



**OPERATING MANUAL
DPP1U SERIES
DC POWER DISTRIBUTION PANELS**

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OPERATING MANUAL

DPP1U SERIES DC POWER DISTRIBUTION PANELS

1.0 INTRODUCTION

UNIPOWER's DPP1U Series of circuit breaker panels provide distribution and overload protection for 1 to 16 circuits with circuit breakers that can be field installed/exchanged without the need for any additional tools. The panels are only one mounting position (1.75 inches) high.

The panels provide up to 16 breakers single bus 150A or 8A+8B 150A+150A distribution and alarm capabilities. The A and B sections of the dual-bus panel are fully isolated, can be separately configured for 12 or 24/48 volts and are polarity neutral. Breaker capacities range from 1 to 30 amperes.

Breaker alarm is indicated by a dual color LED (green/red) and Form C relay contacts for each bus



Figure 1. DPP1U DC Power Distribution Panel

2.0 FEATURES

2.1 The following is a summary of the important features of the DPP1U Series.

- ◆ 48/24V and 12V or Dual Voltage
- ◆ POLARITY NEUTRAL
- ◆ 150A bus bar inputs
- ◆ Single or Dual Feed
- ◆ NO tools required to change breakers
- ◆ Tapered entry for easy insertion
- ◆ NO or NC alarm contacts
- ◆ Alarm LEDs
- ◆ Power Fail form-C alarm
- ◆ 19" & 23" universal mounting brackets
- ◆ Rear panel safety cover standard

3.0 PRODUCT LINE

3.1 Standard Configurations

The following table lists the 8 available standard configurations of the DPP1U series.

MODEL NUMBER	VOLTS EACH FEED	INPUT FEEDS	MAX. # BREAKERS	AMPS EACH FEED	TOTAL AMPS
DPP1U-A1	48/24	1	8	150	150
DPP1U-A6	12				
DPP1U-A1-B1-S	48/24	1	16	150	150
DPP1U-A6-B6-S	12				
DPP1U-A1-B1	48/24 - 48/24	2	8 + 8	150	300
DPP1U-A6-B6	12 - 12				
DPP1U-A1-B6	48/24 - 12				
DPP1U-A6-B1	12 - 48/24				

3.2 Available Breakers

AMPS	PART NUMBER	AMPS	PART NUMBER	AMPS	PART NUMBER
1	348-1436-0000	10	348-1436-0030	25	348-1436-0060
2.5	348-1436-0010	15	348-1436-0040	30	348-1436-0070
5	348-1436-0020	20	348-1436-0050	BLANK	348-1418-0000

Breakers need to be ordered individually and are shipped with each panel as separate items for field installation.

4.0 SAFETY & INDUSTRY STANDARDS

4.1 DPP1U 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 DPP1U 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)

DPP1U 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.

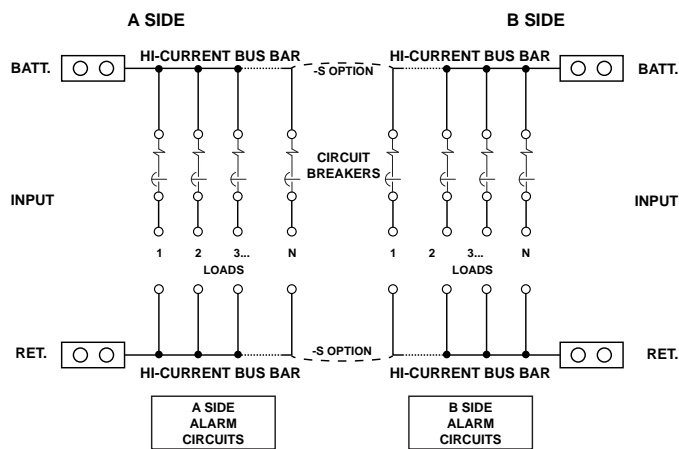


Figure 2. Block Diagram

6.2 Alarm Circuits. The alarm circuits detect a tripped circuit breaker 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
OFF		No Input Power

7.0 SPECIFICATIONS

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

INPUT/OUTPUT

Input/Output Ratings..... 150A Max. @ 40°C, each side A & B
 125A Max. @ 50°C, each side A & B
 50A Max. @ 70°C, each side A & B
 See manual for details on CB deratings
 Configuration..... 150A Single Bus with 1 to 16 Breakers
 300 A Dual Bus 1 to 8 Breakers
 Each Bus
 Breaker Capacity ¹ 1A to 30A
 Voltage ¹
 24/48V Version..... 21-60VDC
 12V Version..... 10.5-15VDC
 PolarityNeutral, Positive or Negative Ground

ALARMS

Alarm Indicator Dual Color LED Per Bus
 LED Status Indication.....Green = Normal
 Red = CB Trip Alarm
 Off = No Power
 Alarm Relays.....Form C Contacts for each Bus

SAFETYUL60950-1 2nd Ed., CSA22.2 No. 60950-1 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
 Case Dimensions, Inches (mm) 1.74 H x 17.12 W x 8.94 D
 (44.2 x 434.9 x 227.1)
 Weight 10.30 lbs. (4.67 kg.)
 Rack Mounting..... 19 or 23 Inch

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 ordering guide to specify.

For thermal reasons, it is recommended when operating the panel continuously at the ambient temperatures defined above, the circuit breaker current shall not exceed the limits as defined below.

40°C Ambient:

150A Max., the CB current should be limited to 18.75A Max.

125A Max., the CB current should be limited to 22.5A Max.

50°C Ambient:

125A Max., the CB current should be limited to 15.6A Max.

100A Max., the CB current should be limited to 21A Max.

70°C Ambient:

50A Max., the CB current should be limited to 15A

8.0 FRONT PANEL DESCRIPTION

The front panel of the DPP1U, shown in Figure 3 below, consists of the A and B sides and a center section. The A and B sides can each accommodate up to 8 field installable/replaceable hydraulic magnetic circuit breakers rated from 1A to 30A. The center section has two green/red LEDs, one for the A side (left) and the other for the B side (right). At the bottom of this center section is a slot for a wallet and designator card. This card permits the recording of each output circuit by number.

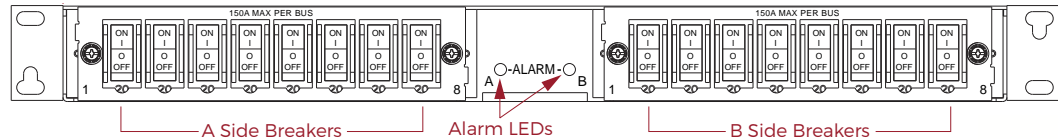


Figure 3. Front Panel View

9.0 BACK PANEL DESCRIPTION

9.1 Back View. Figure 4 shows the back of the DPP1U distribution panel. Inputs are at the left and right ends of the back panel. Side B outputs are at two rows of barrier terminal strips on the left side, and side A 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.

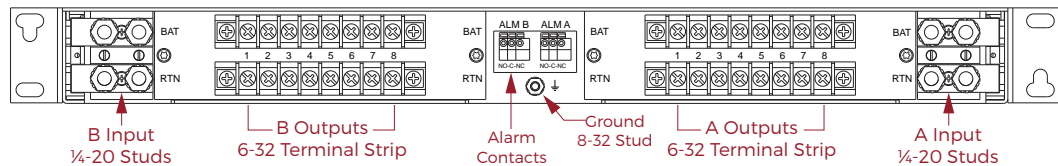


Figure 4. Back Panel View

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 -).

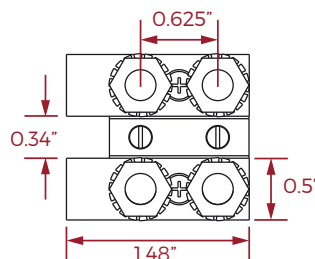


Figure 5. Input Bus Bar Detail

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 the table. 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

9.4 Output Connections. Output connections for A and B loads are shown in Figure 4. There are 8 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. 12 AWG to no. 22 AWG may be used for connections. Figure 6 below shows detailed spacing of the terminals.

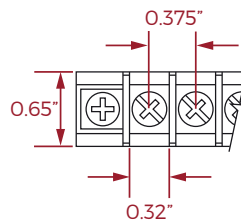


Figure 6. Output Barrier Strip Detail

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 below.

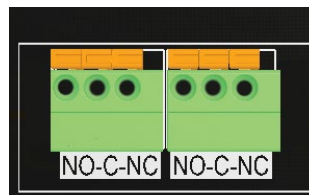


Figure 7. Alarm Contact Detail

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 figure 8 below.

“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 DPP1U Series 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 6.

NOTE: Single feed models DPP1U-A1-B1-S and DPP1U-A6-B6-S 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 150A on any one pair of bus bars in the chain.

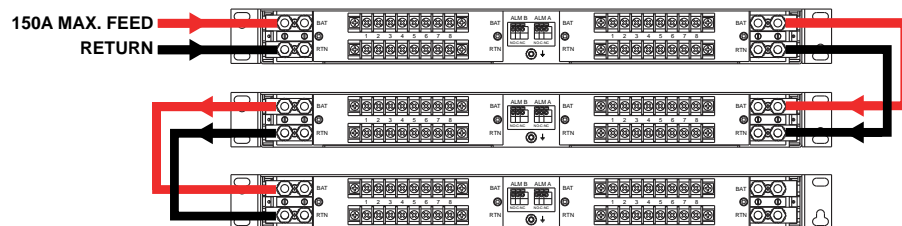


Figure 8. Series Connection of Multiple Panels

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 which is POLARITY NEUTRAL but 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 INSTALLING CIRCUIT BREAKERS

The DPP1U Series employs pluggable circuit breakers that can be easily installed, removed or replaced without the need for an tools. The cover-plate that is fixed over the breakers is designed to be used to extract existing circuit breakers or blanking panels. This operation is carried out without the need to dismount the unit from it's installation.

Installation, removal or replacement of a circuit breaker and connection or disconnection of a load circuit should be carried out only by only by qualified technical persons who are trained in the use of power systems and are well aware of the hazards involved.

Although it may be necessary on some occasions to carry out this operation while power remains applied to the panel, it is always preferable to switch off the power if possible before proceeding.

12.1 Removing the cover plate. To remove the cover plate under the two knurled retaining screws and pull forward. See figure 9 below.

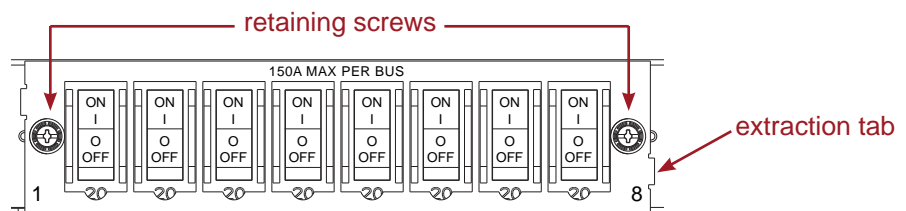


Figure 9. Cover plate removal

12.2 Removing a breaker or blanking panel. To remove a breaker or blanking panel place the tab at the end of the cover plate under the top edge of the breaker or blanking panel and lever out carefully. See figure 10 below.

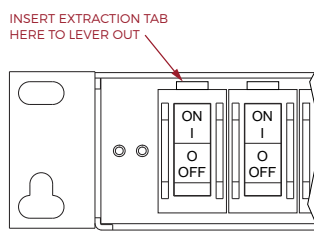


Figure 10. Breaker or blank panel removal

12.3 Installing a breaker or blank panel. Carefully push the breaker or blank panel firmly into the socket and make sure that it is fully seated.

Repeat the above procedure from 12.2 to 12.3 for all positions and then replace the cover plate.

12.4 Connecting or disconnecting load circuits. In cases where a breaker has been installed follow the instructions in section 9.4 to connect the new output wiring. Ensure that the breaker is in the OFF position until all connections have been made and thoroughly checked.

Note that if power remains applied to the panel during breaker installation the alarm LED will show red and the alarm relay will be activated until the new cables have been connected and the breaker set to the ON position.

13.0 SETUP AND TESTING

- 13.1** 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.
- 13.2** 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. Set all circuit breakers to on.
- 13.3** Turn on the input power source. The A side LED should be green. If it is red, one of the 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.
- 13.4** With the A side LED green, use an ohmmeter to check the Form C relay contact outputs. On J4 measure the resistance between pins 1 and 2. This should read “open”. Measure the resistance between pins 2 and 3. This should read “short”.
- 13.5** On the A side trip circuit breaker no. 1. The A side LED should turn red. On J4 measure the resistance between pins 1 and 2. This should read “short”. Measure the resistance between pins 2 and 3. This should read “open”. Reset the circuit breaker.
- 13.6** On the A side check each succeeding breaker by tripping it, and verify that the LED turns red. It is not necessary to recheck the Form C relay contacts.
- 13.7** Repeat the same tests of Sections 13.2 through 13.6 on the B side of the distribution panel, use J3 to check the Form-C relay operation.
- 13.8** The distribution panel may now be connected to its intended application.
- 13.9** 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 either the modules or the shelves and that opening either will void the warranty.

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

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