



**OPERATING MANUAL
POWER DISTRIBUTION PANELS
DPBF1U & DPGF1U SERIES**

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OPERATING MANUAL

DPBF1U & DPGF1U SERIES

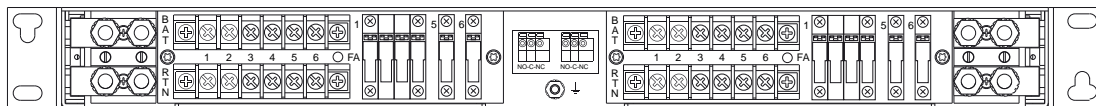
DC POWER DISTRIBUTION PANELS

1.0 INTRODUCTION

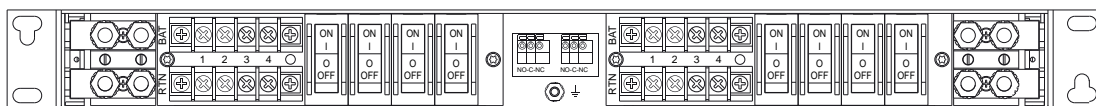
These distribution panels provide protected power distribution to telecommunication equipment. They offer fuse or circuit breaker positions on the A and B sides of the panel. The A and B loads of the distribution panel are totally independent and isolated from each other. There is a green/red LED for each load to indicate normal operation or an open circuit due to a blown fuse or tripped circuit breaker.

The panels are only 1.75 inches (1 mounting position) high to minimize rack space and can be mounted in either a 19- or 23-inch relay rack with corresponding brackets. They can be mounted from the front of the rack with offsets every ¼-inch from front to back to align with existing rackmounted equipment.

Figure 1 shows the two series of panels. The first is the DPGF1U Series which has 4 or 6 GMT fused circuits on both A and B sides. The second is the DPBF1U Series with up to 4 circuit breaker circuits on both A and B sides.



DPGF1U: GMT Fuse Distribution Panel



DPBF1U: Circuit Breaker Distribution Panel

Figure 1. DPGF1U & DPBF1U Front Views

The panels can be configured for 12, 24 or 48 volts with either positive or negative ground. Because the A and B sides are independent and isolated, they can be configured separately. For example, the A side can be 48V positive ground and the B side can be 24V negative ground. The voltage and polarity of each side must be configured at the factory. All models are reverse polarity protected.

Each bus (A and B) has a green/red visual alarm and one Form C relay alarm contact for connection to external audible or visual alarms.

2.0 FEATURES & OPTIONS

2.1 The following is a summary of the important features of the Series.

- ◆ Thin Height: 1.75 inches (1RU)
- ◆ 19 or 23-Inch Rack Mounting
- ◆ Dual A/B Loads
- ◆ Current Capacity: 80 to 150A per Load (Depends on Model)
- ◆ Operating Voltage: 12, 24 or 48VDC
- ◆ Positive or Negative Ground
- ◆ Red/Green LED Indicators
- ◆ 1 Form C Relay Contact per Bus
- ◆ Protection: GMT Fuses or Magnetic Circuit Breakers
- ◆ Independent and Isolated Loads
- ◆ Input Connections: Crimp Type Lugs
- ◆ Output Connections: Barrier Terminal Strips
- ◆ Reverse Polarity Protected

2.2 Options. There are three standard options available:

Option C - Clear plastic rear cover to protect connectors and wiring from damage. This option will be supplied automatically unless it is specifically requested to be deleted.

Option S - This option internally links the A bus to the B bus so that a fully configured unit can be supplied DC from a single feed. The A and B sides have the same voltage and polarity.

3.0 PRODUCT LINE

The following table shows the 3 basic configuration that are available for each type of panel. ‘x’ denotes the voltage and polarity. Full configuration details are given in section 8.

BASE MODEL	INPUT FEEDS	MAX. # BREAKERS / FUSES	AMPS EACH FEED	TOTAL AMPS
DPBF1U-Ax	1	4 Breakers	150	150
DPBF1U-Ax-Bx-S		8 Breakers	150	150
DPBF1U-Ax-Bx	2	4 + 4 Breakers	96	192
DPGF1U-Ax	1	4 or 6 Fuses	80	80
DPGF1U-Ax-Bx-S		8 or 12 Fuses	80	80
DPGF1U-Ax-Bx	2	4 or 6 + 4 or 6 Fuses	64	128

Table 1. Basic Configurations

4.0 SAFETY & INDUSTRY STANDARDS

4.1 DPBF1U & DPGF1U Series power distribution panels meet the following safety requirements:

STANDARD

UL60950-1, 2nd Edition

CSA22.2 No. 60950-1, 2nd Edition

EN60950-1, 2nd Edition

4.2 DPBF1U & DPGF1U Series power distribution panels are CE marked to indicate conformance to the European Union's Low Voltage Directive.

4.3 These Distribution Panels operate at voltages that could potentially be hazardous. Furthermore, inadvertent short circuiting of the system battery and/or rectifier by mis-connection or other error could be harmful. This product should be handled, tested and installed only by qualified technical persons who are trained in the use of power systems and are well aware of the hazards involved.

4.4 When operating this Distribution Panels the chassis ground terminal must be connected to the system frame ground or other proper safety ground for the protection of personnel.

4.5 All connections to the Distribution Panels should be carefully checked for errors before applying power to them.

4.6 The internal voltages may be at hazardous potentials. The top cover should not be removed. There are no user-serviceable components in these units. Removing the top cover will void the warranty.

5.0 WARRANTY (summary)

DPBF1U & DPGF1U Series power distribution panels are warranted for two (2) years from date of shipment against defects in material and workmanship. This warranty does not extend to products which have been opened, altered or repaired by persons other than persons authorized by the manufacturer or to products which become defective due to acts of God, negligence or the failure of customer to fully follow instructions with respect to installation, application or maintenance.

For a complete text of UNIPOWER's warranty conditions please request a copy from your local Sales Office.

6.0 DESCRIPTION OF OPERATION

6.1 Power Distribution Circuits. A simplified schematic diagram of the distribution panels is shown in Figure 2. The battery input to each load connects to a high-current copper bus bar from which the individual fuses or circuit breakers distribute power to the loads. The return input connects to a similar bus bar to which the individual loads terminate. The A and B loads are totally independent and isolated with the exception of models incorporating the ‘S’ option.

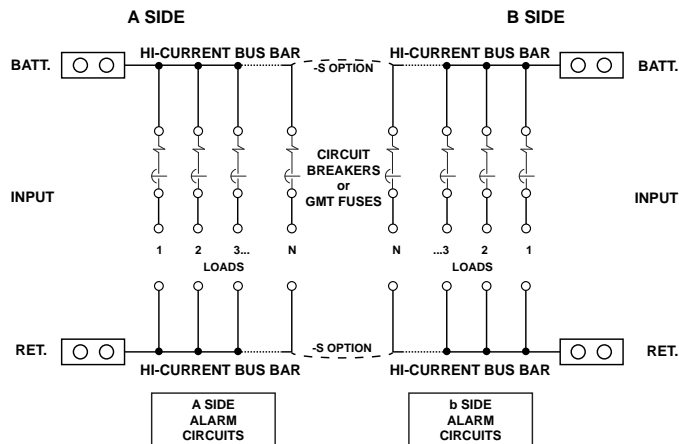


Figure 2. Block Diagram

6.2 Alarm Circuits. The alarm circuits detect a tripped circuit breaker or blown and, in this event, turn on the red part of the LEDs. The alarm circuits also each drive Form C relay contacts. If one or more circuits open or if there is an input power failure, the relays are de-energized and the contacts are used to control external audible or visual alarms. The A and B alarm circuits are also independent and isolated from each other.

LED & RELAY STATE MEANINGS

LED State	Relay State	Meaning
Green	Energized (N.O. is closed)	OK
Red	De-energized (N.O. is open)	Breaker Trip or Breaker OFF or Fuse Blown
OFF		No Input Power

Table 2. LED State Definitions

7.0 SPECIFICATIONS

The following specifications are typical at 25°C unless otherwise noted.

INPUT / OUTPUT

Panel Capacity	See Panel Configuration Table
Configuration	
DPBF1U	
Single Bus	1 to 8 Breakers
Dual Bus	1 to 4 Breakers Each
DPGF1U	
Single Bus	1 to 12 GMT Fuses
Dual Bus	1 to 6 GMT Fuses Each
Breaker/Fuse Capacity ¹	½A to 30A
Voltage ²	
24/48V Nominal	21-60VDC
12V Nominal	10.5-15VDC
Polarity	Polarity Neutral

ALARMS

Alarm Indicator	Dual-Color LED Per Bus
LED Status Indication	Green = Normal
	Red = Breaker/Fuse Trip/Open Alarm
	Off = No Power
Alarm Connections	One Form C Relay Contact Per Bus

SAFETY STANDARDS	UL60950-1 2nd Ed.
	CAS22.2 No.950-1 2nd Ed., EN60950-1 2nd Ed.

ENVIRONMENTAL

Operating Temp. Range	-10°C to +70°C
Storage Temp. Range	-40°C to + 85°C
Humidity	0% to 95%, Non-Condensing

PHYSICAL SPECIFICATIONS

Case Material	Steel
Finish	Powder Coat Black
Dimensions, Inches (mm)	1.75 H x 19.00 W x 9.00 D
	(44.5 x 483 x 229)
Weight	10.30 lbs. (4.67 kg.)
Rack Mounting Width	19 or 23 Inches

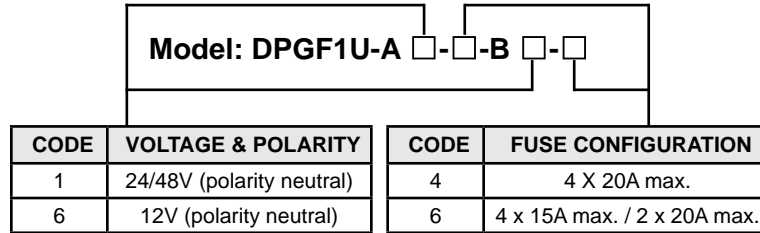
CONNECTIONS

Input Connections	Crimp Type Lug or ¼ - 20 Stud
Output Connections	Barrier Terminal Strips, No. 6-32
Chassis Ground Connection	No. 8-32 Stud
Alarm Relay Connections	Spring Clamp Terminals, 16-26AWG

- NOTES:** 1. See tables for available breaker & fuse sizes.
2. See Ordering Guide to specify voltage.

8.0 CONFIGURATION

8.1 DPGF1U Configuration Details



Example: DPGF1U-A1-4-B6-6 specifies separately configured A and B sections. The A section is 24/48V with 4 x 20A max. fuses. The B section is 12V with 4 x 15A max. plus 2 x 20A max. fuses.

- NOTES:**
1. If section B is not used a blank panel is installed at the factory.
 2. The sum of all fuse currents on either side must not exceed the total rating.

GMT FUSES

AMPS	PART NUMBER	COLOR
½	401-1500-0010	Red
¾	401-1500-0020	Brown
1	401-1500-0030	Gray
1⅓	401-1500-0040	White
2	401-1500-0050	Orange
3	401-1500-0060	Blue
5	401-1500-0070	Green
10	401-1500-0080	Red/White
12	401-1500-0090	Green/Yellow
15	401-1500-0110	Red/Blue
20	401-1523-0000	Green/White
DUMMY	401-1500-0100	

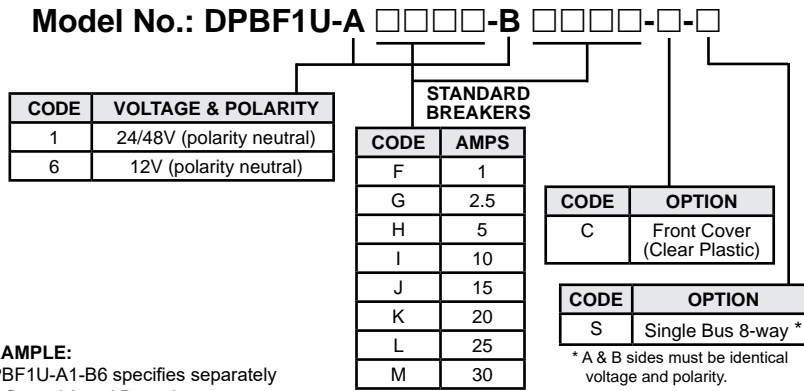
Order fuses separately.

UNIPOWER recommends Bussman fuses for this panel.

They may be ordered from UNIPOWER using the part numbers shown.

Table 3. GMT Fuse Values

8.2 DPBF1U Configuration Details



EXAMPLE:
DPBF1U-A1-B6 specifies separately configured A and B sections. The A section is 24/48V; the B section is 12V.

NOTE:
If section B is not used a blank panel is installed at the factory. The sum of all breaker currents on either side must not exceed the total rating. When the 'S' option is specified each side of the panel is limited to 75A (total 150A).

9.0 FRONT PANEL DESCRIPTION

9.1 Front View. Figures 3 and 4 show the front of the DPBF1U and DPGF1U distribution panels respectively. Inputs are at the left and right ends of the back panel. Side A outputs are at two rows of barrier terminal strips on the left side, and side B outputs are the same on the right side. At the center of the back panel are two spring clamp terminal blocks for the Form C relay contact outputs.

Below these is a chassis ground terminal.

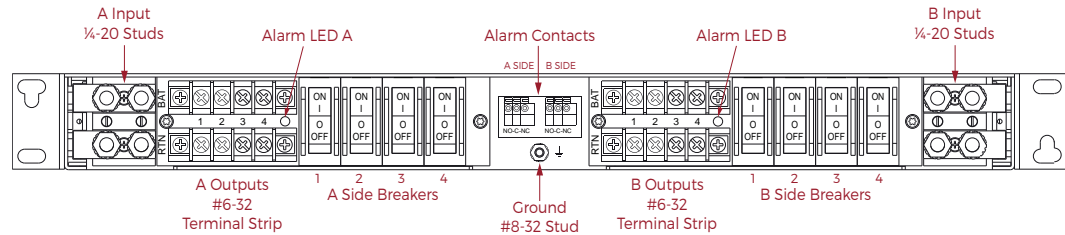


Figure 3. DPBF1U Front Panel View

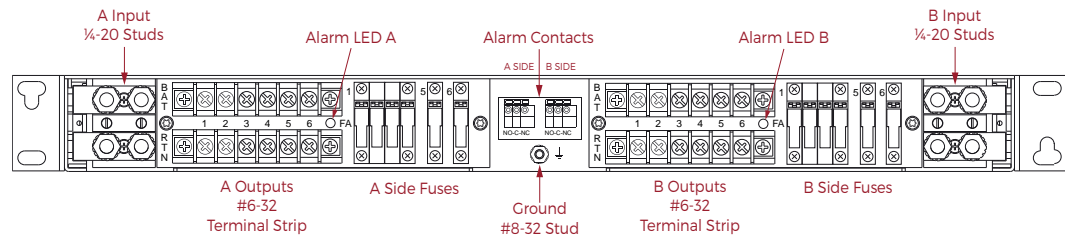


Figure 4. DPGF1U Front Panel View

9.2 Input Connections. See Figure 5. The DC power inputs to the distribution panels are made by means of crimp type lugs or direct connection to 1/4-20 studs to two copper bus bars on side A and side B. The upper bus bar is the battery connection (whether + or -) and the lower bus bar is the return (whether + or -).

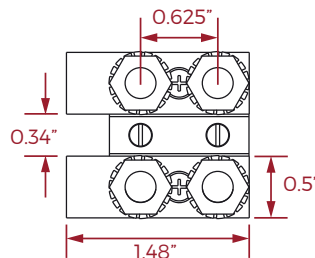


Figure 5. Input Bus Bar Detail

9.3 Crimp Type Lugs. A list of compatible crimp type lugs is shown in the following table for AWG wire sizes from no. 1 to 8 and one- or two- hole lugs. These lugs can be ordered directly from the manufacturer, Panduit Corp., using the model numbers shown in table 4.

A standard kit of four two-hole crimp type lugs for no. 6 AWG copper wire is available from UNIPOWER. Order kit no. 775-1434-0000.

WIRE AWG	.25DIA. HOLES	PANDUIT CORP. PART NUMBER	UNIPOWER PART NUMBER
8	1	LCA8-14-L	625-1665-0010
	2	LCD8-14A-L	625-1665-0110
6	1	LCA6-14-L	625-1665-0020
	2	LCD6-14A-L	625-1665-0120
4	1	LCA4-14-L	625-1665-0030
	2	LCD4-14A-L	625-1665-0130
2	1	LCA2-14-Q	625-1665-0040
	2	LCD2-14A-Q	625-1665-0140
1	1	LCA1-14-E	625-1665-0050
	2	LCD1-14A-E	625-1665-0150

Table 4. Input Cable Lug Sizes & Types

9.4 Output Connections. Output connections for A and B loads are shown in Figure 6. There are 10 sets of barrier terminal strip connections for each side, A and B. The connections are numbered to correspond with the numbers of the front panel breakers. The upper strip connections are from the battery through the breakers; the lower strip connections are the returns. Side B is on the left and side A on the right, as shown.

Each terminal is a no. 6-32 screw and is rated at 30 amperes. Wire sizes from no. 10 AWG up to no. 22 AWG may be used for connections. Figure 7 below shows detailed spacing of the terminals.

When DPBF1U is fitted with either 40A or 50A breakers the additional load rating is accommodated by fitting adaptors that bridge two barrier strip terminals and provide a single #10-32 screw. Minimum wire size for these connections is 8 AWG.

A maximum of two high current breakers is allowed on each bus.

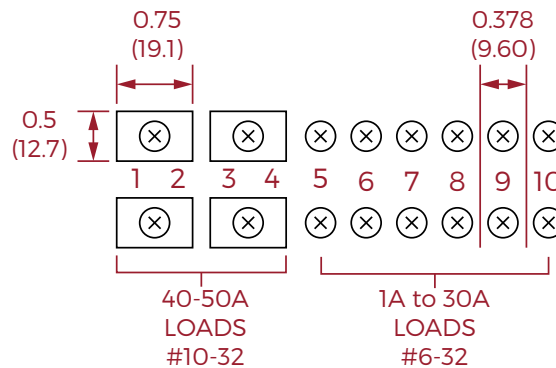


Figure 6. Output Barrier Strip Detail

9.5 Form C Relay Contact Outputs. The center of the back panel has connections to the Form C relay contact outputs for connection to external audible or visual alarm circuits. See Figure 7.

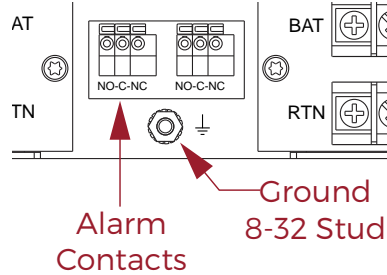


Figure 7. Alarm Contact & Ground Detail

Connection is made via two Phoenix Contact spring clamp terminal blocks. ALM-B is for the Form C relay contact of side B and ALM-A is for the Form C relay contact of side A. The terminals, viewed from left to right, are the normally open (NO) common (C) and normally closed (NC) contacts, respectively. See table 5 below.

PIN	FUNCTION	CONTACT SCHEMATIC
NC	N.C. (normally closed)	
C	C (common)	
NO	N.O. (normally open)	

Table 5. Alarm Relay Contacts

“Normally Closed” and “Normally Open” are defined with the distribution panel powered and providing power to all outputs, i.e. no circuit breakers tripped.

The ratings of the relay contacts are 0.6A at 125VAC or 2A at 30VDC. The spring clamp terminals accept wire sizes nos. 16 to 26 AWG.

When the input power is connected to a side (A or B), the Form C relay of that side is energized. If there is either loss of input power, one or more circuit breakers trip or the relay is de-energized, the normally open contacts close and the normally closed contacts open.

9.6 Chassis Ground Connection. Just below the Form C relay contact terminals is the chassis ground terminal. This terminal is a no. 8-32 stud with a nut.

NOTE THAT IT IS ESSENTIAL THAT THIS TERMINAL IS CONNECTED TO THE SYSTEM FRAME GROUND TO ENSURE SAFE OPERATION.

10.0 UNPACKING AND INSPECTION

- 10.1** This power distribution panel was carefully tested, inspected and packaged for shipment from our factory. The unit and circuit breakers are shipped separately. Upon receipt of the unit it should be carefully unpacked and inspected for any damage in shipment.
- 10.2** If there is evidence of damage, do not attempt to test the unit. The freight carrier should be notified immediately and a claim for the cost of the rectifier system should be filed with the carrier for direct reimbursement. Be sure to include the model and serial number of the damaged unit in all correspondence with the freight carrier. Also save the shipping carton and packing material as evidence of damage for the freight carrier's inspection.
- 10.3** UNIPOWER will cooperate fully in case of any shipping damage investigation.
- 10.4** Always save the packing materials for later use in shipping the unit. Never ship the rectifier system without proper packing.

11.0 INSTALLATION

- 11.1 Mounting.** This distribution panel can be mounted in either 19- or 23-inch racks by using the supplied reversible brackets. Mount it from the front of the rack using the correct offsets to align with existing rack-mounted equipment.

The bracket offsets are every quarter inch from front to back.

- 11.2 Connections.** Input connections should be made with one- or two-terminal crimp type lugs using copper wire size from no. 1 to 8 AWG, depending on current and wire loop distance. See Sections 9.2 and 9.3. Output connections are made to the barrier terminal strips. See Section 9.4 and Figure 7.

NOTE: Single feed models with option S fitted have both left and right side input bus bars fitted. It is only necessary to connect the input feed to one side for correct operation. The unused side is directly connected to the live input feed and can be used for supplying additional panels. See figure 8 below.

CAUTION: The total load must not exceed 80A for DPGF1U or 150A for DPBF1U on any one pair of bus bars in the chain.

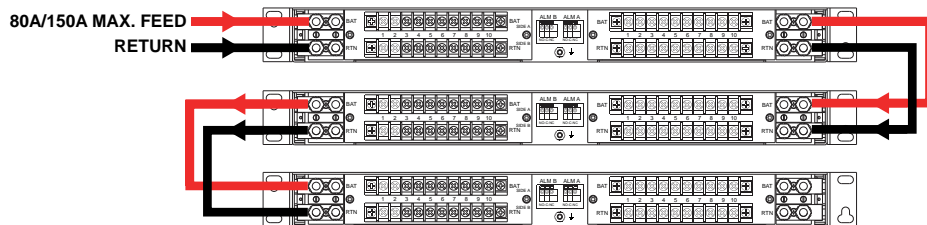


Figure 8. Series Connection of Multiple Panels

The Form C relay contact output connections are made to the spring clamp terminal blocks. See Section 9.5. The chassis ground connection is made to the no. 8-32 stud. See Section 9.6. This safety ground connection should be made before operating the panel.

- 11.3 Checking Connections.** Carefully check the polarity of input connections to the distribution panel and output connections to the load before operating the panel. Reverse connections will not harm the distribution panel as reverse polarity protection is incorporated. However it may cause serious harm to the load. Check to make sure that the chassis safety ground connection is made. Make sure that all connections are clean and secure to minimize contact resistance.
- 11.4 Rear Safety Cover.** Once all of the above have been completed, fit the clear plastic safety cover to the back of the unit using the supplied mounting studs and screws. Instruction for fitting the mounting studs the panel are included in the accessory kit.

12.0 SETUP AND TESTING

- 12.1** It is not necessary to have the distribution panel mounted in a rack for initial testing. This can be done on a bench. It is also not necessary to have loads connected to the panel for this testing.
- 12.2** With the input power source off, connect the input wires to the A side of the distribution panel. Connect ground to the chassis ground terminal. Insert all fuses into fuse holders or set all circuit breakers to on.
- 12.3** Turn on the input power source. The A side LED should be green. If it is red, one of the fuses is blown or a circuit breaker is tripped. If the LED is off, there is no input power to the unit. Check the output voltage at each set of output terminals with a digital voltmeter.
- 12.4** With the A side LED green, use an ohmmeter to check the Form C relay contact outputs. On the upper row of the wire-wrap terminals (side A) measure the resistance between pins 1 and 2 and between pins 4 and 5. Both should read “short”. Measure the resistance between pins 2 and 3 and between pins 5 and 6. Both should read “open”.
- 12.5** On the A side insert a blown fuse into fuse no. 1 position or trip circuit breaker no. 1. The A side LED should turn red. On the upper row (side A) of wire wrap terminals, measure the resistance between pins 1 and 2 and between pins 4 and 5. Both should read “open”. Measure the resistance between pins 2 and 3 and between pins 5 and 6. Both should read “short”. Replace the blown fuse with a good one or reset the circuit breaker.
- 12.6** On the A side check each succeeding fuse by replacing it with a blown fuse, or breaker by tripping it, and verify that the LED turns red. It is not necessary to recheck the Form C relay contacts.
- 12.7** Repeat the same tests of Sections 12.2 through 12.6 on the B side of the distribution panel. Refer to table 5.
- 12.8** The distribution panel may now be connected to its intended application.
- 12.9** If the distribution panel did not operate properly in the above tests, go back and double check the connections and the polarity of the input source to make sure it is correct.

Please note that there are no user serviceable parts inside and that opening the unit will void the warranty.

If you are unable to resolve any problem call your nearest UNIPOWER sales office for support:

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