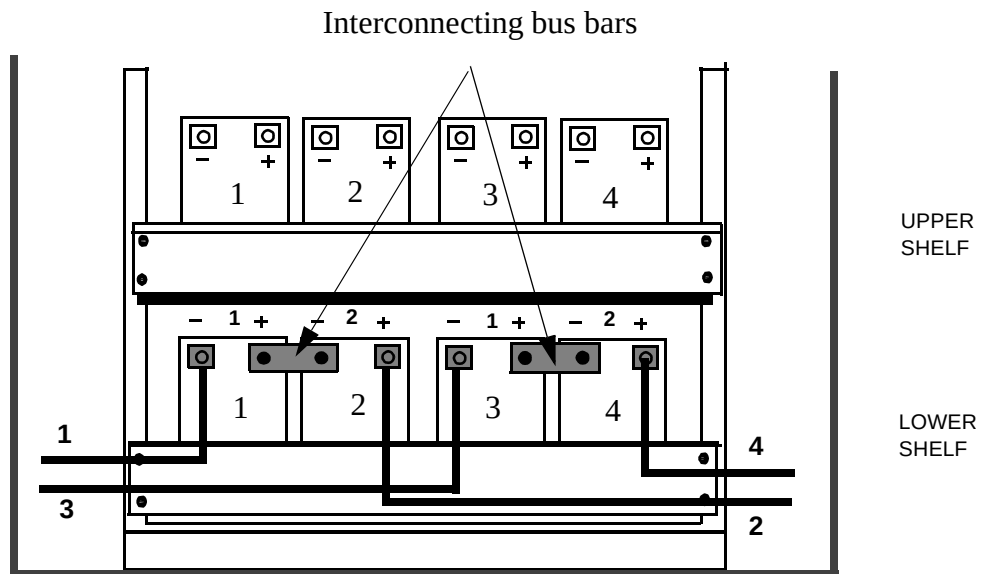


-
- 6** Connect the interconnecting bus bar using the previously removed attaching hardware. Refer to the figure below.



-
- 7** Torque the two bus bar connections using the torque value provided on the battery label. Do not use the torque specifications provided in Chapter 1.
-
- 8** Repeat Steps 1 through 7 for the remaining battery strings.
-
- 9** Skip to [How to make final DC connections](#) on Page A - 140 to continue the installation

How to install 12IR25 batteries in the EZBFo battery modules

Overview This procedure module provides instructions for the installation of 12IR125 batteries.

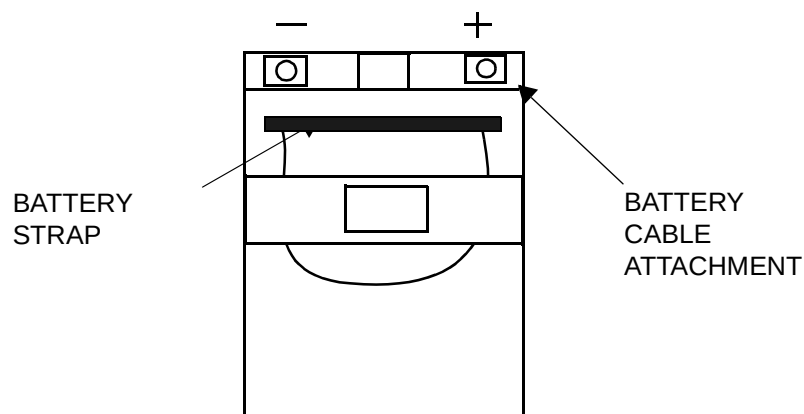
Important! The battery cables will be connected to the batteries and the batteries will be installed on the shelves in this section. The battery cables must not be connected to the bus bars until later. Refer to [How to make final DC connections](#) on Page A - 140.

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

Separate and remove the two piece battery retaining brackets	A - 135
Connect the battery cables to the batteries	A - 136
Place the batteries on the shelves, and replace the retaining brackets	A - 138

Description of typical batteries

The 12IR125 battery terminals are located on the front end of the battery, as well as on the side. The front terminals will be used for EZBFo installation. Positive and negative terminals are clearly labeled "+" and "-". Dual strap handles are permanently attached to the battery along its top. An example 12IR125 battery is shown in the figure below.



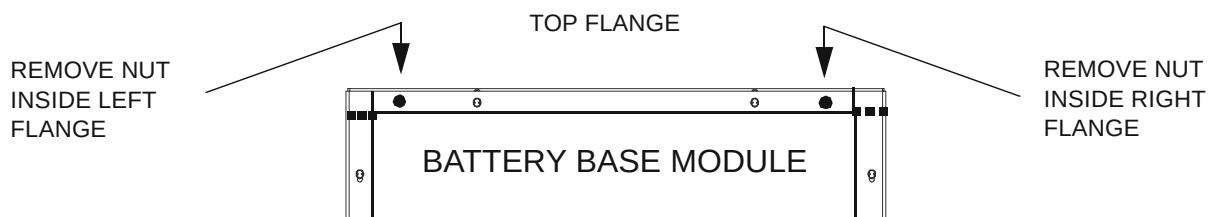
Separate and remove the two piece battery retaining brackets

If they have not been previously removed, use the following procedure to separate and remove the two piece battery retaining brackets.

-
- 1 Check and record battery initial voltages and all battery date codes.

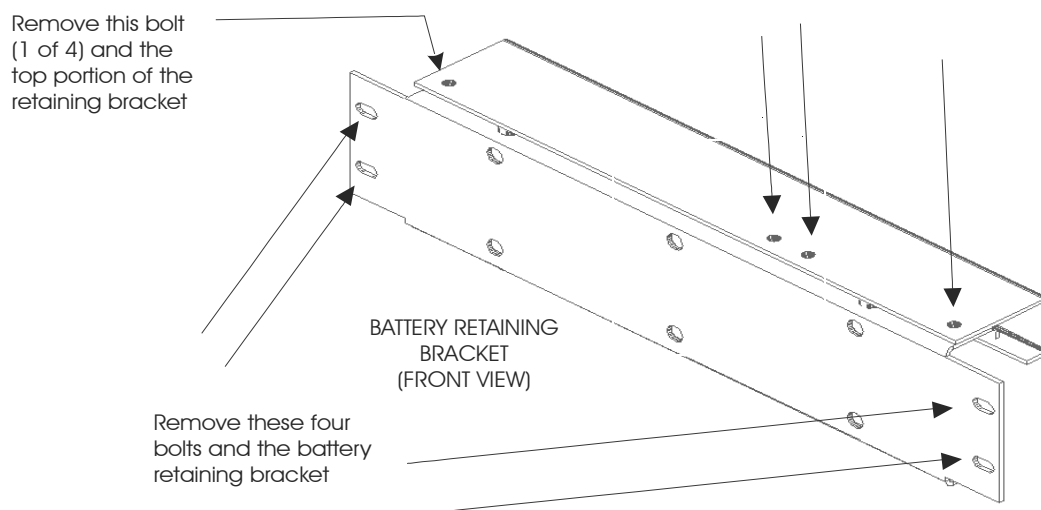
Important! The next step is not required if the top panel has been removed from the module, since the batteries may be installed on the top shelf through the top

- 2 Remove the two nuts and remove the top flange from the front of the battery module. Refer to the figure below.



-
- 3 Remove the four bolts that attach the top portion of the battery retaining bracket and remove the top portion. Repeat for both shelves. They will not be replaced but will be used as a battery spacers in a later procedure. Refer to the figure below.
-

- 4 Remove the battery retaining bracket from both shelves.

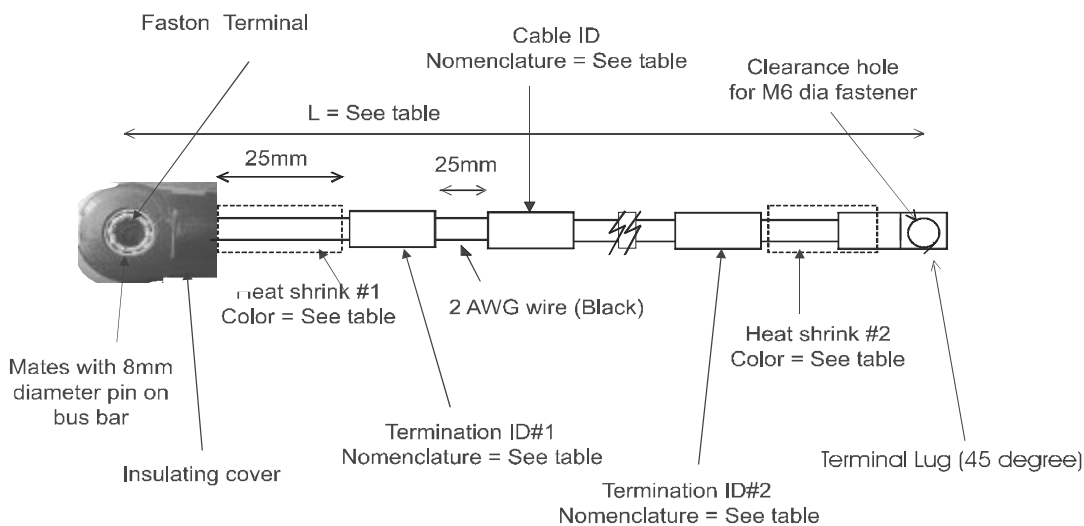


Connect the battery cables to the batteries

Perform the following steps to connect the battery cables to the batteries.

Important! The battery cables will be connected to the batteries and the batteries in this procedure. The battery cables must not be connected to the bus bars.

- 1 Refer to the figure below for an illustration of the battery cables and a table showing the different cables required.



Dash no.	Cable ID	Heat shrink #1 color	Termination ID#1	Length (mm) +/- 10mm	Termination ID#2	Heat shrink #2 color
1	BAT 4(-) - RTN	Black	RTN BUS	1168	BAT4(-)	Black
2	BAT5(-) - RTN	Black	RTN BUS	1066	BAT5(-)	Black
3	BAT6(-) - RTN	Black	RTN BUS	964	BAT6(-)	Black
4	BAT1(-) - 12V	Blue	12V BUS	812	BAT1(-)	Black
5	BAT2(-) - 12V	Blue	12V BUS	660	BAT2(-)	Black
6	BAT3(-) -12V	Blue	12V BUS	517	BAT3(-)	Black
7	BAT4(+) - 12V	Blue	12V BUS	785	BAT4(+)	Red
8	BAT5(+) - 12V	Blue	12V BUS	625	BAT5(+)	Red
9	BAT6(+) - 12V	Blue	12V BUS	475	BAT6(+)	Red
10	BAT1(+) - 24V	Red	24V BUS	710	BAT1(+)	Red
11	BAT2(+) - 24V	Red	24V BUS	558	BAT2(+)	Red
12	BAT3(+) - 24V	Red	24V BUS	406	BAT3(+)	Red

-
- 2** With a magic marker mark the six batteries number 1 through 6 on the top of the battery. Remove the attaching hardware from the two battery terminals on all batteries.

Important! A battery wiring diagram is shipped with the cables

- 3** Using the previously removed attaching hardware (and antioxidant compound), connect the one-hole lug end of the following cables to the positive (+) and negative (-) terminals of the specified battery. Torque the connections to 60 in.-lb. (6.8 Nm). Refer to the table below and the figure on Page A - 136.

Battery cable table

BATTERY NUMBER / SHELF	CABLE NUMBER	CABLE		
		BATTERY END ID / COLOR	CABLE ID	BUS END ID / COLOR
1 BOTTOM SHELF (REAR)	10	BAT1(+) / RED	BAT1(+)-24V	24V BUS / RED
	4	BAT1(-)/BLACK	BAT1(-)-12V	12V BUS / BLUE
2 BOTTOM SHELF (MIDDLE)	11	BAT2(+) / RED	BAT2(+)-24V	24V BUS / RED
	5	BAT2(-)/BLACK	BAT2(-)-12V	12V BUS / BLUE
3 BOTTOM SHELF (FRONT)	12	BAT3(+) / RED	BAT3(+)-24V	24V BUS / RED
	6	BAT3(-)/BLACK	BAT3(-)-12V	12V BUS / BLUE
4 TOP SHELF (REAR)	7	BAT4(+) / RED	BAT4(+)-12V	12V BUS / BLUE
		BAT4(-)/BLACK	BAT4(-)-RTN	RTN BUS / BLACK
5 TOP SHELF (MIDDLE)	8	BAT5(+) / RED	BAT5(+)-12V	12V BUS / BLUE
	2	BAT5(-)/BLACK	BAT5(-)-RTN	RTN BUS / BLACK
6 TOP SHELF (FRONT)	9	BAT6(+) / RED	BAT6(+)-12V	12V BUS / BLUE
	3	BAT6(-)/BLACK	BAT6(-)-RTN	RTN BUS / BLACK

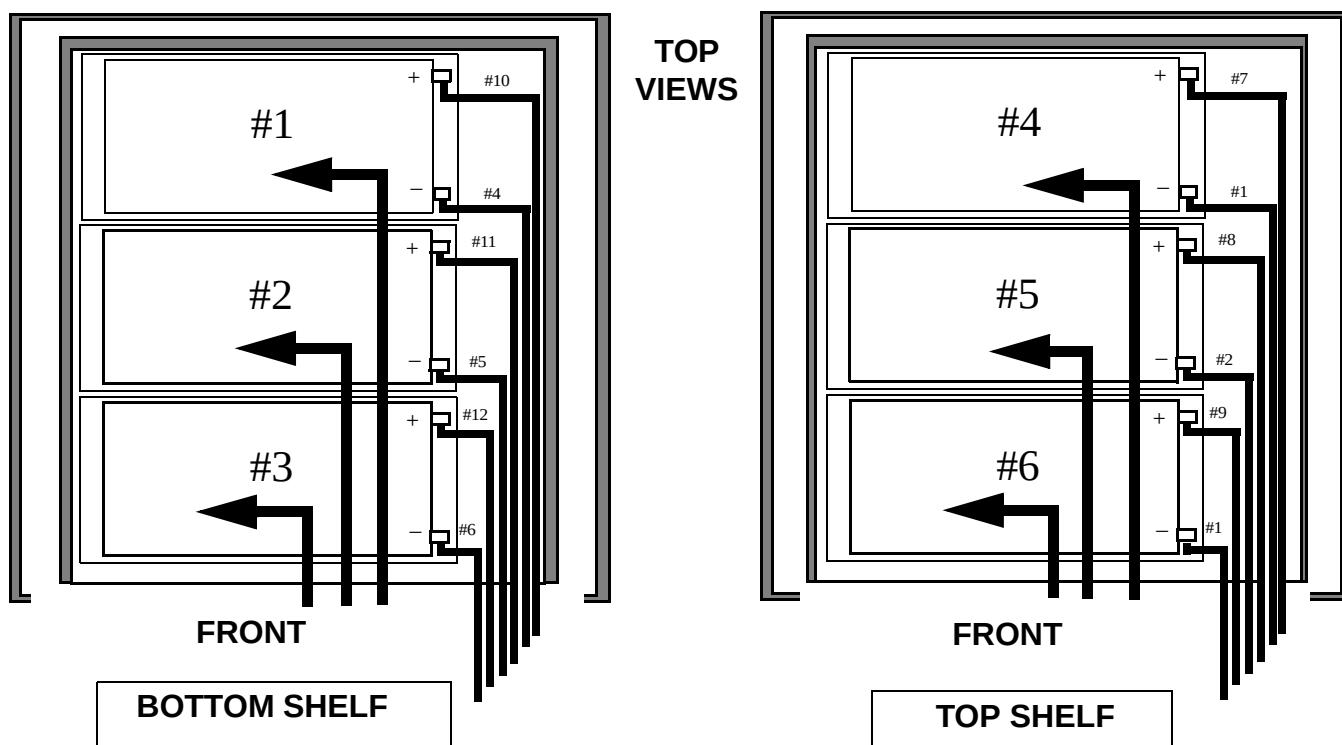
Place the batteries on the shelves, and replace the retaining brackets

Perform the following steps to place the batteries on the shelves, and replace the retaining brackets.

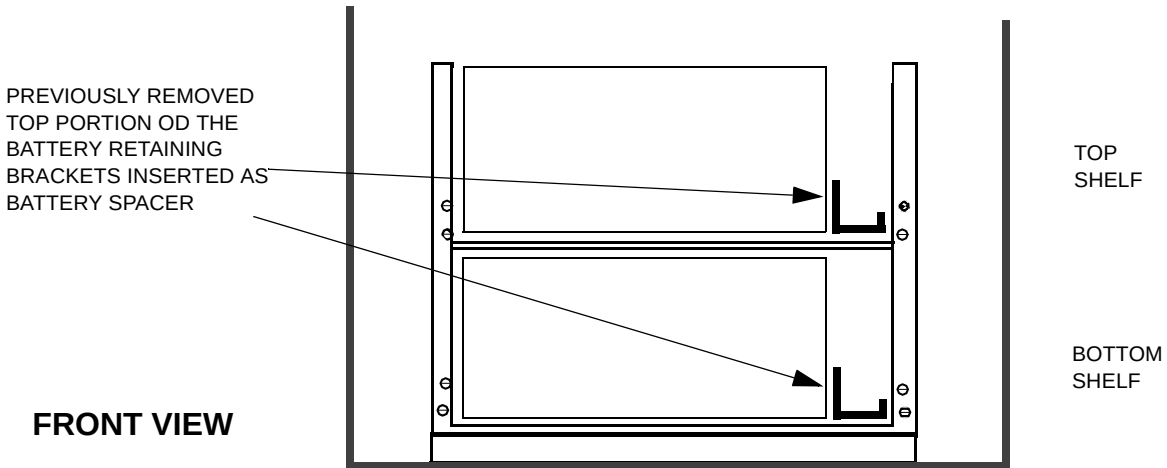
Important! The batteries will be installed on the shelves in this procedure. The battery cables must not be connected to the bus bars.

1 Place the batteries onto the shelves in numerical order

- 1 - 3 on the bottom shelf, back to front
- 4 - 6 on the top shelf, back to front
- Route the cables forwards on the right with the batteries to the rear and to the left as far as possible, and the battery terminals facing to the right. Refer to the figure below.



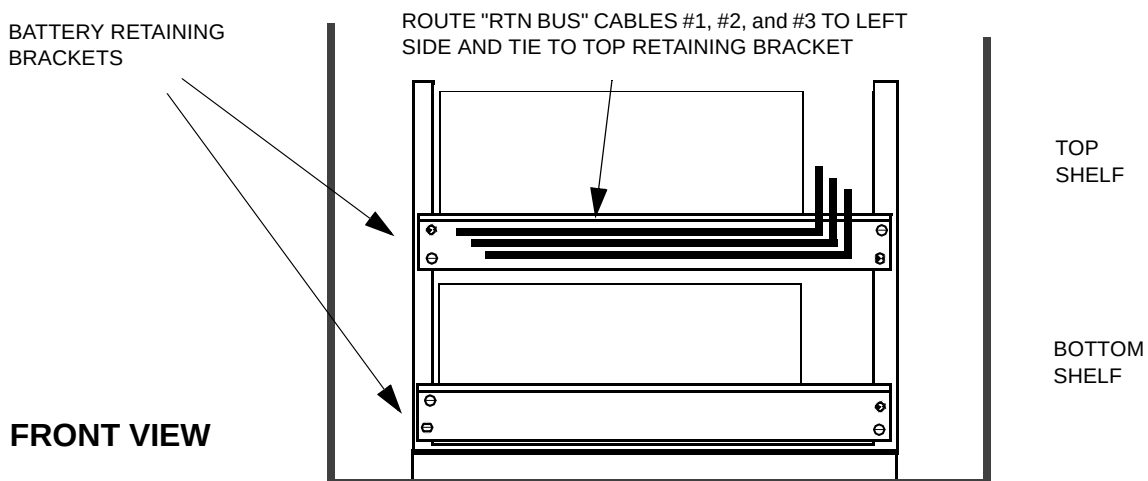
-
- 2 Insert the previously removed top portion of the battery retaining brackets as a spacer on the right side of the batteries as shown below.



-
- 3 Replace the battery retaining brackets. Torque the bolts according to the table in Chapter 1. Refer to the figure below.

-
- 4 Route the following three top battery shelf "RTN BUS" cables to the left across the front of the top retaining bracket. Tie to the bracket. Refer to the figure below.

- Cable #1 (Cable ID "BAT4 (-) -RTN")
- Cable #2 (Cable ID "BAT5 (-) -RTN")
- Cable #3 (Cable ID "BAT6 (-) -RTN")



How to make final DC connections

Overview

Purpose This section provides the procedures for the final DC connections (or reconnections) in the Modular Cell 4.0B cabinet and subsequently in the battery modules. The cables were previously routed into the 4.0B cabinet.

This section contains the following procedures.

<u>Safety</u>	A - 141
<u>How to make the DC connections in the Modular Cell 4.0B cabinet</u>	A - 142
<u>How to make the final L1 battery connections in the battery modules</u>	A - 148
<u>How to make the final 12IR125 battery connections in the battery modules</u>	A - 156

Safety

Safety and precautions

Your understanding of the following information is important to ensure a proper and safe connection of the DC cables in the Modular Cell cabinet and installation of the EZBFo batteries.



WARNING

Injury to Personnel and High Energy Hazard

The following procedures are the safest method to install and connect the batteries. If these procedures are not followed in the exact sequence listed, a serious high electrical energy hazard will result. Ensure that loose cables cannot cause a short circuit. Since the batteries are charged, do not touch battery terminals or cross terminals with metal objects.



WARNING

Electrical Energy Hazard

Failure to follow the order of the installation procedure (as written) can result in an energized DC circuit, which creates an electrical energy hazard. Follow these rules:

- 1. Perform installation steps exactly as written and in the order provided.*
- 2. Do not connect battery cables to the bus bars until instructed to do so.*
- 3. Observe and follow all safety precautions.*
- 4. When completing electrical connections, always use tools that are properly insulated.*

How to make the DC connections in the Modular Cell 4.0B cabinet

Overview This procedure module provides instructions for the final DC connections in the Modular Cell 4.0B cabinet.

Important! The DC cables will be connected to the applicable bus in the Modular Cell cabinet in this module. The battery cables will not be connected to the bus bars in the EZBFo battery base module until How to make the final L1 battery connections in the battery modules on Page A - 142 or How to make the final 12IR125 battery connections in the battery modules on Page A - 156, as applicable

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

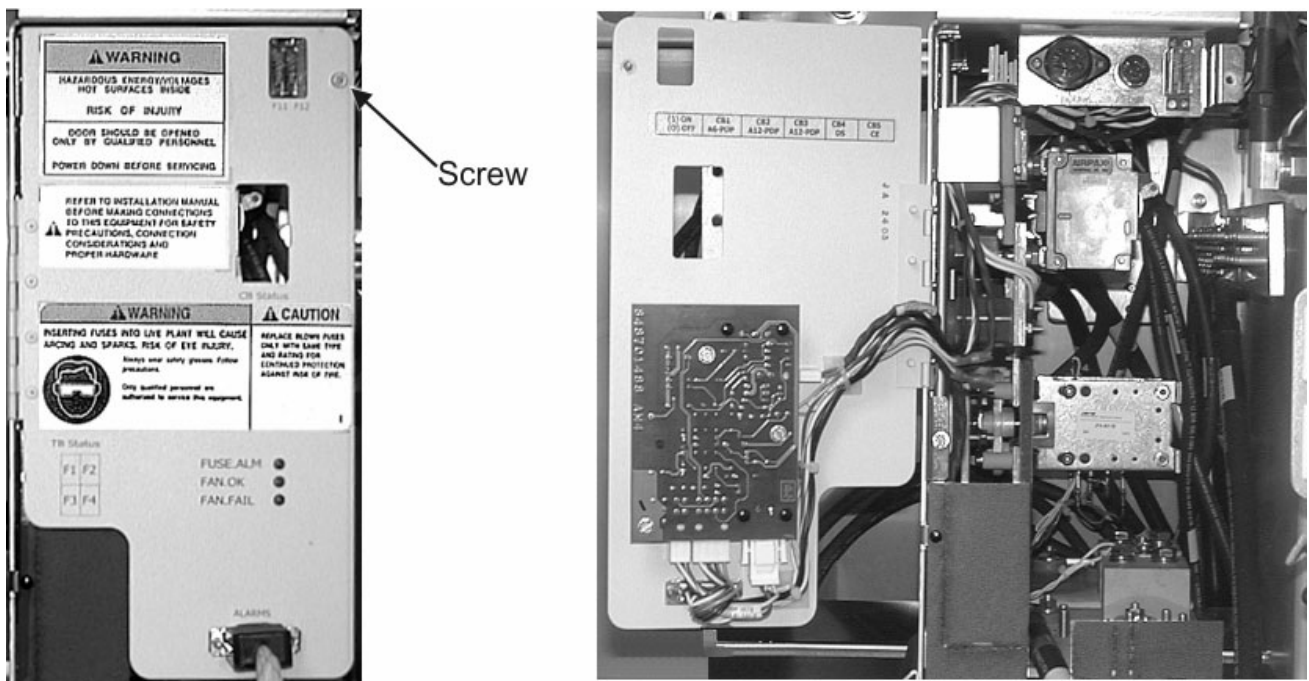
<u>Connect the battery base module +24-VDC cables to the HPDA in the Modular Cell 4.0B cabinet</u>	A - 143
<u>Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet</u>	A - 146

Connect the battery base module +24-VDC cables to the HPDA in the Modular Cell 4.0B cabinet

Important! If installing a second battery base module only, skip to Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet on Page A - 146 to continue the installation.

Perform the following steps to connect the four +24-VDC cables (from the first battery base module) in the Modular Cell 4.0B cabinet.

- 1 Loosen the screw and open the HPDA door. Refer to the figure below.



DANGER

Electrical Shock Hazard

When completing electrical connections, always use tools that are properly insulated.

- 2 Remove the knockout shown in the figure above.

-
- 3** Untape one of the four +24V DC load cables and to cut it to the proper length to reach the load bus in the HPDA. Refer to the figure on Page A - 145.

Important! When cutting the cable to the proper length the cable identification marker may be cut off. If so, remark it with red tape immediately.

-
- 4** Strip the insulation at the end of the cable.

-
- 5** Slip a section of the supplied heat shrink tubing onto each cable.

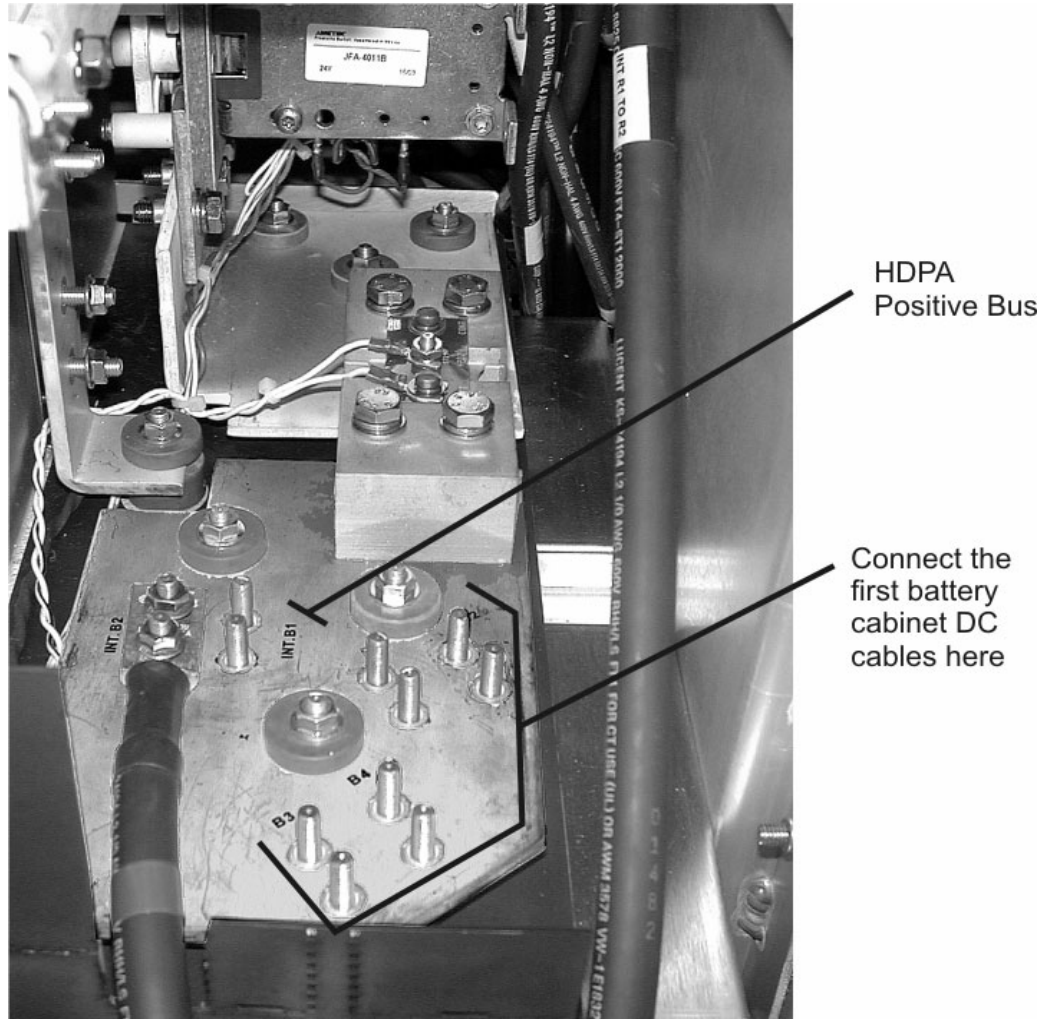
-
- 6** Crimp a supplied two-hole terminal lug onto the end of the cable.

-
- 7** Shrink the tubing with a heat gun.

-
- 8** Connect this +24V DC load cable (from the first battery base module) in the Modular Cell 4.0B cabinet. Refer to the figure on Page A - 145.

-
- 9** Torque the nuts to according to the torque table in Chapter 1.

10 Repeat Steps 3 through 9 for the three remaining +24-VDC cables.



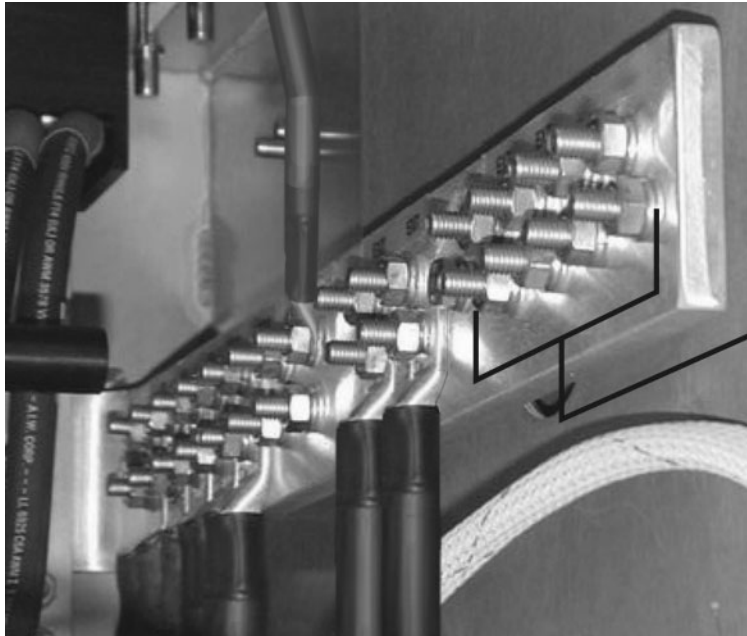
Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet

Perform the following steps to connect (or reconnect) the four 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet

Important! If installing a first battery base module, skip the first step and proceed to step 2.

-
1 Individually untape and reconnect to the return bus the four 24V Return cables (from the first battery base module) that were disconnected for safety reasons. Refer to the figure on Page A - 147.
.....
- 2** Untape one of the four 24V Return cables and to cut it to the proper length to reach the Return bus in the HPDA. Refer to the figure on Page A - 147.
.....
- 3** Strip the insulation at the end of the cable.
.....
- 4** Slip a section of the supplied heat shrink tubing onto each cable.
.....
- 5** Crimp a supplied two-hole terminal lug onto the end of the cable.
.....
- 6** Shrink the tubing with a heat gun.
.....
- 7** Connect this 24V Return cable (from the first battery base module) at the return bus bar in the Modular Cell 4.0B cabinet. Refer to the figure on Page A - 147.
.....
- 8** Torque the nuts to according to the torque table in Chapter 1.

-
- 9 Repeat Steps 2 through 8 for the remaining three 24V Return cables.



Connect or reconnect four 24-VDC
return wires from battery cabinet here

How to make the final L1 battery connections in the battery modules

Overview This procedure module provides instructions for the final L1 battery connections in the battery modules.

Important! The battery cables will be connected to the bus bars in this module.

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

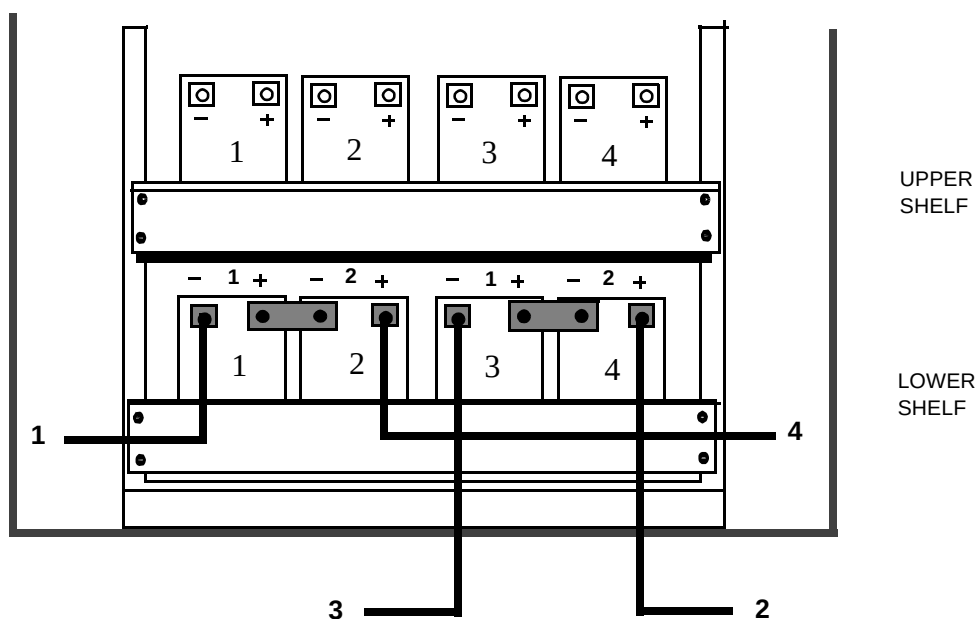
<u>Test and connect the L1 battery cables to the bus bars in the battery modules</u>	A - 149
<u>Complete the installation of batteries</u>	A - 153

Test and connect the L1 battery cables to the bus bars in the battery modules

Important! If installing 12IR125 batteries, skip to [How to make the final 12IR125 battery connections in the battery modules](#) on Page D-156 to continue the installation.

Perform the following steps to test and connect the battery cables to the bus bars in the battery base modules, as applicable.

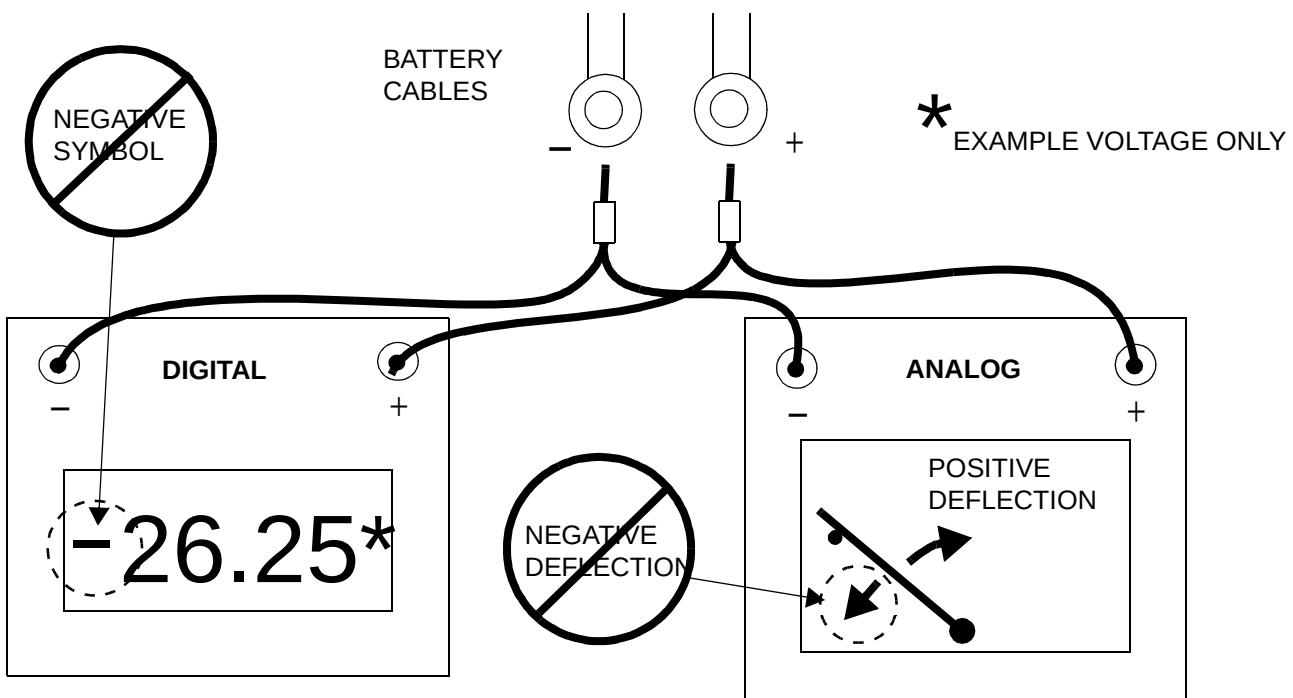
- 1 To determine if you have correctly connected the battery cables to the batteries, measure the voltage and polarity between the positive and negative cables from each battery string (identified in the figure below) prior to connecting the two cables to the applicable buses. Start with the lowest shelf of the first battery frame.
 - Place the negative probe of the meter on "**RTN**" cable #1 (marked black)
 - Place the positive probe of the meter on "**24V**" cable #4 (marked red)



2 To determine that the polarity is correct, refer to the figure below.

- Digital meter - no symbol or positive symbol = **correct** connection.
- Digital meter - negative symbol = incorrect connection.
- Analog meter - positive deflection = **correct** connection.
- Analog meter - negative deflection = incorrect connection.

All of the above assume correct meter lead connection.



3 Repeat the previous two steps for the other battery string on the shelf:

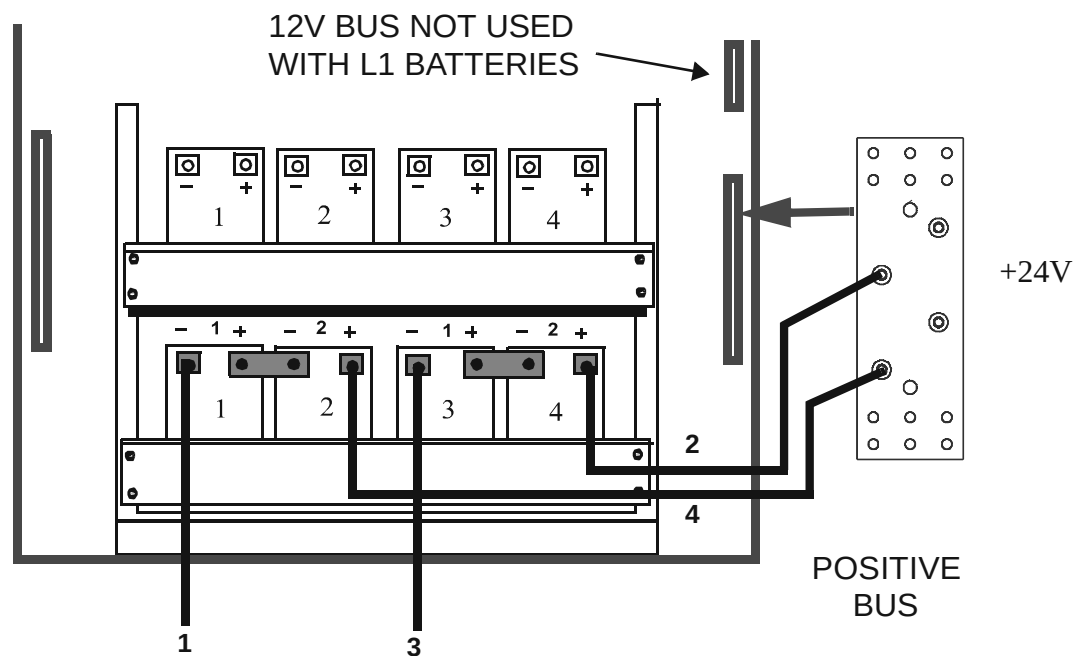
- Place the negative probe of the meter on "**RTN**" cable #3 (marked black)
- Place the positive probe of the meter on " **24V**" cable #2 (marked red)

4 Repeat the previous three steps for all populated battery shelves.

-
- 5 If necessary, rewire the battery cables found to be incorrectly wired.

Important! A battery wiring diagram is shipped with the cables

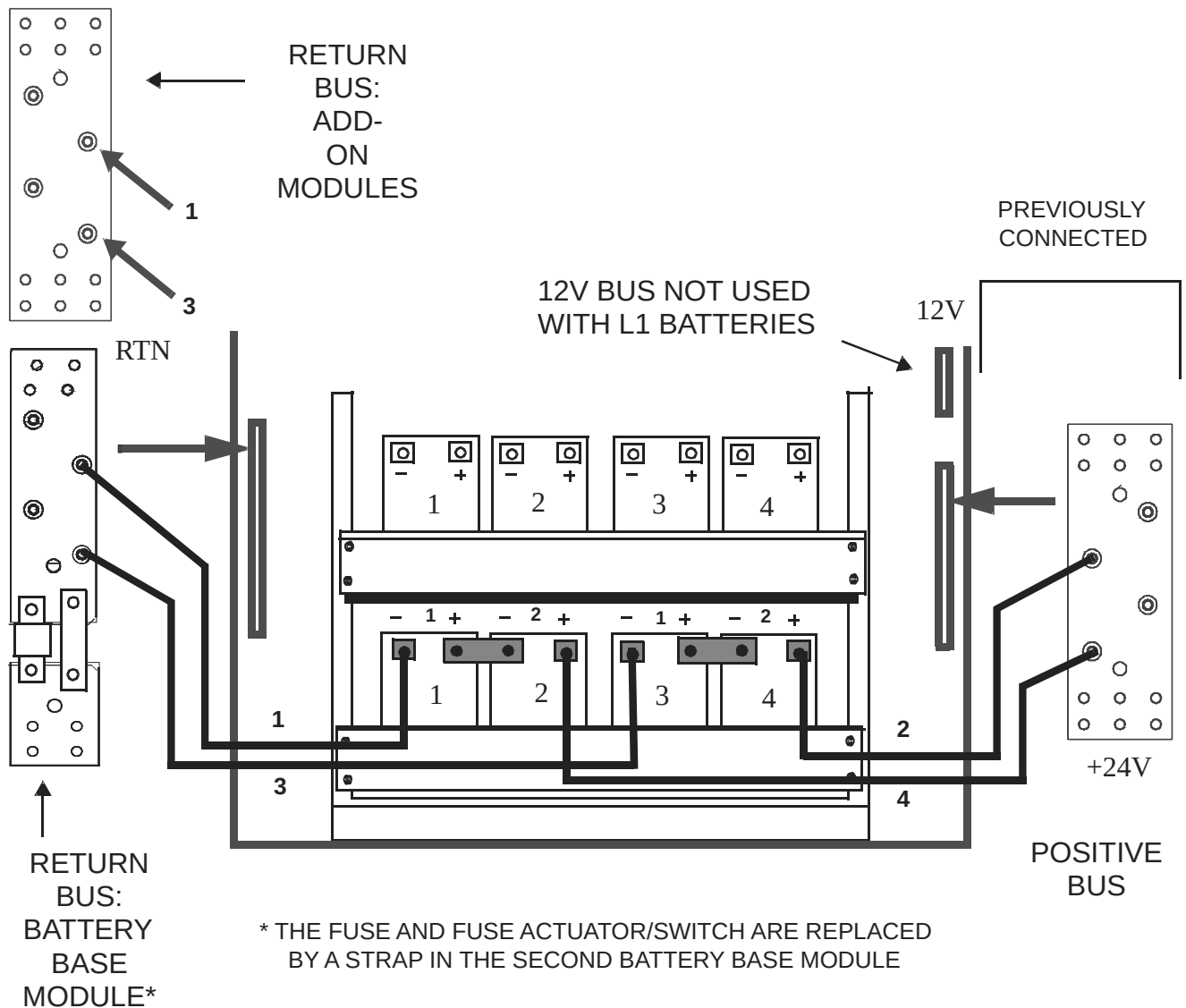
- 6 Connect the following two positive (24V) battery cables starting on the lowest shelf of the first battery frame to the positive (24V) bus.
- Attach cable #4 (marked red) to the positive (24V) bus
 - Attach cable #2 (marked red) to the positive (24V) bus



-
- 7 Repeat the previous step for the positive (24V) cables only on all populated battery shelves.
-
- 8 Tie the two positive (24V) cables to the front of the battery retaining bracket.

9 Connect the following two negative (RTN) battery cables starting on the lowest shelf of the first battery frame to the negative (RTN) bus.

- Attach cable #3 (marked black) to the negative (RTN) bus
- Attach cable #1 (marked black) to the negative (RTN) bus

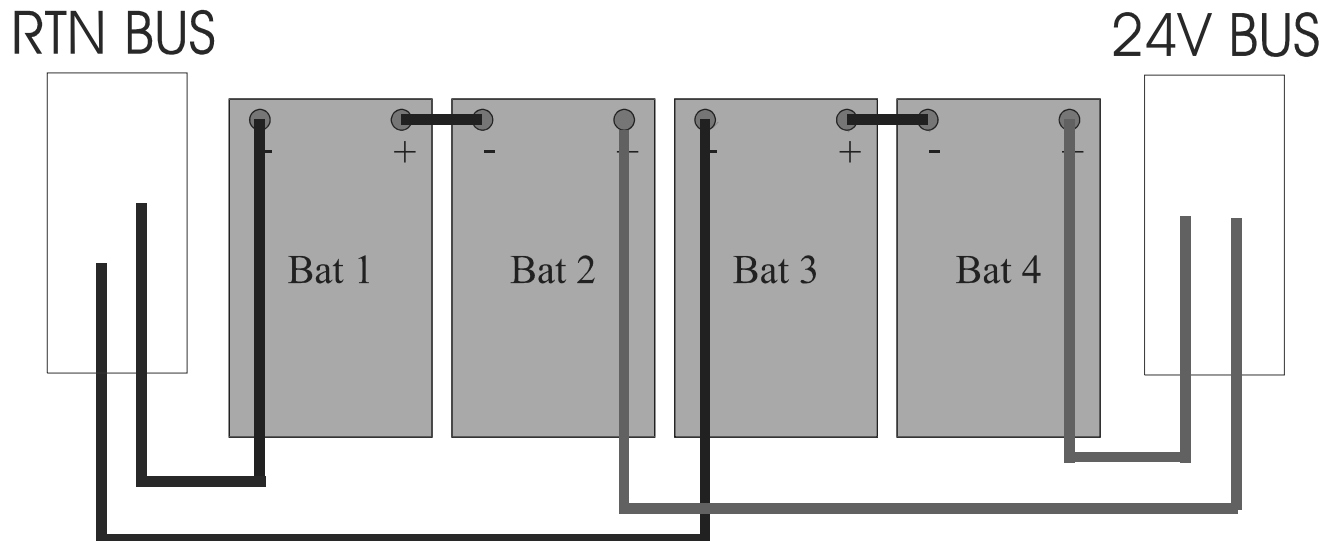


10 Repeat the previous step for all populated battery shelves.

Complete the installation of batteries

Use the following procedure to complete the installation of batteries.

- 1 Dress and tie-wrap any remaining loose cables.
- 2 Replace the plastic cover that shields the 12V and 24V bus bars in all modules. Refer to the Step 2 figure on Page A - 58.
- 3 Check the completed installation against the wiring diagram shipped with the cables or the wiring diagram below.
- 4 Attach the wiring diagram shipped with the cables to the inside of the front panel or door.

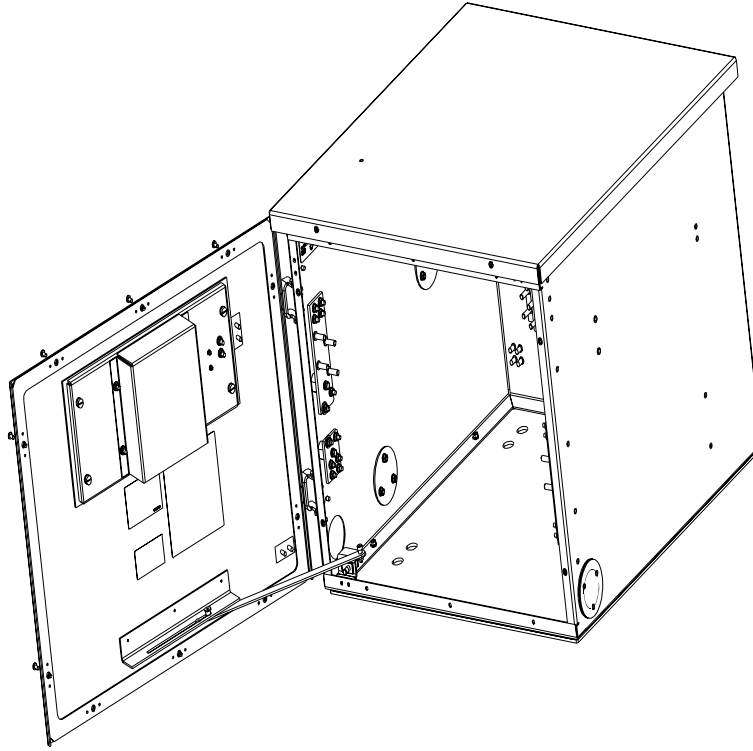


Replace the battery module panels and close/secure the front door(s) (if applicable)

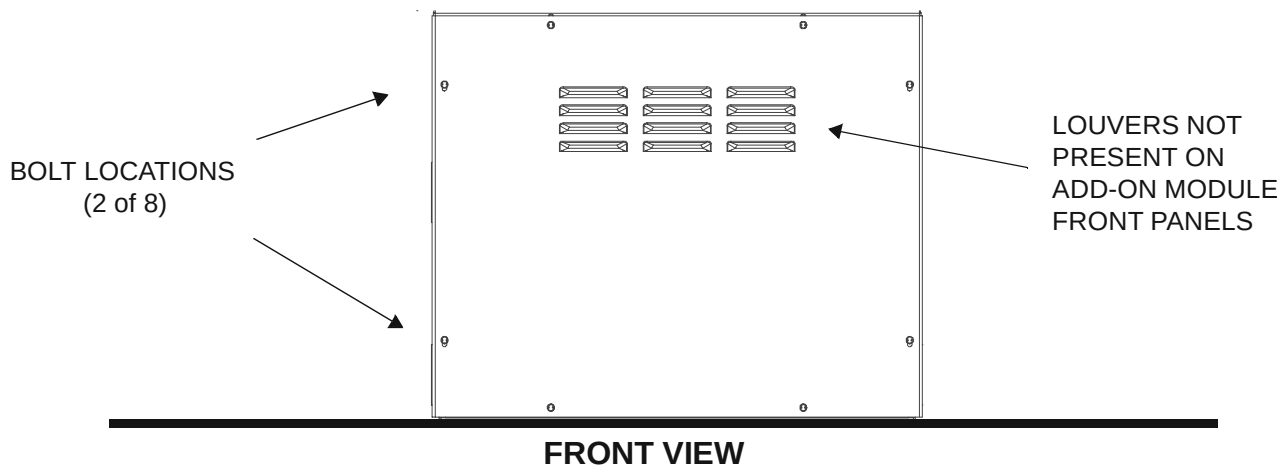
Perform the following steps to replace the battery module front panel on all battery modules, and the filter panel and top panel on the top battery module. Close and secure the front door(s), if applicable.

- 1 Attach the front panel lanyard cable (and the fan power and alarm cable if it is a base module) if either has been disconnected. Refer to the figure below.

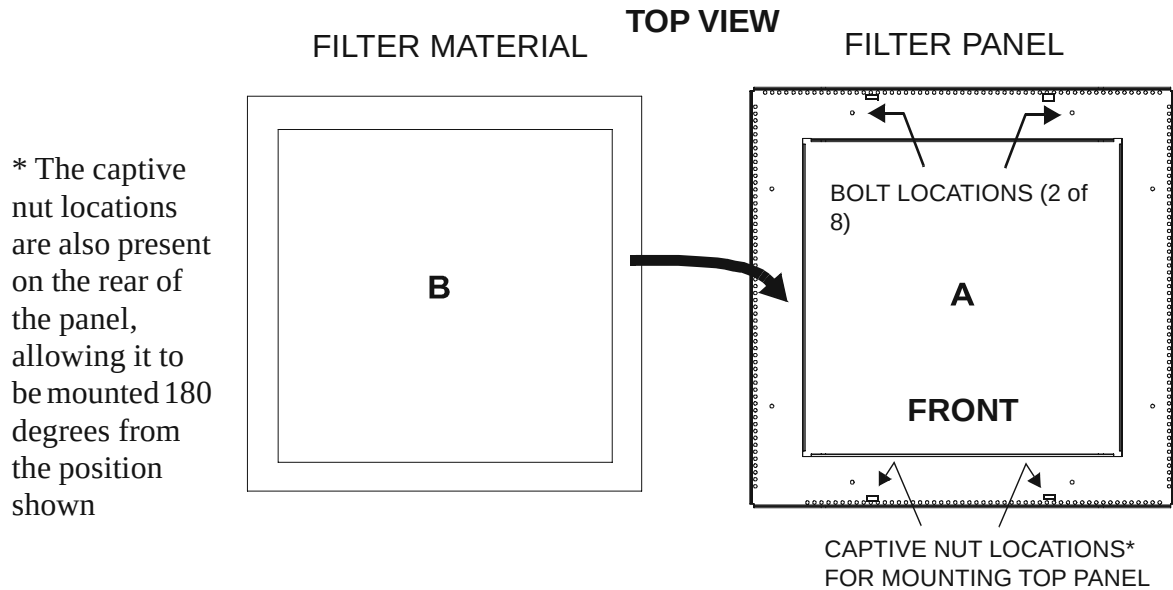
-
- 2** Close the front door, if applicable, or replace the front panel. Use the eight TR 25 Keytorx screws provided, to secure both the panel. Use the 1/4 turn fasteners for the door. Refer to the applicable figure below.



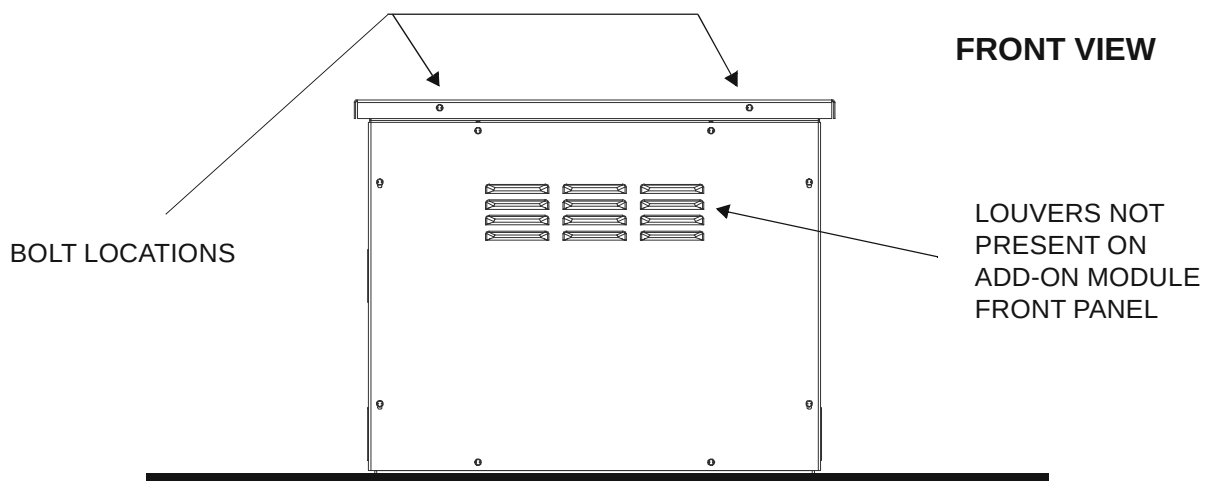
-
- 3** Repeat the previous steps for all front doors or panels.



-
- 4 Position the filter panel with the captive nuts (for front panel mounting) forward as shown in the "A" figure below. Attach the filter panel to the outer frame using the eight bolts that were previously removed. Torque according to the table in Chapter 1.
-
- 5 Replace the filter material. Refer to "B" in the figure below.
-



-
- 6 Reattach the lanyard cable and replace the top panel using the two TR 25 Keytorx screws previously removed. Torque according to the table in Chapter 1. Refer to the figure below.
-



How to make the final 12IR125 battery connections in the battery modules

Overview This procedure module provides instructions for the final 12IR125 battery connections in the battery modules.

Important! The battery cables will be connected to the bus bars in this module.

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

<u>Test and connect the 12IR125 battery cables to the bus bars in the battery modules</u>	A - 157
<u>Complete the installation of 12IR125 batteries</u>	A - 160
<u>Replace the battery module panels and close/secure the front door(s), if applicable (Reference)</u>	A - 162

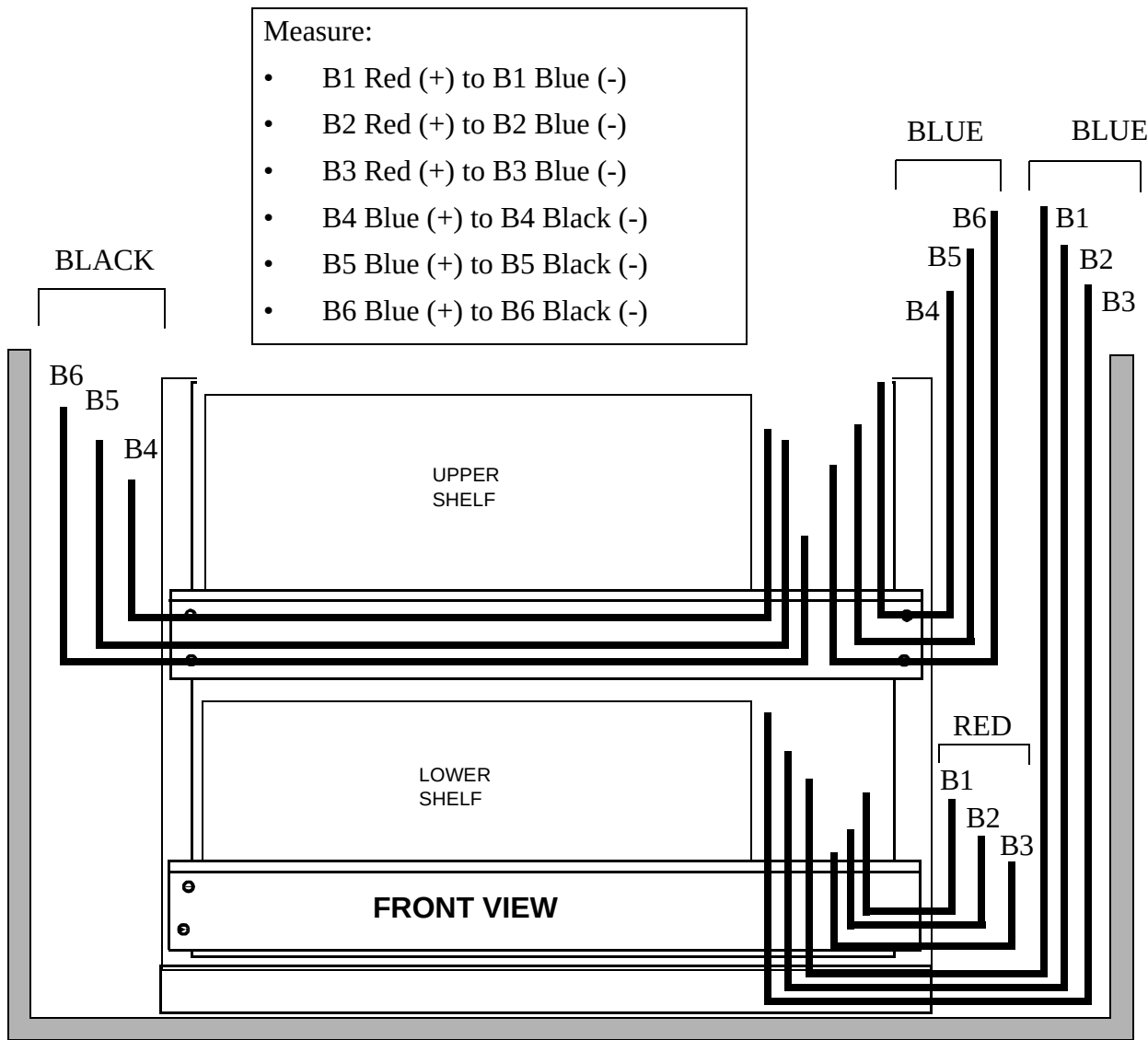
This procedure module provides instructions for the final 12IR125 battery connections in the battery modules.

Important! All six 12IR125 batteries must be installed in the battery module.

Test and connect the 12IR125 battery cables to the bus bars in the battery modules

Perform the following steps to test and connect the battery cables to the bus bars in the battery base modules, as applicable.

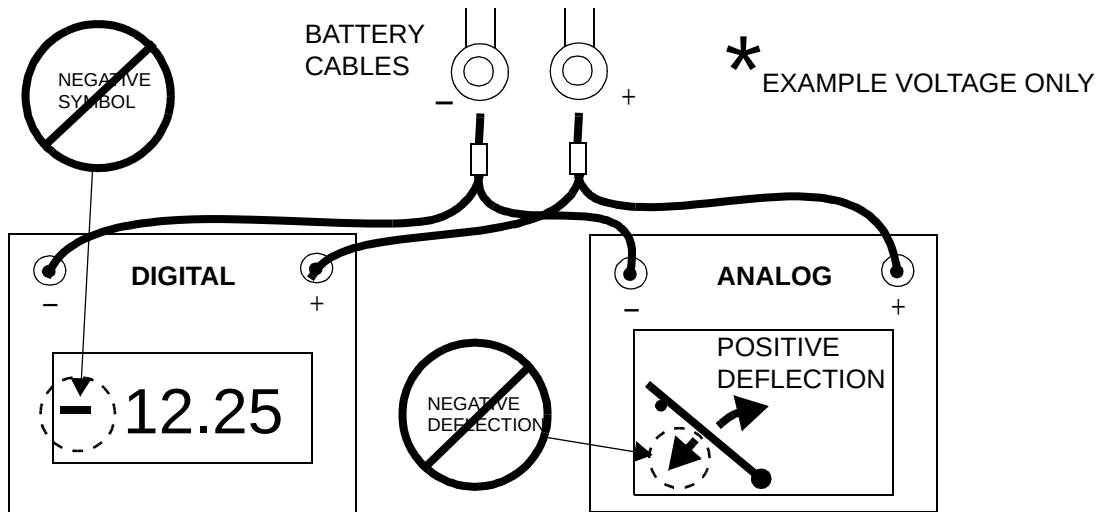
- 1 Prior to connecting the cables to the applicable buses, determine if you have correctly connected the battery cables to the batteries by measuring the voltage and polarity between the positive and negative cables from each battery. Use the figure below for measuring points.



2 To determine that the polarity is correct, refer to the figure below.

- Digital meter - no symbol or positive symbol = **correct** connection.
- Digital meter - negative symbol = incorrect connection.
- Analog meter - positive deflection = **correct** connection.
- Analog meter - negative deflection = incorrect connection.

All of the above assume correct meter lead connection.



3 Repeat the previous two steps on every pair of battery shelves populated with 12IR125 batteries.

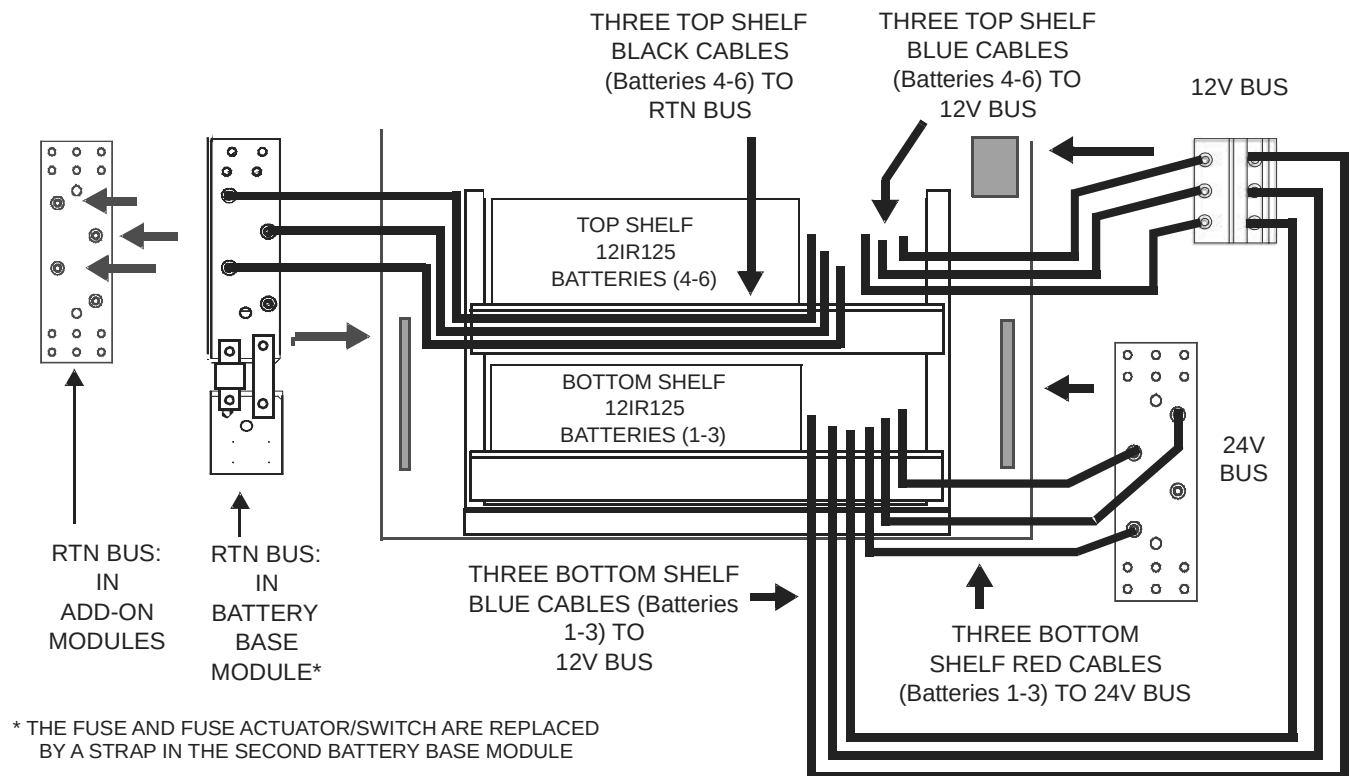
4 If necessary, rewire the battery cables found to be incorrectly wired.

Important! A battery wiring diagram is shipped with the cables

5 Connect the three battery 1, 2, and 3 positive cables (labeled “24V BUS” with RED heat shrink) from the bottom battery shelf to the positive (24V) bus. Refer to the figure on Page A - 159.

6 Connect the three battery 4, 5, and 6 positive cables (labeled “12V BUS” with BLUE heat shrink) from the top battery shelf to the rear most portion of the 12V bus. Refer to the figure on Page A - 159.

-
- 7 Connect the three battery 1, 2, and 3 negative cables (labeled "12V BUS" with BLUE heat shrink) from the bottom battery shelf to the front most portion of the 12V bus. Refer to the figure below.
-
- 8 Connect the three battery 4, 5, and 6 negative cables (labeled "RTN BUS" with BLACK heat shrink) from the top battery shelf to the RTN bus. Refer to the figure below.
-



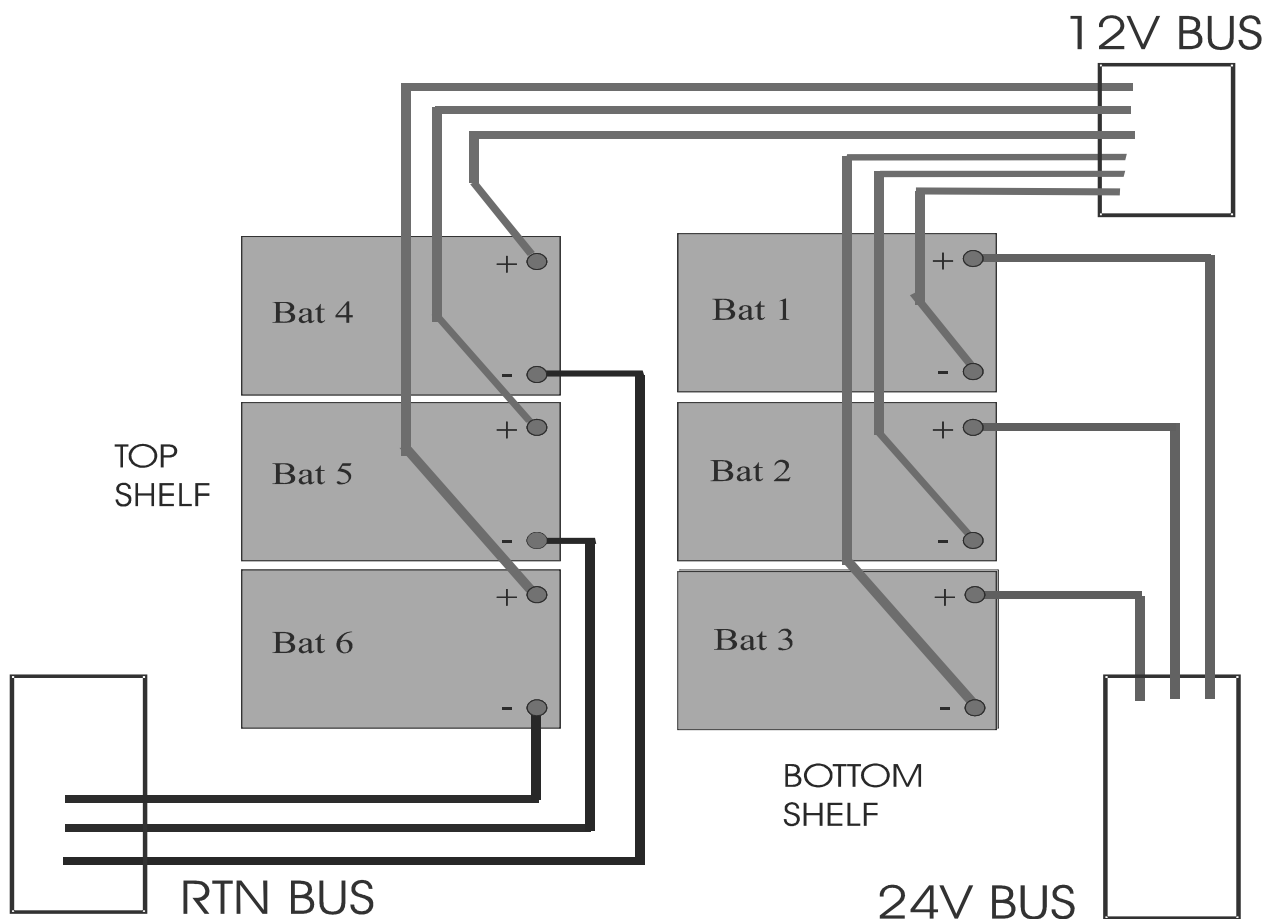
-
- 9 Repeat the steps 1 through 8 for all populated battery modules.
-

Important! When you have finished connecting the batteries to the bus bars skip to Complete the installation of 12IR125 batteries on Page A - 160. Continue to the next step only if you have not marked the battery cables B1-B6 and have not yet connect the battery cables to the bus bars.

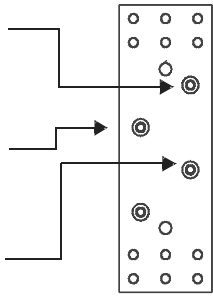
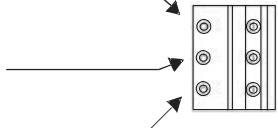
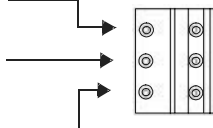
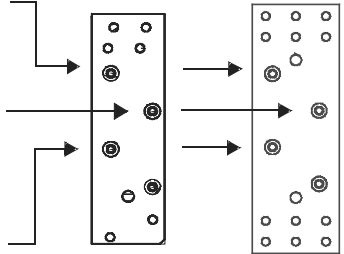
**Complete the installation of
12IR125 batteries**

Use the following procedure to complete the installation of the
12IR125 batteries.

- 1 Dress and tie-wrap any remaining loose cables.
- 2 Replace the plastic cover that shields the 12V and 24V bus bars in all modules. Refer to the Step 2 figure on Page A - 58.
- 3 Check the completed installation against the wiring diagram shipped with the cables or the wiring diagram below.
- 4 Attach the wiring diagram shipped with the cables to the inside of the front panel or door.



5 Refer to the table below for specific battery cable connections.

BATTERY NUMBER/ SHELF LOCATION	CABLE NUMBER	CABLE			BUS CONNECTION
		BATTERY END ID/ COLOR	CABLE ID	BUS END ID/ COLOR	
BATTERY 1 LOWER SHELF	10	BAT1(+)/ RED	BAT1(+)-24V	24V BUS/ RED	 24V BUS
BATTERY 2 LOWER SHELF	11	BAT2(+)/ RED	BAT2(+)-24V	24V BUS/ RED	
BATTERY 3 LOWER SHELF	12	BAT3(+)/ RED	BAT3(+)-24V	24V BUS/ RED	
BATTERY 1 LOWER SHELF	4	BAT1(-)/ BLACK	BAT1(-)-12V	12V BUS/ BLUE	 12V BUS
BATTERY 2 LOWER SHELF	5	BAT2(-)/ BLACK	BAT2(-)-12V	12V BUS/ BLUE	
BATTERY 3 LOWER SHELF	6	BAT3(-)/ BLACK	BAT3(-)-12V	12V BUS/ BLUE	
BATTERY 4 UPPER SHELF	7	BAT4(+)/ RED	BAT4(+)-12V	12V BUS/ BLUE	 12V BUS
BATTERY 5 UPPER SHELF	8	BAT5(+)/ RED	BAT5(+)-12V	12V BUS/ BLUE	
BATTERY 6 UPPER SHELF	9	BAT6(+)/ RED	BAT6(+)-12V	12V BUS/ BLUE	
BATTERY 4 UPPER SHELF	1	BAT4(-)/ BLACK	BAT4(-)-RTN	RTN BUS/ BLACK	 RTN BUS
BATTERY 5 UPPER SHELF	2	BAT5(-)/ BLACK	BAT5(-)-RTN	RTN BUS/ BLACK	
BATTERY 6 UPPER SHELF	3	BAT6(-)/ BLACK	BAT6(-)-RTN	RTN BUS/ BLACK	

Replace the battery module panels and close/secure the front door(s), if applicable (Reference)

Refer to Replace the battery module panels and close/secure the front door(s) (if applicable) on Page A - 153 to replace the battery module front panels and top cover, and close the door(s), if applicable.



Appendix B: Non-Lucent power ancillary hardware installation, cable routing and connection

Overview

Purpose This appendix provides the following instructions that are required when a customer supplied non-Lucent power source is being utilized to power a line-up configuration consisting of a Cell 4.0B primary cabinet and a Modular Cell 4.0B dual band cabinet:

- Installation the ancillary hardware required for routing of DC, AC, and power alarm cables from the power source to the outdoor Modular Cell 4.0B cabinets.
- Direct (or remote connection using conduits) connection of the power source to the outdoor Modular Cell 4.0B primary cabinet.
- Routing and connection of DC, AC and power alarm cables from the power source to the outdoor Modular Cell 4.0B primary cabinet, as well as DC and AC cable routing and connection to the Modular Cell 4.0B dual band cabinet.

Contents This appendix contains the following sections.

<u>Installation of ancillary hardware</u>	B - 2
<u>Procedures to route and connect all non-Lucent power cables in the Modular Cell 4.0B cabinets</u>	B - 16
<u>Finishing the installation</u>	B - 74

Installation of ancillary hardware

Overview of this section

Purpose This section describes the procedures required for the installation the ancillary hardware required for routing of DC, AC, and power alarm cables from the power source to the outdoor Modular Cell 4.0B cabinets.

Contents This section covers the following procedures.

<u>How to install the cable duct assembly</u>	B - 2
<u>How to install the AC conduit</u>	B - 6
<u>How to attach the non-Lucent power source to the cable duct assembly</u>	B - 10

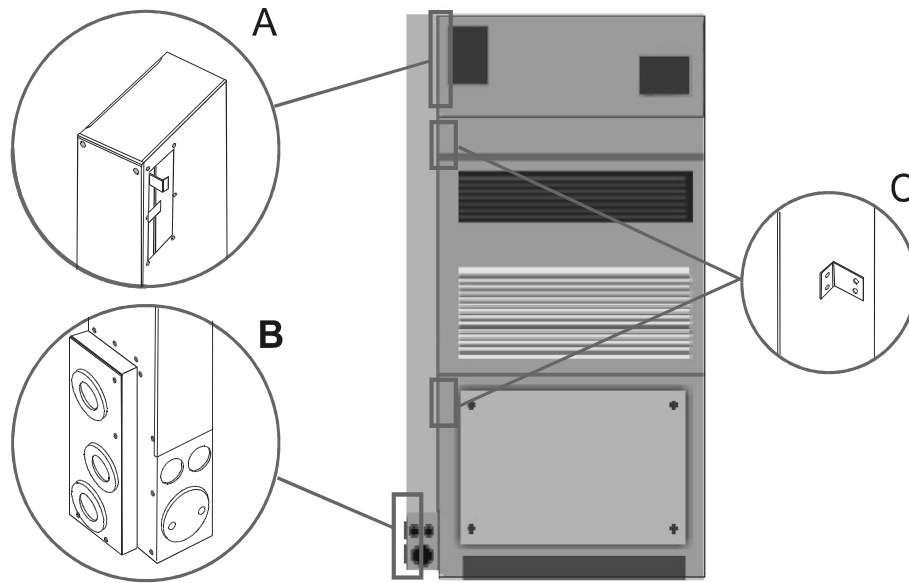
How to install the cable duct assembly

Description of cable duct assembly and AC conduit kit The cable duct assembly and AC conduit kit provides a weatherproof duct to route DC and AC power cables, as well as the power user alarm cable. The kit consists of the following components:

- Vertical Duct Cable Assembly (quantity: 1)
- Rectangular spacer with gasket foam on both sides (quantity: 1)
- Conduit **nipple**, threaded alum., 2-in. dia. **X 2-in. long** (quantity: 1)
- Conduit, flexible, 2-in. dia. **X. 2-in. long** (quantity: 1)
- Conduit, fitting, 2-in. dia. (quantity: 2)
- Conduit body, LL69 (quantity: 1)
- Conduit body, cover 690 (quantity: 1)
- Conduit body gasket, gasket 1946 (quantity: 1)
- **Chase nipple** (quantity: 2)
- Locknut, 2-in. dia. (quantity: 6)
- Sealing washer (quantity: 2)

- Bushing, insulating, 2-in. dia. (**quantity: 3**)
- Grommet, caterpillar, 20-in. long (quantity: 2)
- Plug 2-1/2 in. (quantity: 1 - used when there is no dual band cabinet)

The figure below illustrates the cable duct assembly viewed from the rear, and identifies the connections to the primary cabinet.



Detail A: Connections for six hex-head screws

Detail B: Location for conduit connections (on left) for routing of DC, AC, and power alarm cables from the non-Lucent power source. For the conduit connections on the right (rear) of the cable duct, refer to Chapter 3 for T1/E1 and external user alarm routing and connection.

Detail C: Connections for four tamper-proof screws (requires #14 drilled spanner driver)

The right side of the cable duct assembly (as viewed from the rear) is attached to the Modular Cell 4.0B primary cabinet at two locations: On the right side using tamper-proof screws, and at the top using hex-head screws. The mounting locations are shown in the figure above (details A and C). Refer to the figure on Page B - 5, which shows a different view.

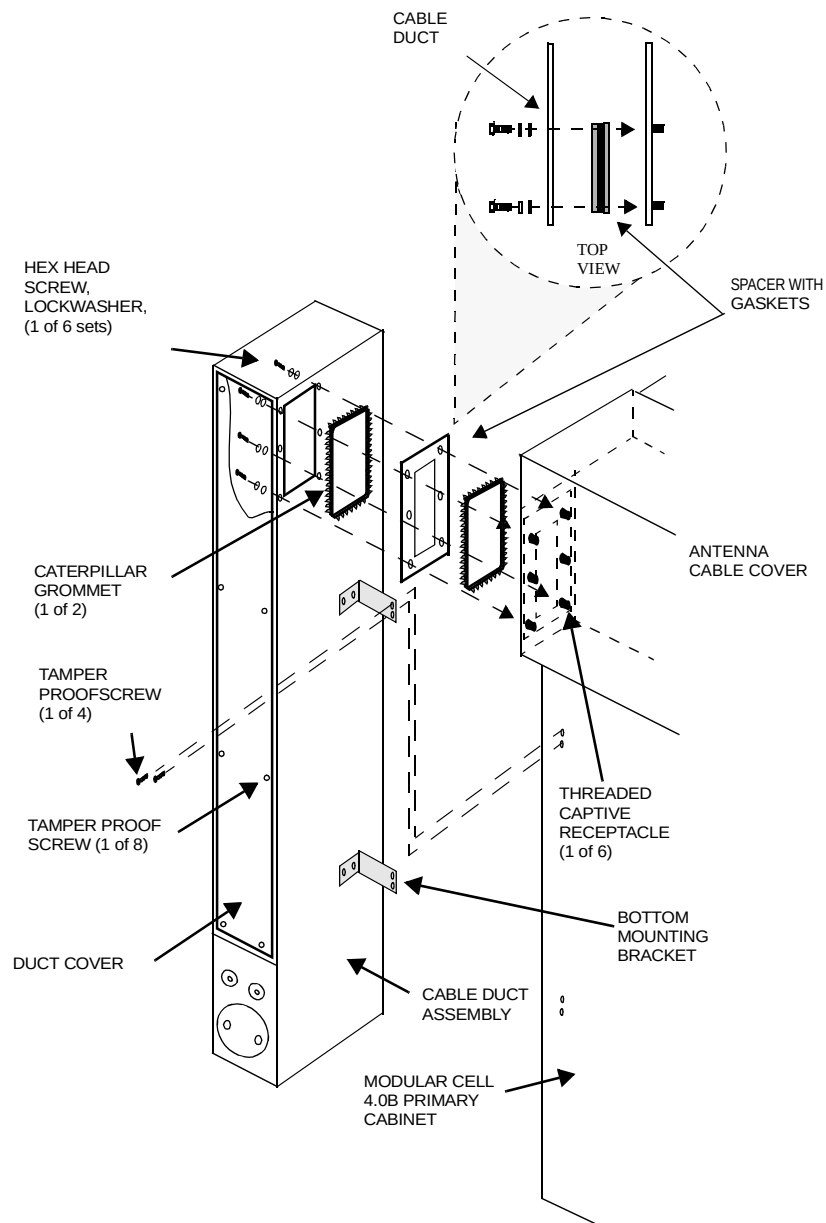
Important! If the interface hardware is not going to be installed at this time and the Modular Cell 4.0B cabinet is to be left unattended, provisions must be made to cover the opening on the left side of the antenna cable cover in the event of inclement weather.

Install the cable duct assembly

This instruction describes the procedures for installing the cable duct assembly (required for non- Lucent power connection) on the Modular Cell 4.0B primary cabinet. Use the following procedure to install the cable duct assembly. Refer to the figure on Page B - 5.

- 1 Obtain the DC interface kit. Inventory the kit to ensure all required items are available. Remove the duct cover if not already separated.
- 2 Insert the caterpillar grommet provided with the kit around the top opening of the duct and the cabinet's antenna cable cover.
- 3 Remove the four tamper-proof screws from the rear of the cabinet.
- 4 Partially attach the cable duct assembly to the Modular Cell 4.0B primary cabinet using *one* tamper-proof screw at the bottom-most position of the duct's bottom mounting bracket. Refer to the figure on Page B - 5
- 5 Align the top of the duct with gaskets to the end of the Modular Cell 4.0B primary cabinet antenna cover. Use the hex-head screw sets (quantity: 6). Do not tighten the hardware.
- 6 Loosely install the remaining three tamper-proof screws.
- 7 Tighten the four tamper-proof screws and the six hex-head screws.

- 8 Set aside the two sets of 2-inch chase nipples lock nuts, and insulating bushings. This hardware will be used later to connect the bottom of the duct to the non-Lucent power cabinet if it is to be placed flush against the cable duct. Refer to the figure on Page B - 13. These parts will not be used if the non-Lucent power cabinet is positioned away from the cable duct and connected via conduits. Refer to the figure on Page B - 15



How to install the AC conduit

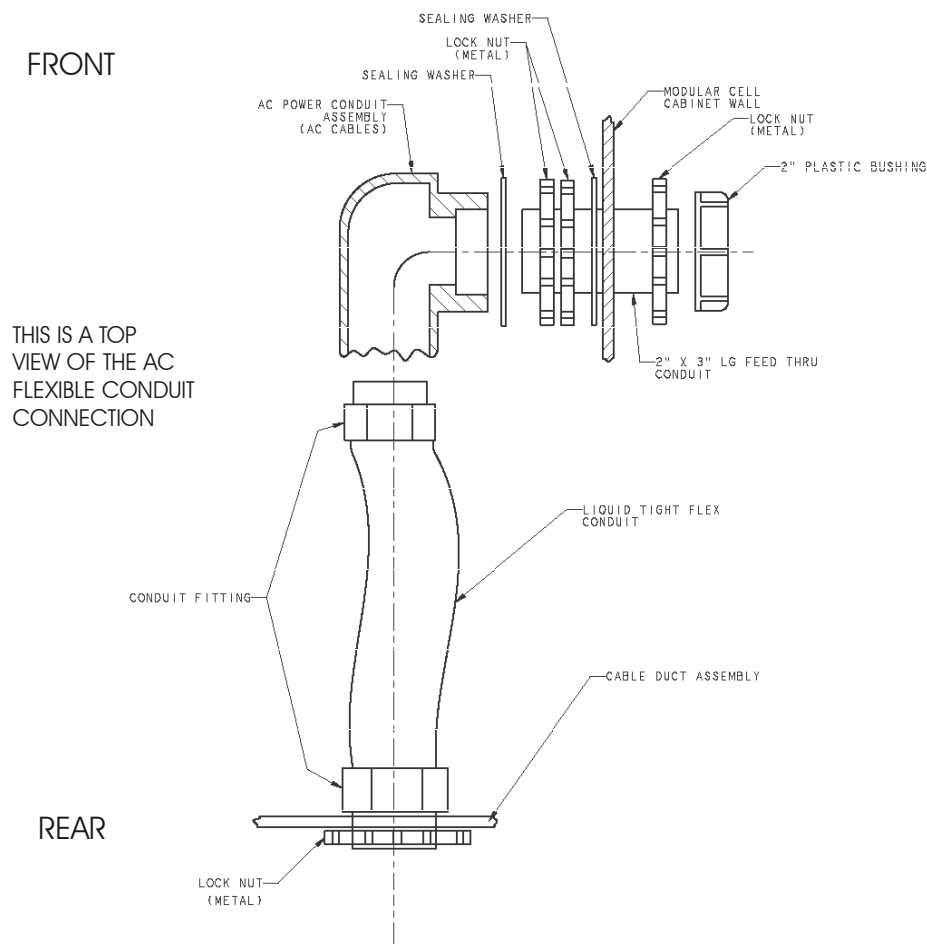
Install the AC conduit

Important! The AC interface conduit must pre-assembled to accurately measure the required length of the liquid tight flexible conduit.

This instruction describes the procedure for installing the AC interface conduit. The AC interface conduit connects to the bottom front of the cable duct assembly at one end, and to the bottom right AC port on the Modular Cell 4.0B primary cabinet at the other end. Refer to the figures on Page B - 7 and B - 9.

-
- 1 Screw a conduit fitting into the end of the 90 degree conduit body that is in line with the long axis of the 90 degree conduit body. Refer to the figure on Page B - 7.
 - 2 Screw the 3-inch conduit nipple into the other end of the 90 degree conduit body, making sure it seats fully.
 - 3 Assemble a sealing washer, two lock nuts, and another sealing washer (in that order) on the 3-inch long conduit nipple.
 - 4 Insert the end of the 3-inch long conduit nipple into the AC port (bottom right side of Modular Cell 4.0B primary cabinet). Refer to the figures on Page B - 7 and B - 9.
 - 5 Install a lock nut on the conduit nipple from inside the Modular Cell 4.0B primary cabinet.
 - 6 Insert the second conduit fitting into the 2-inch diameter hole at the bottom front of the cable duct assembly. Have a second technician install a lock nut on the conduit fitting from inside the cable duct assembly. Refer to the figures on Page B - 7 and B - 9.

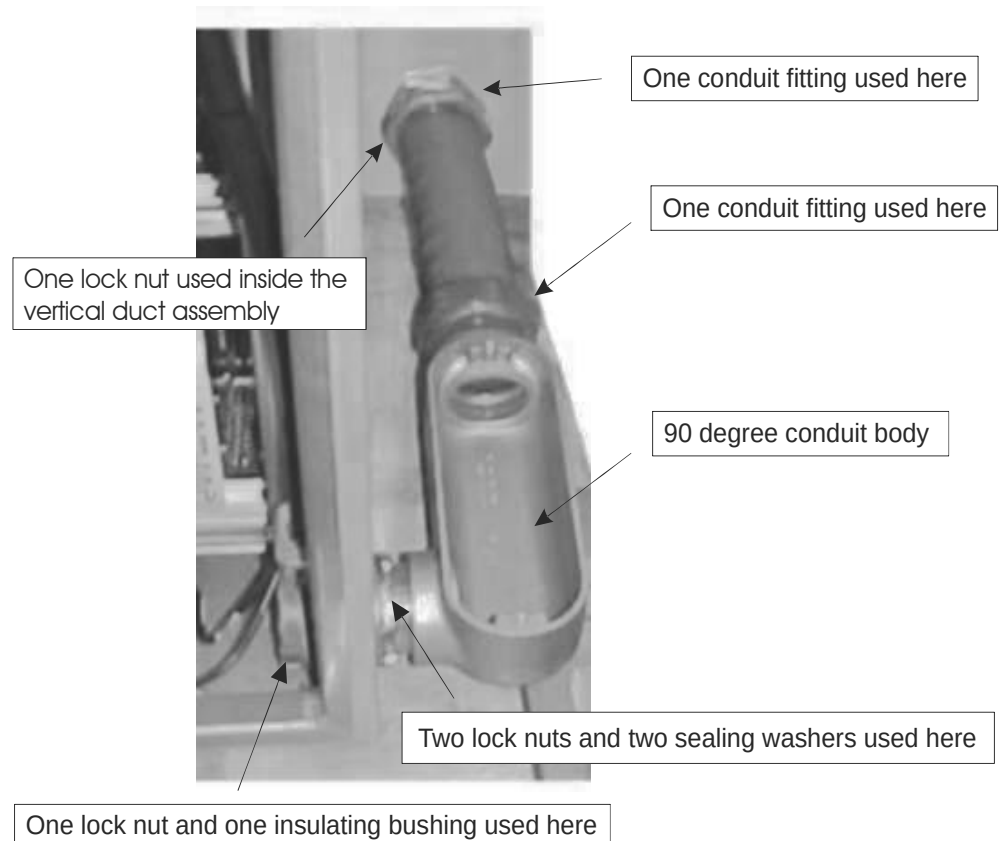
-
- 7 Line up the conduit fitting on the end of the 90 degree conduit body with the conduit fitting on the cable duct assembly.
-
- 8 Using a tape measure, measure the distance between conduit fittings. Add to this distance the length of liquid tight flexible conduit that goes into each conduit fitting. The provided piece of liquid tight flexible conduit must be cut to this length. This should be approximately 9 1/2".
-
- 9 Using a hacksaw, cut the 2-inch diameter liquid tight flexible conduit to the calculated length.
-
- 10 Deburr both ends of the liquid tight flexible conduit.
-



-
- 11** Unscrew the lock nut on the conduit nipple at the AC port inside the bottom right side of Modular Cell 4.0B primary cabinet. Refer to the figures on Page B - 7 and B - 9.
-
- 12** Then remove the 90 degree conduit body and the attached 3-inch conduit nipple from the AC port.
-
- 13** Unscrew the liquid tight conduit fitting from the 90 degree conduit body. Refer to the figure on Page B - 7
-
- 14** Unscrew the lock nut inside the cable duct and remove the liquid tight conduit fitting from the cable duct assembly.
-
- 15** Assemble a liquid tight flexible conduit fitting at each end of the 2-inch liquid tight flexible conduit.
-
- 16** Screw one liquid tight flexible fitting into the end of the 90 degree conduit body that is in line with the long axis of the 90 degree conduit body and tighten with channel lock pliers.
-
- 17** Insert the other conduit fitting into the 2-inch diameter hole at the bottom front of the cable duct assembly. (Have a second technician reinstall a lock nut on the conduit fitting from inside the cable duct assembly.) Refer to the figure on Page B - 9
-
- 18** Insert the 3-inch long conduit nipple into the AC port (bottom right side of Modular Cell 4.0B primary cabinet).
-
- 19** Install a lock nut and insulating bushing on the conduit nipple from inside the Modular Cell 4.0B primary cabinet.
-

20 Using a screwdriver and hammer, tighten all lock nuts and the insulating bushing.

21 Do not place the cover and gasket on the 90 degree conduit body at this time



How to attach the non-Lucent power source to the cable duct assembly

Overview The non-Lucent power source may be connected directly to the cable duct assembly, or alternately, located away from the primary cabinet with conduits utilized for cable routing to the cable duct assembly. Perform one of the following procedures to connect the non-Lucent power source to the bottom of the cable duct assembly.

This section covers the following procedures, as applicable.

<u>Attach the non-Lucent power source directly to the cable duct (zero spacing), if applicable</u>	B - 11
<u>Attach the non-Lucent power source to the cable duct assembly using conduits.</u>	B - 14

Attach the non-Lucent power source directly to the cable duct (zero spacing), if applicable

Important! If using conduits to attach the non-Lucent power source to the cable duct, skip to Attach the non-Lucent power source to the cable duct assembly using conduits. on Page B - 14

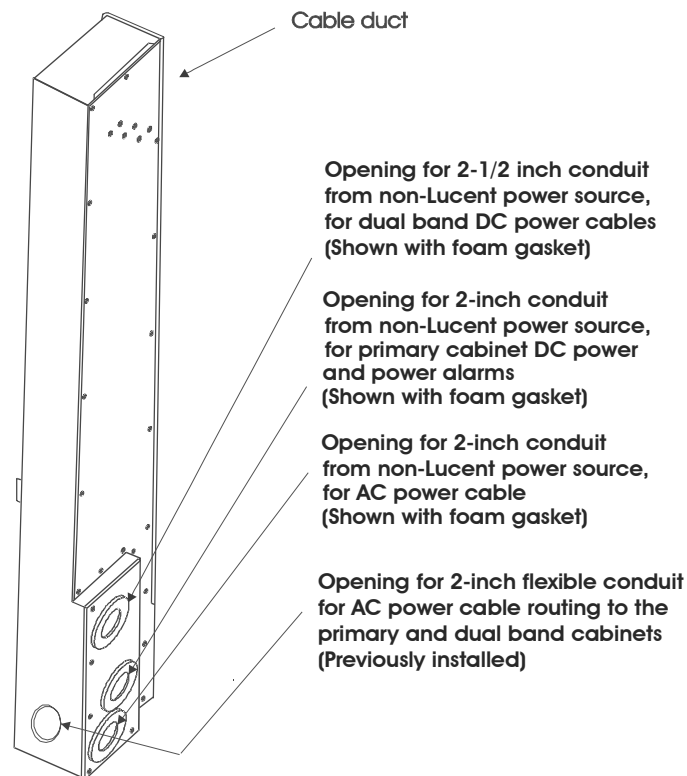
Use the following steps to connect the non-Lucent power source directly to the bottom of the cable duct assembly (zero spacing). This is only possible if openings that are adaptable to the cable duct openings are available on the non-Lucent power source.

! WARNING

Equipment damage

When performing the next step, the correct method to align the non-Lucent power source to the three openings in the cable duct is to re-level the non-Lucent power source and/or the Modular Cell 4.0B primary cabinet.

- 1 Align the openings at the bottom of the cable duct assembly to the opposite openings on the non-Lucent power source. Refer to the figure below.



-
- 2 Install the bottom 2- inch chase nipple, lock nuts, and insulating bushing into the correct opening, and hand-tighten. Refer to the figure on Page B - 13.
-

- 3 Repeat the previous step for middle (2-inch) chase nipple.
-

Important! The top chase nipple (2-1/2 inch) is only needed for the dual band cabinet. The 2-1/2 inch chase nipple, lock nuts, and insulating bushing are not supplied with the cable duct kit. They are supplied if a dual band cabinet is being installed.

- 4 Adjust the position of the Modular Cell 4.0B primary cabinet and the non-Lucent power source to achieve correct alignment of the chase nipple connections.
-

Important! The sides must be parallel with each other.

- 5 Hold the lock nut inside of the non-Lucent power source with a wrench, and tighten the lock nut inside of the cable duct with a hammer and a screwdriver (two technicians needed). Refer to the figure on Page B - 13
-

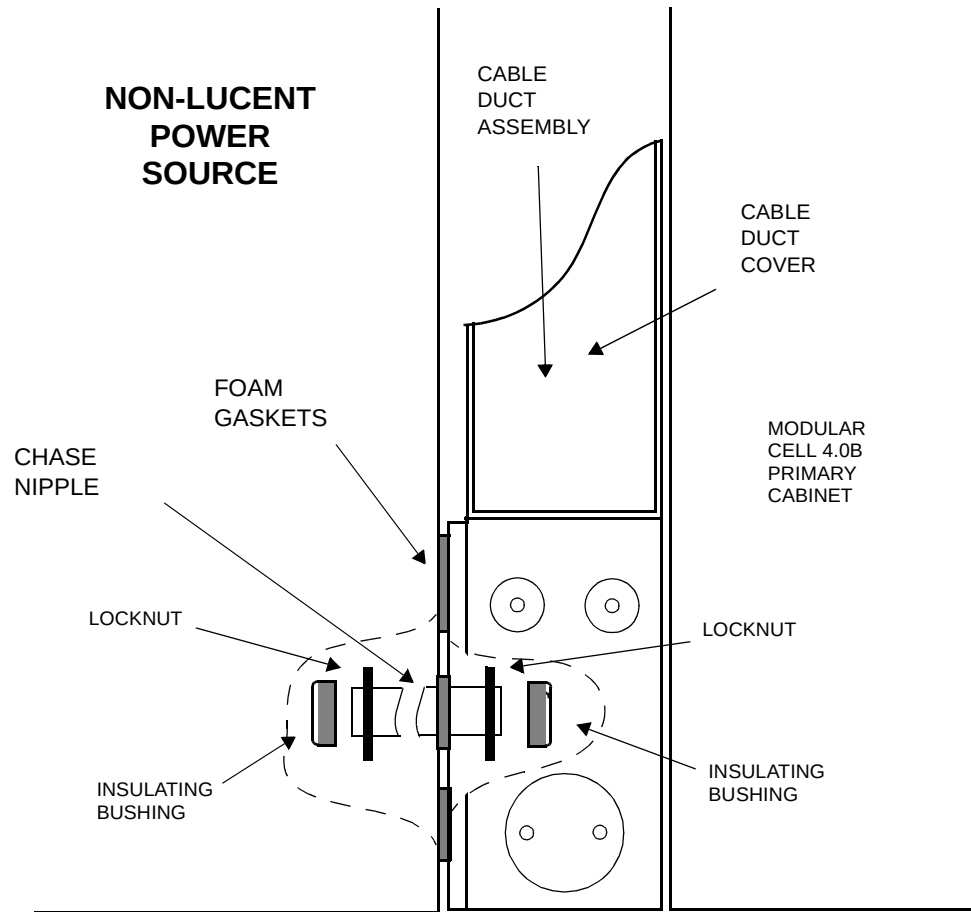
- 6 Repeat the previous step for the remaining locknuts inside the cable duct.
-

- 7 Tighten the cable duct assembly hardware on the primary cabinet.
-

- 8 Tighten the anchor bolts or nuts on the primary cabinet (and non-Lucent power source, if applicable) as follows. The anchors were installed in Chapter 2, "Modular Cell cabinet handling, placement, anchoring and grounding".

- Seismic zones 0, 1, and 2: Torque the bolts to 18 ft.-lb (24 Nm).
- Seismic zones 3 and 4: Torque the nuts to 58 ft.-lb (79 Nm).

ZERO SPACING



**Attach the non-Lucent
power source to the cable
duct assembly using
conduits.**

Important! If the non-Lucent power source is attached directly to the cable duct, skip to Procedures to route and connect all non-Lucent power cables in the Modular Cell 4.0B cabinets on Page B - 16.

- 1 Remove the three foam gaskets from the cable duct.

Important! The top (2-1/2- inch) opening must be sealed with a hole plug, if not used at this time. If installing a 2-1/2 inch conduit, remove that foam gasket, as well.

-
- 2 Install a 2-inch conduit (from the power source) and conduit fitting at the bottom 2-inch opening in the cable duct. Refer to the figure on Page B - 15.

-
- 3 Thread a locknut and insulating bushing onto the end of the conduit fitting inside of the cable duct., and hand-tighten Refer to the figure on Page B - 15

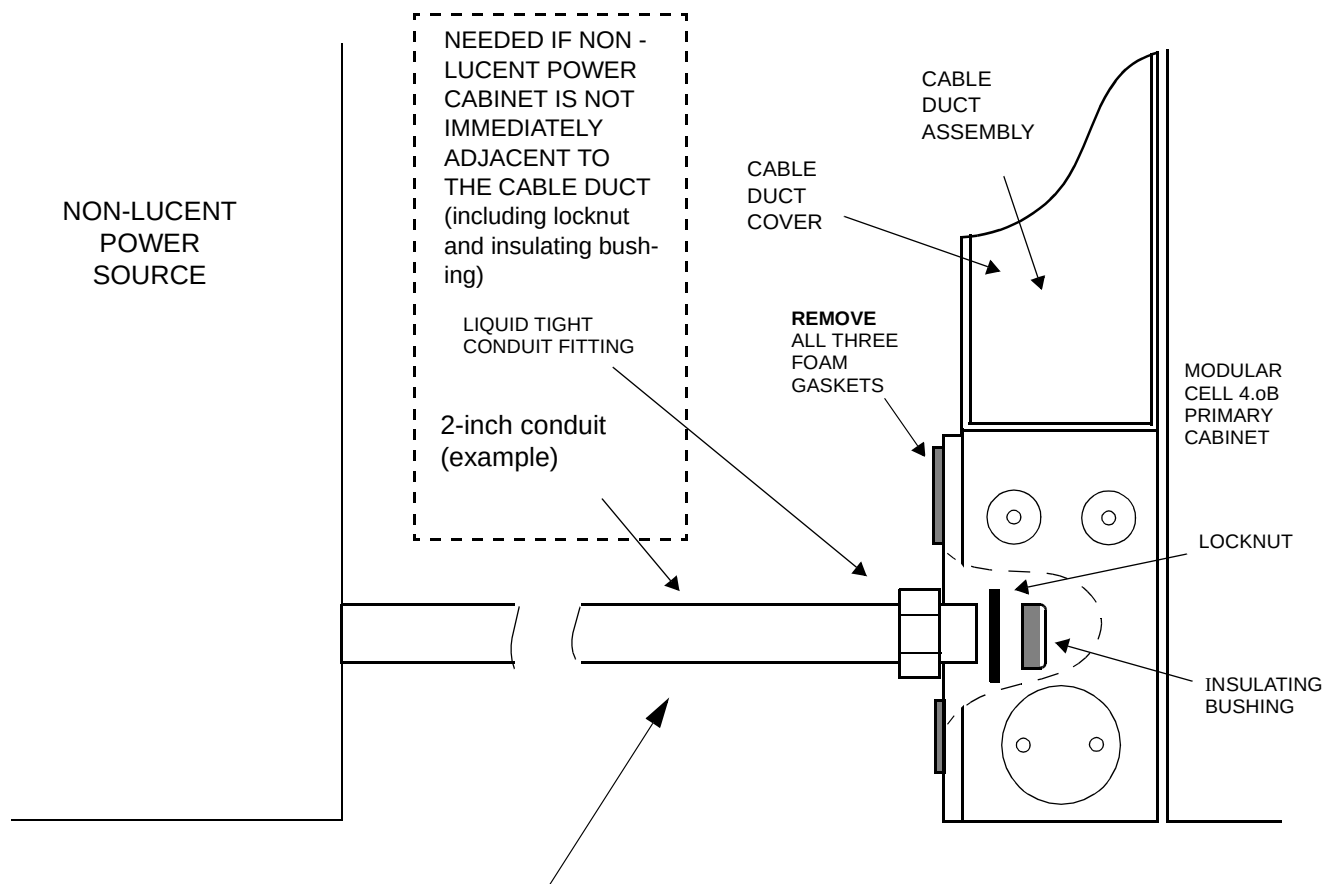
-
- 4 Repeat the two previous steps for the middle (2-inch) conduit.

Important! The top chase nipple (2-1/2 inch) is only needed for the DC cables for a dual band cabinet. Note that the 2-1/2 inch chase nipple, lock nuts, and insulating bushing are not supplied with the cable duct kit. Note that in this application, the 2-1/2 opening in the cable duct must be sealed with the supplied cover if a dual band cabinet is not being installed.

-
- 5 Hold the fitting with a wrench, and tighten the locknut inside of the cable duct with a hammer and a screwdriver (two technicians needed). Refer to the figure on Page B - 15

-
- 6 Repeat the previous step for the remaining fittings.

- 7 Tighten the anchor bolts or nuts on the primary cabinet (and non-Lucent power source, if applicable) as follows. The anchors were installed in Chapter 2, "Modular Cell cabinet handling, placement, anchoring and grounding".
- Seismic zones 0, 1, and 2: Torque the bolts to 18 ft.-lb (24 Nm).
 - Seismic zones 3 and 4: Torque the nuts to 58 ft.-lb (79 Nm).



If flush mounting is not possible, conduit (example) should be used for routing of cables from the non-Lucent power source to the cable duct.

Procedures to route and connect all non-Lucent power cables in the Modular Cell 4.0B cabinets

Overview of this section

Purpose This section describes the procedures for routing and connecting all cables from the non-Lucent power source to the Modular Cell 4.0B cabinets

<u>Cable pre-installation instructions for the primary cabinet</u>	B - 17
<u>How to route and connect DC power cables to the Modular Cell 4.0B primary cabinet</u>	B - 18
<u>How to route the power cabinet alarm cable to the Modular Cell 4.0B primary cabinet</u>	B - 26
<u>How to route and connect the power cabinet alarm cable at the Modular Cell 4.0B primary cabinet</u>	B - 30
<u>How to route the AC power cables to the Modular Cell 4.0B primary cabinet</u>	B - 40
<u>How to route and connect the AC power cables at the Modular Cell 4.0B primary cabinet</u>	B - 44
<u>Cable pre-installation instructions for the dual band cabinet</u>	B - 50
<u>How to install ancillary hardware for the dual band cabinet DC cables</u>	B - 51
<u>How to route and connect DC power cables to a Modular Cell 4.0B dual band cabinet</u>	B - 54
<u>How to route and connect AC power cables for a 4.0B dual band Modular Cell cabinet</u>	B - 64

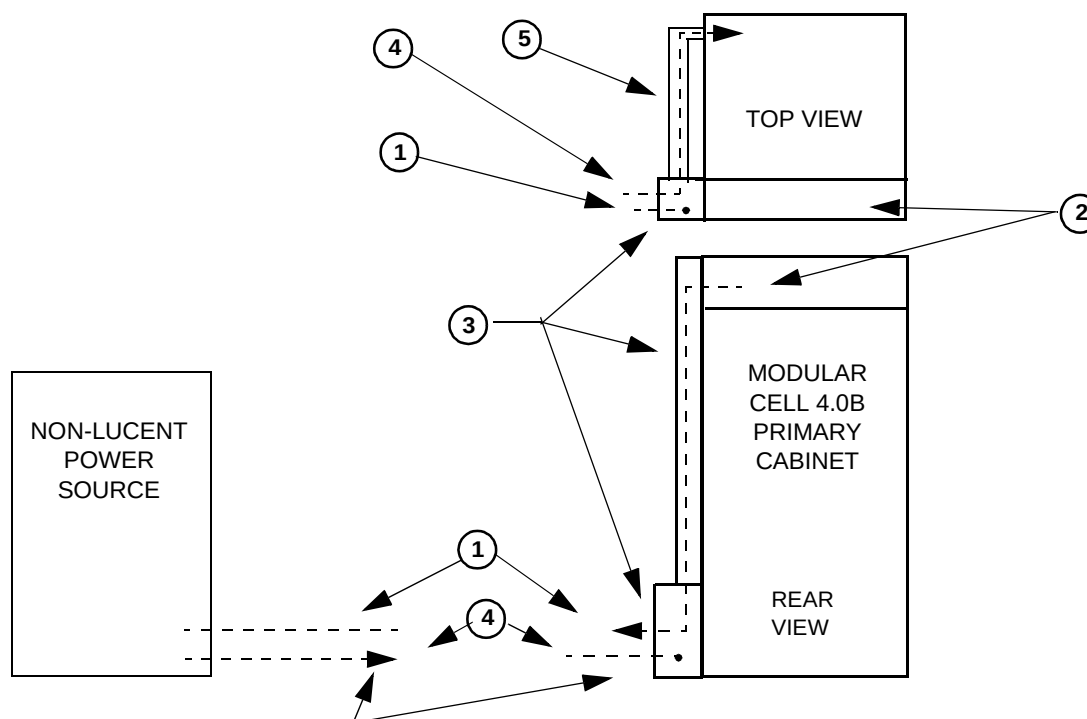
Cable pre-installation instructions for the primary cabinet

Wiring overview

Important! If installing a Modular Cell 4.0B dual band cabinet, skip to [Cable pre-installation instructions for the dual band cabinet](#) on Page B - 50 to continue the installation.

The following is the wiring overview, item number coded to the figure below.

- a. DC load and return wiring, as well as the alarm cable (see item 1), are routed from the antenna cable cover (see item 2), on the Modular Cell primary cabinet, and follow a vertical route down through the cable duct assembly (see item 3), through the upper 2-inch opening at the bottom of the cable duct, through the top 2-inch conduit to the non-Lucent power source.
- b. AC wiring from the non-Lucent power source (see item 4) is routed through the bottom 2-inch conduit to and through the bottom 2-inch opening in the cable duct (see item 3) and then is routed forward through the AC conduit (see item 5) and through the opening at the bottom front of the cabinet.



If the power source is not flush mounted with zero spacing to the cable duct, a 2-inch conduit is used for routing of cables between the cable duct and the non-Lucent power source

How to route and connect DC power cables to the Modular Cell 4.0B primary cabinet

Overview **Important!** If installing a Modular Cell 4.0B dual band cabinet, skip to [Cable pre-installation instructions for the dual band cabinet](#) on Page B - 50 to continue the installation.

These procedure provide instructions for the installation of the DC power cables from non-Lucent power source to the primary cabinet. Step-by-step instructions are provided for the following tasks.

Label primary cabinet +24VDC cables	B - 21
Label primary cabinet 24VDC return cables	B - 21
Route the DC cables from the Modular Cell 4.0B primary cabinet to the non-Lucent power source	B - 22
Connect the DC cables at the Modular Cell 4.0B primary cabinet	B - 24

For DC power requirements, refer to Appendix E of the following document.

Flexent® Modular Cell 4.0/4.0B Outdoor Site Preparation Guidelines, 401-703-413

If the requirements listed in the applicable document have been met, refer to the applicable vendor documentation and use this document for the DC power connections.

**Description of the DC
power cables**

Modular Cell cabinets without integrated power require DC power cables, red feed cables (+) and black return cables (-) for attachment from a separate power source. Note that the terminal lugs for attachment at the Modular Cell 4.0B primary cabinet are supplied with the primary cabinet.

**DC feeders and connection
interface**

Each Modular Cell outdoor cabinet requires three DC feeds as shown in the table on the next page. One additional DC feed is required if the Modular Cell is equipped with an A6 amplifier shelf. Alternate wire gauges may be used for the DC feeders, but shall be sized to limit the round trip voltage drop between the power system output terminals and the Modular Cell input terminals to less than one volt (for +24 VDC systems). A current level equal to 80% of the circuit breaker current rating specified shall be used for this calculation. The wire used for the DC feeders shall be rated for the environmental condition in which it is used and shall be rated and sized according to the applicable section in the National Electrical Code or Canadian Electrical Code, Part I (NAR markets) and IEC 60364, or the local electrical code in effect (international markets). The circuit breaker shall be type 51 with DC trip-delay curve characteristics.

The DC power terminal block is located at the top rear of a Modular Cell 4.0B outdoor cabinet. The table on Page B - 20 provides the circuit breaker sizes, wire gauges, maximum wire lengths and lug dimensions for DC feeders #1, #2, #3, and #4 for 4.0B Modular Cells.

DC cable specifications The following table provides the DC cable specifications for 4.0B cabinets. The fourth feed is required for the A6 amplifier shelf only.

DC feeders and connection interface: Modular Cell 4.0B				
Modular Cell 4.0B	Feeder 1#, #2, #3, #4 (Note 1)			Dimensions for lug on DC terminal block
	Circuit breaker (AMPS)	Wire size (AWG)	Max. Length (Feet)	
+24 VDC	150	1 (Note 2)	40	5/16 (threaded stud) 11/16 (max. width)

NOTES

Note 1: The fourth feed is required only if the Modular Cell 4.0B cabinet is equipped with an A6 amplifier shelf

Note 2: DC wires and lugs must be rated for 90 degrees C. For longer wire runs, calculate wire size and circuit breaker rating according to the National Electric Code or canadian Electrical Code, Part I (NAR markets) and IEC 60364, or local electrical code in effect (International markets).

**Label primary cabinet
+24VDC cables**

Label both ends of each +24VDC primary cabinet cable with a permanent marker or a wire tag, as shown in the table below. The (number) in parentheses indicates the DC terminal block position for connection of each cable. The primary cabinet has DC terminal block positions numbered 1 through 4 from right to left. Refer to the figure on Page B - 25.

If installing:	Then label +24VDC cables:
4.0B Primary Cabinet (L3A required for primary cabinets with A6 shelf)	• #1 AWG: Label L1 (1) • #1AWG: Label L2 (2) • #1 AWG: Label L3 (3) • #1 AWG: Label L3A (4) (for A6 shelf only)

**Label primary cabinet
24VDC return cables**

Label both ends of each 24VDC return primary cabinet cable with a permanent marker or a wire tag, as shown in the table below. The (number) in parentheses indicates the DC terminal block position for connection of each cable. The primary cabinet has DC terminal block positions numbered 1 through 4 from right to left. Refer to the figure on Page B - 25.

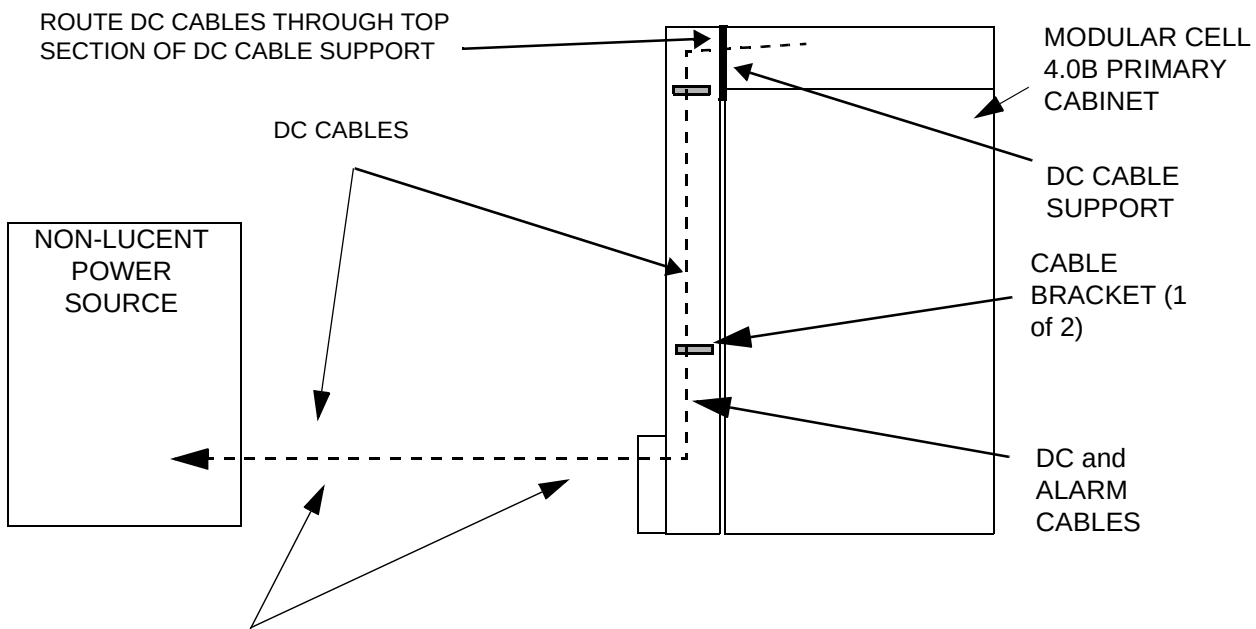
If installing:	Then label 24VDC Return cables:
4.0B Primary Cabinet (L3A required for primary cabinets with A6 shelf)	• #1 AWG: Label L1 (1) • #1AWG: Label L2 (2) • #1 AWG: Label L3 (3) • #1 AWG: Label L3A (4) (for A6 shelf only)

Route the DC cables from the Modular Cell 4.0B primary cabinet to the non-Lucent power source

Important! In order to make the routing of the DC cables as easy as possible, it is recommended that they be routed in a direction from the primary cabinet to the non-Lucent power source, prior to connection at either end.

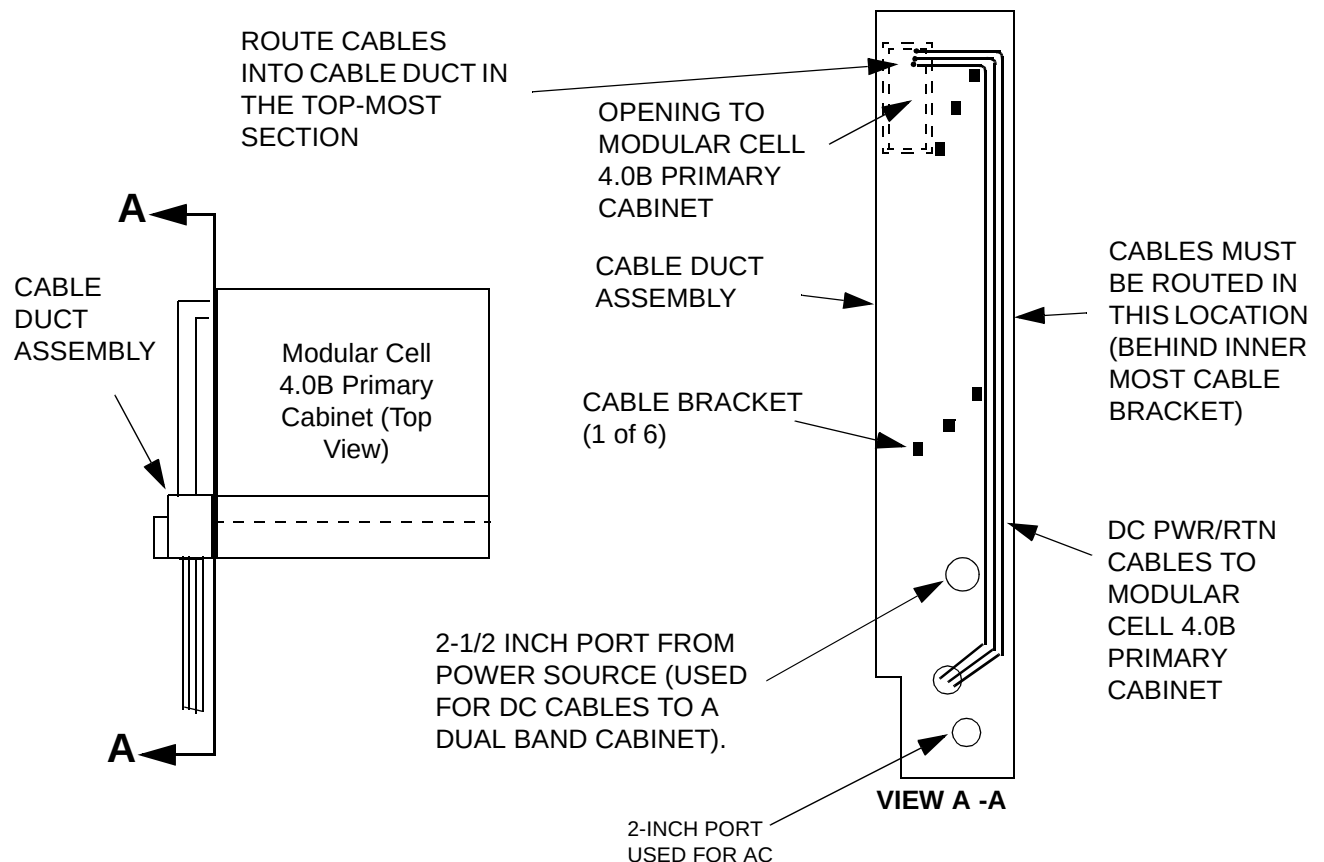
Use the following procedure to route the DC cables from the Modular Cell 4.0B primary cabinet to the non-Lucent power source.

- 1 Thoroughly tape over the ends of all DC cables, and start the routing of the cables from the area of the DC terminal block at the top of the primary cabinet.
- 2 Route two cables at a time through the top section of the opening between the antenna cable cover and the cable duct and into the cable duct. Refer to the figure below.



If the power source is not flush mounted to the cable duct, conduits are used for routing of cables from the non-Lucent power source to the cable duct.

-
- 3 Within the cable duct assembly, route the cables downward *behind the deepest (inner-most) cable guides*. Attach later with wire ties. Refer to the figure below. Attach later with wire ties.
-
- 4 Route the cables into the non-Lucent power source through the middle (2- inch) port (and conduit, if applicable). Refer to the figure below.
-



-
- 5 If the DC cables need to be shortened before they are attached in the non-Lucent power source, the labels may be cut off. Remember to re-label each cable immediately after it is cut.
-

Important! The installer may wish to wait until after the DC cables are connected in the non-Lucent power source before performing the next procedure

**Connect the DC cables at
the Modular Cell 4.0B
primary cabinet**

Refer to the figure on Page B - 25 and perform the following steps to connect the DC cables at the Modular Cell 4.0B primary cabinet.

-
- 1** At the top of the primary cabinet, remove the terminal block cover, if provided, from the terminal block.

-
- 2** Remove the straight single-hole terminal lugs from the DC power terminal block (or from the loose parts bag shipped with the Modular Cell 4.0B primary cabinet).

Important! When performing the next step, keep all of the DC cables at the top of the opening between the cable duct assembly and the antenna cable cover.

-
- 3** At the top of the cable duct assembly, cut each cable to the correct length (allow adequate slack).

Important! The cable markings/tags may be cut off when the excess cable is removed. Re-mark or tag each cable after cutting.

-
- 4** Strip the insulation at the end of each cable.

-
- 5** Slide a section of the supplied heat shrink onto the end of each cable.

-
- 6** Crimp a terminal lug onto the end of each cable, and then slide the heat shrink over the terminal lug and shrink with a heat gun.

-
- 7** Connect the 24-VDC return cables (black) to the cabinet DC power terminal block.

Important! Use the four lower terminals labeled *RETURN*, and connect the cables by label number in order *from right to left*. Use the terminals listed in the applicable table on Page B - 21. Refer to the figure on Page B - 25

-
- 8 Hand-tighten the nuts to guard against cross-threading, and then torque the 5/16-inch, 24-VDC return cable connections to 75 in.-lb. (8 Nm). Do not use the torque specifications provided in Chapter 1.
-

- 9 Connect the +24-VDC cables (red) to the cabinet DC power terminal block.

Important! Use the upper terminals labeled *LINE* (+24 VDC), and connect the cables by label number in order *from right to left*. Use the terminals listed in the applicable table on Page B - 21. Refer to the figure below.

- 10 Hand-tighten the nuts to guard against cross-threading, and then torque the four 5/16-inch, +24-VDC cable connections to 75 in.-lb. (8 Nm). Do not use the torque specifications provided in Chapter 1.
-

- 11 Replace the terminal block cover.
-



Warning:

Hand-tighten the nuts before using the torque wrench

TORQUE LUG NUTS TO 75 IN-LBS
OVERTIGHTENING MAY RESULT IN DAMAGE



CONNECT 1 AWG HERE
IF PRIMARY CABINET HAS
AN A6 AMPLIFIER SHELF

1 AWG

How to route the power cabinet alarm cable to the Modular Cell 4.0B primary cabinet

Overview **Important!** If installing a 4.0B dual band cabinet, skip to [How to route and connect AC power cables for a 4.0B dual band Modular Cell cabinet](#) on Page B - 64 to continue the installation.

This procedure provides instructions for the routing of one power alarm cable from the non-Lucent power source to the primary cabinet.

The following description and step-by-step instructions are provided:

Description of power source alarm cable routing and connection	B - 26
Route the power source alarm cable to the Modular Cell 4.0B primary cabinet	B - 27

For power system alarm requirements, refer to Appendix E of the following document.

- *Flexent® Modular Cell 4.0/4.0B Outdoor Site Preparation Guidelines*, 401-703-413

If the requirements listed in the applicable document have been met, refer to the applicable vendor documentation and use *this* document for power connections.

Description of power source alarm cable routing and connection

The primary cabinet provides connections for one power source alarm cable.

The power source alarm cable will be routed via the same route as the DC power cables that were previously installed, but in the reverse direction (from the power source to the Modular Cell primary cabinet).

**Route the power source
alarm cable to the Modular
Cell 4.0B primary cabinet**

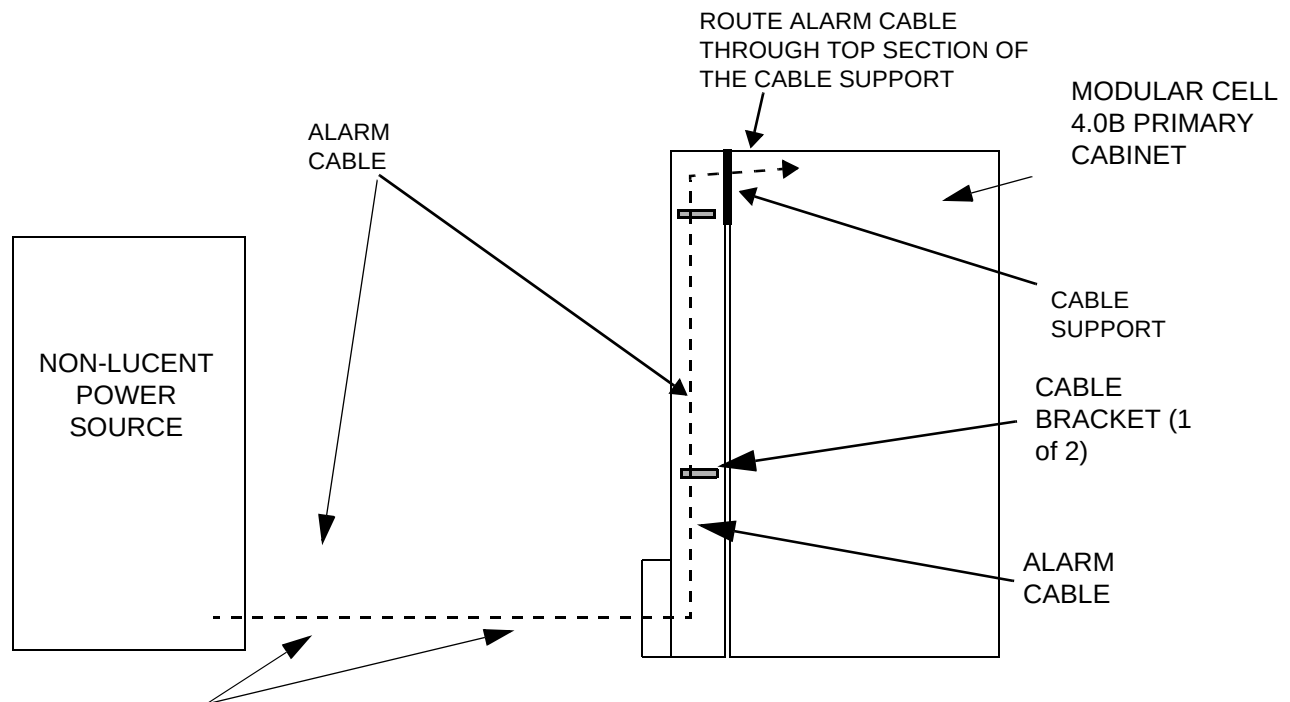
Use the following procedure to route the power source alarm cable.

-
- 1 Locate the power source alarm cable at the non-Lucent power cabinet. Refer to the figure below.
-

- 2 Route the alarm cable through the conduit (if applicable) and into the cable duct as illustrated in the figure below.
-

Important! When performing the next step, route the cable behind the deepest (front-most) cable guides within the cable duct assembly and attach with wire ties. Refer to the figure on Page B - 28.

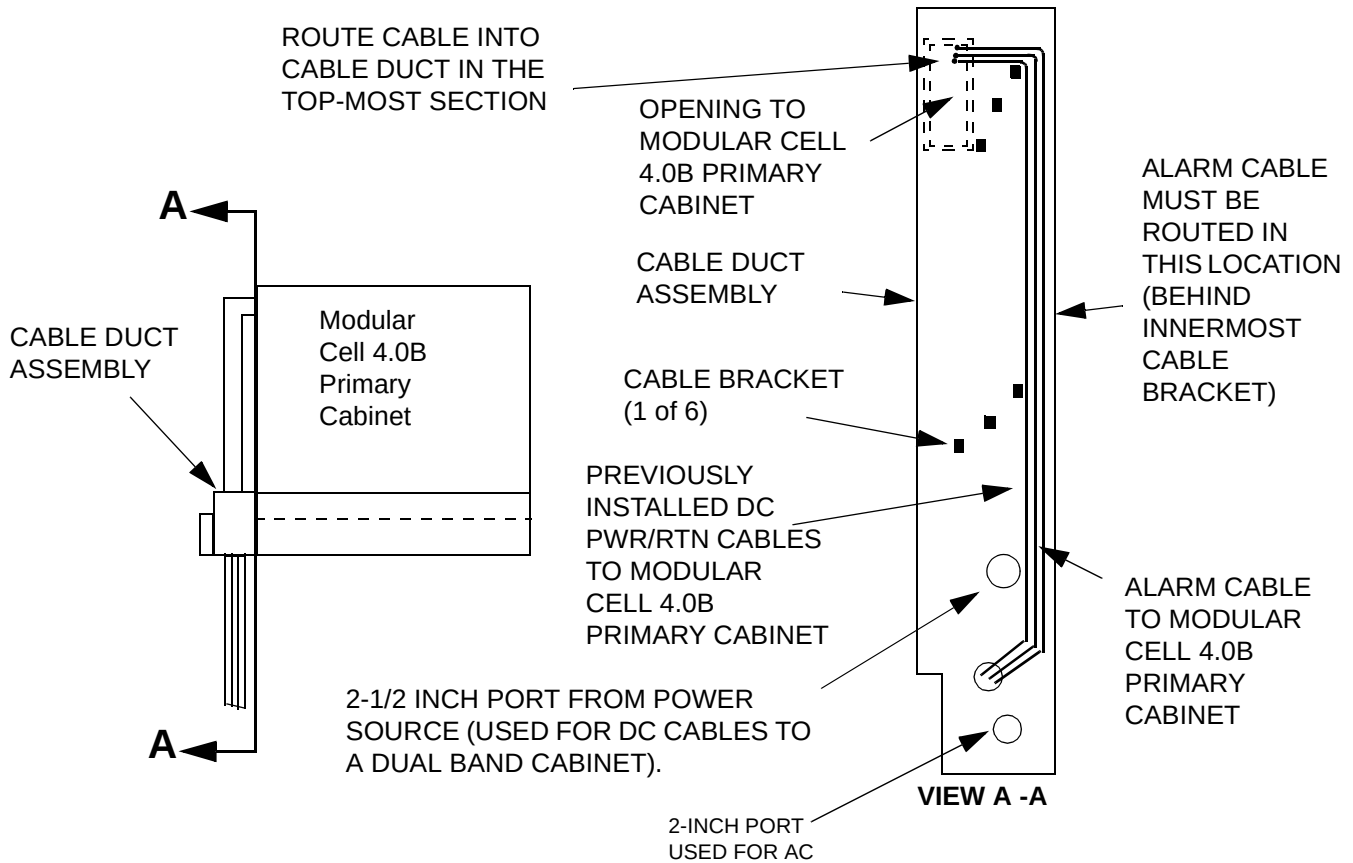
- 3 Route the alarm cable up to the top the cable duct as illustrated in the figure below, and the figure on Page E - 28
-



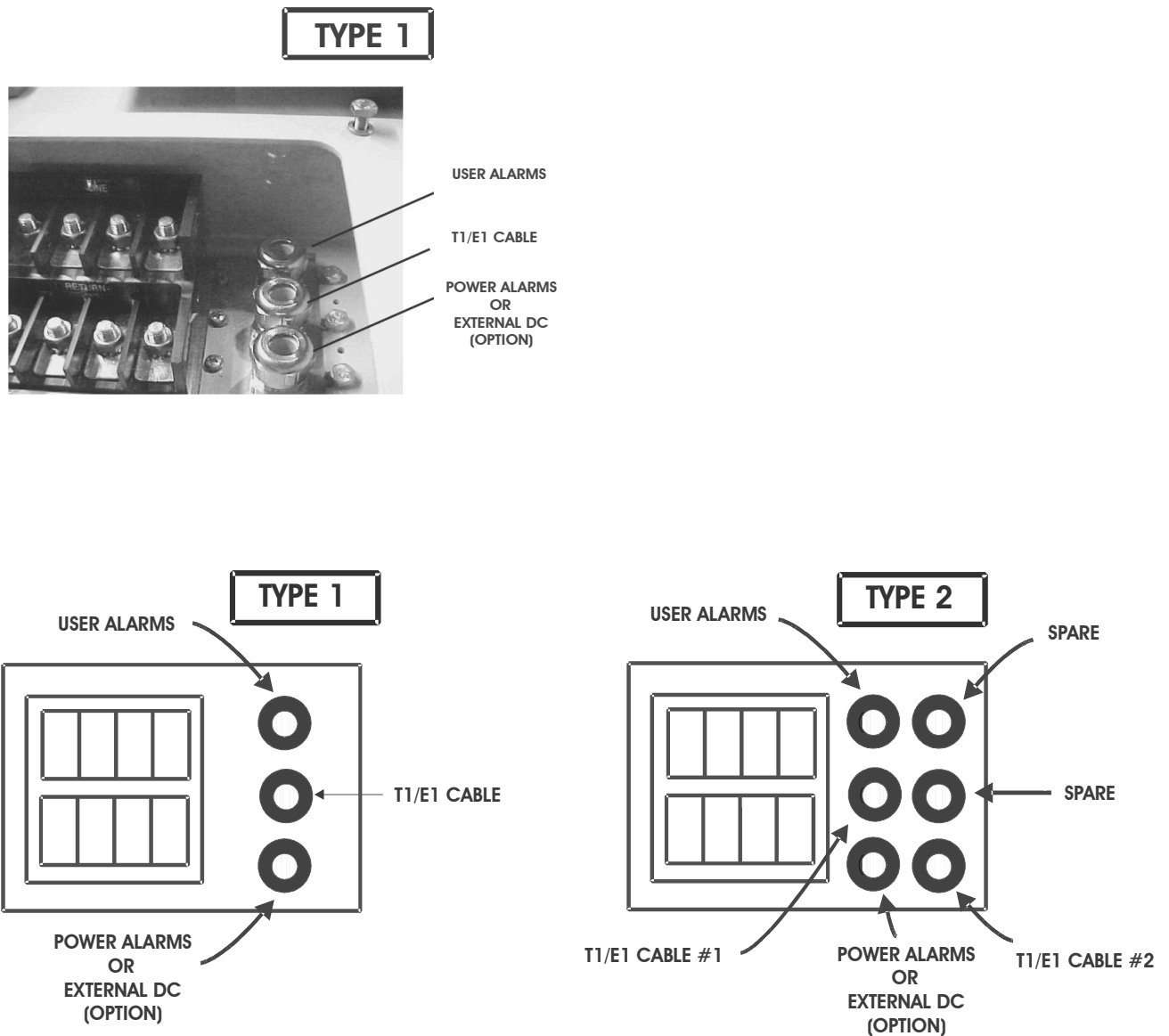
If flush mounting is not possible, two 2-inch conduit s are used for routing of cables from the non-Lucent power source to the cable duct. The middle (upper 2-inch) conduit is used to route the power alarm cable

Important! When performing the next step, keep the alarm cable in the top section of the opening in the cable duct.

- 4 Route the cable out the top of the duct and into the antenna cable cover on the top rear of Modular Cell 4.0B. Refer to the figure below.



-
- 5 Route the cable out the top of the duct and to the alarm cable entry point on the top rear of Modular Cell 4.0B. Refer to the figure below for the location of the alarm cable entry point in the two types of feed-through configurations that may be encountered



-
- 6 Allow a minimum of 2 meters (6.5 feet) of the alarm cable for routing inside of the Modular Cell 4.0B primary cabinet and cut off the remainder.

How to route and connect the power cabinet alarm cable at the Modular Cell 4.0B primary cabinet

Overview This procedure module provides instructions for the installation of one non-Lucent power alarm cable from the power source to the primary cabinet.

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

<u>Install the EMI / RFI cord grip seal with the alarm cable</u>	B - 32
<u>Prepare the alarm cable for punchdown and ground connection at the facilities interface panel</u>	B - 35
<u>Connect alarm cable to the EFIM punchdowns in Modular Cell 4.0B cabinet</u>	B - 37

Description of power source alarm cable routing and connection

The alarm cable is routed into the Modular Cell 4.0B primary cabinet through a cord grip seal. This seal provides sealing and strain relief. Inside of the Modular Cell 4.0B primary cabinet, the power source alarm cable will be connected to a punch-down terminal block. The terminal block is easily accessible from the front of the cabinet, behind a slide-out module, the "facilities interface panel".

Description of power alarm cable

The Modular Cell 4.0B primary cabinet requires one power alarm cable. The recommended cable is specified in *Flexent® Modular Cell 4.0/4.0B Site Preparation Guidelines, 401-703-413*.

Important! Installation procedures contained in this document are based on the recommended 24-pair cable. Refer to the table below. If a different wire is used, the wire colors may vary.

Important! The outside diameter of the twisted-pair cable must be within the range of 6 mm (0.24 inches) to 12 mm (0.47 inches), in order to fit through the connector supplied on the Modular Cell 4.0B cabinet.

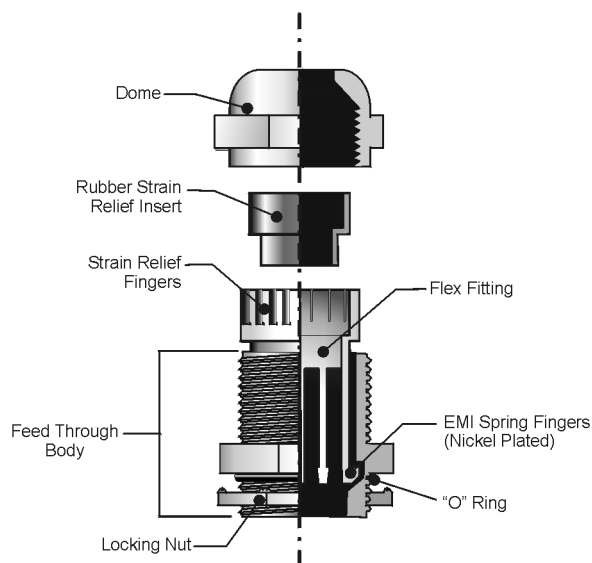
Color Code for specified cable		
PAIR NO	COLORS	
1	White-Blue	Blue-White
2	White-Orange	Orange-White
3	White-Green	Green-White
4	White-Brown	Brown-White
5	White-Slate	Slate-White
6	Red-Blue	Blue-Red
7	Red-Orange	Orange-Red
8	Red-Green	Green-Red
9	Red-Brown	Brown-Red
10	Red-Slate	Slate-Red
11	Black-Blue	Blue-Black
12	Black-Orange	Orange-Black
13	Black-Green	Green-Black
14	Black-Brown	Brown-Black
15	Black-Slate	Slate-Black
16	Yellow-Blue	Blue-Yellow
17	Yellow-Orange	Orange-Yellow
18	Yellow-Green	Green-Yellow
19	Yellow-Brown	Brown-Yellow
20	Yellow-Slate	Slate-Yellow
21	Violet-Blue	Blue-Violet
22	Violet-Orange	Orange-Violet
23	Violet-Green	Green-Violet
24	Violet-Brown	Brown-Violet

Install the EMI / RFI cord grip seal with the alarm cable

The power alarm cable enters the cabinet through an EMI / RFI cord grip seal. This seal grounds the cable shield to the cabinet. Use the following procedure to install the EMI / RFI cord grip seal on the power alarm cable.

The figure below shows the various parts of the cord grip seal. Note that the cord grip seal *should not be disassembled*.

Refer to the figure on Page B - 34 for the completed installation.



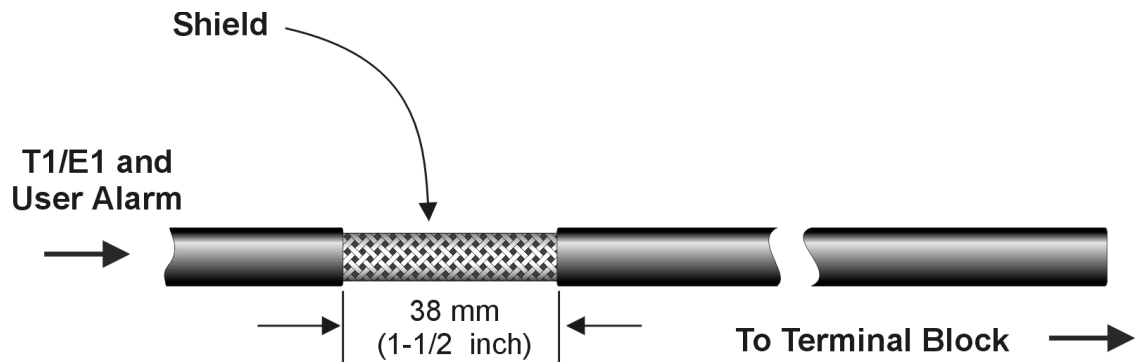
- 1 From the front of the cabinet, loosen the thumb screws on the facilities interface panel, and open the panel. Refer to the figure on Page B - 37.

- 2 Loosen the *dome*.

Important! When performing the next two steps, it is necessary to have a second person help by pulling the cable through the facilities interface panel from the front of the cabinet.

- 3 Insert the end of the cable into the top of the cord grip seal assembly (on the top of the cabinet).

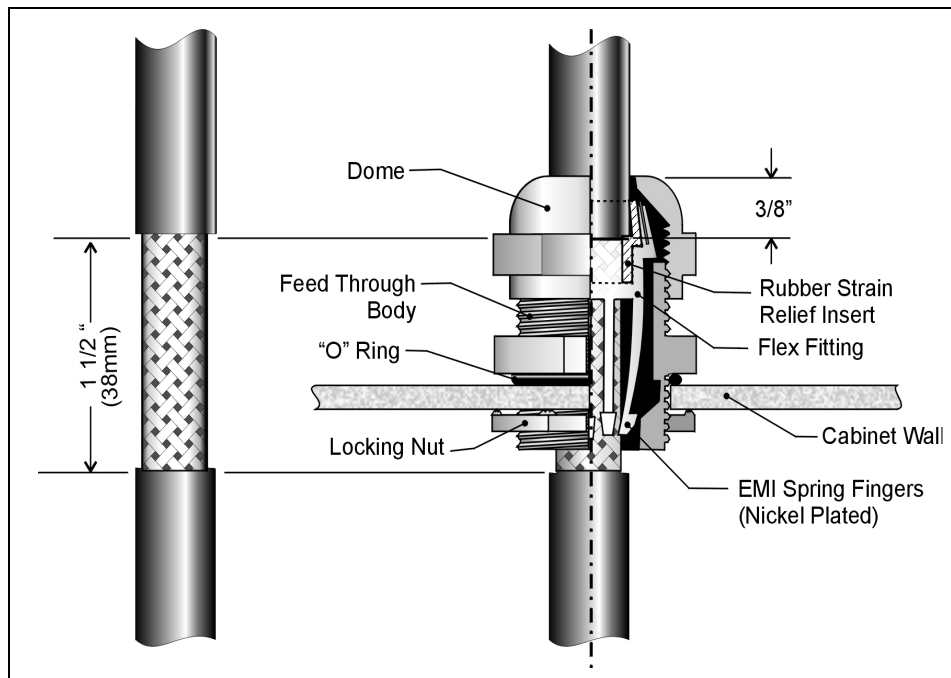
-
- 4 Slowly push the cable through the cord grip seal assembly until the cable is fully into the cabinet.
-
- 5 Pull the cable back a few inches, and strip the outer insulation from the cable to expose approximately 38 mm (1.5 inch) of the shield, as shown in the figure below. Do not cut the cable shield.



Important! When performing the next step, take care not to insert the cable insulation (above the stripped area) more than 3/8-inch into the rubber strain relief insert.

-
- 6 Insert the cable back into the seal. Refer to the figure on Page B - 34.

Important! The figure below is not drawn to scale.



7 Tighten the *dome*.

As the *dome* is tightened, the *fingers at the top of the flex fitting* are compressed against the rubber strain relief insert, which is, in turn, compressed against the cable insulation. Simultaneously, the nickel-plated EMI spring fingers at the bottom of the flex fitting are compressed against the exposed cable shield. The EMI spring fingers are grounded to the feed-through body, which, in turn, is bonded to the cabinet enclosure. This effectively grounds the cable shield.

Prepare the alarm cable for punchdown and ground connection at the facilities interface panel

Prepare the alarm cable for punchdown at the facilities interface panel.

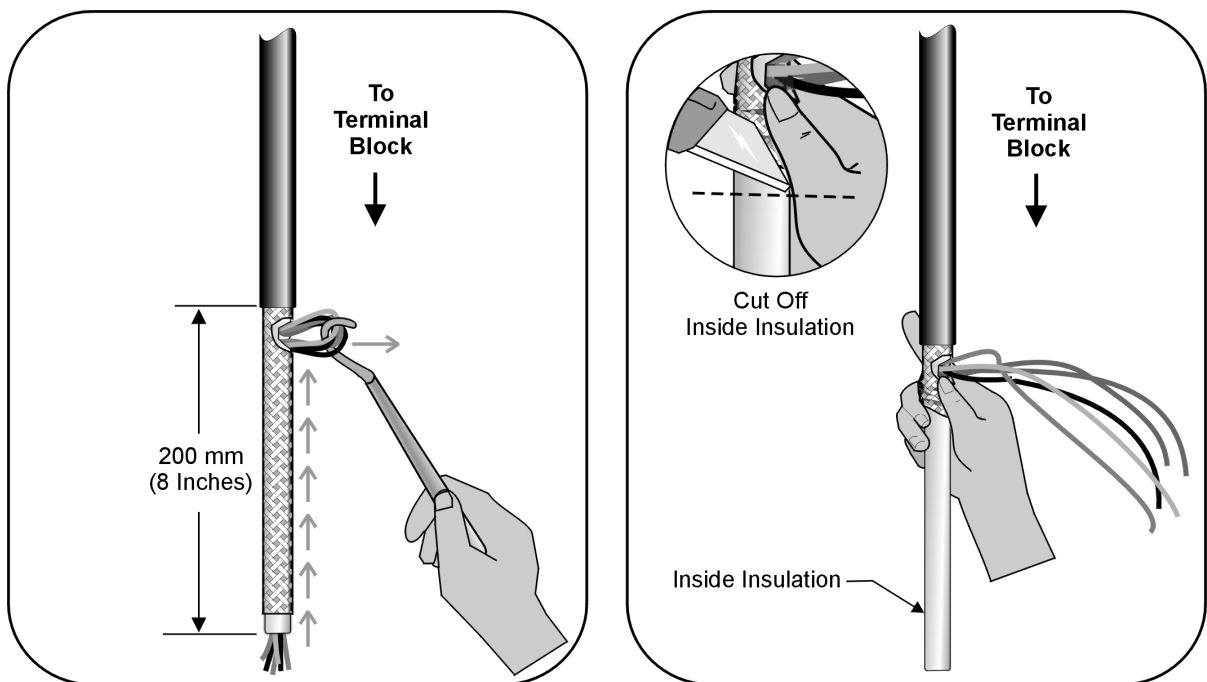
1 Allow adequate slack and cut the alarm cable to the correct length.

2 Strip the outer cable insulation to expose 200 mm (8 inches) of the braided shield. Refer to the figure below.

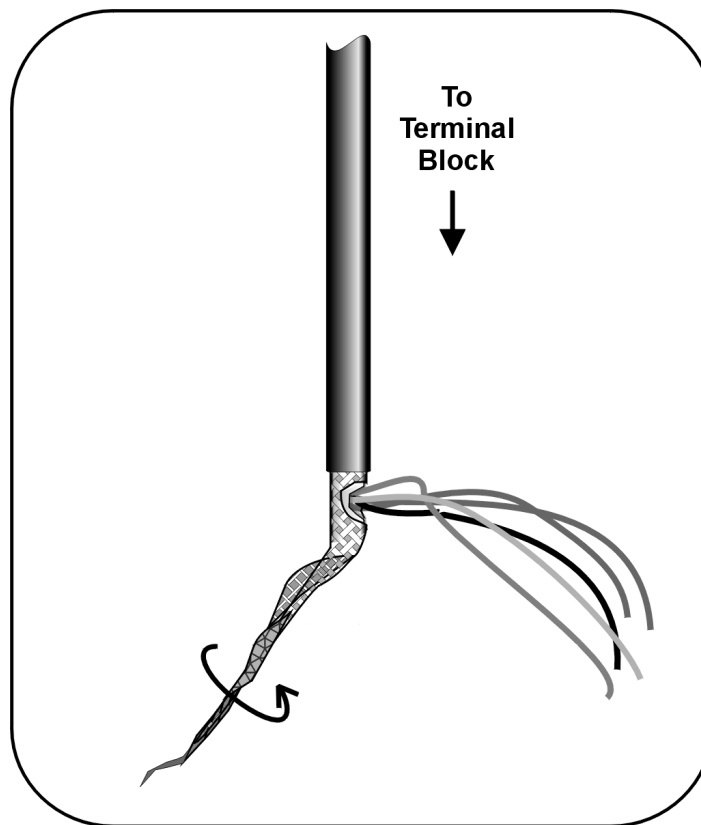
Important! Be careful not to cut into the cable shield.

3 At the end of the outer insulation, cut an opening in the braided shield, and the insulation inside it, to expose the individual wires.

4 Using a hook or equivalent tool, pull the wires out through the opening made in the previous step, as shown in the figure below.



-
- 5 Push the braided shield back on the inside insulation as shown.
-
- 6 Cut off the exposed inside insulation.
-
- 7 Twist the alarm cable shield at the end of the cables in preparation for their attachment to a grounding clamp located on the facilities interface panel. Refer to the figure below.

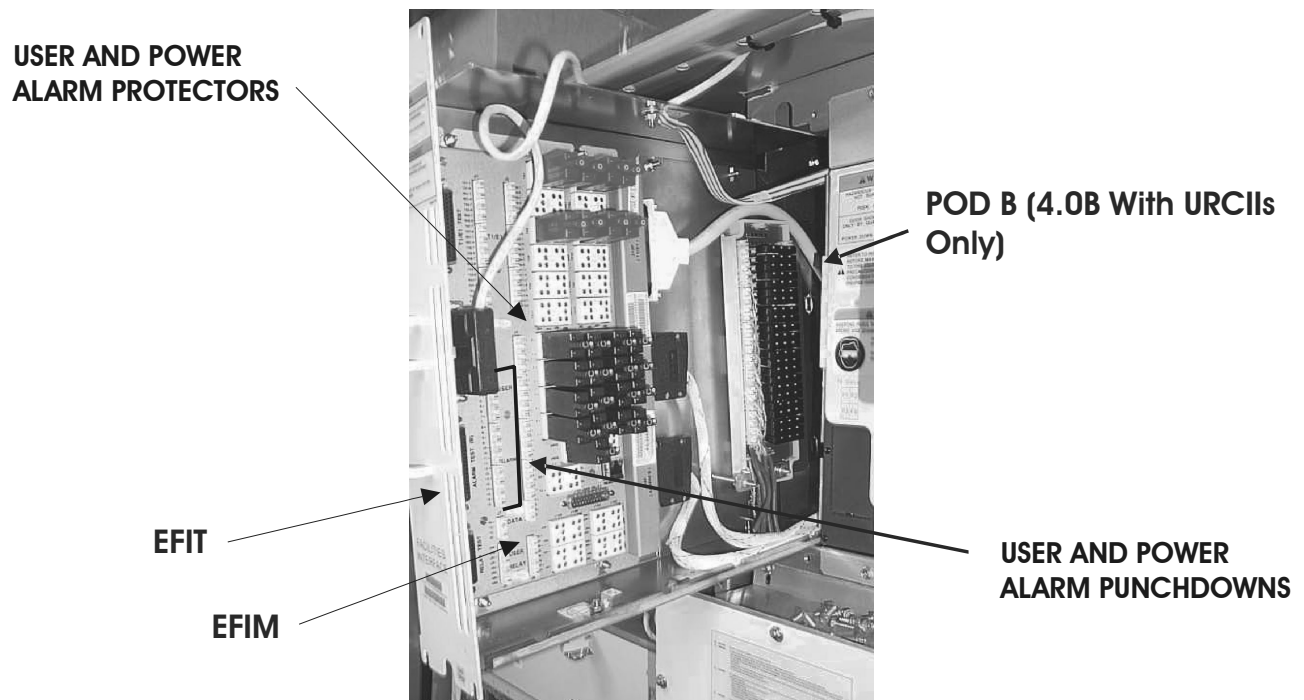


-
- 8 Quality Check - Verify the following.
1. Check that the cable is firmly held by the seal and is not loose.
 2. Using an ohmmeter, check continuity between the frame and the cable shield at the end of the cable to ensure that it is bonded in the cord grip seal.

**Connect alarm cable to the
EFIM punchdowns in
Modular Cell 4.0B cabinet**

The wires of the alarm cable will be connected to the punchdown terminals on the EFIM inside of the Modular Cell 4.0B primary cabinet. The EFIM is accessible from the front of the cabinet, behind a slide-out panel (EFIT- facilities interface tray). See the figure below. Use the following procedure to connect the wires of the alarm cable to the punchdowns on the EFIM in the Modular Cell 4.0B primary cabinet.

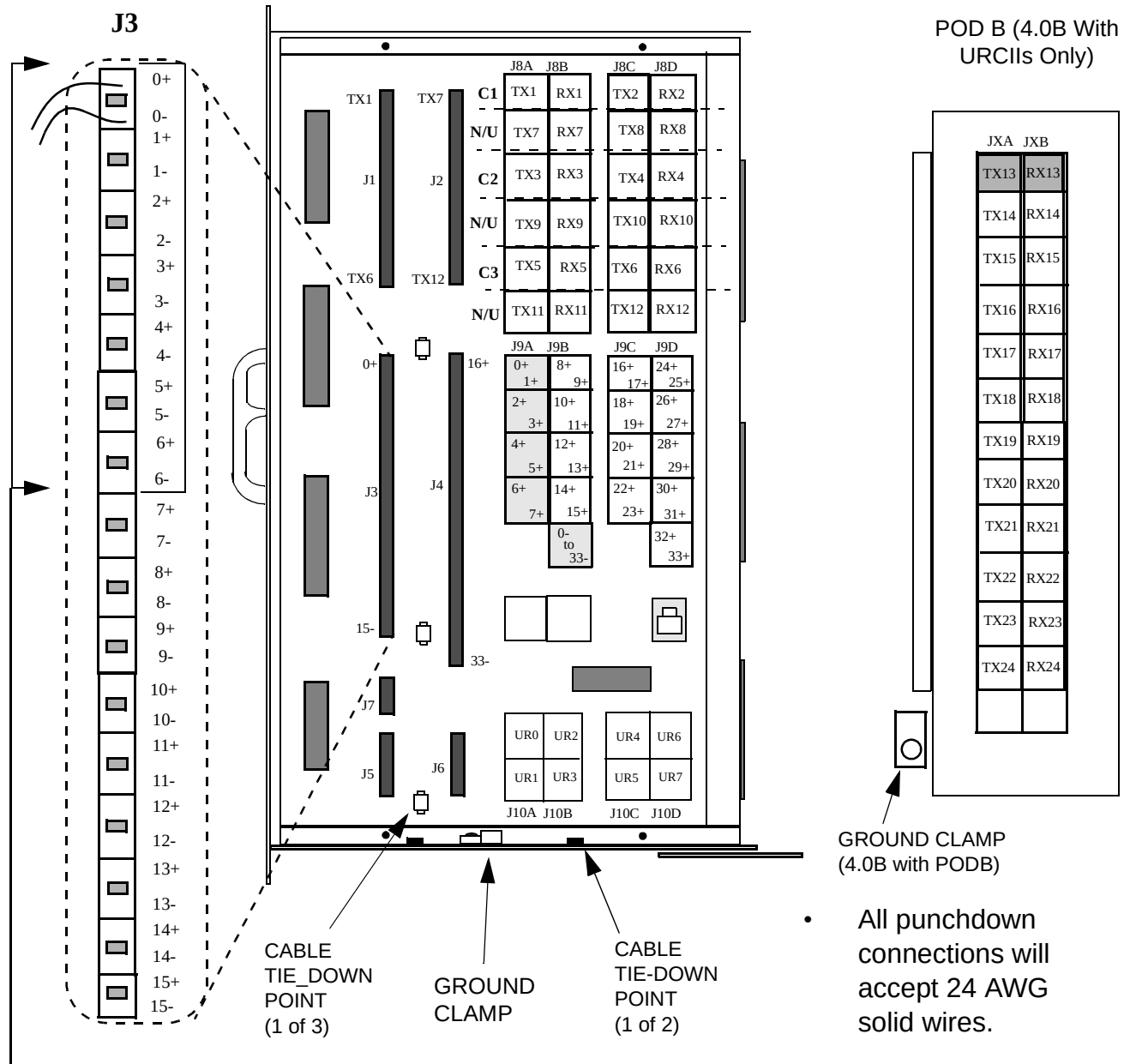
- 1 Open the EFIT. Refer to the figure below.
- 2 Connect the twisted end of the alarm cable shield to the grounding clamp located on the EFIT. There are two possible grounding locations depending upon the presence of POD B. Refer to the figure on Page B - 38 for details.



- 3 Connect the alarm wire pairs. Refer to the figure on Page B - 38 and the table on Page B - 39. Start at pair 0 (zero).

- 4 Check that the protectors are installed in the correct protector locations for each installed alarm. The protector location marked "0-33" must also be populated. Refer to the figure below.

- 5 Close and secure the EFIT with the four thumb screws.



START AT PUNCHDOWN PAIR 0 ON J3, AND CONTINUE THROUGH PAIR 6, AS APPLICABLE

POWER ALARM TABLE

Alarm	Wire Color **	EFIM "J" Connector	Terminal Block Pair	Block Color Code	Protector	Function	
User 0 Alarm	White-Blue	J3	+ 0 (Top)	Blue	J9A (0 / 1)	Power Major (PMJ)	
	Blue-White		- 0 (Bottom)				
User 1 Alarm	White-Orange	J3	+ 1 (Top)	Orange		J9A (2 / 3)	Power Minor (PMN)
	Orange-White		- 1 (Bottom)				
User 2 Alarm	White-Slate	J3	+ 2 (Top)	Green	J9A (4 / 5)		AC Fail (ACF)
	Slate-White		- 2 (Bottom)				
User 3 Alarm	Red-Blue	J3	+ 3 (Top)	Brown		J9A (6 / 7) *	Power Cabinet Intrusion (INTR)
	Blue-Red		- 3 (Bottom)				
User 4 Alarm	White-Green	J3	+ 4 (Top)	Blue	J9A (6 / 7) *		Batteries on Discharge (BD)
	Green-White		- 4 (Bottom)				
User 5 Alarm	White-Brown	J3	+ 5 (Top)	Orange		J9A (6 / 7) *	Fuse Alarm
	Brown-White		- 5 (Bottom)				
User 6 Alarm		J3	+ 6 (Top)	Green	J9A (6 / 7) *		Reserved
			- 6 (Bottom)				

* User (power) alarm 6 shares the protector P9A (6 / 7) with user (external) alarm 7.

** Shown is the wire color code of the recommended cable. The customer's wire color code may differ.

How to route the AC power cables to the Modular Cell 4.0B primary cabinet

Overview This procedure provides instructions for the routing and connection of the AC power cable or cables in the primary cabinet.

The following description and step-by-step instructions are provided:

<u>Description of the AC power cables</u>	B - 41
<u>Route the AC power cables to the Modular Cell 4.0B primary cabinet</u>	B - 42