

***Product Manual  
J85568D-1***

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***Lucent Technologies  
Lineage<sup>®</sup> 2000  
Eight-Load BDFB  
(Battery Distribution Fuse Bay)  
and  
Six-Load PDF  
(Power Distribution Frame)***

Notice:

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

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# ***1 Introduction***

## ***General Information***

This product manual (Select Code 157-005-101) describes the J85568D-1 eight-load Battery Distribution Fuse Bay (BDFB) and the six-load Power Distribution Frame (PDF). The J85568D-series BDFB/PDF is shown in Figures 1-1 and 1-2. It serves as a secondary fuse distribution center for dc power delivered from a central office battery plant to the using equipment. It provides space-efficient branch loading for distributing  $\pm 24$ , 48, 130, or 140 volt dc power. In many applications telecommunication equipment requires power redundancy from the battery plant. A BDFB/PDF provides this redundancy with multiple load buses. A load bus consists of one or more fuse panels protected by a single circuit breaker or fuse at the battery plant. The J85568D-1 is a cabinetized distribution system that supports up to eight load buses for the BDFB and six load buses for the PDF.

Each load bus has a rated current carrying capacity of 300 amperes for List 1 or 3 and 400 amperes for List 2, and may be configured to include one or multiple fuse panels. Each fuse panel provides ten mounting positions that may be equipped with WP-92461 cartridge fuses that range from 3 to 70 amperes and/or GMT fuse modules containing three fuses ranging from 1/2 to 5 amperes. Additional features include a digital meter, remote monitoring capability for alarms, spare fuse holders, and optional 2-hole ground bus arrangements mounted either above the cabinet or on a cable rack. These features and many more provide greater flexibility for customers with different distribution requirements.

The PDF for 4ESS™ has the same features as mentioned above, except that it has a load precharge and filter panels to prevent voltage lag if a fault occurs. The PDF provides current signals to

the Galaxy Controller through remote peripheral monitoring modules for each shunt.

The topics covered in this manual include a general product description, basic features and options, ordering guides, and engineering and installation information. The main emphasis will be to familiarize the user with alarm options and cabling issues, such as connector and hardware requirements for input load bus feeds, output load leads, and discharge return leads. Suggested cable routing strategies are also discussed.

## ***Technical Support***

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On a post-sale basis, **during the Product Warranty period**, our Technical Support telephone number 1-800-CAL RTAC (1-800-225-7822) provides coverage during normal business hours. Product Specialists are available to answer your technical questions and assist in troubleshooting problems. For out-of-hours EMERGENCIES, the 800 number will put you in touch with a Regional Technical Assistance Center Engineer via our 24 hour a day, 7 day per week Help Desk.

When Technical Support is required in **the Post-Warranty Period**, the service may be billable unless you hold an extended warranty or contractual agreement.

### ***Central and South America***

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### ***Central and South America***

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### ***Europe, Middle East, and Africa***

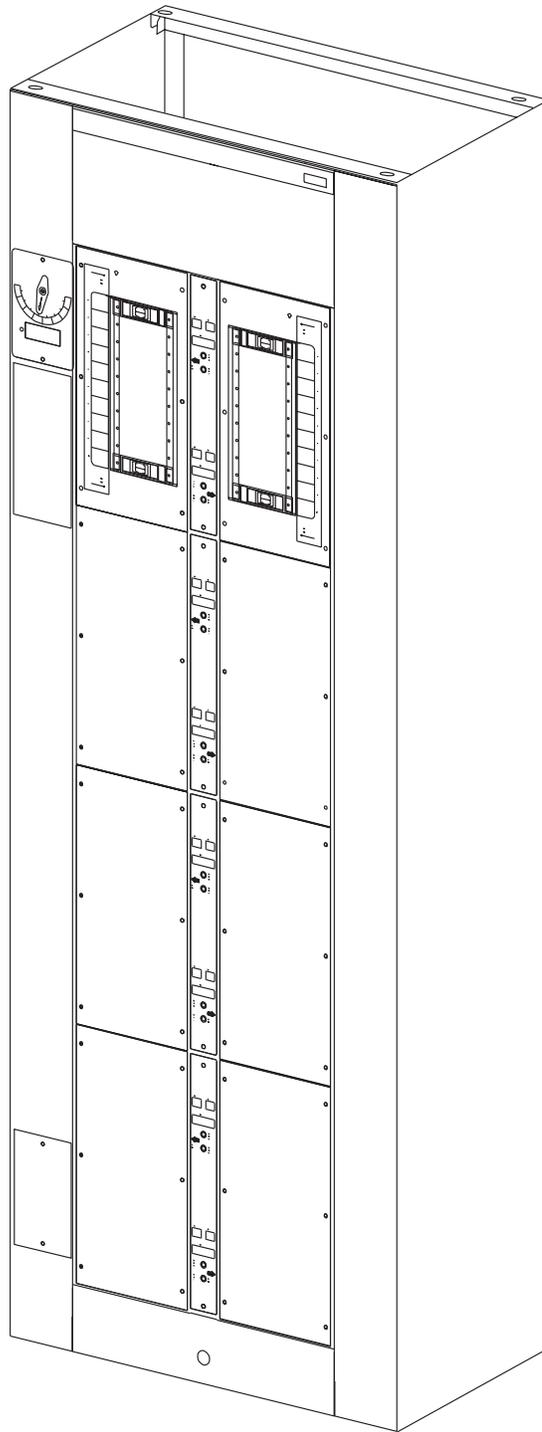
If you need to return a product for repair, your sales representative will be happy to discuss your individual situation.

### ***Asia Pacific Region***

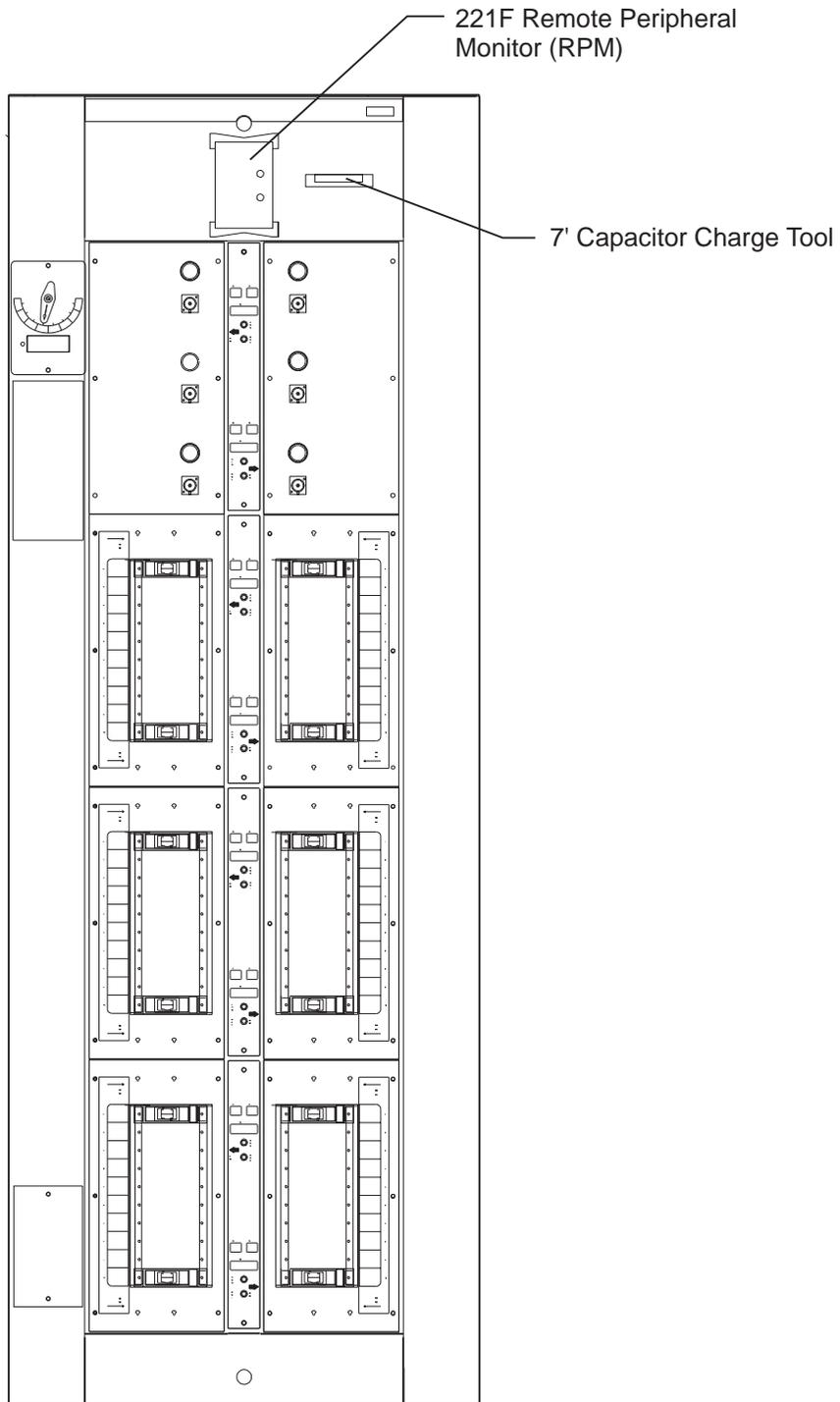
If you need to return a product for repair, your sales representative will be happy to discuss your individual situation.

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For customer service, any other product or service information, or for additional copies of this manual or other Lucent Technologies documents, call 1-800-THE-1PWR (1-800-843-1797). Specify the select code number for manuals, or drawing number for drawings. Contact your regional customer service organization or sales representative for information regarding spare parts.



***Figure 1-1: J85568D-1 Battery Distribution Fuse Bay***



**Figure 1-2: J85568D-1 Power Distribution Frame (for 4ESS™ Only)**

## 2 *Product Description*

### *Introduction*

The Battery Distribution Fuse Bay (BDFB) and Power Distribution Frame (PDF), Model J85568D-1, is six feet in height and has a footprint 26 inches wide by 15 inches deep. A 12-inch extension cabinet is available when the BDFB/PDF is used in 7-foot equipment lineups.

### *Battery Distribution Fuse Bay (BDFB)*

The BDFB cabinet accommodates up to eight fuse panels. These fuse panels are ordered in accordance with drawing ED83127-30. An alarm circuit module should also be ordered with each fuse panel to provide visual and remote alarms for panel power loss and fuse alarms.

The cabinet may be configured with one to eight separate load buses. All battery cabling is terminated at the top center (or bottom center) of the cabinet. Each load feed is then bused down (or up) the center of the cabinet to fuse panel(s). This eliminates the congestion and expense associated with routing input power feeds to each fuse panel in the cabinet and provides a common termination point. Each load bus is equipped with a load monitoring shunt. A digital meter is also provided to allow the user to conveniently monitor individual load bus current to determine actual usage and remaining capacity.

Load leads from each fuse are routed along cable troughs on either side of the cabinet. This leaves ample room for installation personnel to add load leads or fuse panels in the future without having to work around existing cabling. The discharge return bus bar arrangement is located on top of the cabinet or on a cable rack and complies with industry 2-hole grounding requirements.

## ***Power Distribution Frame (PDF)***

The PDF frame has six fuse panels, with two filter panels in positions one and two for voltage lag protection during a fault. Included in the PDF are RPM modules that communicate the currents for each fuse panel. Also included is the capacitor precharge panel that allows charging of the capacitors in the load equipment.

## ***Features***

The following is a list of features provided with this product:

- Distribution of  $\pm 24$ , 48, 130, or 140 volt dc power
- 6-foot cabinet height
- One to eight load buses
- Digital ammeter with load select switch
- Cable entry from the top or bottom of cabinet
- 80 cartridge fuse positions
- Accommodation of fuse sizes 1/2 to 70-amperes.
- 3/8-inch self-drill anchor bolts
- Protective back covers
- 150-, 300-, or 600-ampere monitoring shunts
- Frame alarm indicator lamp
- Panel fuse alarm and power loss indicator lamps
- Individual fuse alarm indicator
- Alarm circuit modules for remote monitoring
- Spare fuse holder
- 12-inch extension cabinet for 7-foot environments
- Capacitor charge panel

### ***Capacitor Charge Tool***

Included as part of the PDF bay is a Capacitor Charge Tool that is used to precharge a capacitive load before installing the load fuse. The capacitor charge tool is mounted at the top of the PDF bay and is protected with a 2-ampere 70-type fuse. (See Figure 1-2.) The capacitor panel three and factory charge tool is powered from the 2-ampere fuse.

The probe is attached to the end of a 7-foot retractable cable. When in use the probe is connected to the alarm fuse location of the load circuit being charged. A Charge button is then depressed and a red LED (labeled **CAP CHG/TEST**) lights, indicating the circuit is being charged. When fully charged the LED extinguishes, indicating the circuit is ready for the load fuse to be installed. This prevents the operation of the fuse at the time of insertion due to the capacitive charging of the load. The LED is typically on for less than one second.

A second yellow LED (labeled **LOAD FAULT**) is also available on the front panel and is used to indicate to the operator that a load fault condition exists and should be investigated. Since charging should normally take a very short time, this LED will also light if the **CHARGE** pushbutton is held operated for more than 5 seconds.

For safety reasons, voltage appears only at the tip of the probe while the **CHARGE** pushbutton switch is operated. **Never touch the tip of the charge probe.** The operation of the Capacitor Charge Unit is as follows:

1. Connect charge probe to alarm fuse location of load circuit to be activated. It is keyed and can only be inserted in the correct position.
2. Operate **CAP CHG/TEST** pushbutton. The red LED lights, then extinguishes, indicating load capacitor has been charged. Release the button at this time. If the yellow **LOAD FAULT** LED lights, operate pushbutton a second time. If the **LOAD FAULT** LED lights a second time, investigate the problem.

#### Note

If the pushbutton is held for more than 5 seconds, the circuit will remove its output and light the <b>LOAD FAULT</b> LED.
--

3. When the red LED extinguishes, indicating the load capacitor has been charged, remove charge probe and insert load fuse. This should be immediately after the red LED extinguishes. Then remove the charge probe.
4. Insert alarm fuse, and repeat operations as required.

## Specifications

List 1, 2, or 3 Cabinet:	six fuse panel positions.
Height:	72 inches (1829 mm)
Width:	26 inches (660 mm)
Depth:	15 inches (381 mm)
Weight:	approximately 300 pounds (8 panels)

Refer to Figure 5-1 for cabinet footprint information.

## **J85568D-1 Cabinet**

**Configurations** The cabinet may be configured for either top or bottom cable entry. Figures 2-1 and 2-2 show the two possible cabinet configurations. For bottom feed applications, a List BF or BE (BE for 4ESS™ only) should be ordered in addition to the main list. In either case, the same cabinet is used, but the cabinet is rotated 180 degrees and the digital meter and spare fuse holder swap positions. This is important to know for engineering personnel who may wish to field modify a BDFB/PDF from a bottom feed application to a top feed application or vice-versa.

### **Note**

List "BE" cabinet is not rotated because of the Precharge ED83127-30 G22.
---

A List 1, 2, or 3 cabinet contains eight fuse panel positions. Each of these panel positions must be equipped with either a fuse panel or a List D blank panel. When ordering fuse panels, it is important to remember the numbering schemes associated with top and bottom feed applications. Refer again to Figures 2-1 and 2-2 for fuse panel position numbers for each application. This information is necessary to communicate where fuse panels with different configurations should be located on factory orders. Panel numbering is also stamped on the front of each cabinet at the factory as an installation reference. Labels numbering from 1-80 for sequential fuse locations are now supplied with each frame panel.

### **Note**

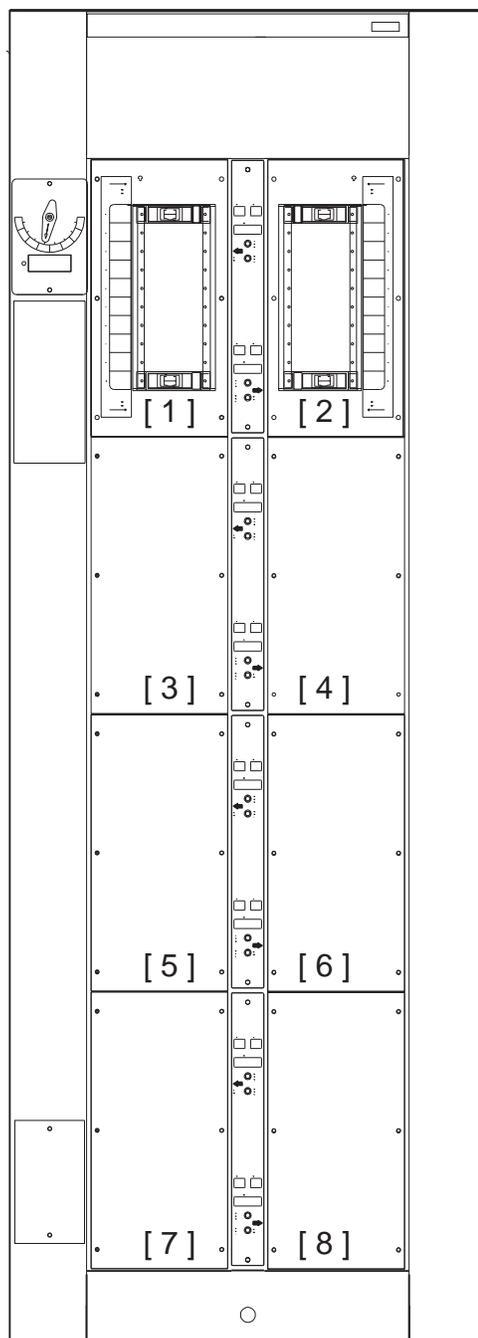
Equip fuse panels starting at panel position 1 to eliminate possible cable congestion when installing additional fuse panels in the field.
--

The back of the BDFB/PDF is enclosed with two removable clear covers. These covers are made of Lexan with a UL 94V-O rating. The PDF is enclosed with a rear door access. List F is now available that provides a rear door with a 1/4 turn knob for easy accessibility.

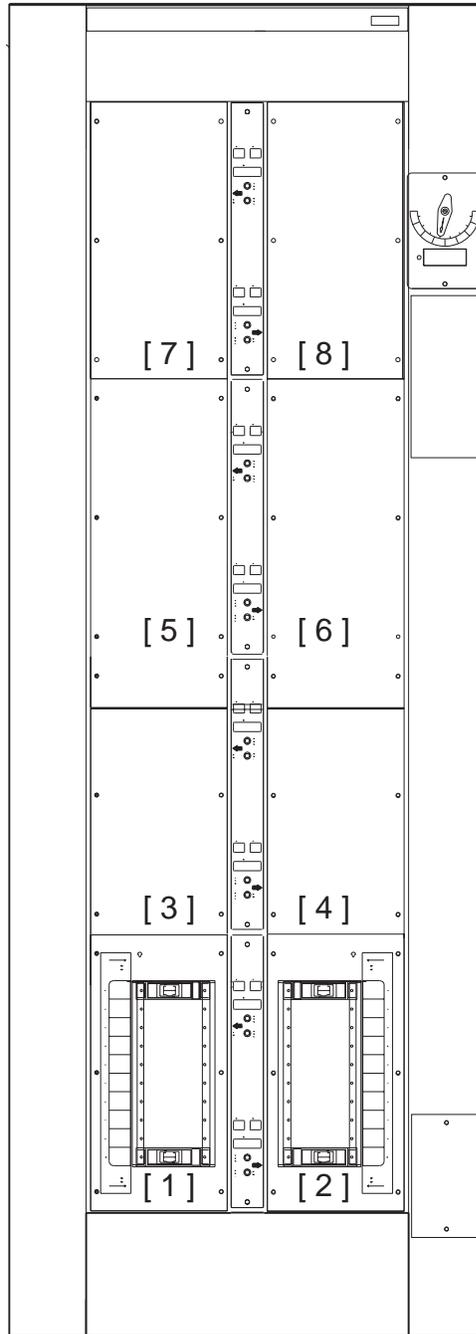
The frame ground connection is located on top of each cabinet. Connection is made using a 1/4-inch double hole terminal lug on

.625-inch centers. For ground wire connection greater than 2 gauge, order Comcode 846337798 bus bar adapter to allow for 3/8-inch double hole terminal lugs on 1.00-inch centers. Refer to Figure 2-7 for location of frame ground connection.

A List 1, 2, or 3 cabinet is six feet tall. To use the BDFB/PDF in seven-foot equipment environments, order a 12-inch extension cabinet (List E). The extension is factory installed as shown in Figure 2-3.



**Figure 2-1: 6-foot Cabinet (List 1)**



**Figure 2-2: 6-foot Cabinet (List 1, BF)**

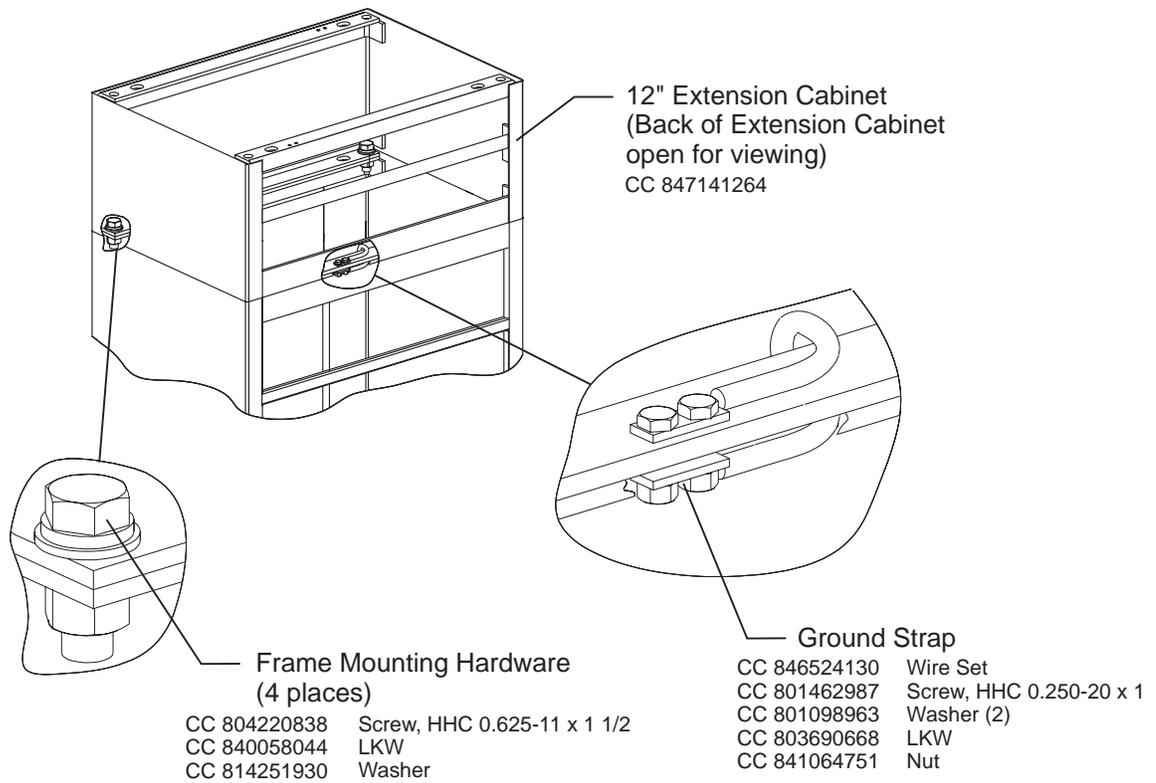
### ***Load Bus Arrangements***

Cabling from the battery plant is terminated at the top of the cabinet for top feed or the bottom of the cabinet for bottom feed. Cables are terminated to each load bus on a set of 3/8-inch studs with 1.00-inch centers. Table 2-A lists recommended terminal lugs for different cable sizes. Notice that the largest cable that can be terminated is 750 KCMIL. Lists 11 through 18, 21 through 28, and Lists 31 through 38 provide bus bar assemblies that connect the input cabling to each fuse panel. These bus bars are sized to provide a 300-ampere for List 1 and 3, or 400-ampere for List 2, current carrying capacity for each load bus. Figure 2-4 shows this busing arrangement on one side of the BDFB/PDF. Battery is bused across a load monitoring shunt to each fuse panel.

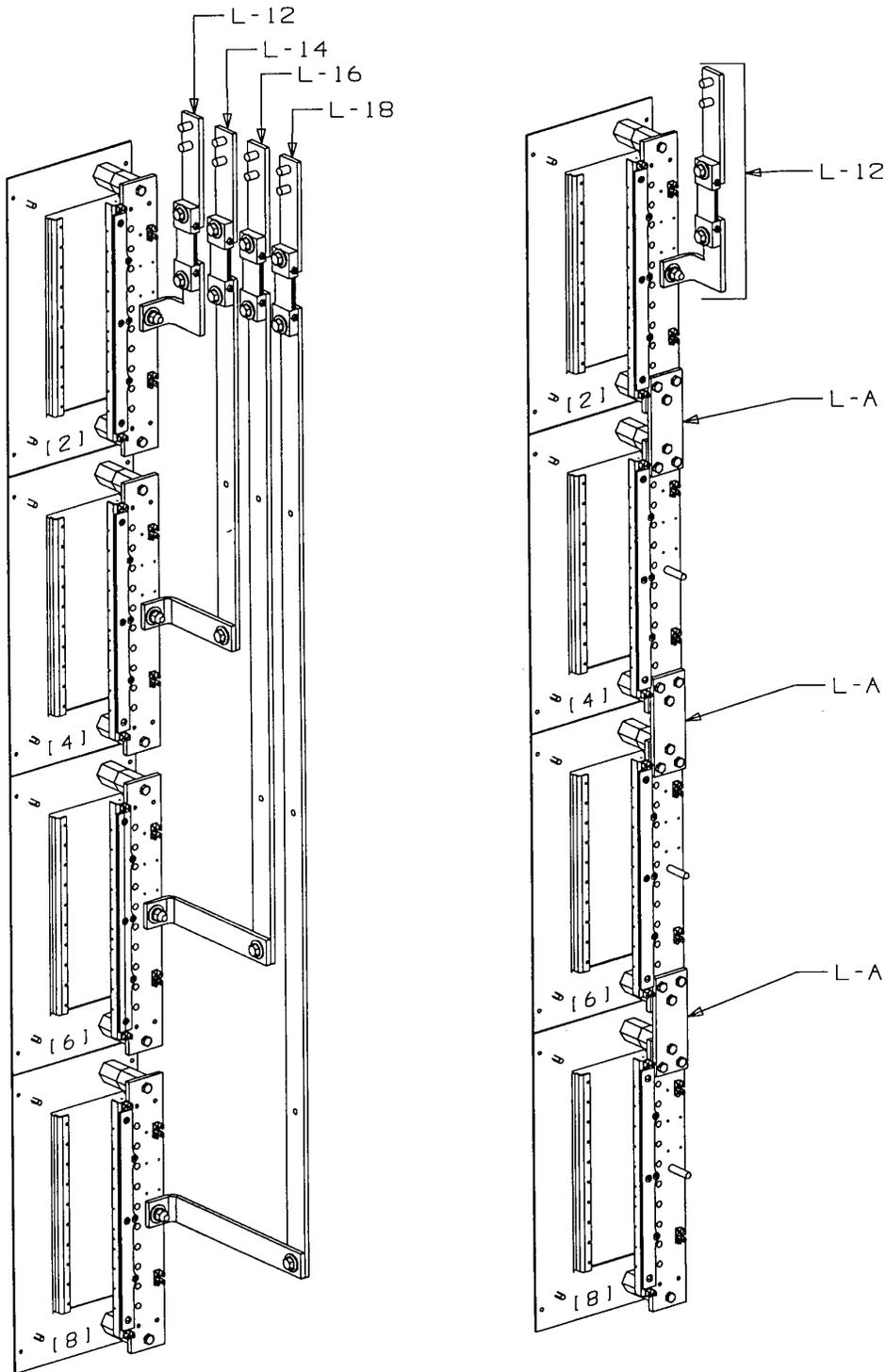
If fewer load buses are required, it is possible to connect fuse panel battery buses together using a List A bus bar link. This feature is shown on Figure 2-5. This may be desirable for two, four, or six load BDFB/PDF applications where more than ten fuse positions are required for a single load. Only fuse panels mounted above or below one another may be connected, i.e., fuse panels mounted on the left side of the cabinet cannot be joined to fuse panels mounted on the right side of the cabinet. When multiple fuse panels share a common load bus, battery input cabling should be connected to the lowest numbered panel position. For example, if positions two, four, six, and eight are linked together as shown in Figure 2-5, one List 12 would be ordered for busing to panel position 2 and three List A's for linking panels 8 to 6, 6 to 4, and 4 to 2. Remember that the 300- or 400-ampere capacity for each load bus applies even if multiple fuse panels are connected together.

#### **Note**

All bus bars used in this product are copper with a solder plate finish. BUS BARS DO NOT REQUIRE BUFFING OR THE APPLICATION OF NO-OX BEFORE CONNECTION OF TERMINAL LUGS OR OTHER BUS BARS.
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**Figure 2-3: 12-inch Extension Cabinet for 7-foot Environments**



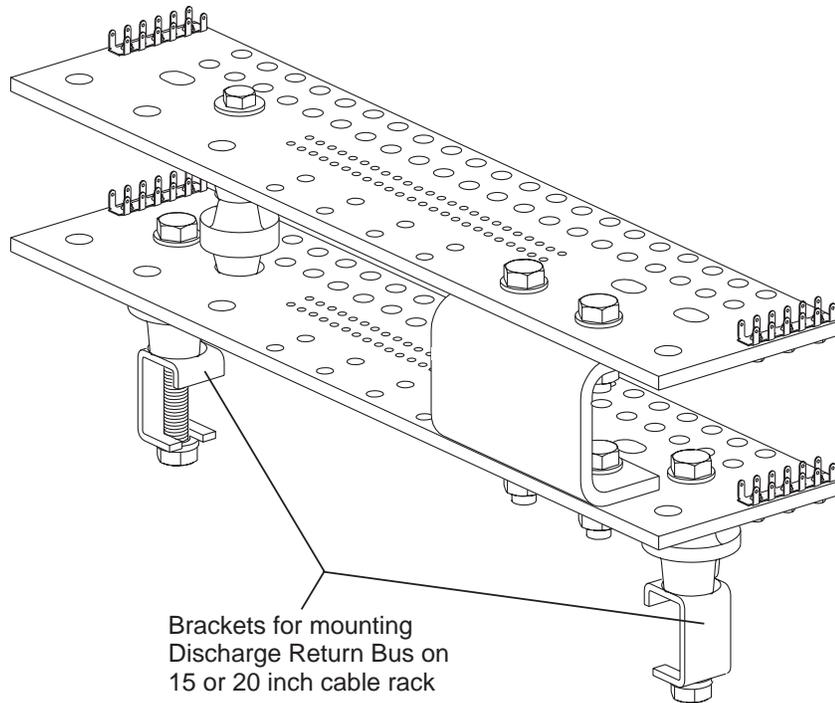
**Figure 2-4 (Left): Busing Scheme to Fuse Panels**  
**Figure 2-5 (Right): Connecting Multiple Battery Buses**

**Discharge  
Return Bus**

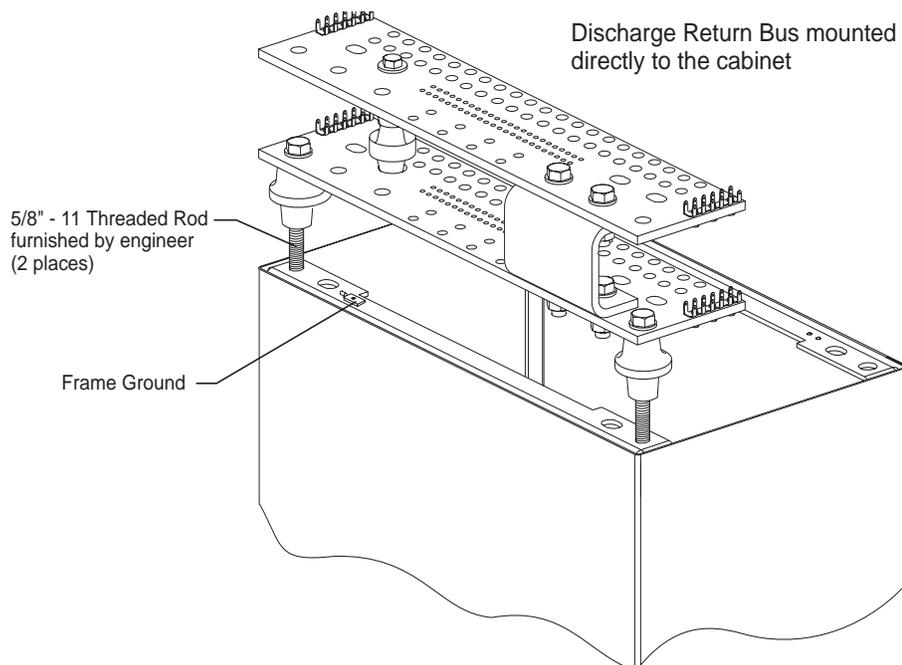
The discharge return bus bar arrangement is shown in Figures 2-6 and 2-7. This external bus can either be mounted on a standard 15- or 20-inch ladder type cable rack or mounted directly to the cabinet as shown. These busbars are each rated for 2400 amperes of current. List K1 provides the first bus bar and the cable rack mounting hardware. List K2 provides a bus bar, the connecting bus bar, and insulating standoffs for stacking additional tiers as required. Figure 2-8 shows the arbitrary numbering assignment and hole pattern for the discharge return bus bar beginning with List K1. Rows A and D are for terminating returns from the cartridge type fuse holders. Rows B and E are for terminating GMT fuse returns, and rows C and F are for cabling back to the battery plant. Solder terminal strips are also provided for miscellaneous grounding to the digital meter and alarm circuit modules in the BDFB/PDF. Recommended terminal lugs for terminating to the discharge return bus bar are listed in Table 2-B. The engineer must furnish all mounting hardware according to Table 2-C.

**Table 2-A: Recommended Double Hole Terminal Lugs  
for Terminating Input Battery Cables (750 KCMIL Maximum)**

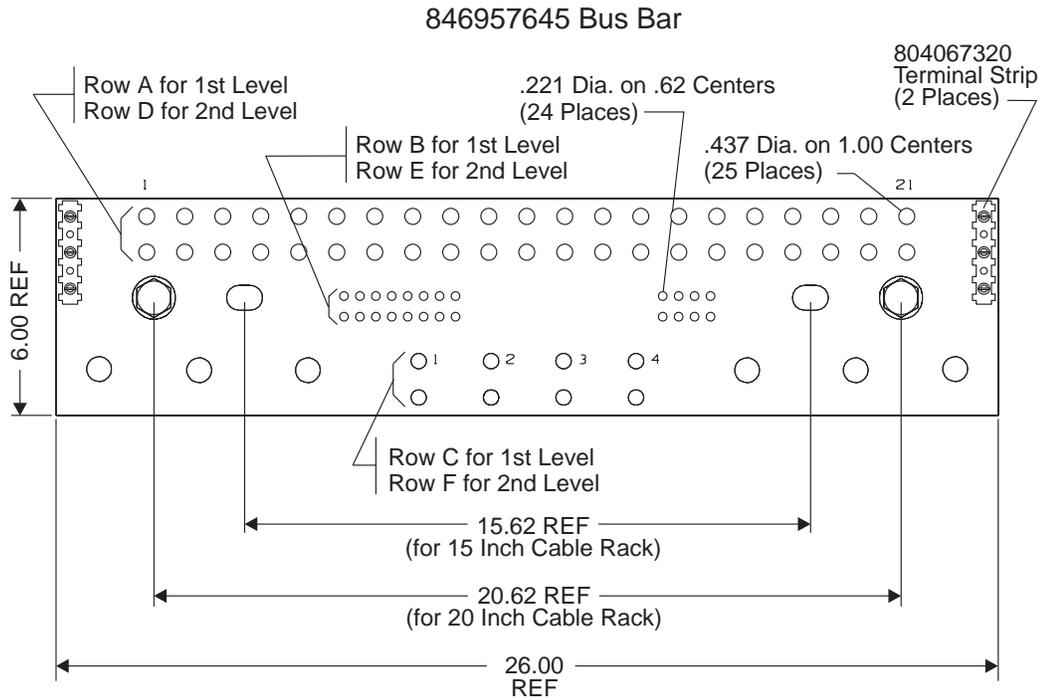
KS-5482 or KS-23814 Wire	KS-20921 or KS-23835 Wire	WP-91412 List	Comcode	Bolt Size	Centers	Die	Die Code
2/0	1/0	57	405348236	0.375	1.00	Black	45
-	2/0	77	406021725	0.375	1.00	Orange	50
4/0	-	59	405348251	0.375	1.00	Purple	54
-	4/0	27	405347923	0.375	1.00	Yellow	62
350	-	61	405348277	0.375	1.00	Red	71
-	350	86	406021915	0.375	1.00	-	80
500	-	63	405348293	0.375	1.00	Brown	87
-	500	165	406434241	0.375	1.00	Pink	99
750	-	135	406335141	0.375	1.00	Black	106
-	750	170	406434290	0.375	1.00	Yellow	115



**Figure 2-6: External Discharge Return Bus on Cable Rack**



**Figure 2-7: Discharge Return Bus on Cabinet**



**Figure 2-8: Bus Bar Hole Pattern and Numbering Scheme**

**Table 2-B: Recommended Double Hole Terminal Lugs  
for Terminating to List K1 and K2 Discharge Return Bus**

KS-5482 or KS-23814 Wire	KS-20921 or KS-23835 Wire	WP-91412 List	Comcode	Bolt Size	Centers	Die	Die Code
Rows B and E							
14-10	14-10	73	405356171	10	0.62	R5473	-
8	8	52	405348178	10	0.62	Red	21
6	6	108	406332841	10	0.62	Blue	24
Rows A, C, D, and F							
6	6	111	406332841	0.375	1.00	Blue	24
4	4	116	406332940	0.375	1.00	Grey	29
2	-	121	406338665	0.375	1.00	Brown	33
1/0	-	56	405348228	0.375	1.00	Pink	42
2/0	1/0	57	40534 8236	0.375	1.00	Black	45
-	2/0	77	406021725	0.375	1.00	Orange	50
4/0	-	59	405348251	0.375	1.00	Purple	54
-	4/0	27	405479923	0.375	1.00	Yellow	62
Rows C and F Only							
350	-	61	405348277	0.375	1.00	Red	71
-	350	86	406021915	0.375	1.00	-	80
500	-	63	405348293	0.375	1.00	Brown	87
-	500	165	406434241	0.375	1.00	Pink	99
750	-	135	40633 5141	0.375	1.00	Black	106
-	750	170	406434290	0.375	1.00	Yellow	115

**Table 2-C: Recommended Mounting Hardware for Securing Double Hole Terminal  
Lugs to Lists K1 and K2 Discharge Return Bus**

Bolt Size	Comcode	Quantity	Description
10	840059885	2	Screw, PHM
	802841510	2	Washer, Plain
	802235127	2	Lockwasher
	800812935	2	Nut, Hex
0.375	801273129	2	Screw, HH Cap
	814251898	4	Washer, Plain
	801829607	2	Lockwasher
	841064777	2	Nut, Hex

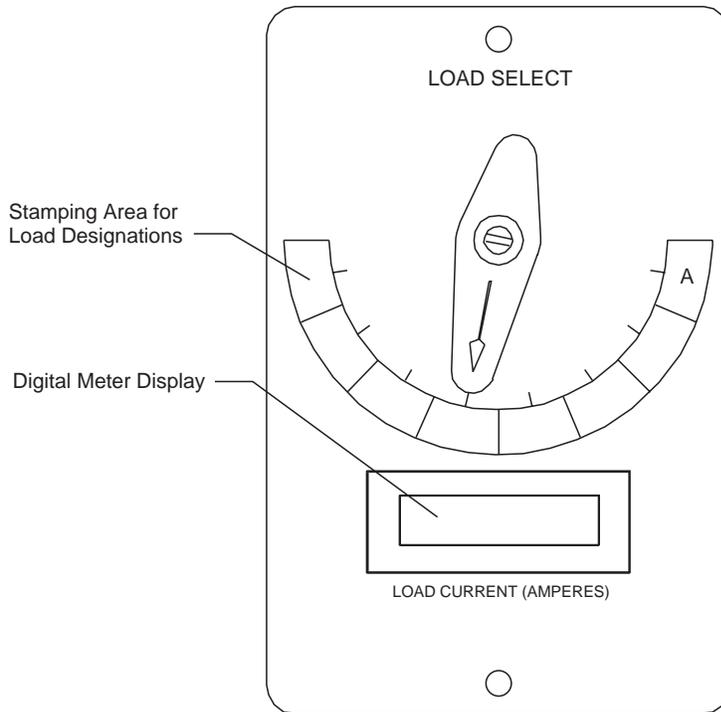
***MOV Installation***

The PDF used for 4ESS™ must have the MOV installed to the solder terminal strip to frame ground. MOV and installation connectors are provided in the J85568D-1 documentation package. See Sheet F3 of the H569-429 drawing for an installation figure and instructions. **Note: The connections should be made with 10-gauge stranded wire provided by the Engineer.**

***Digital Meter  
and Monitoring  
Shunts***

As discussed previously, there are eight possible load buses in the BDFB/PDF, four on each side. Each bus is equipped with a 150, 300, or 600-ampere shunt. Shunts are provided to determine actual current use and the remaining capacity of each load bus. They are monitored in the BDFB/PDF with a digital meter. See Figure 2-9. The PDF ED83127-30 G22 precharge for 4ESS™ provides an RPM to report currents to the Galaxy Controller. See the 415B Battery Plant product manual (Select Code 167-792-121).

Shunts are factory wired to a rotary switch, allowing the user to select among the eight possible load buses. The meter is powered from panel position 1 on the cabinet. It operates from a 24, 48, 130, or 140-volt source. The negative lead (battery or return) is inserted in meter terminal 2. The positive lead is inserted in meter terminal 1 if the panel is 48V, terminal 3 for 24V, or terminal 4 for 130V or 140V. For example, a -48-volt fuse panel in panel position 1 would power the meter. A 22-gauge wire is run from the fuse panel battery bus to meter terminal 2. Another wire is run by installation from the discharge return bus to meter terminal 1. Refer to Wiring Diagram T-83170-30, Figure 4, for more information.



**Figure 2-9: Digital Meter Assembly**

## ***ED83127-30 Fuse Panel***

Two types of fuse panels are available. Group 3 provides panels for mounting on the left side of the cabinet and Group 4 provides panels for mounting on the right side of the cabinet. Each of these fuse panels has ten mounting positions that must be equipped with either a fuse block (Group A or B) or a blank filler (Group C). Figure 2-10 shows the different fuse panel options. Figure 2-10A shows the fuse panel options for the 4ESS™. (Table 3-B gives the Fuse Panel ordering information.)

Group A provides one 3-70 ampere cartridge type fuse holder, comcode 406686980. This fuse block is UL listed and provides a more compact design than previous fuse holders. The fuse block was developed by USD (Underwriters Switching Devices) to accommodate the WP-92461 List 100-111 fuses. These fuses offer a big advantage over other fuse types in that they are UL recognized to UL standard 198L DC INDUSTRIAL FUSES and have a 170 Vdc, 100,000 ampere interrupt rating. Table 2-D shows the sizes and comcodes of fuses available.

### **Caution**

<p>The required alarm fuse is GMT 18/100 (0.18 ampere, comcode 402328926), which is used for the alarm fuse only. Using a higher rated GMT fuse will damage the current limiting resistor of the fuse block, and no alarm signal will be generated.</p>
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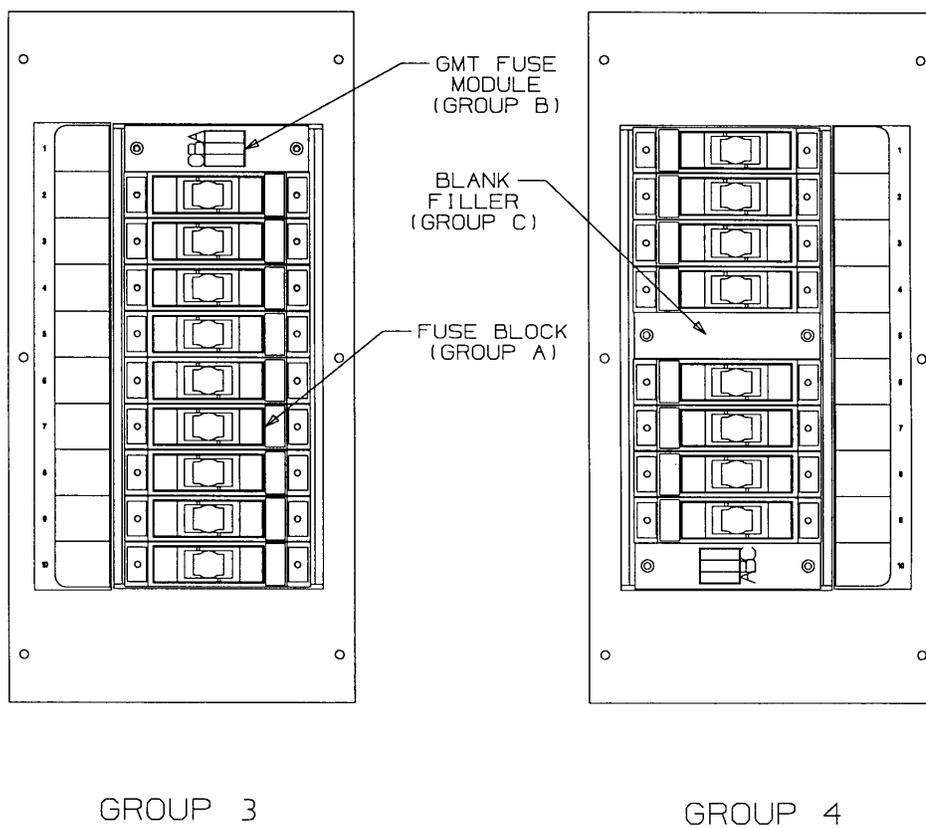
Table 2-E lists the recommended terminal lugs for terminating different load lead cable sizes to the fuse block. Notice that the largest cable size allowable is 2/0 standard wire or 1/0 flex wire.

Group B provides one GMT fuse module containing three fuse positions. Each fuse position may be equipped with a GMT fuse ranging from 1/2 to 5 amperes. Table 2-F lists the sizes and comcodes available. Table 2-G lists recommended terminal lugs. The GMT fuse module offers the customer the option of using the BDFB/PDF for small miscellaneous loads in the office that might otherwise require a separate fuse panel.

Group C is a blank filler bracket used to cover open mounting positions when fewer than ten fuses are required. They may also be removed at a later time and the positions populated with fuse blocks.

Groups 20 and 21 provide a filter panel for use in a PDF to reduce voltage bus lag if a short is induced by the equipment when a fuse is clearing.

Group 22 provides a precharge circuit to the 4ESS™ equipment. SD4A008-02 requires installer to place the keyed charge probe into the GMT slot to precharge the 4ESS™.



**Figure 2-10: ED83127-30 Fuse Panels**

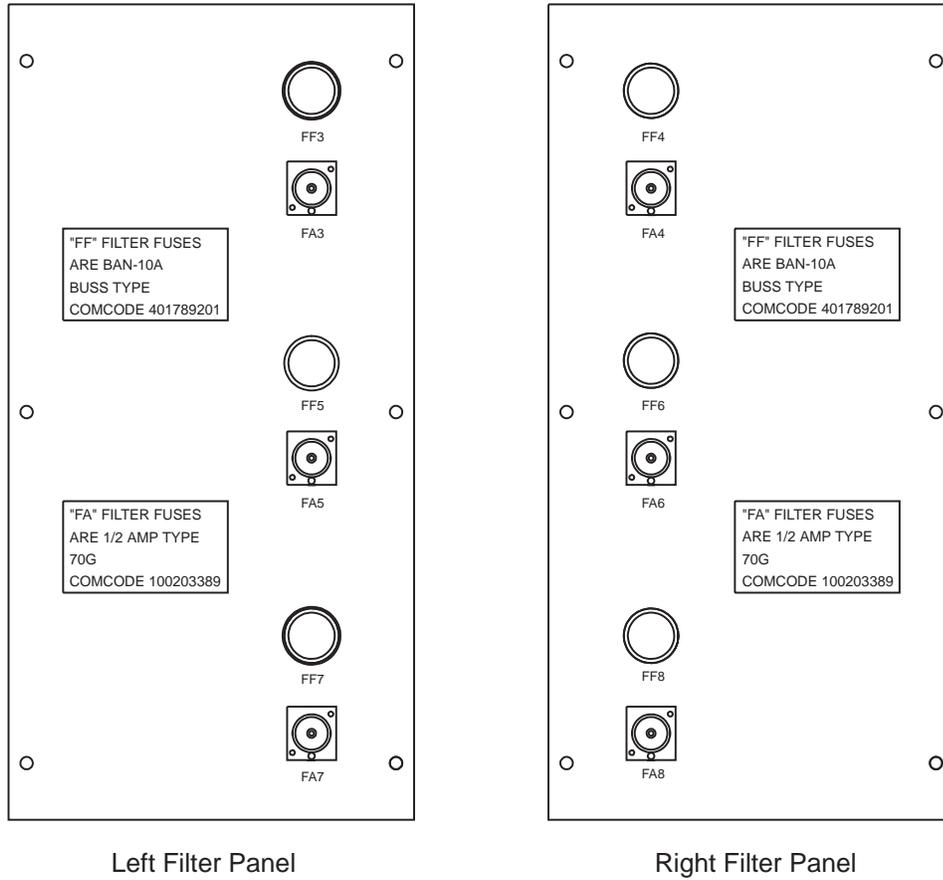


Figure 2-10A: ED83127-30 Filter Panels

Table 2-D: WP-92461 Cartridge Fuse Ordering Information

Comcode	WP-92461 List	Amp Rating
406700567	100	3
406700583	101	5
406700591	102	6
406700609	103	10
406700617	104	15
40670 0625	105	20
406700633	106	25
406700641	107	30
406700658	108	40
406700674	109	50
406700682	110	60
406700690	111	70

**Table 2-E: Recommended Single Hole Terminal Lugs for Terminating to ED83127-30 Group "A" Fuse Block**

KS-5482 or KS-23814 Wire	KS-20921 or KS-23835 Wire	WP-91412 List	Comcode	Bolt Size	Die	Die Code
14-10	14-10	94	406338152	0.250	R-5473	-
8	8	74	405356189	0.250	Red	21
6	6	2	405347436	0.250	Blue	24
4	4	4	405347543	0.250	Grey	29
2	-	53	405348186	0.250	Brown	33
-	2	7	405347659	0.250	Green	37
1/0	-	125	406338707	0.250	Pink	42
2/0	1/0	55136 (T&B)	406896373	0.250	Black	45

**Table 2-F: GMT Fuse Ordering Information**

Comcode	Amp Rating
401231501	1/2
401841473	1
400994604	1-1/3
401231527	3
401231535	5
Required GMT Alarm Fuse	
402328926	18/100 (0.18 ampere)

**Table 2-G: Recommended T&B Lugs for Terminating GMT Load Leads**

Wire Size	T&B Lug	Comcode	Bolt Size
18-22	RA333	997588891	6
14-16	RB854	403950975	6
10-12	RC333	401437033	6

## ***Alarm Circuit Module***

### ***General Description***

The alarm circuit module, apparatus code A-CP/BEP1, provides a means for indicating a power loss and a fuse alarm for each fuse panel. Indications of these alarms are by means of an LED and by contact closures. The BEP1 pack will accept nominal input voltages of 24 and 48 volts. Operation in 130 and 140 volt BDFB/PDF frames is achieved by addition of a dropping resistor mounted on the ED83127-30 fuse panel to drop the nominal 130 or 140 volt level to the nominal 48 volt level.

The BEP1 alarm module is provided with ED83127-30 Groups E, F and G. These groups describe the nominal voltage at which the fuse panel will operate (24, 48, 130, or 140 volts). Figure 2-11 shows the layout of the alarm circuit module and Figure 2-12 shows the input (P102) and output (P101) connector pin descriptions. The alarm module provides two form C contacts for power loss and three form C contacts for fuse failure. The alarm output connector references of audible, visual and remote given with each alarm module are arbitrary and are provided as a suggested standard for remote monitoring equipment. However, installation personnel may select any set of form C contacts.

### ***Detailed Circuit Description***

The BEP1 consists of two circuits. One monitoring for panel power loss and the other monitoring for fuse failures. The monitoring circuits are described as follows.

#### **Power Input**

DC power (24, 48, 130, or 140 Vdc through external resistor) is provided to P102 pins 11 or 6. Nominal input voltage to bridge CR101 is 24 Vdc. Bridge CR101 is provided to allow the BEP1 to operate from either positive or negative voltages. Output voltage of nominal 22 Vdc from CR101 is applied to relay K101 and LED DS101. Relay K101 is held normally operated and DS101 (green) is illuminated. Fuse alarm power is provided through P102 pins 7 or 8. Bridge CR102 allows operation from either voltage polarity. CR102 output of 22 Vdc nominal is applied to relay K102 and LED DS102 (red). Fuse alarm power is normally present only when a fuse blows and thus K102 is

normally released and DS102 is extinguished. The return path for the power monitor and fuse alarm monitor is through P102-12 & 14.

### **Power Loss Alarm**

Loss of bus voltage will cause relay K101 to release and LED DS101 (green) to extinguish. Two form C contacts on K101 are available through P101 to monitor for power loss.

### **Fuse Alarm**

A cleared fuse will apply power through P102 to operate relay K102 and illuminate LED DS102 (red). Three form C contacts on K102 are provided through P101 for external alarms.

### **Frame Alarm**

In addition to the individual panel alarm indicators, there is also a frame alarm at the top of the bay. This frame alarm lights when power is lost to a fuse panel or there is a fuse alarm. Power for lighting the frame LED is brought from the battery plant on an auxiliary battery supply (ABS) lead. Figure 2-13 shows the frame alarm and ABS termination points at the top of the cabinet. When ABS is from a positive ground battery plant, it is brought into the BDFB/PDF on terminal E3 and daisy chained through all the circuit modules by alternately connecting common pins P102-3 and 10 together between packs. These pins are connected to one set of normally open contacts from the fuse alarm circuit and one set of normally closed contacts from the power alarm circuit to provide a means to operate the frame alarm LED. A fuse failure or power loss puts ABS onto connector output pins P102-2 and P102-9 that are daisy chained up to terminal E1 through a current limiting resistor to the frame LED socket. See Figure 2-14. The ABS return lead back to the battery plant is also connected to the frame alarm LED via terminal E4 to complete the circuit.

In some installations, the use of an ABS lead from the battery plant may not be available or desirable to the engineer. An alternative alarming method substitutes power from a load bus for ABS. A 22-gauge wire may be run from the battery bus of fuse panel number 1 to terminal E3. The return lead from the frame LED via terminal 4 would go to the discharge return bus located on the cable rack. The obvious consequence of this

option is if power is lost to fuse panel number 1, the frame alarm will not light.

***Monitoring  
Multiple Alarm  
Modules for  
Negative Plants***

**Fuse Alarm**

In most BDFB/PDF applications, customers require remote monitoring of a frame fuse alarm only and not individual load buses. Therefore, fuse alarms on multiple packs may be connected so that the remote fuse alarm signal on one pack can be operated from the other packs. This daisy chain is factory wired so that frame fuse alarm may be monitored from the position 1 alarm module. A fuse alarm on any pack will cause current flow through opto-isolator U101 causing it to turn on and apply voltage to P102 pins 4 and 5. Pins 4 or 5 are alternately connected from pack to pack providing a common fuse alarm output signal. The position 1 alarm module monitors the other packs by connecting its P102 pin 1 fuse alarm input to P102 pin 4 of the position 2 alarm module. See Figure 2-14. Thus voltage from any pack with an active fuse alarm will cause K102 of the position 1 pack to be operated via P102 pin 1, causing an alarm on its P101 contacts. This feature is intended to provide a local visual indication of a fuse alarm (DS102 of the pack with the fuse alarm) and remote monitoring of the form C contacts of a single alarm module. All packs will alarm independently by simply disconnecting pin 1.

**Power Loss Alarm**

Remote monitoring of power loss is furnished for individual fuse panels. However, power loss alarms will probably not be remotely monitored in most applications because loss of power in a BDFB/PDF usually results in a number of other simultaneous alarms from the battery plant and load equipment. If power loss alarm for the entire cabinet is desired, the installer must connect the alarm module output pins P101 - 1, 2, 3, 4, 9, 10 as shown in Figure 2-15. The connections can be made with 26 gauge solid wire soldered or wire-wrapped to the 405095043 output connectors. These connectors are furnished with each alarm module.

***Monitoring  
Multiple Alarm  
Modules for  
Positive Plants***

Remote monitoring of the frame fuse alarms for the positive plant must be wired individually and are daisy-chained together. Three "Form C" contacts are provided and must be connected to alarm module output pins on connector P101 5, 6, 7, 8, 11, 12,

13, 14, and 15 (see Figure 2-12A). The connections can be made with 26-gauge solid wire and wire-wrapped to the 405095043 output connectors. The normally open pins are 14, 11, and 15, with common pins being 13, 12, and 8. The normally closed pins are 5, 6, and 7, with common pins 13, 12, and 8.

**Note**

The NC1 or NO1 communicates with C1 return; NC2 or NO2 communicates with C2; NC3 or NO3 communicates with C3.
---

**Reference Data**    **Input Voltage. 24V (21 to 30 Vdc), 48V (42 to 60 Vdc). Current Drain.** 12 milliamps normal operation, 22 milliamps with fuse alarm.

**Functional Designations:**

R101	Dropping resistor 48V to 24V, power monitor
R102	LED current limit resistor, power monitor
R103	Dropping Resistor 48V to 24V, fuse alarm
R104	LED current limit resistor, fuse alarm
U101	Opto-isolator, remote fuse alarm
K101	Relay, 24V, power monitor
K102	Relay, 24V, fuse alarm
CR101	Diode bridge, power monitor
CR102	Diode bridge, fuse alarm
CR103	Voltage blocking diode
DS101	Green power LED
DS102	Red fuse alarm LED.

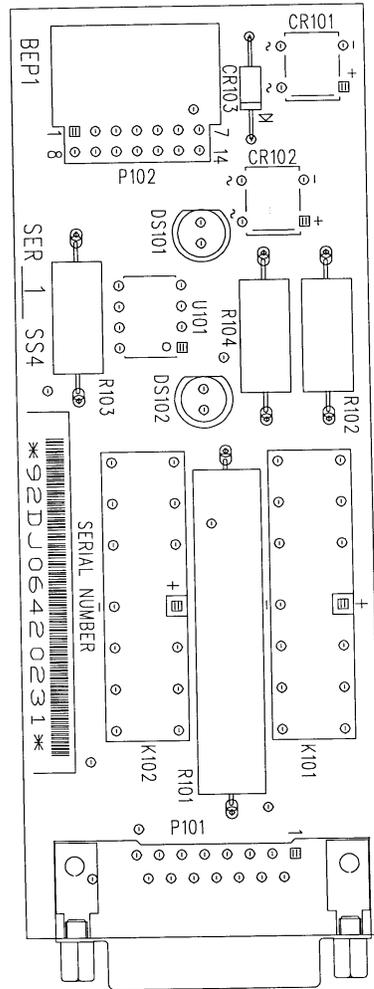
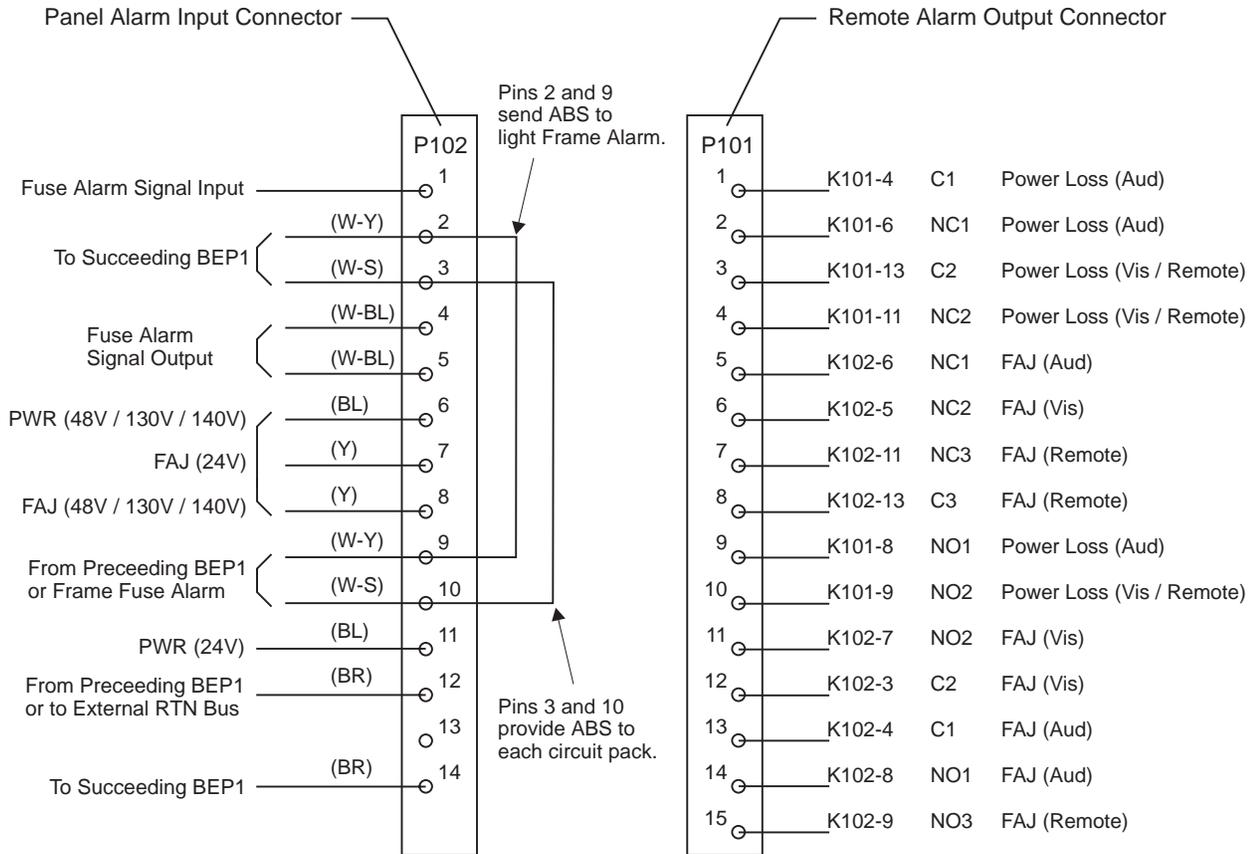
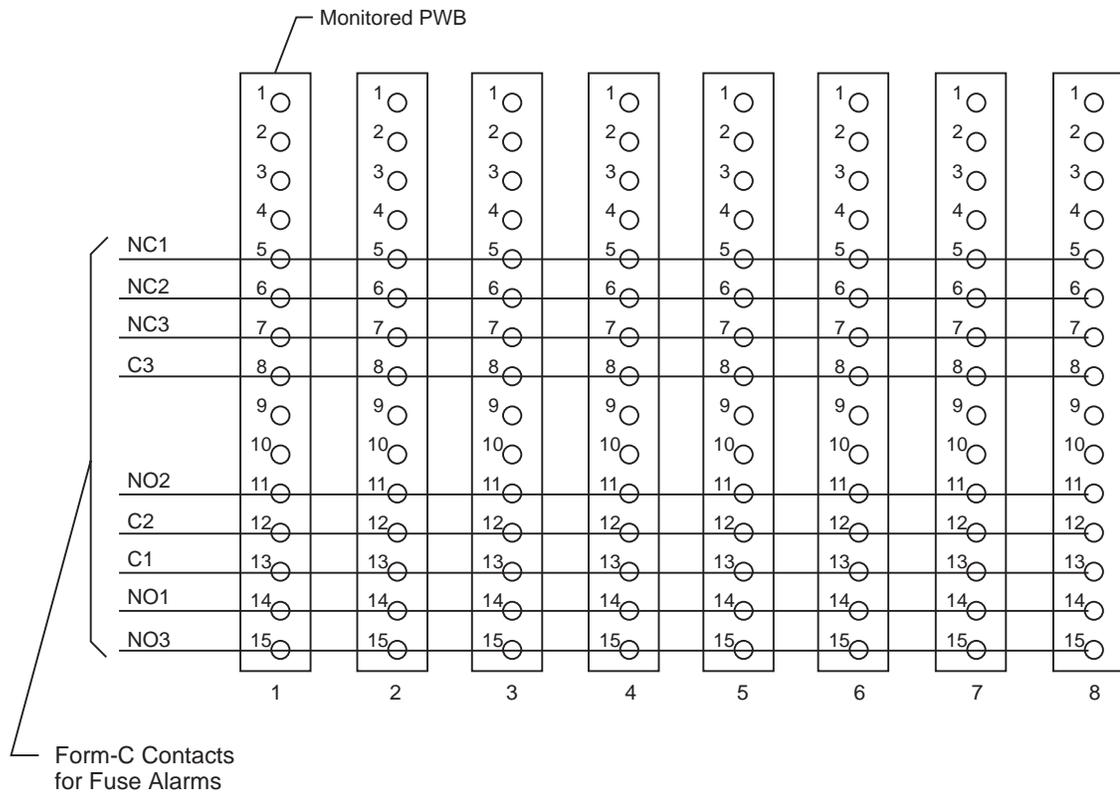


Figure 2-11: A-CP/BEP1 Board Layout



**Figure 2-12: A-CP/BEP1 Input/Output Connections**



**Figure 2-12A: Fuse Alarm Wiring for Positive Plant P101**

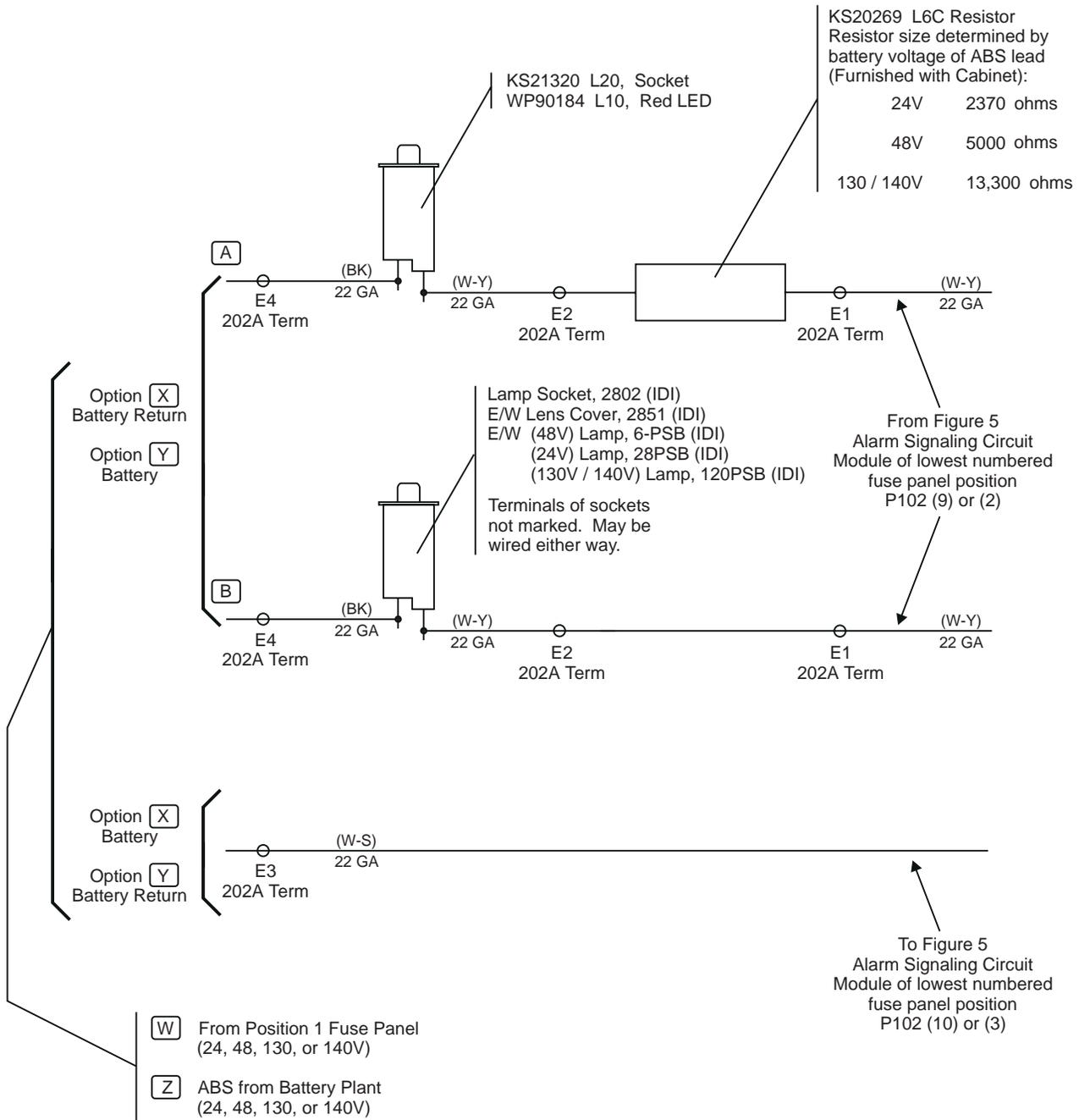


Figure 2-13: Frame Alarm

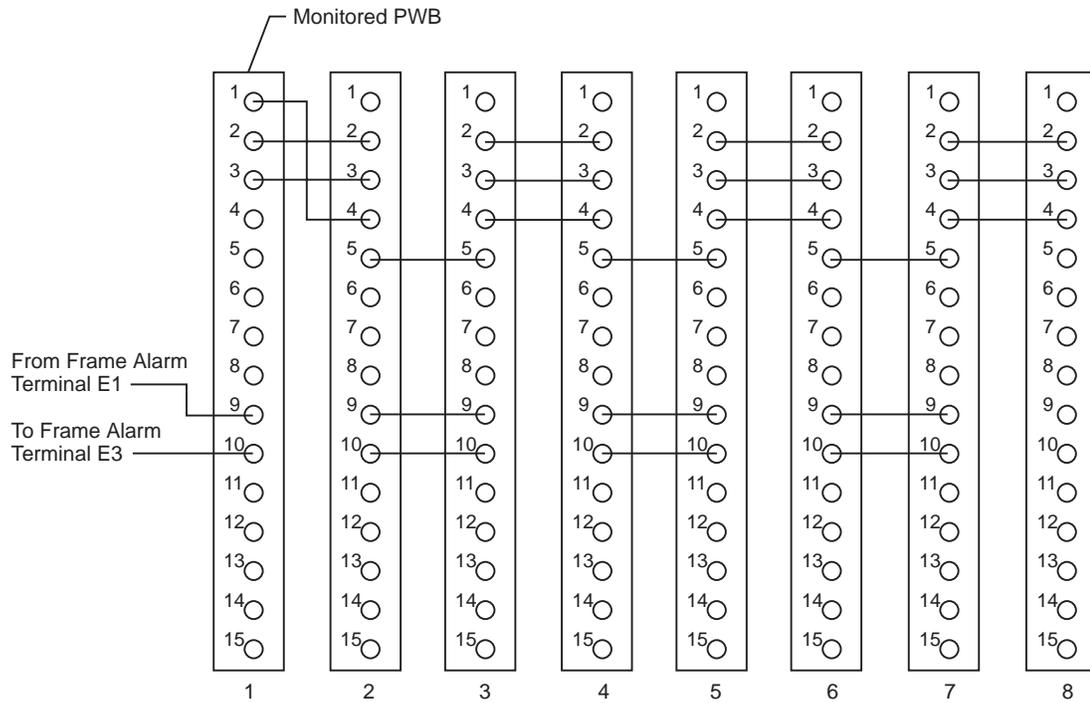


Figure 2-14: P102 Factory Alarm Wiring

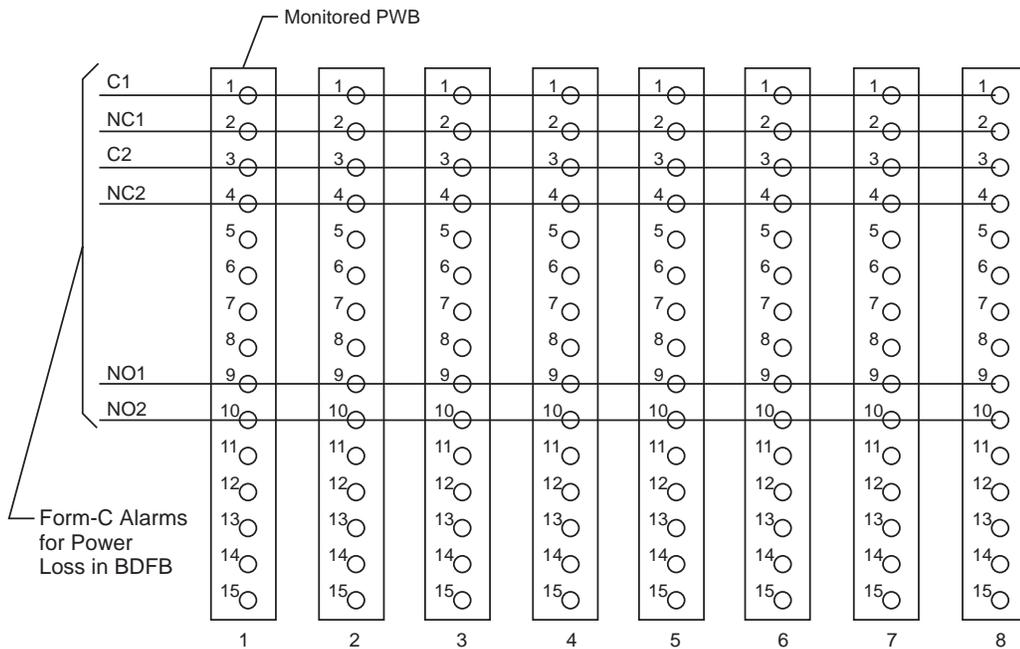


Figure 2-15: P101 Frame Power Loss Alarm Wiring

## 3 *Ordering Information*

### *List Structures*

The following tables are provided to describe the list structure of the J85568D-1 Battery Distribution Fuse Bay/Power Distribution Frame (BDFB/PDF). Table 3-A provides a summary of the J85568D-1 List structure and Table 3-B gives a summary of ED83127-30 Group options. A detailed description of each of the options on the BDFB/PDF is presented in Section 2.

### *BDFB/PDF Ordering Information*

**Table 3-A: J85568D-1 Lineage<sup>®</sup> 2000 BDFB/PDF  
Ordering Information**

<b>Description</b>	<b>List</b>
Provides a 6-foot cabinet and 300-ampere digital meter assembly (accommodates up to eight fuse panels and from one to eight load buses)	1
Same as List 1 except with 600-ampere meter	2
Same as List 1 except with 150-ampere meter	3
Equipment required for terminating battery cabling. Provides a bus bar connection and 300-ampere load monitoring shunt from a fuse panel in position 1 to the top or bottom of cabinet	11
Same as List 11 except for panel position 2	12
Same as List 11 except for panel position 3	13
Same as List 11 except for panel position 4	14
Same as List 11 except for panel position 5	15
Same as List 11 except for panel position 6	16
Same as List 11 except for panel position 7	17
Same as List 11 except for panel position 8	18

**Table 3-A: J85568D-1 Lineage® 2000 BDFB/PDF  
Ordering Information**

Same as List 11 except with 600-ampere shunt	21
Same as List 21 except for panel position 2	22
Same as List 21 except for panel position 3	23
Same as List 21 except for panel position 4	24
Same as List 21 except for panel position 5	25
Same as List 21 except for panel position 6	26
Same as List 21 except for panel position 7	27
Same as List 21 except for panel position 8	28
Same as List 11 except with 150-ampere shunt	31
Same as List 31 except for panel position 2	32
Same as List 31 except for panel position 3	33
Same as List 31 except for panel position 4	34
Same as List 31 except for panel position 5	35
Same as List 31 except for panel position 6	36
Same as List 31 except for panel position 7	37
Same as List 31 except for panel position 8	38
Bus bar link for connecting two fuse panel battery buses together	A
One blank panel required for each unequipped fuse panel position	D
Equipment required in addition to List 1 to provide one 12-inch extension cabinet when the BDFB/PDF is used in 7-foot equipment environments	E
Equipment required in addition to List 1, 2, or 3 to provide a rear door assembly with brackets	F
Equipment required in addition to List 3 for arranging a bottom entry for 4ESS™	BE
Equipment required to arrange a cabinet for bottom load feed	BF
Optional material to provide a 2400-ampere discharge return bus arranged for mounting on a 15- or 20-inch ladder type cable rack	K1
Optional material required in addition to List K1 to provide an additional 2400-ampere discharge return bus bar for a stacked bus arrangement	K2

**ED83127-30 Fuse  
Panel Ordering  
Information**

**Table 3-B: ED83127-30 Fuse Panel Ordering Information**

Description		Group
One 10-position fuse panel for mounting on the left side of the J85568D Series BDFB/PDF		3
One 10-position fuse panel for mounting on the right side of the J85568D Series BDFB/PDF		4
One left side position 1 filter panel		20
One right side position 2 filter panel		21
One top-mounted precharge panel		22
Required in addition to Group 3 or 4 to provide one:	3-70 amp WP-92461 cartridge type fuse block	A
	1-5 amp GMT fuse module (3)	B
	Blank fuse position cover	C
Required in addition to Group 3 or 4 to provide one alarm signaling circuit module for:	24 volt	E
	48 volt	F
	130 or 140 volt	G
Required in addition to Group 3 or 4 for:	Positive polarity	WA
	Negative polarity	WB

**Documentation  
References**

This product manual (Select Code 157-005-101) is part of a set of documentation developed to assist engineering and installation personnel. Additional product information includes the following:

- ED83127-30            Fuse Panel Drawing
- T-83170-30           Wiring Drawing
- SD-83170-01        Schematic Drawing

This documentation is provided with each BDFB/PDF in Documentation Service Kit, Comcode 847113990.

# 4 *Safety*

Please read this section carefully before installing, maintaining, or repairing the J85568D-1 Battery Distribution Fuse Bay/Power Distribution Frame (BDFB/PDF).

## *Admonishments*

Always take precautions to protect personal safety as well as the equipment when working on power systems. Throughout this manual, admonishments relating to personal safety are labeled **DANGER** or **Warning**. Those relating to equipment damage are labeled **Caution**. Please read all admonishments carefully and follow safety instructions and warnings.

## *Safety Statements*

- For use only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17, and 110-18 of the U.S. National Electric Code (NEC), ANSI/NFPA No. 70, and pursuant to applicable local codes.
- This equipment must not be installed over combustible surfaces.
- This equipment is to be used in controlled environments (an area where the humidity is maintained at levels that can not cause condensation on the equipment, the contaminating dust is controlled, and the steady-state ambient temperature is within the range specified).
- This equipment has been evaluated for use in a continuous ambient temperature of up to 95° Fahrenheit (35° Celsius).
- For installations in the United States, UL-listed compression connectors should be used to terminate UL-listed field-wired conductors where required. For all installations, the appropriate connector should be applied only to the correct size conductor as specified by the

connector manufacturer, using only the connector manufacturer's recommended tooling or tooling approved for that connector.

- If the proper connector for the country of installation is not provided, obtain appropriate connectors and follow manufacturer's and all local requirements for proper connections. All national and local rules and regulations must be followed when making field connections.
- Torque electrical connections to the values specified on labels or in the product documentation.
- Alarm contacts on the connector are not fused within the unit. Therefore, current limiting protection for these contacts must be provided by external circuits. Maximum ratings for alarm connections are 60Vdc and 0.5A. Exceeding these maximum ratings could result in fire or damage to the unit.

## ***Precautions***

When working on or using this type of equipment, follow these precautions:

- This unit must be installed, serviced, and operated only by skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.
- Because of the hazardous voltages supplied to and within the equipment, make sure the equipment, all associated framework, and the cable rack are properly grounded according to local job instructions before connecting any power.
- For equipment connected to batteries, disconnecting the ac alone will not necessarily remove power to the equipment. Make sure the equipment is not also powered by the batteries or the batteries are not connected to the output of the equipment.
- Hazardous dc energy and voltage (from batteries and rectifier output) are present in the unit. Use a voltmeter to insure no voltage, or the expected voltage, is present before contacting any uninsulated conductor surface. Follow the procedures in the order given to minimize dangerous encounters with these voltages. Exercise extreme caution when working near the battery busbars.
- The circuitry on the circuit boards within the unit is referenced to the non-ground side of the hazardous dc output voltage. Therefore, these circuits will also be at

hazardous voltage with respect to ground (earth ground and equipment frame). If the boards must be serviced or removed, disconnect all connectors to the boards first (even before removing plastic covers), taking care not to touch any bare circuits. Replace all plastic covers before attaching connectors.

- Capacitors will stay charged for at least one minute after power is disconnected.
- Use only properly insulated tools.
- Remove all metallic objects (key chains, glasses, rings, watches, or any other jewelry).
- Wear safety glasses.
- Test circuits before touching.
- Lock out and tag any circuit breakers/fuses when possible to prevent accidental turn on.
- Be aware of potential hazards in the area you are working before entering the equipment.
- Identify exposed hazardous electrical potentials on connectors, wiring, etc. (note the condition of these circuits, especially any wiring).
- Use care when removing or replacing any covers; avoid contacting any circuits.
- Use gloves when handling thermally hot components inside the rectifier. Transformers are very hot after sustained operation.

### ***Warning Statements and Safety Symbols***

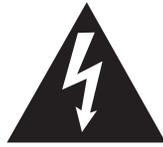
The symbols may sometimes be accompanied by some type of statement. For example, "Hazardous voltage/energy inside. Risk of injury. This unit must be accessed only by qualified personnel."



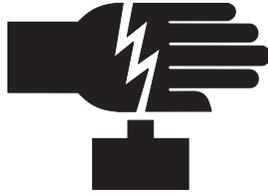
This symbol identifies the need to refer to the equipment instructions for important information.



This symbol (or equivalent) is used to identify the presence of hazardous ac mains voltage.



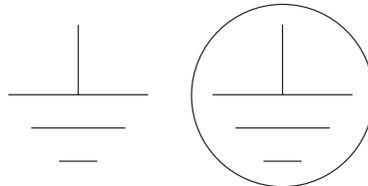
This symbol is used to identify the presence of hazardous ac or dc voltages. It may also be used to warn of hazardous energy levels.



This symbol identifies the presence of rectifier and battery voltages. The symbol may sometimes be accompanied by some type of statement. For example, “Battery voltage present. Risk of injury due to high voltage. Avoid contacting conductors with uninsulated metal objects. Follow safety precautions.”



This symbol is used to identify the presence of a hot surface. It may also be accompanied by a statement explaining the hazard. A symbol like this with a lightning bolt through the hand also means that the part is or could be at hazardous voltage levels.



These symbols (and/or the word “gnd”, “ground”, or the equivalent) are used to identify the safety earth ground or bonding point for the equipment. Make sure the associated

framework and cable rack are properly grounded, according to local job instructions, before turning on any rectifier.

### ***Electrostatic Discharge (ESD)***

- Assume all circuit packs containing electronic (solid-state) components can be damaged by ESD.
- When handling circuit packs (storing, inserting, removing, etc.) or when working on the backplane, always use the appropriate grounding procedure: either a wrist strap connected to ground or, when standing, a heel strap with a grounded dissipative floor mat.
- A grounded person must never hand an unprotected circuit pack to an ungrounded person. A static discharge from the ungrounded person through the circuit pack to the grounded person could cause an electrostatic discharge failure. All

persons and equipment at a work location must be at the same common ground potential to be static safe.

- Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.
- Do not rub or wipe circuit packs to clean them unless you and the circuit pack are at the same ground potential.
- Observe warning labels on bags and cartons. Whenever possible, do not remove circuit packs from antistatic bags or cartons until ready to insert into the equipment. Otherwise, open all circuit packs at a static-safe work position with wrist straps and dissipative table mats.
- Upon removal from the equipment, immediately put circuit packs into antistatic packages. Always store and transport circuit packs in antistatic packaging. Shielding is not required unless specified.
- Keep all static-generating materials away from all circuit packs. These materials include common plastics such as food wrappers, clear plastic bags, styrofoam containers, packing material, drinking cups, notebooks, and nonconductive plastic solder suckers. The insulation on small hand tools does not represent a static hazard.
- Keep adhesive tape (Scotch, masking, etc.) away from static-sensitive devices.
- When soldering static-sensitive semiconductor devices, the soldering iron must be grounded to the work table, which must also be earth grounded.
- Whenever possible, maintain relative humidity above the 20-percent level.
- Minimize electrostatic discharge when handling circuit modules.

## 5 *Installation*

Please read Section 4, *Safety*, carefully before installing the J85568D-1 eight-load BDFB/PDF.

### ***Installation Material Provided***

- Floor mounting hardware (concrete floors only)
  - (4) 3/8 inch self-drill anchor bolts
  - (4) hold-down washers
  - (4) insulating washers
- Frame ground mounting hardware (1/4 inch)
- Battery lead mounting hardware (3/8 inch)
- Load lead mounting hardware (1/4 inch)

### ***Installation Material Required But Not Provided***

- Input and output cable and terminal lugs
- Material handling equipment to unload BDFB at site, remove from shipping container and set in final position
- Lifting eye bolts, (4) 5/8-11 threaded holes provided
- Drill to bore hole for floor anchors (3/8 inch self-drill anchors provided)
- Cable rack and associated hardware
- Common electrician's hand tools, including jeweler's screwdriver, electrical tape, wire cutters and strippers, 6 AWG to 750 MCM
- Proper crimping tools and dies for connectors. The connectors specified in this section are WP-91412 and may be installed with compression tools made by Thomas & Betts using color-coded dies
- Common mechanic's hand tools, including flat blade screwdriver, socket and torque wrenches for 1/4 inch and 3/8 inch bolts, crowbar for uncrating and a small soldering iron
- All WP-92461 and GMT type load fuses

- Alarm fuses for cartridge type fuse holders, 0.18 ampere GMT fuse, comcode 402328926
- Mounting hardware for connecting load return leads to discharge return bus
- Central office and frame ground lugs
- 22-gauge wiring to connect discharge return leads to the digital meter and alarm circuit modules

## ***Cabinet Anchoring***

The BDFB floor footprint is 26 inches wide by 15 inches deep. See Figure 5-1. The cabinet is equipped with four 0.75x1.00 inch slots to accommodate various sizes and types of anchor bolts.

The J85568D is shipped with four self-drill, 3/8 inch anchor bolts to provide a simple, inexpensive solution for most applications. Figure 5-2 shows the typical floor mounting detail. The cabinet has passed Zone 2 and 3 earthquake testing with these anchors. However, various regions of the country have their own requirements for anchoring power equipment. For earthquake Zone 4, 12 millimeter anchors are recommended. Other anchor sizes and types can be ordered from the H569-407 Anchor Bolt Kit drawing. Table 5-A provides a summary of the anchor bolt options.

**Table 5-A: H569-407 Anchor Bolt Ordering Information**

Group	Description
1	(4) 1/2 inch self-drill anchors with threaded rod
2	(4) 1/2 inch drop-in anchors with threaded rod
3	(4) 12 millimeter heavy duty anchors with threaded rod and hold-down plates
4	(4) 12 millimeter heavy duty anchors with torque cap bolt and hold-down plates
10*	(4) 3/8 inch self-drill anchors with threaded rod
11	(4) 3/8 inch drop-in anchors with threaded rod

\*Furnished with each BDFB. See Figure 5-2.

## ***Cable Routing Strategy***

Fuse panels should be equipped starting at panel position 1 to eliminate possible cable congestion when adding input leads or installing additional fuse panels.

Load leads are routed along cable troughs on either side of the cabinet. Location of the cable rack with respect to the BDFB is critical to avoid cable routing problems. If possible locate the cable rack along the front of the BDFB as shown in Figure 5-3.

Run the load leads in four distinct quadrants down the sides of the cabinets. Run load leads to the top panel toward the front of the cabinet. Run load leads to the bottom panel toward the back of the cabinet. This routing scheme will simplify future cabling in the BDFB.

### ***Frame Ground***

The frame ground connection is located at the top of the cabinet.

Connection is made using a 1/4 inch double hole terminal lug on .625 inch centers. For ground wire connections greater than 2 gauge, order comcode 846337798 bus bar adapter to allow for 3/8 inch double hole terminal lugs on 1.00 inch centers. Table 5-B provides a list of compatible terminal lugs. Mounting hardware is furnished with each cabinet. If the bus bar adapter is used, refer to Table 5-C for 3/8-inch bolt hole, 1-inch center connectors, and to Table 3-C for bolting hardware.

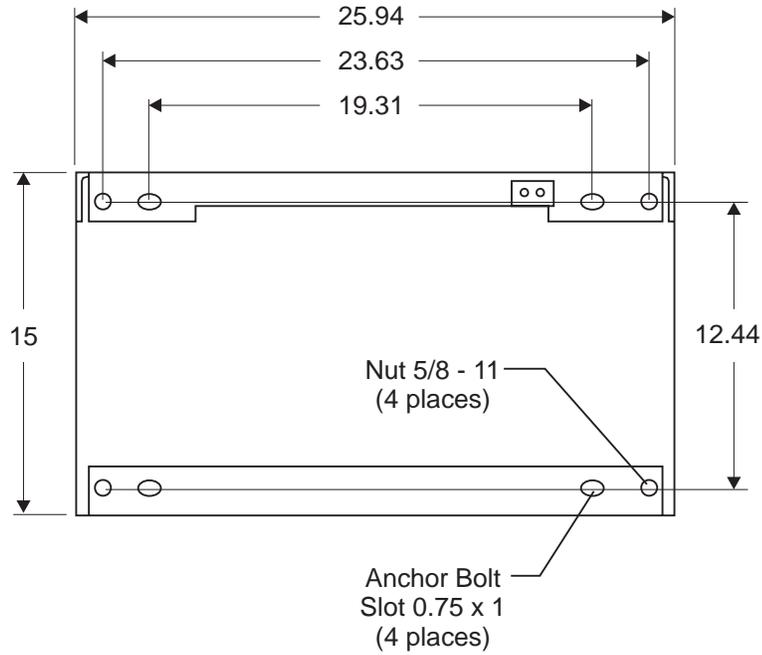
**Table 5-B: Recommended Double Hole Terminal Lugs for Frame Ground**

KS-5482 or KS-23814 Wire	KS-20921 or KS-23835 Wire	WP-91412 List	Comcode	Bolt Size	Centers	Die	Die Code
8	8	75	406021626	0.250	0.62	Red	21
6	6	3	405347519	0.250	0.62	Blue	24
4	4	5	405347576	0.250	0.62	Grey	29
2	-	54	405348202	0.250	0.62	Brown	33
-	2	8	405347683	0.250	0.62	Green	37

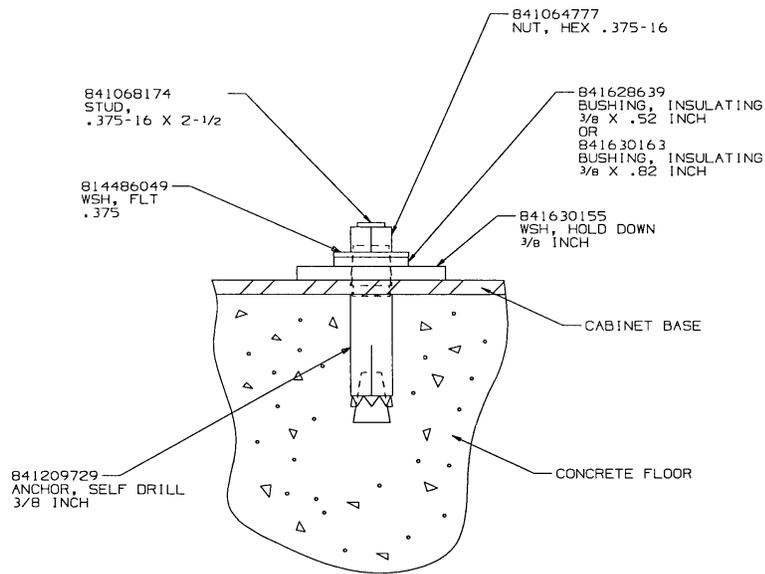
### ***Central Office Ground***

Lucent Technologies recommends that central office ground (C.O. ground) be run from the battery plant discharge return bus to building ground. The List K1 discharge return bus option as shown in Figures 2-5, 2-6, and 2-7 has row A, position 21 reserved for terminating C.O. ground.

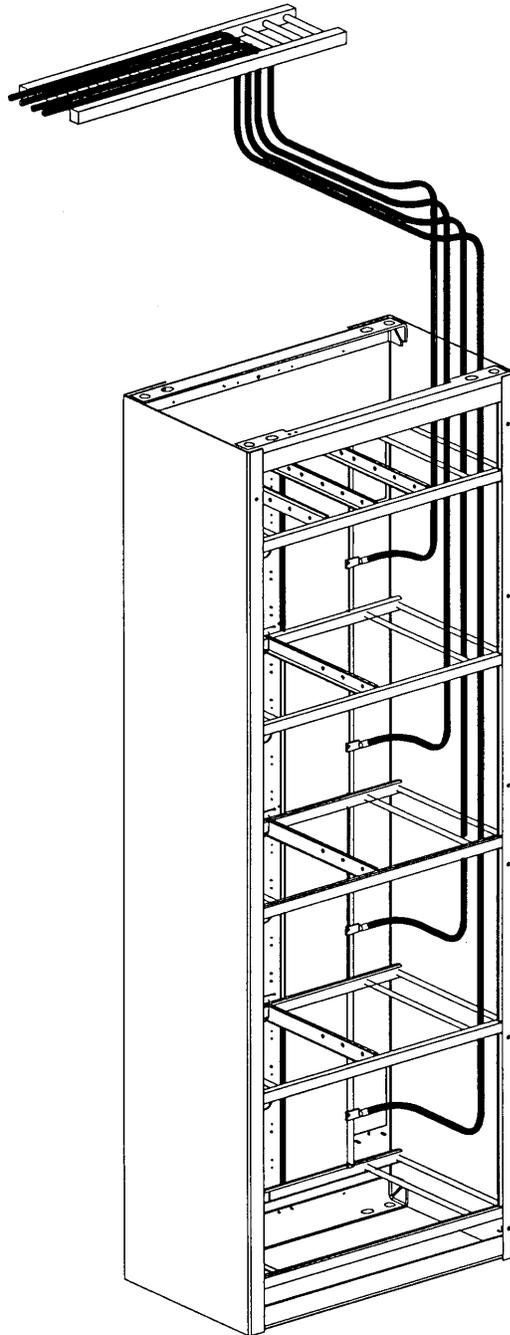
All C.O. ground connections accommodate 3/8 inch double hole terminal lugs on 1.00 inch centers. Wire size is determined by engineering based on local office requirements. Table 5-C lists some recommended terminal lugs.



**Figure 5-1: BDFB Floor Footprint**



**Figure 5-2: Floor Mounting Detail**



***Figure 5-3: Cable Rack Location***

**Table 5-C: Recommended Double Hole Terminal Lugs for Central Office Grounds**

KS-5482 or KS-23814 Wire	KS-20921 or KS-23835 Wire	WP-91412 List	Comcode	Bolt Size	Centers	Die	Die Code
6	6	111	406332841	0.375	1.00	Blue	24
4	4	116	406332940	0.375	1.00	Grey	29
2	-	121	406338665	0.375	1.00	Brown	33
1/0	-	56	405348228	0.375	1.00	Pink	42
2/0	1/0	57	405348236	0.375	1.00	Black	45
-	2/0	77	40602 1725	0.375	1.00	Orange	50
4/0	-	59	405348251	0.375	1.00	Purple	54
-	4/0	27	405347923	0.375	1.00	Yellow	62
350	-	61	405348277	0.375	1.00	Red	71
-	350	86	406021915	0.375	1.00	-	80
500	-	63	405348293	0.375	1.00	Brown	87
-	500	165	406434241	0.375	1.00	Pink	99
750	-	135	406335141	0.375	1.00	Black	106
-	750	170	406434290	0.375	1.00	Yellow	115

### ***Digital Meter***

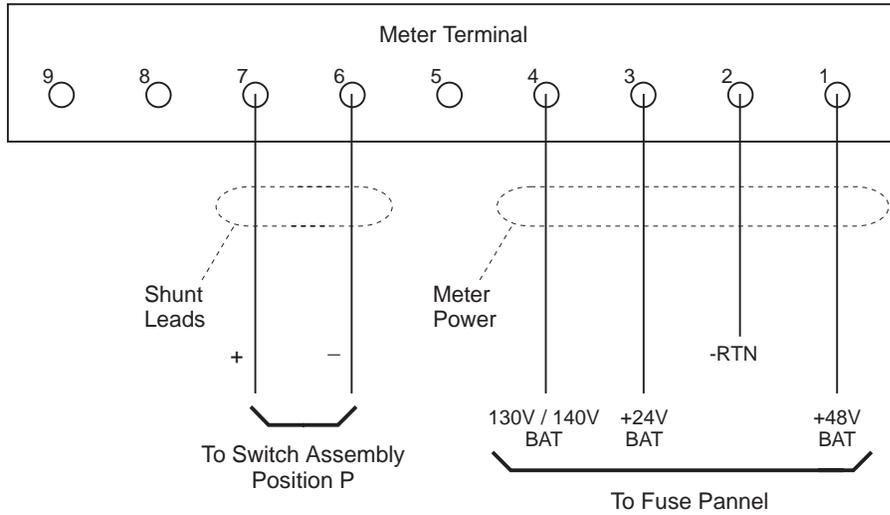
Load monitoring shunts are wired to a rotary switch allowing the user to select between the eight possible load buses in the cabinet. The switch is wired beginning with panel position 1 to switch position A and proceeds through switch position H for panel position 8 for cabinets with eight load buses.

A stamping area is provided under the switch for the factory to stamp load bus designations. The stamping sequence begins on the right side with load bus A for panel position 1 and proceeds clockwise through load bus H for panel position 8. When multiple panels are connected together as a common load bus, no designation is stamped for the switch positions of the connected panels. The meter will read zero when switched to those positions since no separate shunt is present.

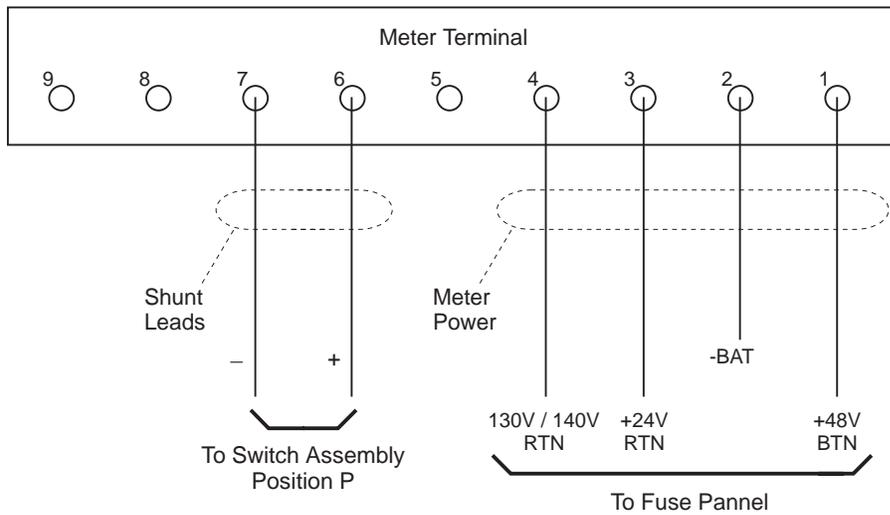
The meter is powered from the first equipped panel position on the cabinet. It operates from a 24-, 48-, 130-, or 140-volt source. The negative lead (battery or return) is inserted in meter terminal 2. The positive lead is inserted in meter terminal 1 if the panel is 48V, terminal 3 for 24V, or terminal 4 for 130V or 140V. For example, a -48-volt fuse panel in panel position 1 would power the discharge meter. A 22-gauge wire is run from the fuse panel

battery bus to meter terminal 2. Another is run from the return bus mounted in the cable rack to meter terminal 1. The installer must connect this lead. Figure 5-4 shows meter wiring options for a positive or negative ground plant.

### Negative Ground Plant



### Positive Ground Plant



**Figure 5-4: Meter Wiring Options**

## ***Alarm Circuit Modules***

### ***Accessing Alarm Modules***

The alarm circuit modules, apparatus code A-CP/BEP1, provide a means for indicating a power loss and fuse alarm for each fuse panel. The alarm modules are located down the center of the cabinet. They are accessed by first removing the top cover and then lifting the alarm cover up and pulling out. Refer to Figure 5-5. The cover has labeling information with arrows that associate each alarm module with a fuse panel. The labels also contain stamping areas for load designations. See Figure 5-6.

### ***Alarm Outputs***

Each alarm module provides two form-C contacts for power loss and three form-C contacts for fuse failure. The alarm output connector references of audible, visual and remote given with each alarm module are arbitrary and are provided as a suggested standard for remote monitoring equipment. However, installation personnel may select any set of form-C contacts. Figure 2-12 shows the output (P101) connector pin descriptions. The output connector is a standard 15 pin D-subminiature female connector. A mating connector, comcode 405095043, is provided with each alarm module for wire-wrapping alarm leads. Figure 5-7 shows the connector pin numbering.

### ***Monitoring Multiple Alarm Modules for Negative Plants***

#### **Fuse Alarm**

In most BDFB applications, customers require remote monitoring of a frame fuse alarm only and not individual load buses. Therefore, fuse alarms on multiple packs may be connected so that the remote fuse alarm signal on one pack can be operated from the other packs. This daisy chain is factory wired so that frame fuse alarm may be monitored from the position 1 alarm module. A fuse alarm on a pack will apply voltage to P102 pins 4 and 5. Pins 4 or 5 are connected from pack to pack as shown in Figure 2-14, providing a common fuse alarm output signal. The position 1 alarm module monitors the other packs by connecting P102 pin 1, which is the fuse alarm input, to P102 pin 4 of the position 2 alarm module. Thus voltage from any pack with a fuse alarm will cause the monitoring pack to alarm on its P101 contacts. All packs will alarm independently by simply disconnecting P102 pin 1 from the position 1 pack.

## Power Loss Alarm

Remote monitoring of power loss is furnished for individual fuse panels. However, power loss alarms will probably not be remotely monitored in most applications because loss of power in a BDFB usually results in a number of other simultaneous alarms from the battery plant and load equipment. If power loss alarm for the entire cabinet is desired, the installer must connect the alarm module output pins P101 - 1, 2, 3, 4, 9, 10 as shown in Figure 2-15. The connections can be made with 26 gauge solid wire soldered or wire-wrapped to the 405095043 output connectors furnished with each alarm module.

### *Monitoring Multiple Alarm Modules for Positive Plants*

Remote monitoring of the frame fuse alarms for the positive plant must be wired individually and are daisy-chained together. Three "Form C" contacts are provided and must be connected to alarm module output pins on connector P101 5, 6, 7, 8, 11, 12, 13, 14, and 15 (see Figure 2-12A). The connections can be made with 26-gauge solid wire and wire-wrapped to the 405095043 output connectors. The normally open pins are 14, 11, and 15, with common pins being 13, 12, and 8. The normally closed pins are 5, 6, and 7, with common pins 13, 12, and 8.

### Note

The NC1 or NO1 communicates with C1 return; NC2 or NO2 communicates with C2; NC3 or NO3 communicates with C3.
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### *Frame Alarm Lamp*

A frame alarm is located at the top of each cabinet. This frame alarm lights when power to a fuse panel is lost or there is a fuse alarm. Power for lighting the frame lamp is from an auxiliary battery supply (ABS) lead which is a 22-gauge wire run from the battery plant. Refer to Figure 2-13 for frame alarm and ABS termination points. The ABS lead is soldered to terminal E3 and the ABS return lead is soldered to terminal E4 for a negative plant (positive ground). Reverse these leads for a positive plant (negative ground).

Each cabinet has a 48-volt lamp for use with the ABS lead. If another voltage is used, change the lamp (24-volt comcode 407226836 or 130-volt comcode 407227164) to agree with the ABS voltage. Each List 3 4ESS™ cabinet is equipped with the 130-volt lamp.

If no ABS lead from the battery plant is available, an installer may choose an alternative alarming method, substituting power from a load bus for ABS. For a negative plant (positive ground), run a 22 gauge wire from the battery bus of fuse panel number 1 to terminal E3. Connect the return lead from the external discharge return bus located on the cable rack to solder terminal E4. For a positive plant (negative ground, reverse these two leads. The obvious consequence of this option is that if power is lost to fuse panel number 1, the frame alarm will not light.

## ***Alarm Verification***

Perform the following verification procedures with the load buses powered from the battery plant, but with no load equipment in service.

Simulate a fuse failure alarm on each panel using a blown GMT fuse. Insert the GMT fuse in one of the GMT indicating fuse positions on each fuse panel. Verify that the red LED on the associated BEP1 circuit pack lights as well as the frame alarm lamp at the top of the cabinet. If remote alarms are connected, verify that office alarms are generated as specified by the job records.

Simulate a panel power loss alarm on each fuse panel by turning off or disconnecting the circuit breaker or fuse feeding each load bus. Verify that the green LED on the associated BEP1 circuit pack is extinguished and that the frame alarm lamp at the top of the cabinet lights. If remote alarms are connected, verify that office alarms are generated as specified by the job records.

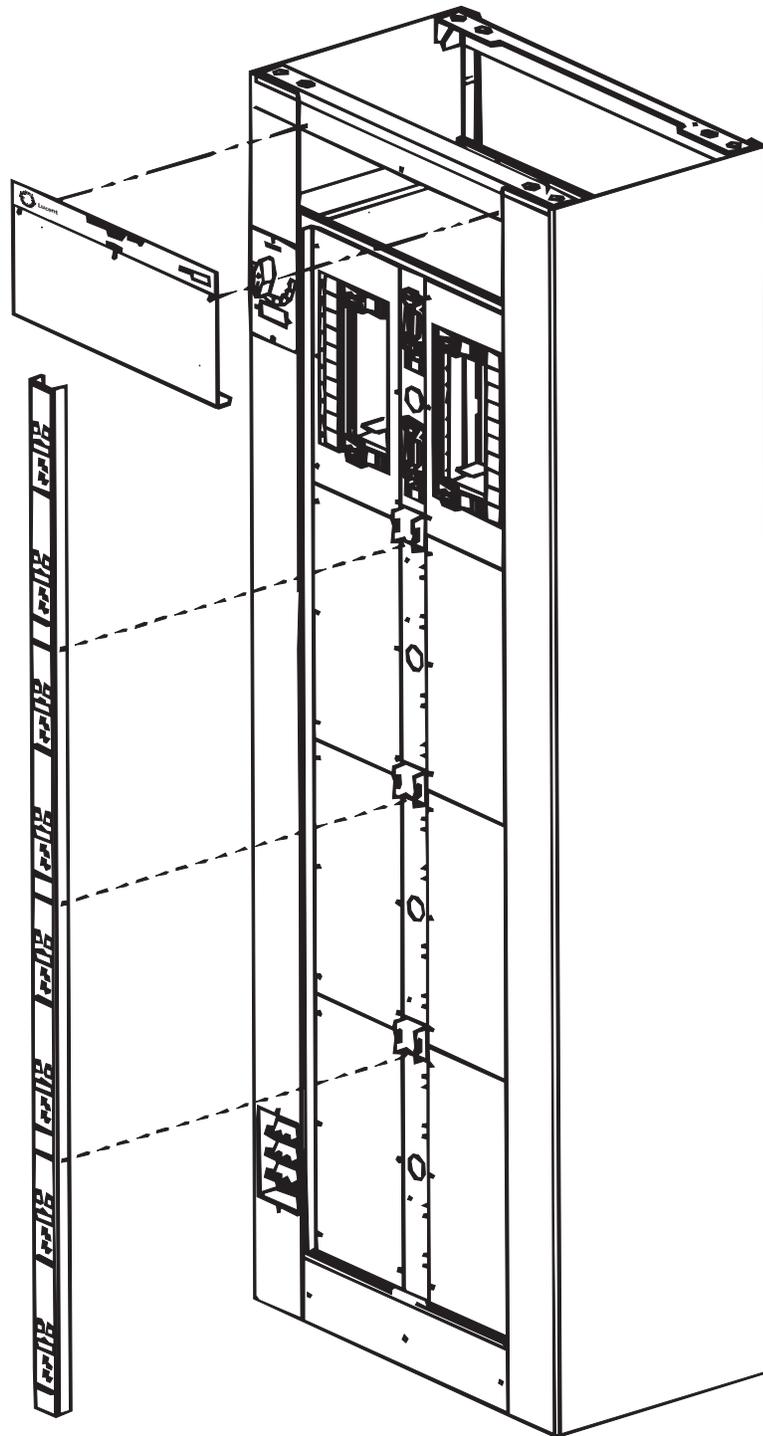
If alarms are not indicated as described, re-check alarm wiring on T-83170-30, Figures 5 and H2. If alarms still do not function, it may be necessary to replace the BEP1 circuit module, comcode 106849506.

## ***Recommended Torque Settings***

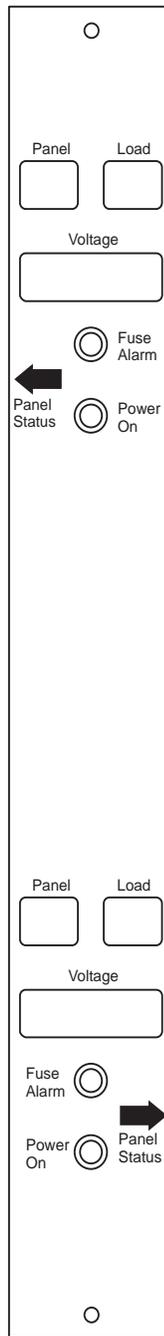
Table 5-D lists the recommended torque settings for the input and output connections on the BDFB.

**Table 5-D: Recommended Torque Settings for BDFB Connections**

Connection	Screw or Nut Size	Torque Tool Setting inch/pounds
GMT fuse module	#6	10
Cartridge type fuse block Frame ground Internal return bus	1/4	75
Input battery and returns External return bus Anchor bolts	3/8	260

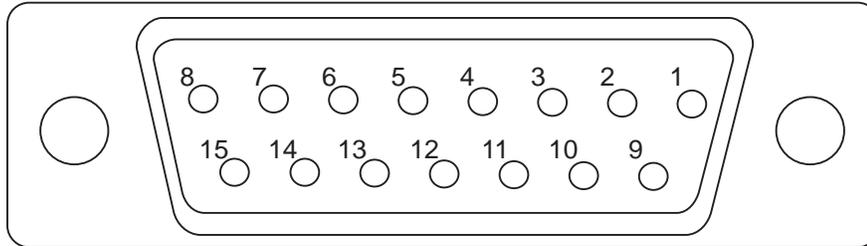


*Figure 5-5: Accessing Alarm Modules*



**Figure 5-6: Load Designation Labels**

405095043  
DA 15PF179  
15 Position Connector  
E/W Wire Wrap Pins  
(Cinch)



***Figure 5-7: Alarm Output Connector***

## **6**                      ***Product Warranty***

A. Seller warrants to Customer only, that:

1. As of the date title to Products passes, Seller will have the right to sell, transfer, and assign such Products and the title conveyed by Seller shall be good;
2. Upon shipment, Seller's Manufactured Products will be free from defects in material and workmanship, and will conform to Seller's specifications or any other agreed-upon specification referenced in the order for such Product;
3. With respect to Vendor items, Seller, to the extent permitted, does hereby assign to Customer the warranties given to Seller by its Vendor of such Vendor Items, such assignment to be effective upon Customer's acceptance of such Vendor Items. With respect to Vendor items recommended by Seller in its specifications for which the Vendor's warranty cannot be assigned to Customer, or if assigned, less than Sixty (60) days remain of the Vendor's warranty or warranty period when the Vendor's items are shipped to Customer or when Seller submits its notice of completion of installation if installed by Seller, Seller warrants that such Vendor's items will be free from defects in material and workmanship on the date of shipment to Customer. In such an event, the applicable Warranty Period will be sixty (60) days.

- B. The Warranty Period listed below is applicable to Seller's Manufactured Products furnished pursuant to this Agreement, unless otherwise stated:

**Warranty Period**

Product Type	New Product	Repaired Product or Part*
Central Office Power Equipment**	24 Months	6 Months

\* The Warranty Period for a repaired Product or part thereof is as listed or, in the case of Products under Warranty, is the period listed or the unexpired term of the new Product Warranty Period, whichever is longer.

\*\* The Warranty Period for Products ordered for Use in Systems or equipment Manufactured by and furnished by Seller is that of the initial Systems or equipment.

C. If, under normal and proper use during the applicable Warranty Period, a defect or nonconformity is identified in a Product and Customer notifies Seller in writing of such defect or nonconformity promptly after Customer discovers such defect or nonconformity, and follows Seller's instructions regarding return of defective or nonconforming Products, Seller shall, at its option attempt first to repair or replace such Product without charge at its facility or, if not feasible, provide a refund or credit based on the original purchase price and installation charges if installed by Seller. Where Seller has elected to repair a Seller's Manufactured Product (other than Cable and Wire Products) which has been installed by Seller and Seller ascertains that the Product is not readily returnable for repair, Seller will repair the Product at Customer's site.

With respect to Cable and Wire Products manufactured by Seller which Seller elects to repair but which are not readily returnable for repair, whether or not installed by Seller, Seller at its option, may repair the cable and Wire Products at Customer's site.

D. If Seller has elected to repair or replace a defective Product, Customer shall have the option of removing and reinstalling or having Seller remove and reinstall the defective or nonconforming Product. The cost of the removal and the reinstallation shall be borne by Customer. With respect to Cable and Wire Products, Customer has the further responsibility, at its expense, to make the Cable and Wire Products accessible for repair or replacement and to restore the site. Products returned for repair or replacement will be accepted by Seller only in accordance with its instructions and procedures for such returns. The transportation expense

associated with returning such Product to Seller shall be borne by Customer. Seller shall pay the cost of transportation of the repair or replacing Product to the destination designated by Customer within the Territory.

- E. The defective or nonconforming Products or parts which are replaced shall become Seller's property.
- F. If Seller determines that a Product for which warranty service is claimed is not defective or nonconforming, Customer shall pay Seller all costs of handling, inspecting, testing, and transportation and, if applicable, traveling and related expenses.
- G. Seller makes no warranty with respect to defective conditions or nonconformities resulting from actions of anyone other than Seller or its subcontractors, caused by any of the following: modifications, misuse, neglect, accident, or abuse; improper wiring, repairing, splicing, alteration, installation, storage, or maintenance; use in a manner not in accordance with Seller's or Vendor's specifications or operating instructions, or failure of Customer to apply previously applicable Seller modifications and corrections. In addition, Seller makes no warranty with respect to Products which have had their serial numbers or month and year of manufacture removed, altered, or with respect to expendable items, including, without limitation, fuses, light bulbs, motor brushes, and the like.

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