Torque according to the table in Chapter 1. Refer to the figure on Page A - 31.

8 Connect the heater pads to the AC connectors shown in the figure below.



Level and anchor the battery base module

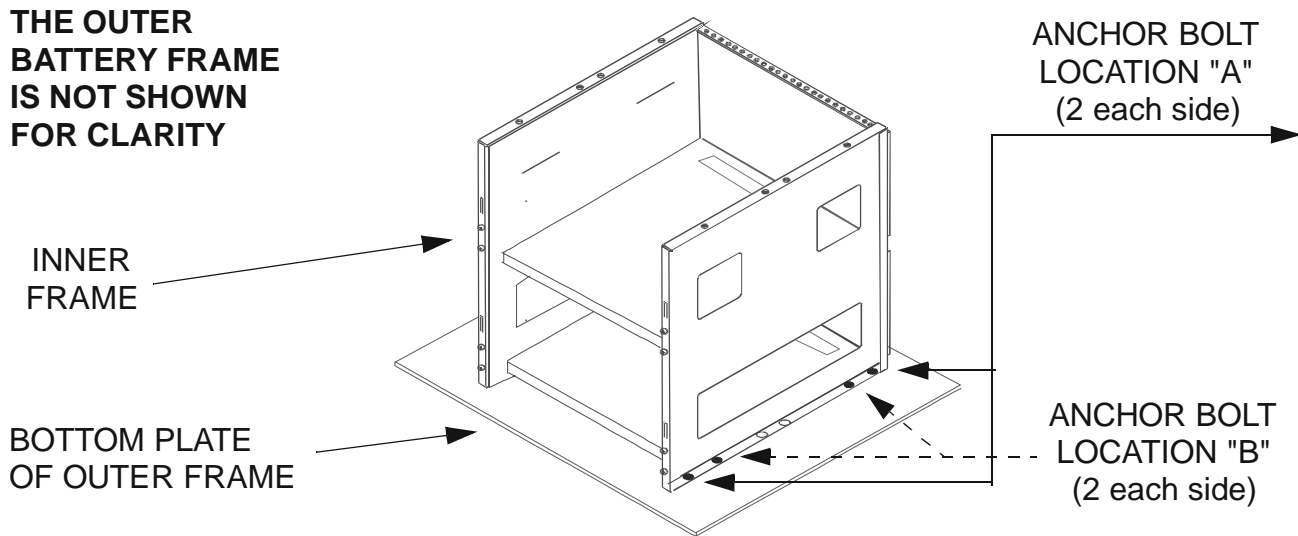
Important! If installing an add-on module, return to Attach the internal ground cable between the add-on module and the module below it on Page A - 83 to continue the installation.

Use the following procedure to level and anchor the battery base module and attach the internal ground cable.

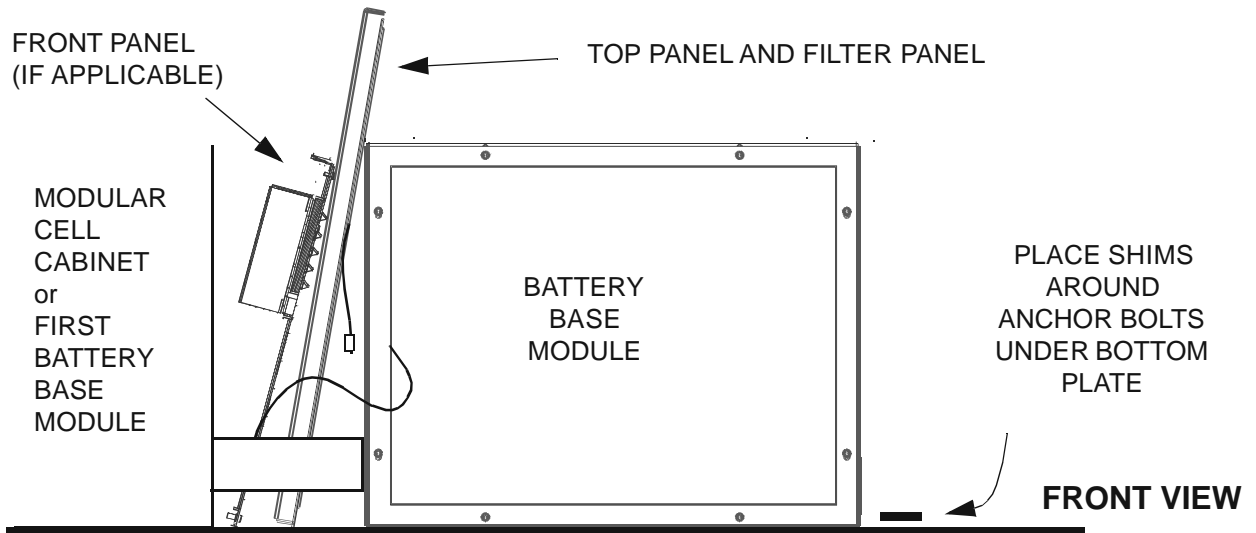
- 1 Align the battery base module inner frame and outer frame mounting holes with the anchor holes or anchors, as applicable.
 - Seismic Zones 0, 1, and 2: Over the four installed anchors
 - Seismic Zones 3 and 4: Over the eight installed anchors.

Important! When performing the next step, do not tighten the anchor bolts until the battery base module has been leveled in the following step.

-
- 2 Insert the four or eight anchor bolts, as applicable, with two washers each but leave loose. Refer to the figure below.



-
- 3** Level the battery module using shims under the bottom plate. Refer to the figure below.



-
- 4** Observe the minimum 1/4-inch clearance between the inner battery frame and the 12v bus. Refer to the figure on Page A - 30.

-
- 5** Tighten the anchor bolts to 18 ft.-lb (24 Nm).

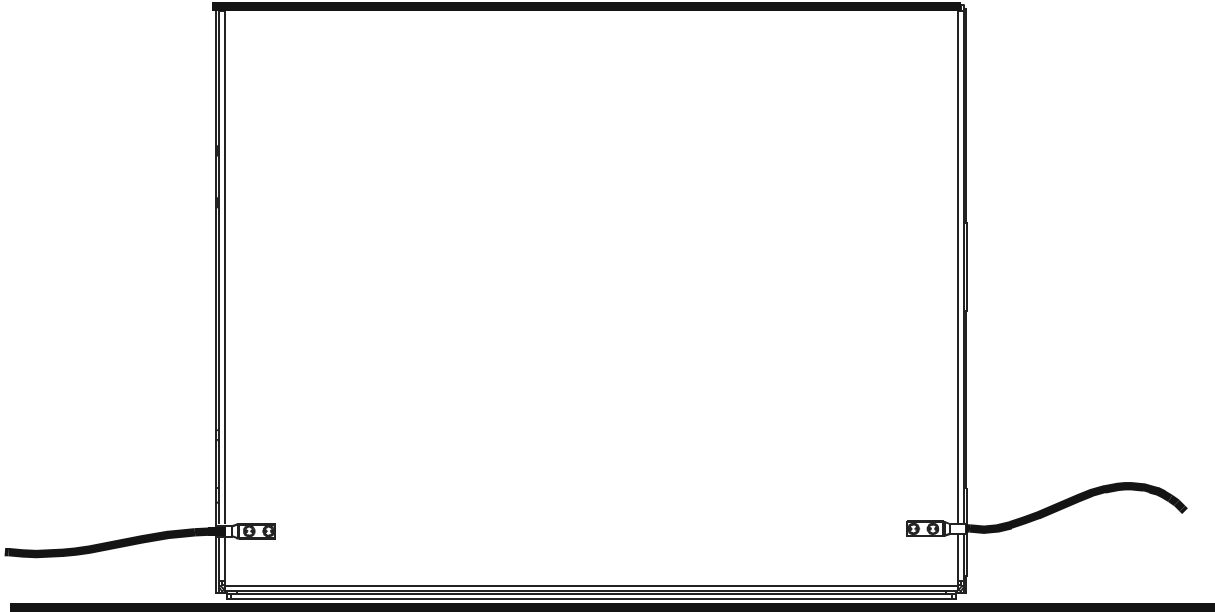
Connect the battery base module grounding cables

This procedure provides instructions for the installation of two # 2 AWG / 35-mm² battery base module grounding cables. The battery base module requires two grounding cables that connect the base module to the grounding system. The grounding cables are supplied as part of site preparation. The crimp lugs, with installation hardware, are supplied with the base module. Refer to the figure on Page A - 35. Perform the following steps to connect the battery base module grounding cables.

Important! This section describes the procedures for grounding of the first and second EZBFo battery base modules. Instructions for the subsequent internal grounding of stackable add-on battery modules on top of the battery base module are provided later in this appendix as part of the installation instructions. Batteries are also installed later in this appendix.

- 1 Prepare the grounding cables with sufficient length to reach from the grounding system to the rear of the battery base module. Leave approximately six inches of slack. Refer to the figure on Page A - 35.
- 2 Strip the battery base module end of both cables.
- 3 Remove the two double-hole terminal lugs from the shipping location on the bottom rear of the battery base module. Refer to the figure on Page A - 35.
- 4 Crimp a double-hole terminal lug onto the battery base module end of both cables.
- 5 Verify that the battery base module grounding lug locations are free of paint and polish if necessary.

-
- 6** Connect the grounding lugs to the battery base module using the provided hardware (antioxidant compound required). Refer to the figure below.



-
- 7** Torque according to the table in Chapter 1.
-
- 8** If installing a second battery base module skip to How to route and connect the signal cables from the first to the second battery base module on Page A - 105.

How to identify and route the cables from the Modular Cell cabinet to the first EZBFo battery base module

Overview

Purpose This section identifies and routes the cables necessary to interface the first EZBFo battery base module to the Modular Cell 4.0B cabinet. The installer will identify the correct ends of each cable to route, and route all cables from the from Modular Cell 4.0B cabinet to the EZBFo battery base module. A wiring overview is provided.

Instructions are given for right-hand (primary cabinet) installation. Left hand installation (4.0B Dual Band cabinet) is the same except for the routing of the cables into and through the 4.0B Dual Band cabinet. This alternate routing is provided.

Contents Step-by-step instructions are provided for the following tasks:

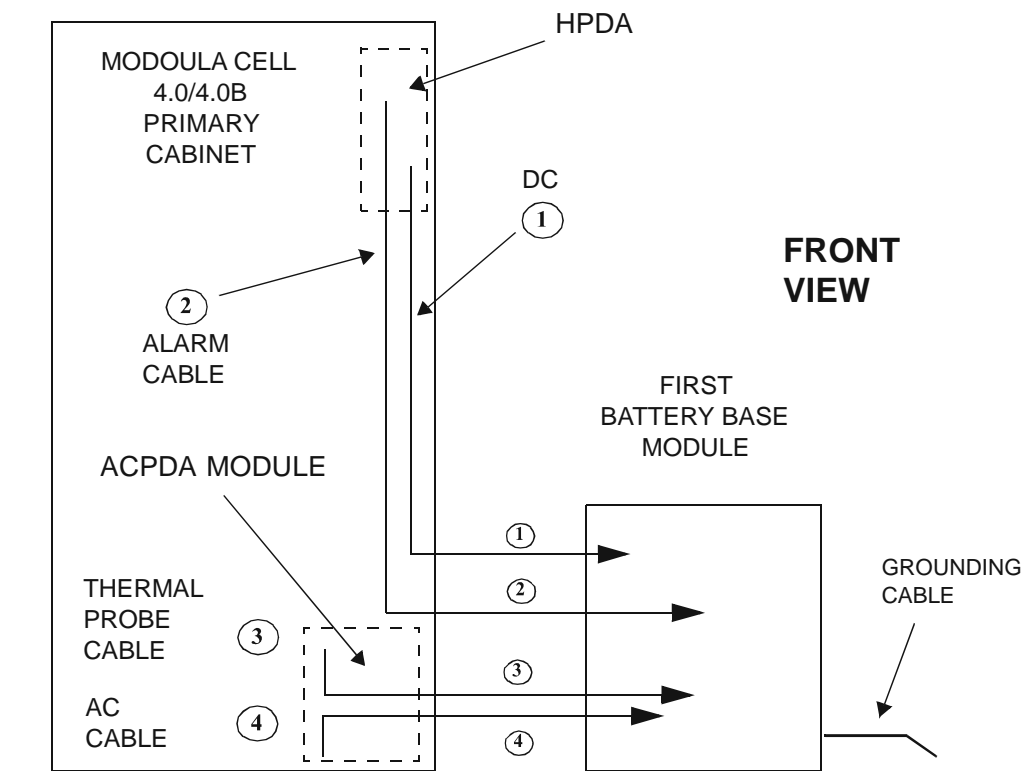
<u>Wiring overview</u>	A - 37
<u>How to identify the Modular Cell to first EZBFo battery base module cables</u>	A - 39
<u>How to identify the connectors and route the cables from the Modular Cell 4.0B cabinet to the first EZBFo battery base module</u>	A - 42

Wiring overview

Overview This module provides a overview of the DC wiring from the Modular Cell 4.0B cabinet to the first EZBFo battery base module, as well as the thermal probe, fuse, fan / power and intrusion alarm cables. Refer to the figure below (right side installation) or the figure on the next page (left side installation).

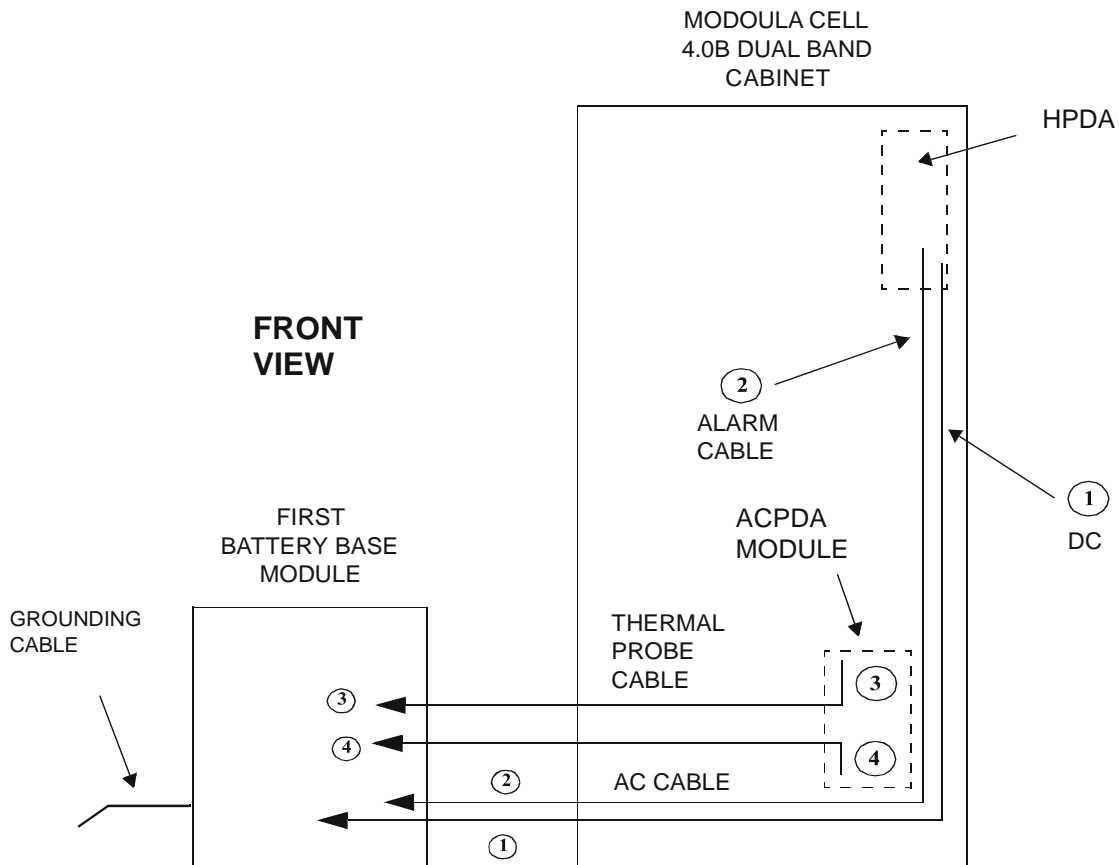
RIGHT SIDE INSTALLATION (FOR 4.0B PRIMARY CABINETS)

1. DC cables (four +24V DC load and four 24V Return) between the Modular Cell cabinet and the first EZBFo battery base module
2. Fuse, intrusion, fan power and alarm cable harness between the Modular Cell cabinet and the first EZBFo battery base module
3. Thermal probe cable between the Modular Cell cabinet and the first EZBFo battery base module
4. AC heater cable (3-wire) between the Modular Cell cabinet and the first EZBFo battery base module



**LEFT SIDE INSTALLATION
(FOR 4.0B DUAL BAND CABINETS)**

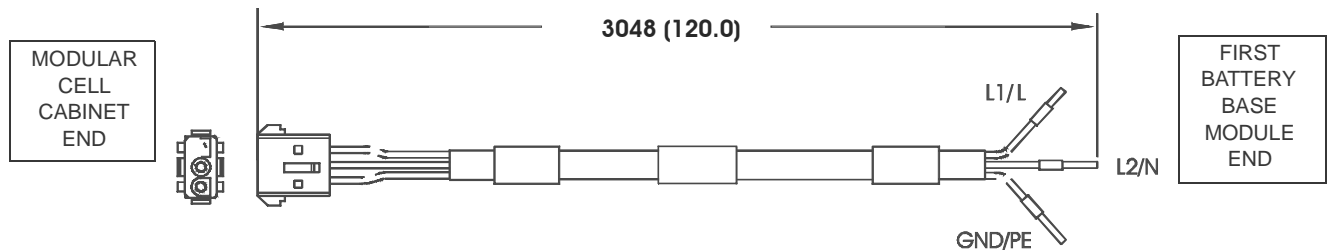
1. DC cables (four +24V DC load and four 24V Return) between the Modular Cell cabinet and the first EZBFo battery base module
2. Fuse, intrusion, fan power and alarm cable harness between the Modular Cell cabinet and the first EZBFo battery base module
3. Thermal probe cable between the Modular Cell cabinet and the first EZBFo battery base module
4. AC heater cable (3-wire) between the Modular Cell cabinet and the first EZBFo battery base module



How to identify the Modular Cell to first EZBFo battery base module cables

Identify the first EZBFo battery base module AC heater cable

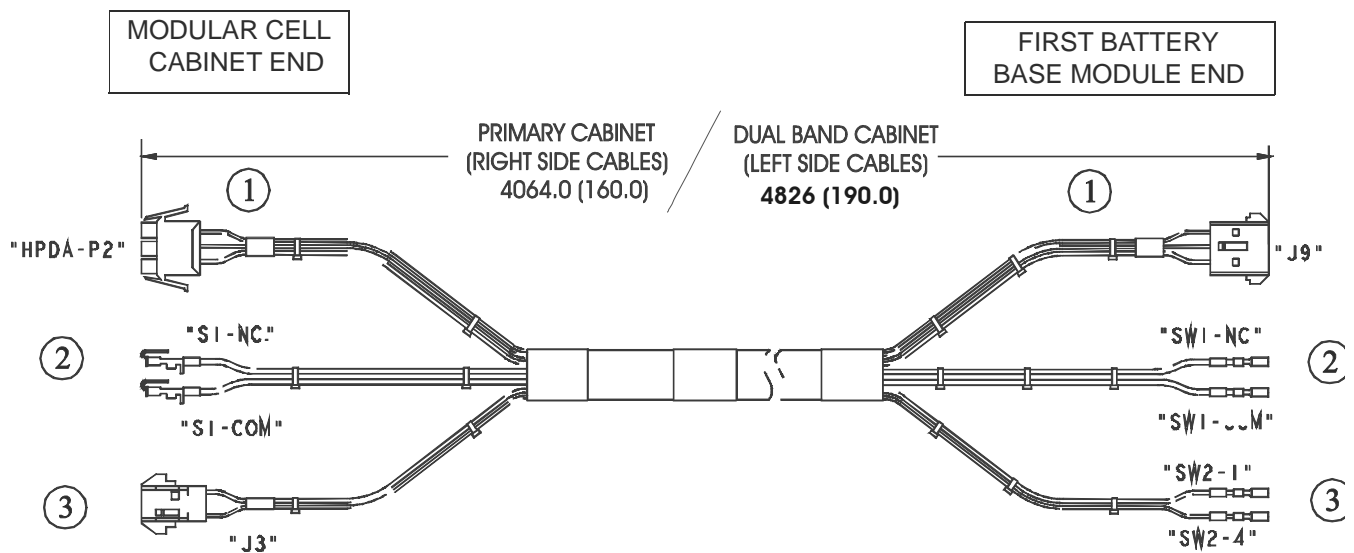
The first EZBFo battery base module AC heater cable is shown in the figure below:



Identify the first EZBFo battery base module alarm and fan power cable harness

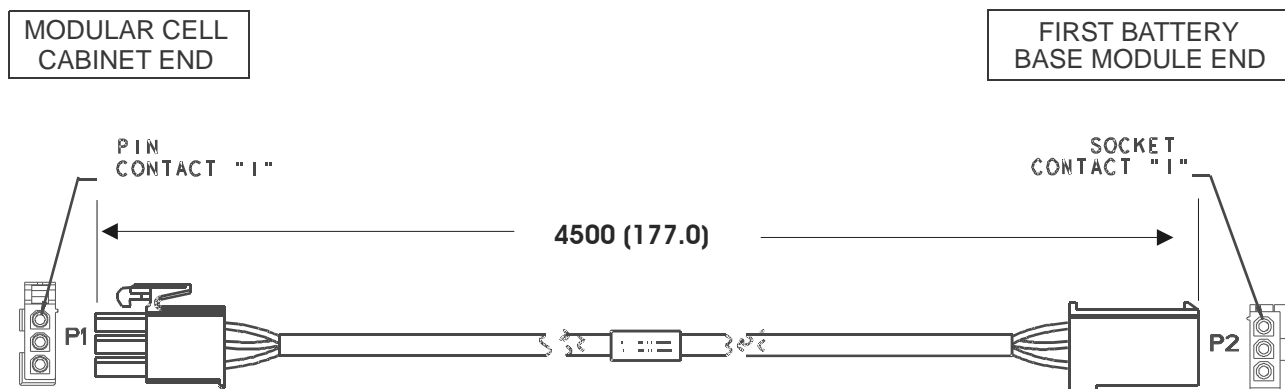
The first EZBFo battery base module alarm and fan power cable harness consists of the following cables combined in one harness. Refer to the figure below:

1. The fan power and alarm cable
2. The intrusion alarm cable
3. The fuse alarm cable



Identify the first EZBFo battery base module thermal probe cable(s) and thermal probe(s)

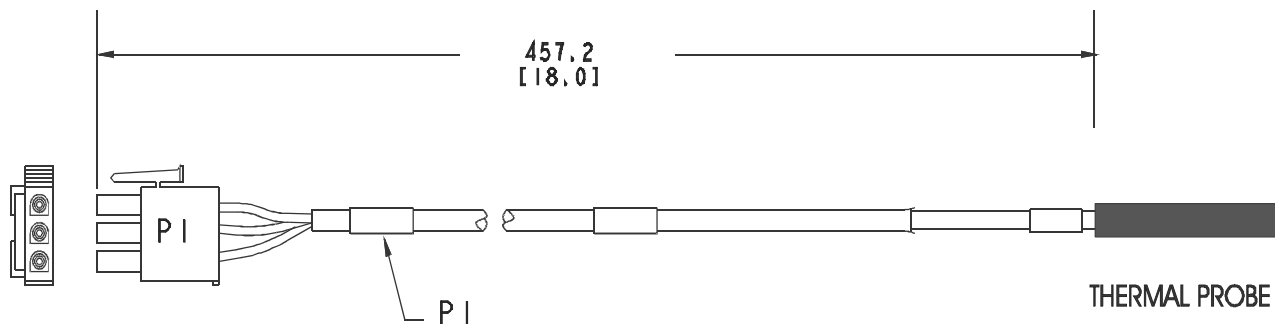
The first EZBFo battery base module thermal probe cables for use with 4.0B cabinets are shown in the figure below:



THERMAL PROBE CABLE FROM MODULAR CELL 4.0B

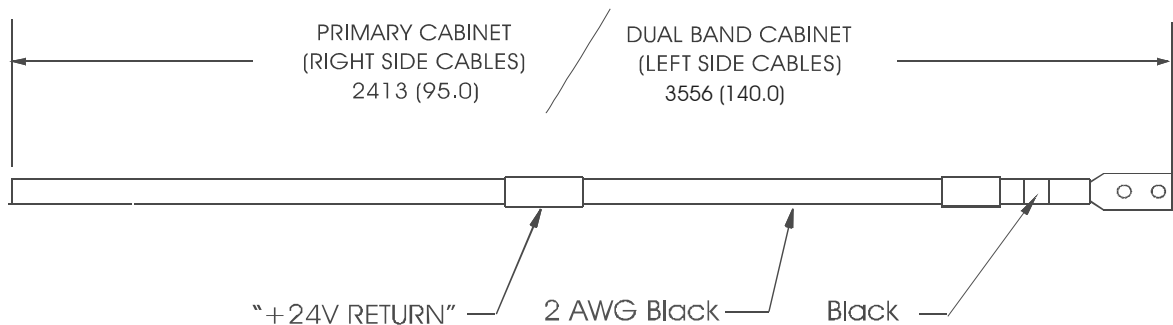
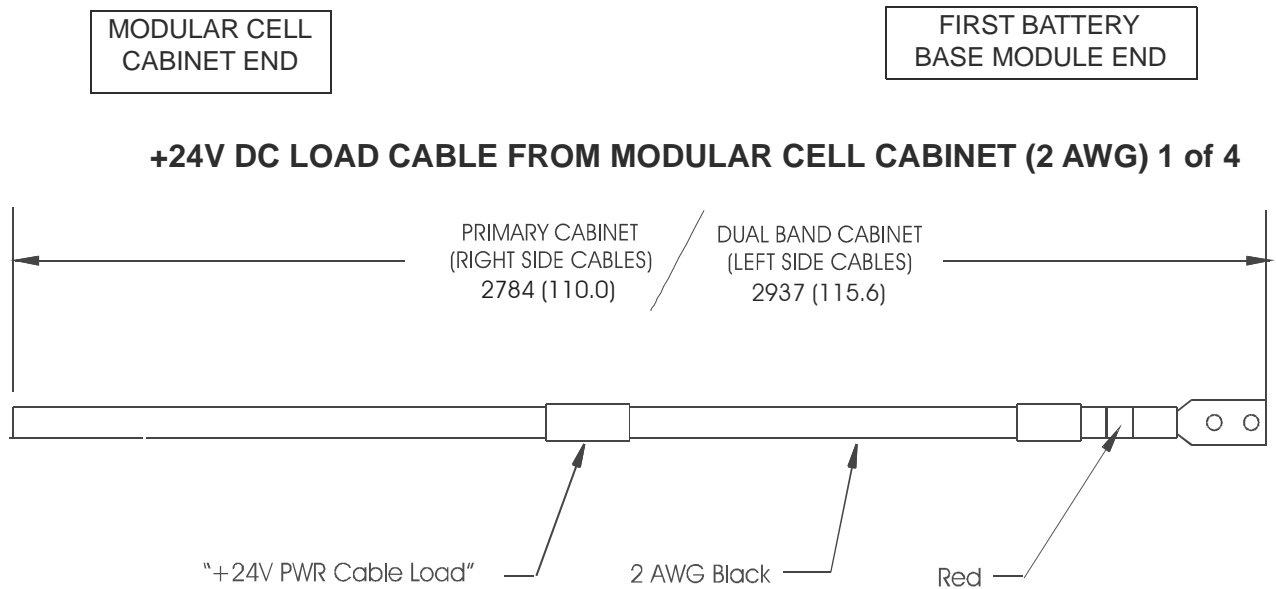
The thermal probe is shown in the figure below:

THERMAL PROBE CABLE IN EZBFo



Identify the first EZBFo battery base module 2 AWG DC cables

The first EZBFo battery base module 2 AWG DC cables are shown in the figure below. Lengths are given for use with both primary cabinets (right side installation) and dual band cabinets (left side installation, which are longer). Note that the four +24V DC load cables (marked red) are the longer of the eight cables.right side cables, but are the shorter of the eight left side cables.:



24V RETURN (RTN) DC CABLE FROM MODULAR CELL CABINET (2 AWG) 1 of 4

How to identify the connectors and route the cables from the Modular Cell 4.0B cabinet to the first EZBFo battery base module

Overview This module provides instructions for routing the first EZBFo battery base module cables from the Modular Cell 4.0B cabinet. The parts required are shipped separate from the EZBFo battery base module. Instructions are given for right-hand (primary cabinet) installation. Left hand installation (4.0B Dual Band cabinet) is the same except for the routing of the cables into and through the 4.0B Dual Band cabinet. Refer to the figure on Page A - 5. This alternate routing is provided.

Important! DC cables must be routed last. They will be routed and individually taped at the Modular Cell cabinet end but will not be connected in the Modular Cell cabinet at this time

<u>Identify the individual cable connectors and their terminations on each end</u>	A - 43
<u>Route the cables through the conduit into the first battery base module</u>	A - 45

Identify the individual cable connectors and their terminations on each end

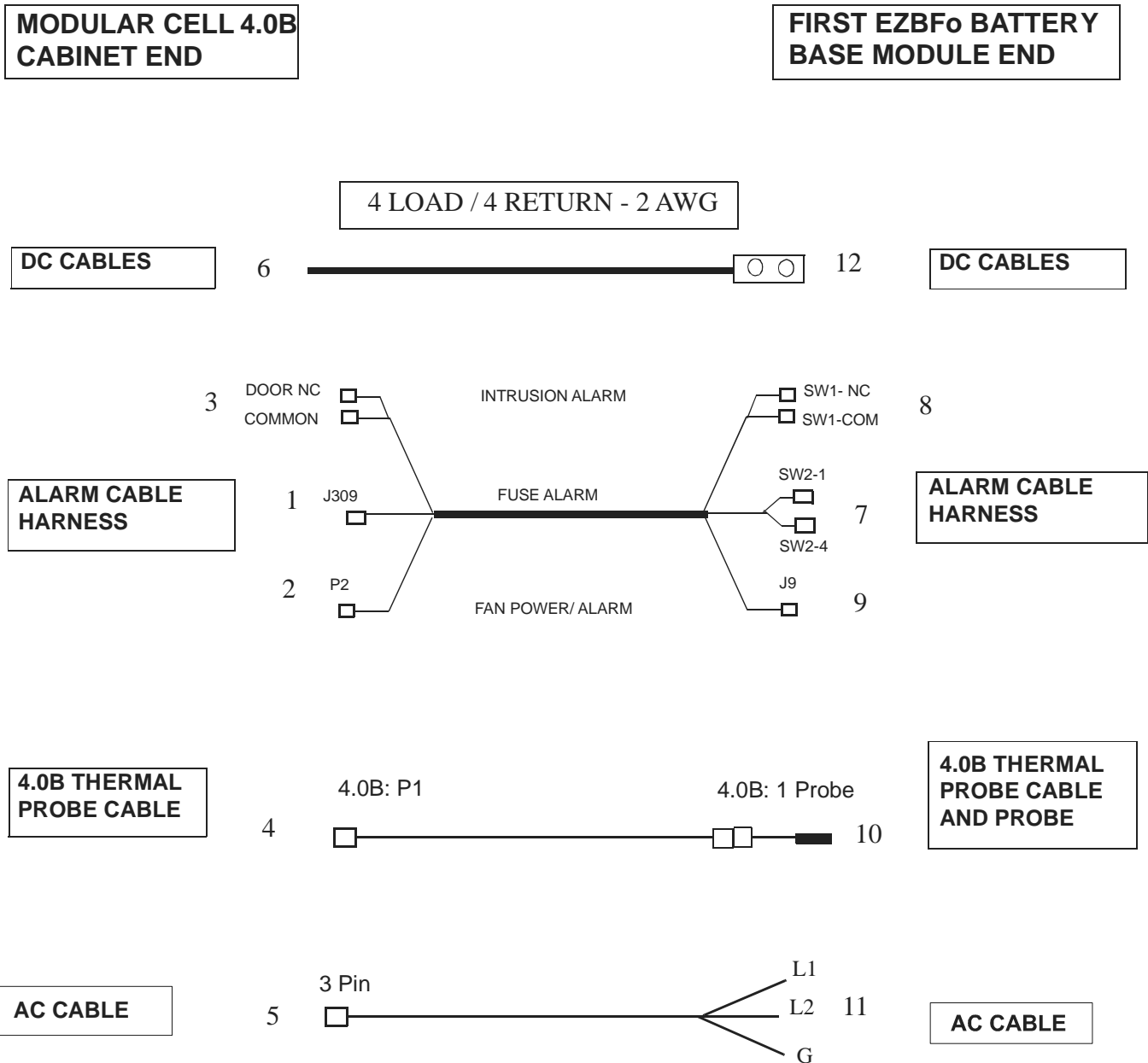
Identify the individual cable connectors on the Modular Cell cabinet end. Refer to the numbered list below and the figure on Page A - 44 for cable and connector identification.

1. The fuse alarm cable (J309)
2. The battery module fan power/alarm cable (P2)
3. The intrusion alarm cable (SW1-COM and SW1-NC)
4. 4.0B Thermal probe cable
5. The AC heater cable 3-Pin
6. The DC cables (four +24V load / four 24V Return, without terminal lugs) 2 AWG

Identify the individual cables/connectors on the first EZBFo battery base module end. Refer to the numbered list below and the figure on Page A - 44 for cable and connector identification.

7. The fuse alarm cable: Connectors SW2-1 and SW2-4
8. The intrusion alarm cable: Connectors "SW1-COM" and "SW1- NC"
9. The fan power/alarm cable: Connector "J9" (the fan power/alarm connector)
10. 4.0B Thermal probe cable with thermal probe
11. The AC heater cable (3 wire)
12. The DC cables (four +24V load / four 24V Return, with 2 hole terminal lugs) 2 AWG

MODULAR CELL TO EZBF₀ CABLES



Route the cables through the conduit into the first battery base module

Important! Routing of the alarm and thermal probe cables, as well as the AC cable, through the conduit from the Modular Cell 4.0B cabinet to the first battery base module must be accomplished prior to routing of the DC cables through the conduit. DC cables must be routed last and individually taped in the Modular Cell cabinet. No cables will be connected in the Modular Cell cabinet at this time

Perform the following steps to route the cables through the conduit into the first battery base module.

1 Route the correct end of the alarm cable harness through the conduit from the Modular Cell 4.0B cabinet to the first battery base module. Refer to the figure on Page A - 46 for the first battery base module end of the cables.

2 Route the correct end of the thermal probe cable through the conduit from the Modular Cell 4.0B cabinet to the battery base module.

3 Route the correct end of the AC cable through the conduit from the Modular Cell 4.0B cabinet to the first battery base module.

Important! When performing the next step leave sufficient length in the Modular Cell cabinet to reach the HPDA at the top right of the cabinet

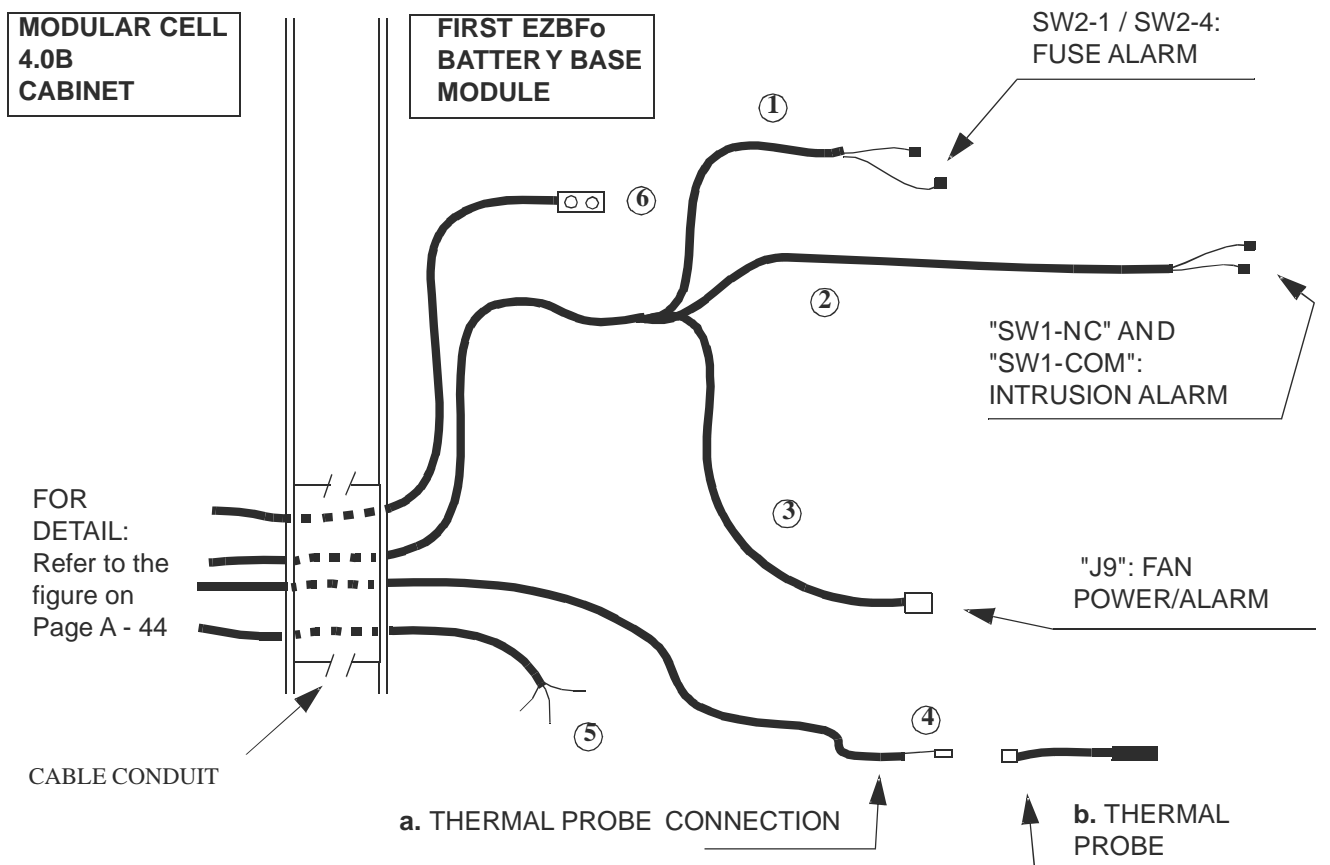
4 Route the correct ends of the eight DC cables through the conduit from the Modular Cell 4.0B cabinet to the first battery base module.

Important! The next step is absolutely necessary to prevent electrical shock and damage to equipment.

5 Individually tape the unterminated ends all eight of the DC cables inside the Modular Cell 4.0B cabinet

KEY

1. The fuse alarm cable: Connectors SW2-1 and SW2-4
2. The intrusion alarm cable: Connectors "SW1-COM" and "SW1-NC"
3. The fan power/alarm cable: Connector "J9" (the fan power/alarm connector)
4. The thermal probe cable
 - a. Thermal probe cable
 - One for first battery base module, when installed , to be moved to the second battery base module, when installed
 - b. Thermal probe ; the thermal probe is shipped unconnected
 - One for each connector on the thermal probe cable
5. The AC heater cable (3 wire)
6. The DC cables (four +24V DC load/ four 24V Return / with terminal lugs)



How to route and connect the cables in the first EZBFo battery base module

Overview

Purpose In this module the installer will perform the following procedures to route and connect the cables from the Modular Cell cabinet in the first EZBFo battery base module.

- Route and connect the signal cables in the first battery base module
- Route and connect the DC cables in the first battery base module
- Install and connect heater pads and AC wiring in the battery module

Instructions are given for right-hand (primary cabinet) installation. Left hand installation (4.0B Dual Band cabinet) is the same except for the routing of the cables into and through the 4.0B Dual Band cabinet. This alternate routing is provided.

Instructions for the subsequent installation of one or two stackable add-on battery modules on top of each battery base module are provided later in this appendix.

This section contains the following procedures:

Contents Step-by-step instructions are provided for the following tasks:

<u>How to connect the AC cable from the Modular Cell cabinet</u>	A - 48
<u>How to route and connect the signal cables in the first battery base module</u>	A - 51
<u>How to route and connect the DC cables in the first battery base module</u>	A - 57
<u>How to seal the cable conduit</u>	A - 62

How to connect the AC cable from the Modular Cell cabinet

Overview

<u>Route and connect the AC cable from the Modular Cell cabinet to the AC block in the battery base module</u>	A - 48
----------------------------------------------------------------------------------------------------------------	--------

Description of the AC wiring installation for the heater pads in the battery base module

The AC cable from the Modular Cell cabinet will be routed across the bottom front of the battery base module and connected to the AC terminal block that was previously installed as part of the AC heater kit.

Route and connect the AC cable from the Modular Cell cabinet to the AC block in the battery base module

Perform the following steps to route and connect the AC cable in the battery base module.

- 1 Route the AC cable from the conduit on the left side of the battery base module, across the bottom front of the module to the right side. Refer to the figure below.

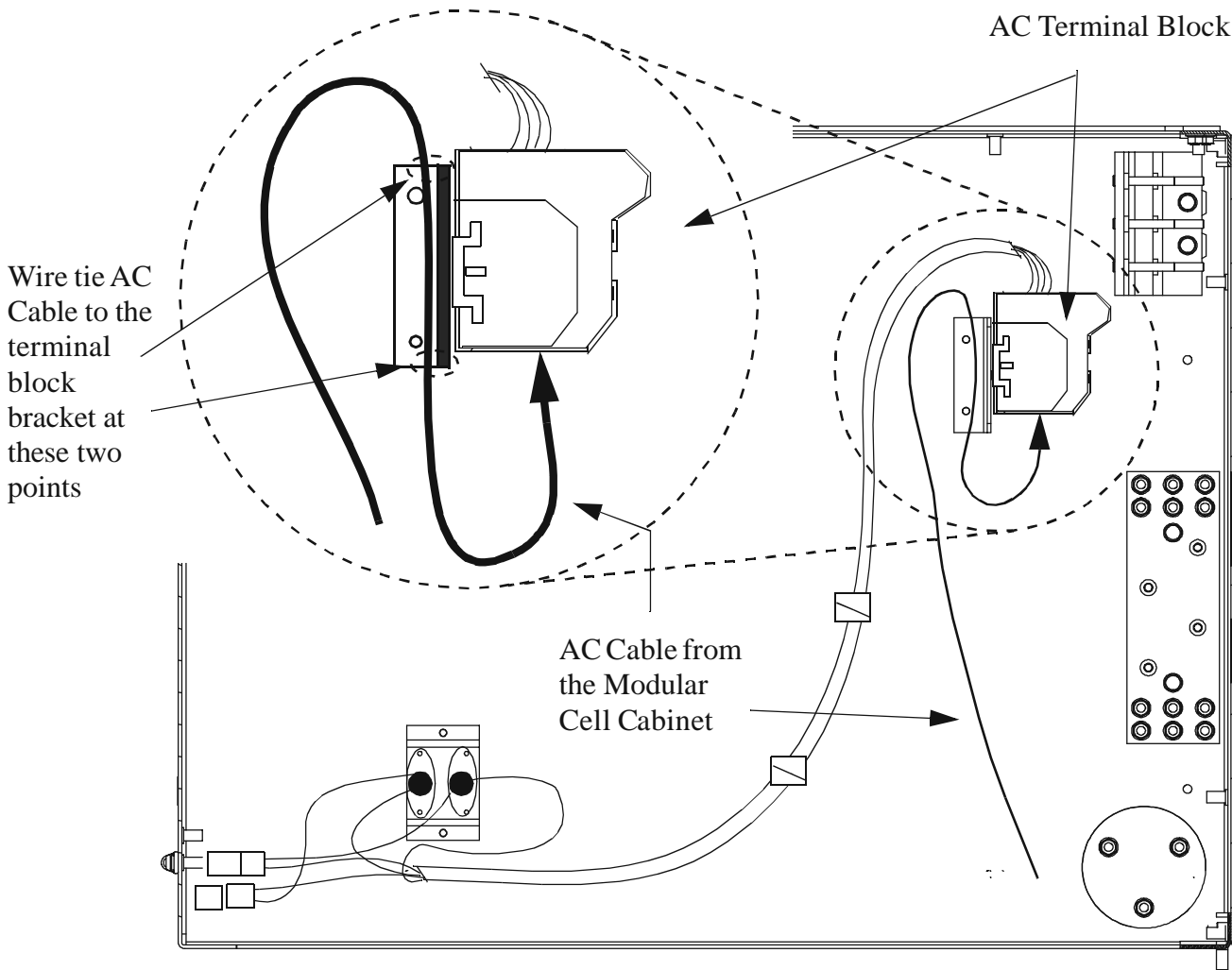


- 2 Position the cable against the inside front edge of the outer frame.
- 3 Dress the AC cable, and secure it to the inside front edge of the outer frame with wire ties, in such a way that:
 - It does not come into contact with DC cables
 - It does not interfere with the subsequent installation of batteries

- It does not interfere with the reinstallation of the front panel

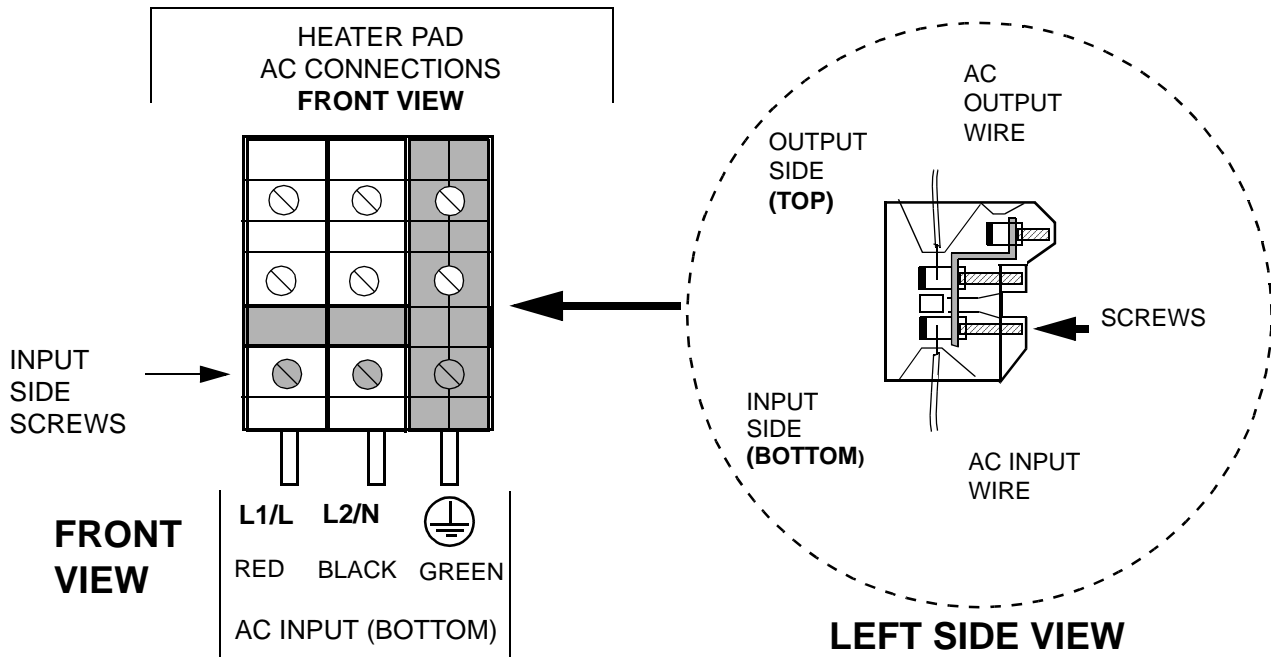
4 Route the AC cable up to the top of the AC terminal block mounting bracket and then down from the top as shown in the figure below.

5 Wire tie the cable to the mounting bracket in the two locations shown in the figure below.



6 Route the AC cable to the bottom of the AC block and cut it to the correct length, while leaving adequate slack. Refer to the figure on Page A - 49

-
- 7 Strip the individual wires to expose 5/8-inch.
-
- 8 Fully loosen the applicable input screws, and connect the AC input wires to the terminal block. Refer to the figure below for connection references.
-
- 9 Torque the screws to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.).
-



How to route and connect the signal cables in the first battery base module

Overview This procedure module provides instructions on how to route and connect the signal cables in the first battery base module. Instructions are given for right-hand (primary cabinet) installation. Left hand installation (4.0B Dual Band cabinet) is the same except for the routing of the cables into and through the 4.0B Dual Band cabinet. This alternate routing is provided.

Step-by-step instructions are provided for the following tasks:

<u>Install the fuse, the fuse alarm actuator and the fuse alarm switch in the first battery base module</u>	A - 52
<u>Route and attach the fuse alarm cable to the fuse alarm switch in the battery base module</u>	A - 53
<u>Route and attach the fan power and alarm cable in the battery base module</u>	A - 54
<u>Route and attach the intrusion alarm cable in the battery base module</u>	A - 55
<u>Route the thermal probe cable and mount the thermal probe in the battery base module</u>	A - 56

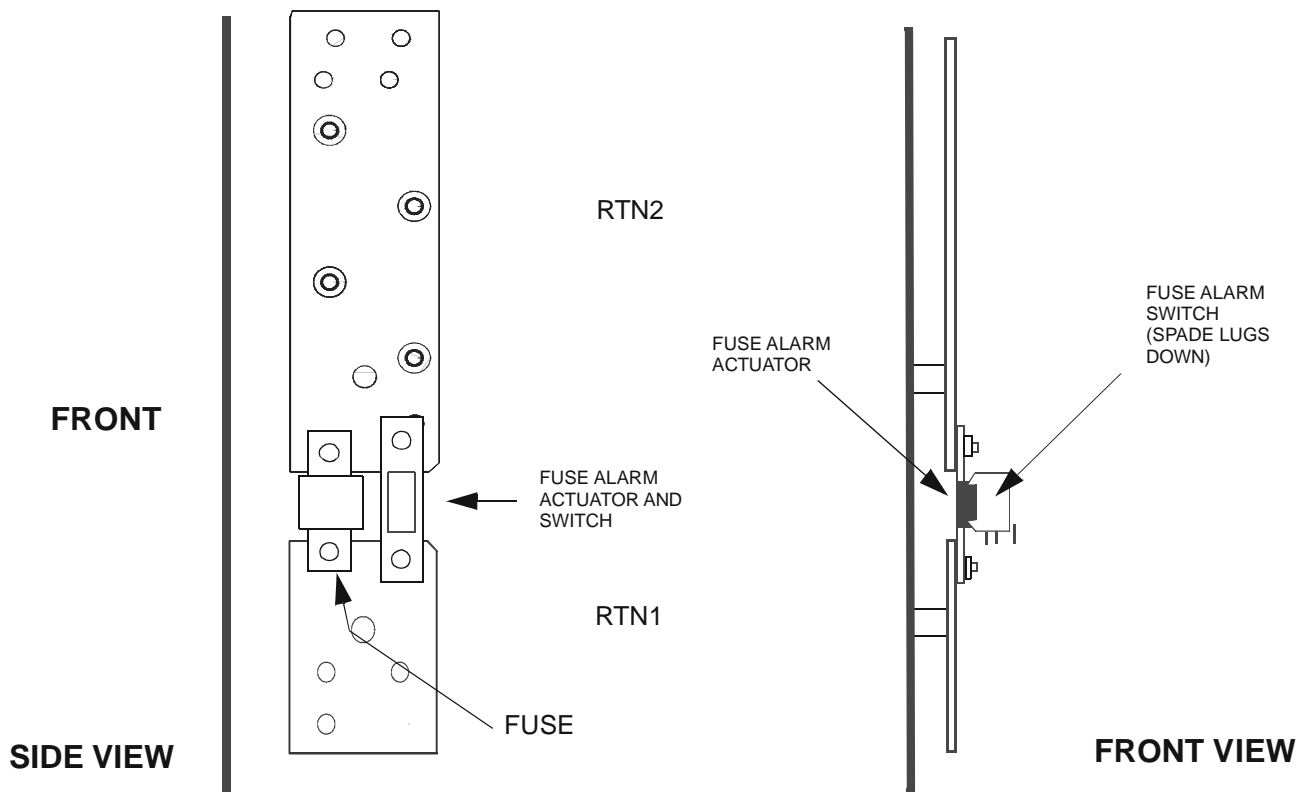
Description of heater pad and AC wiring installation in the battery base module

The fuse, fuse alarm actuator and switch will be installed on the return bus. The fuse alarm, fan power and alarm, intrusion alarm cables from the Modular Cell cabinet will be routed and connected. The thermal probe cable will be routed and the thermal probe placed.

Install the fuse, the fuse alarm actuator and the fuse alarm switch in the first battery base module

Perform the following steps to install the fuse, fuse alarm actuator and fuse alarm switch in the first battery base module. Use the hardware supplied on the bus bars.

- 1 Attach the fuse between the upper and lower return bus bars which are mounted on the inside front left side of the outer frame. Refer to the figure below. The fuse rating will vary depending upon the application.
- 2 Attach the fuse alarm actuator between the upper and lower return bus bars next to the fuse.
- 3 Mount the fuse alarm switch on the top of the actuator with the spade lugs pointing down.

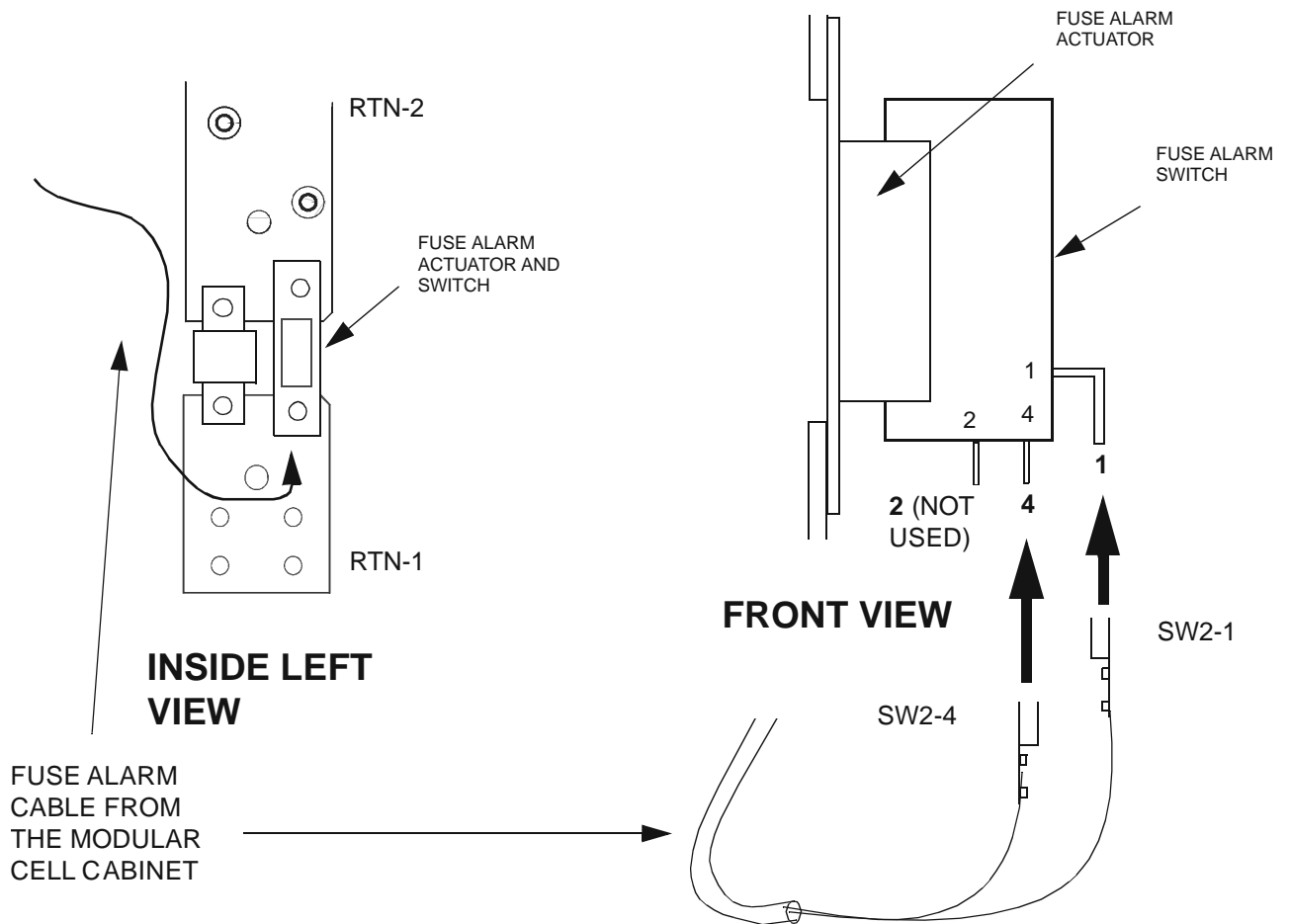


- 4 Torque all connections to 28Nm (250 in.-lb.).

Route and attach the fuse alarm cable to the fuse alarm switch in the battery base module

Refer to the figure below, and perform the following steps to route and attach the fuse alarm cable to the fuse alarm switch in the battery base module.

- 1 Refer to the figure below for an illustration of the connectors to be attached.
- 2 Connect the cable spade lugs to the fuse alarm switch as shown in the figure below: SW2-1 to lug 1 (COMMON) and SW2-4 to lug 4. (NO).
- 3 Route and dress the cable using the cable ties and self-stick anchors provided.

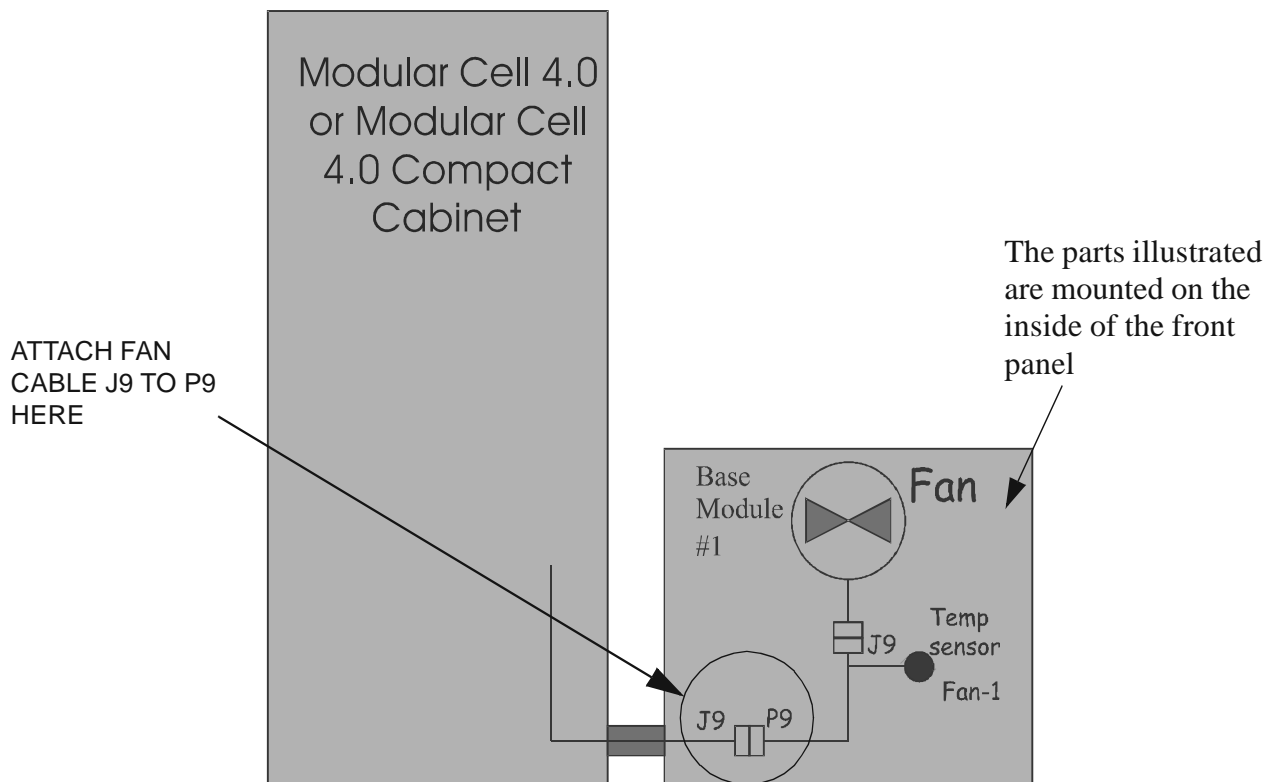


Route and attach the fan power and alarm cable in the battery base module

Important! The fan, temperature sensor, and cable are located on the front panel of the battery module. Therefore the front panel must be connected to the outer frame via the lanyard cable when connecting the fan power and alarm cable.

Refer to the figure below, and perform the following steps to route and attach the fan power and alarm cable in the battery base module.

- 1 Locate the fan power and alarm cable harness from the Modular Cell cabinet. Refer to the figure below
- 2 Connect J9 on the fan power and alarm cable harness to connector P9 at the fan unit on the front panel of the battery base module. Refer to the figure below.
- 3 Route and dress the cable using the cable ties and self-stick anchors provided. The slack allowed in the cable must be at least as long as the lanyard cable.

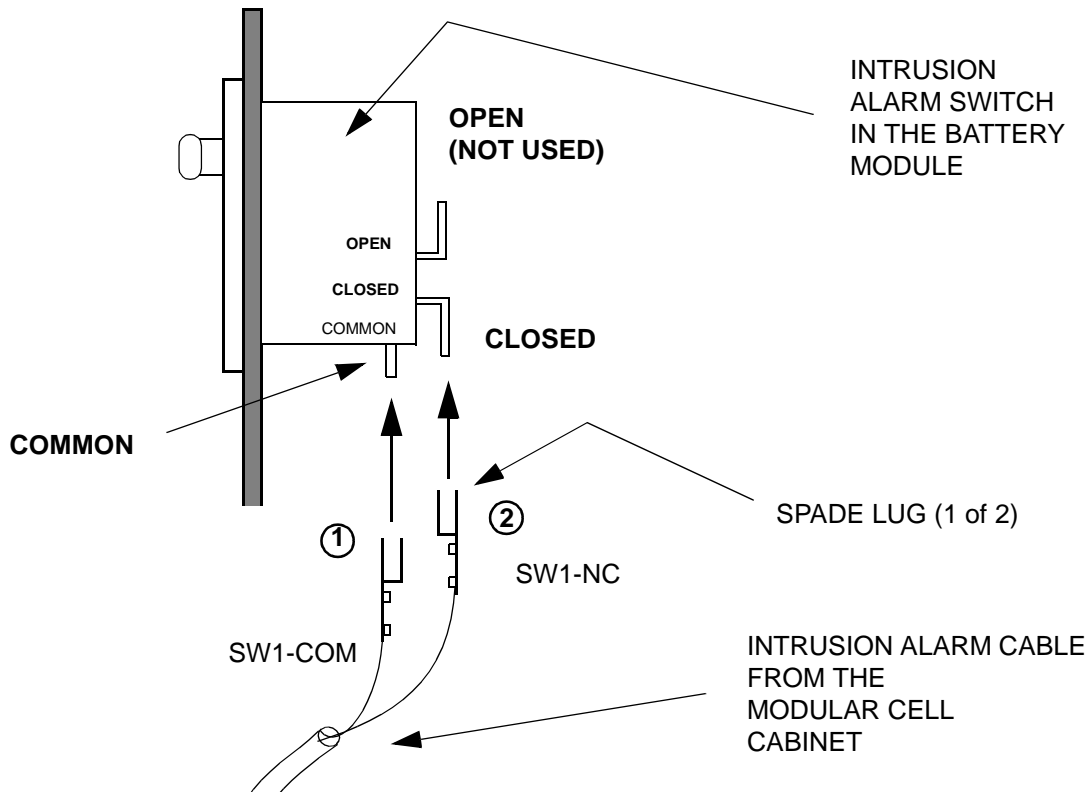


Route and attach the intrusion alarm cable in the battery base module

Refer to the figure below, and perform the following steps to route and attach the intrusion alarm cable in the battery base module.

Important! On battery modules that have a front door instead of a panel, the intrusion alarm switch is located at the bottom front, on the *opposite* side from the door hinge, either the left or right side, as applicable. Refer to the Step 3 figure on page A - 10

- 1 Locate the alarm cable harness from the Modular Cell cabinet and the double spade lugs marked SW1- NC and SW1-Com. Connect the SW1-COM spade lug to the COMMON connector on the intrusion alarm switch as shown in the figure below, item 1.
- 2 Connect the SW1- NC spade lug to the CLOSED connector on the intrusion alarm switch as shown in the figure below, item 2.
- 3 Route and dress the cable using the cable ties and self-stick anchors provided.



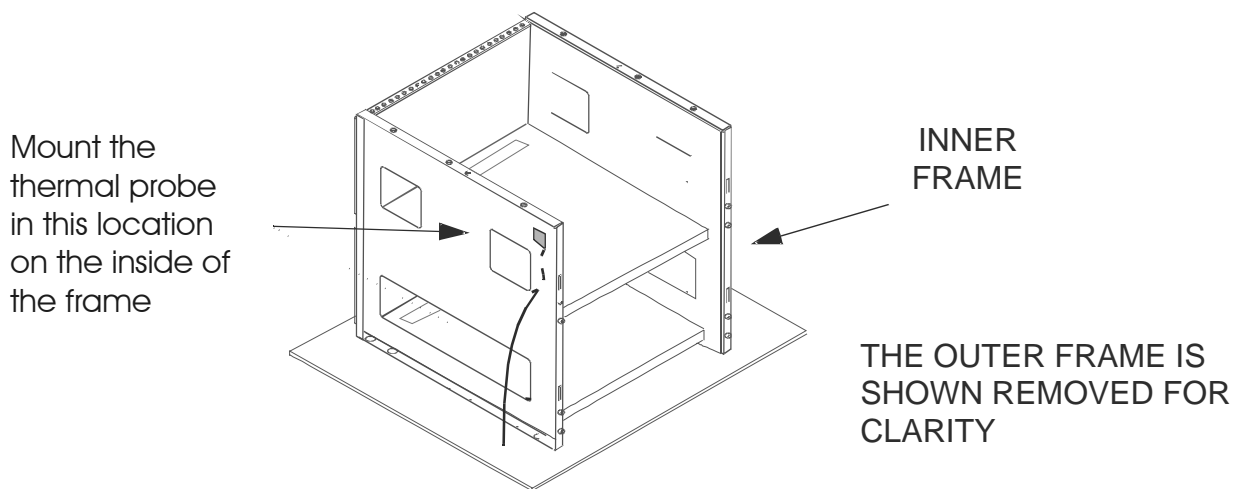
Route the thermal probe cable and mount the thermal probe in the battery base module

Perform the following steps to route the thermal probe cable and mount the thermal probe in the battery base module.

-
- 1 Locate the thermal probe cable from the Modular Cell cabinet. This cable has a connector for connection of an internal thermal probe. Attach the internal thermal probe to the connectors.

Important! Note that the internal thermal probe cable is made long enough for other applications. Therefore, excess cable should be properly dressed.

-
- 2 Route the thermal probe cable from the outer frame into the inner frame on the left side. Using the self-stick mounting bracket and wire tie, attach the thermal probe in the location inside the frame shown in the figure below.



Important! The thermal probe will be moved up to the top add-on module as subsequently installed.

How to route and connect the DC cables in the first battery base module

Overview **Important!** DC cables must be individually taped in the Modular Cell cabinet at this time

This procedure module provides instructions for the routing and connection of the eight 2 AWG DC power cables (four +24V DC load and four 24V Return) from the Modular Cell cabinet, in the first EZBFo battery base module.

Step-by-step instructions are provided for the following tasks

<u>Route and connect the four +24V DC load cables in the battery base module</u>	A - 58
<u>Route and connect the four 24V Return cables in the battery base module</u>	A - 60

Description of DC power cable routing and connection

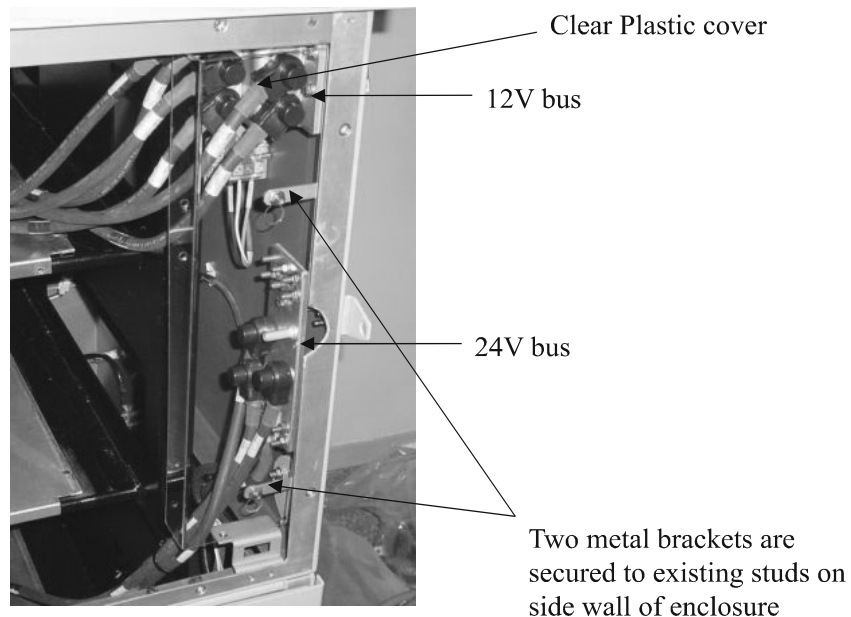
The first battery base module requires eight 2 AWG DC power cables from the Modular Cell cabinet: Four +24V DC load cables (+) and four 24V Return cables (-). These cables are terminated with two hole terminal lugs on the first battery base module end and unterminated on the Modular Cell end.

Route and connect the four +24V DC load cables in the battery base module

Perform the following steps to route and connect the four +24V DC load cables in the battery base module.

Important! Before performing the following step be sure that the unterminated ends (Modular Cell ends) are individually taped.

- 1 Lay out the four +24V DC load cables across the bottom front of the battery base module to reach the load bus (Marked “24V”) located inside the outer frame on the right side. Refer to the figure on Page A - 59.
- 2 Remove the plastic cover that shields the 12V and 24V bus bars. Refer to the figure below. Do not replace the cover until instructed later.

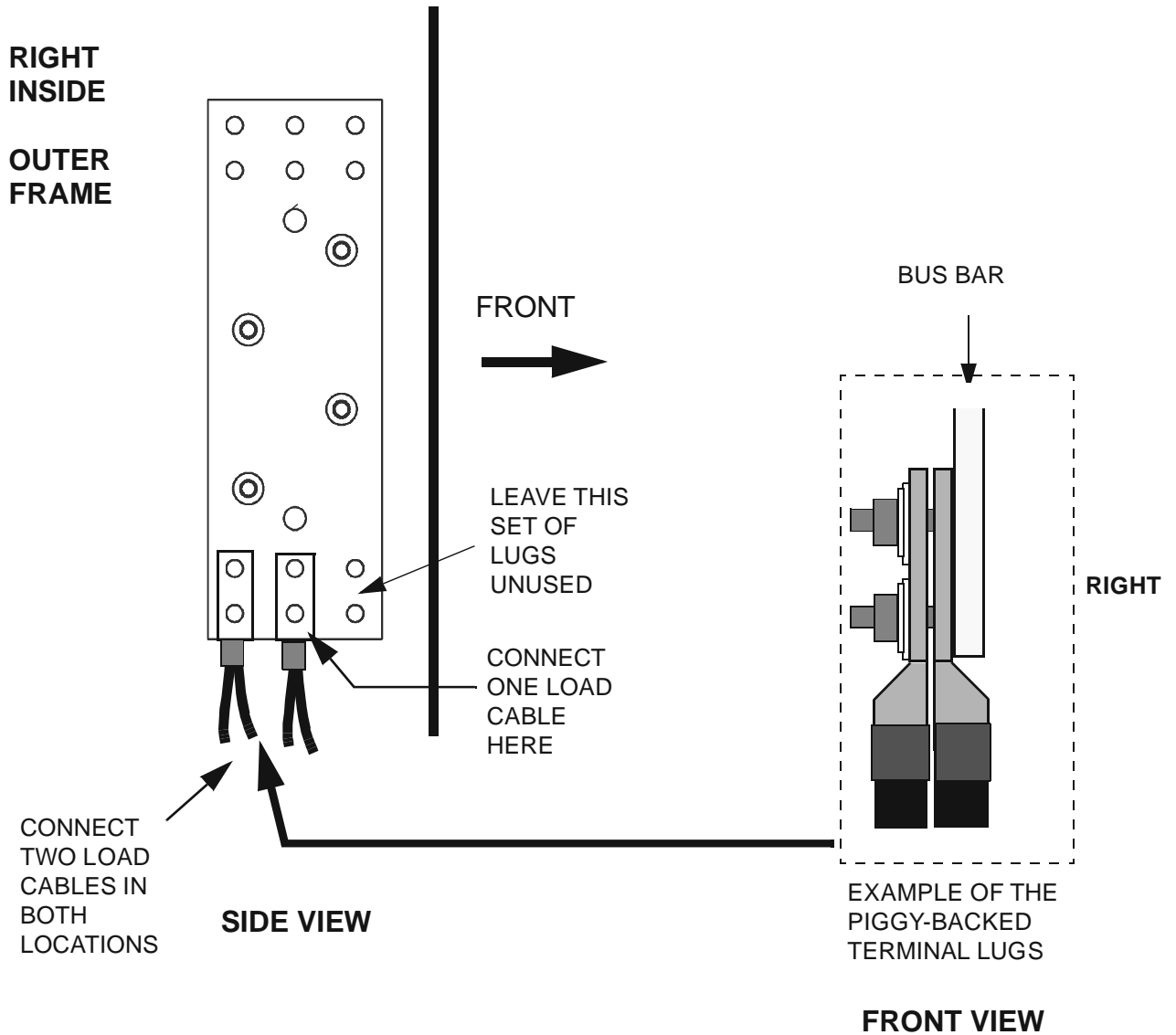


Covers are easily installed on existing EZBFo modules in the field and are standard on modules with a front door.

- 3 Remove the nuts from the specific load bus bar locations. Refer to the figure on Page A - 59.

4 Using antioxidant compound, place the terminal lugs of the four load cables on the threaded studs in the locations shown, two piggy-backed on both sets of studs. Refer to the figure below.

5 Replace the nuts and torque all connections to 28Nm (250 in.-lb.).



Route and connect the four 24V Return cables in the battery base module

Perform the following steps to route and connect the four 24V Return cables in the battery base module.

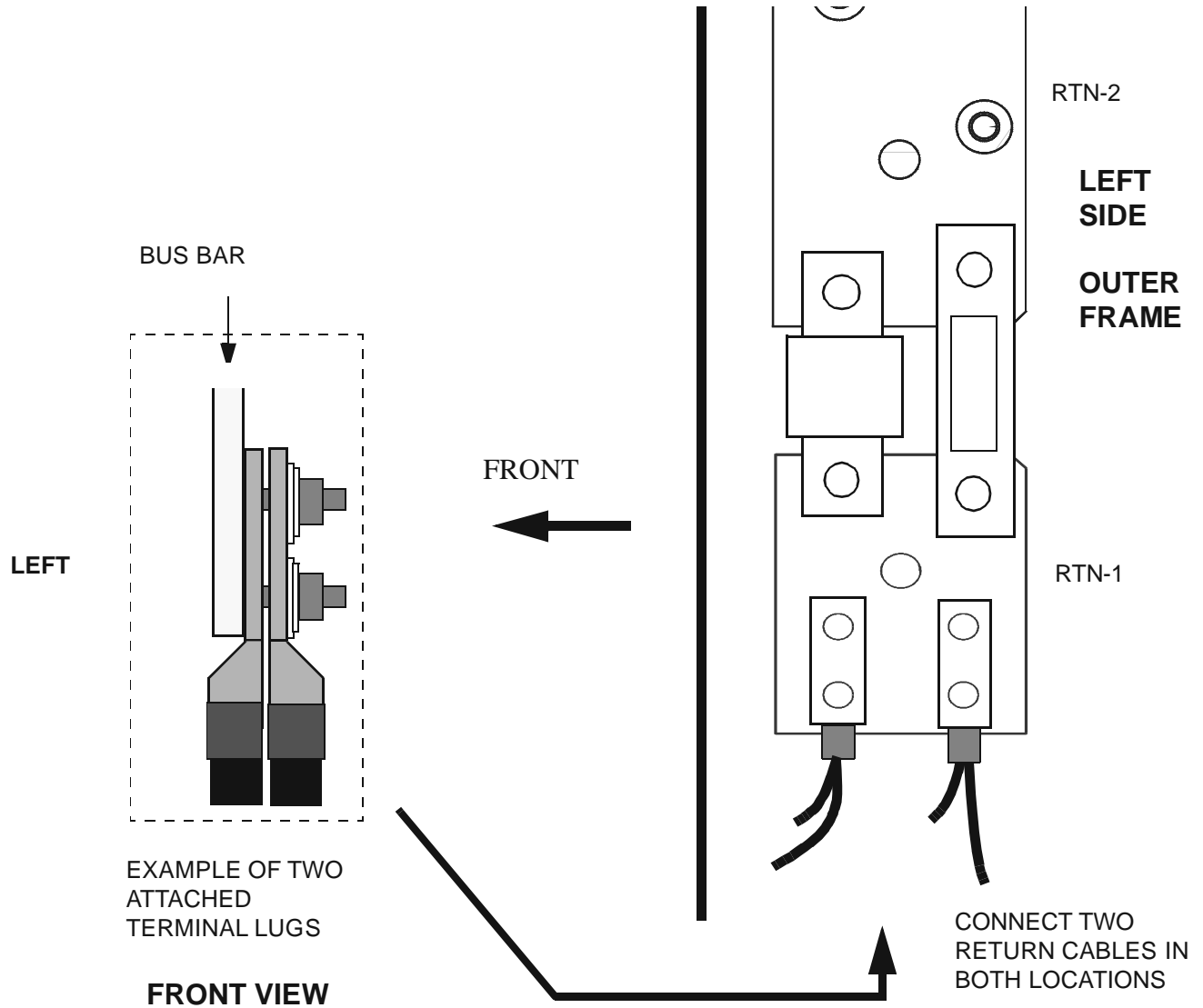
Important! Before performing the following step be sure that the unterminated ends (Modular Cell ends) are individually taped.

-
- 1** Lay out the four 24V Return cables in the battery base module to reach the 24V Return bus (Marked “RTN-1) located inside the outer frame on the left side. Refer to the figure on Page A - 61.

 - 2** Remove the nuts from the specific RTN bus bar locations. Refer to the figure on Page A - 61.

 - 3** Using antioxidant compound, place the four load cables on the threaded studs in the locations shown, two piggy-backed on both sets of studs. Refer to the figure on Page A - 61

- 4 Replace the nuts and torque all connections 28Nm (250 in.-lb.).



How to seal the cable conduit

Overview This procedure module provides instructions for the sealing of the cable conduit at the first EZBFo battery base module and the Modular Cell 4.0B cabinet ends.

Step-by-step instructions are provided for the following task

<u>Seal both ends of the cable conduit inside of the first battery base module.</u>	A - 63
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Description of cable conduit sealing

Both ends of the cable conduit must be sealed with electrical duct seal to prevent air from passing between the Modular Cell cabinet and the EZBFo battery base module.