



**OPERATING MANUAL
PDUAC3U SERIES
AC POWER DISTRIBUTION UNITS**

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OPERATING MANUAL

PDUAC3U SERIES DC POWER DISTRIBUTION PANELS

1.0 INTRODUCTION

UNIPOWER's PDUAC3U Series AC power distribution units accept a 3-phase input and provide single phase outputs that are distributed from the phases to ensure load balance on the source. They provide AC distribution and overload protection for up to 12 load circuits distributed through field wireable terminal blocks.

There are 3 basic configurations operating from nominal 120VAC, 208VAC or 230VAC outputs respectively. Each of these is available with either 4, 8 or 12 2-pole load circuit breakers rated at 25A.

Model with and without input surge protection are available.

These panels are only 3RU high and are supplied with brackets that allow mounting in a 19" frame.



Figure 1. PDUAC3U AC Power Distribution Unit

2.0 FEATURES & OPTIONS

The following is a summary of the important features of the PDUAC3U Series.

- ◆ Load Balancing on 3-Phase Source
- ◆ 3RU Rack Height
- ◆ 19” Rack-Mounting
- ◆ Mates with UNIPOWER rectifier systems
- ◆ Terminal Block Connections
- ◆ 3 Phase Input - Single Phase Output
- ◆ 120VAC, 208VAC or 230VAC Output
- ◆ Input Surge Protection (OPTION)

3.0 PRODUCT LINE

3.1 Standard Configurations

The following table lists the 18 available standard configurations of the PDUAC3U series.

MODEL NUMBER	SURGE PROTECTION	NOMINAL AC INPUT	NOMINAL AC OUTPUT	OUTPUTS ¹
PDUAC3U-120-04	NO	120/208VAC 3-phase 4 wire + GND	120VAC Line-Neutral	4 x 25A
PDUAC3U-120-08				8 x 25A
PDUAC3U-120-12				12 x 25A
PDUAC3U-208-04		120/208VAC 3-phase 4 wire + GND	208VAC Line-Line	4 x 25A
PDUAC3U-208-08				8 x 25A
PDUAC3U-208-12				12 x 25A
PDUAC3U-230-04		230/400VAC 3-phase 4 wire + GND	230VAC Line-Neutral	4 x 25A
PDUAC3U-230-08				8 x 25A
PDUAC3U-230-12				12 x 25A
PDUAC3U-120-04-SP	YES	120/208VAC 3-phase 4 wire + GND	120VAC Line-Neutral	4 x 25A
PDUAC3U-120-08-SP				8 x 25A
PDUAC3U-120-12-SP				12 x 25A
PDUAC3U-208-04-SP		120/208VAC 3-phase 4 wire + GND	208VAC Line-Line	4 x 25A
PDUAC3U-208-08-SP				8 x 25A
PDUAC3U-208-12-SP				12 x 25A
PDUAC3U-230-04-SP		230/400VAC 3-phase 4 wire + GND	230VAC Line-Neutral	4 x 25A
PDUAC3U-230-08-SP				8 x 25A
PDUAC3U-230-12-SP				12 x 25A

Notes:

1. Alternative ratings are available, consult factory.

4.0 SAFETY & INDUSTRY STANDARDS

- 4.1 PDUAC3U 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 PDUAC3U Series power distribution units (PDU) are CE marked to indicate conformance to the European Union's Low Voltage Directive.
- 4.3 These PDUs operate at voltages that could potentially be hazardous. Furthermore, inadvertent short circuiting 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 All connections to the PDU should be carefully checked for errors before applying power to them.
- 4.5 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)

PDUAC3U Series PDUs 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. Simplified schematic diagrams of the distribution panels is shown in Figure 2. The inputs from each phase and Neutral connect to a internal copper bus bars from which the circuit breakers distribute power to the loads, either one phase and neutral for each circuit (figure 2a) or two phases for each circuit (figure 2b) where neutral is not distributed. This latter provides a 208VAC output.

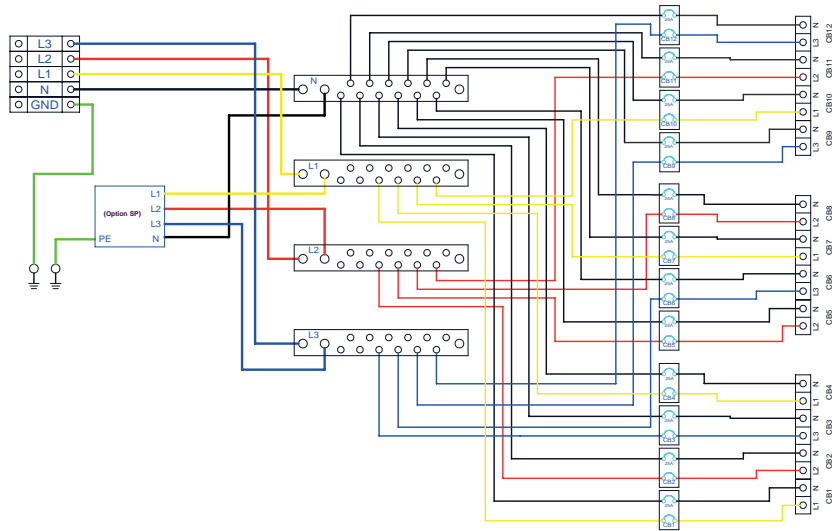


Figure 2a. Block Diagram - 4-wire 3-phase to single phase L-N

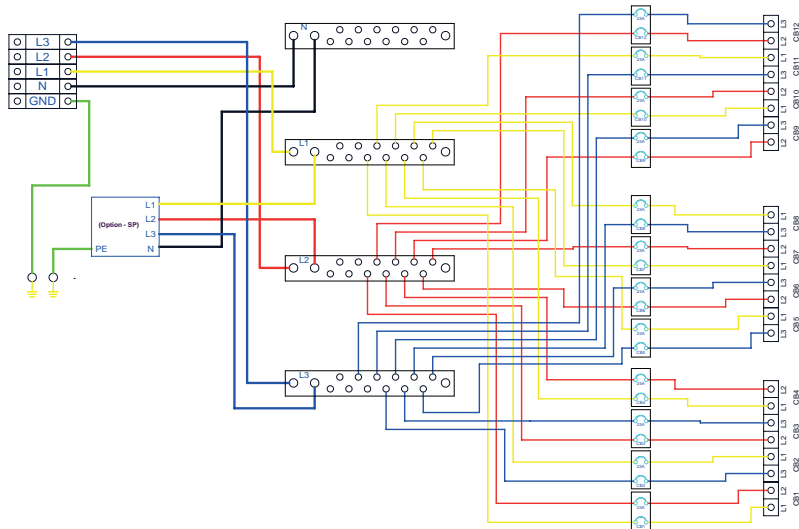


Figure 2b. Block Diagram - 3-wire 3-phase to two phase L-L (208V)

7.0 SPECIFICATIONS

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

INPUT/OUTPUT

Input Voltage.....	3-phase, 120/208 or 230/400VAC 4 wire & GND
Input Current.....	100A Max. per phase
Load Circuit Breakers	
-04	4 x 25A
-08	8 x 25A
-12	12 x 25A
Output Voltage Range	
-120	85-132VAC
-208	180-264VAC
-230	180-264VAC
Frequency.....	47-63Hz

REGULATORY

Safety Certifications.....	UL60950-1 CSA22.2 No. 60950-1 2nd Ed. EN60950-1 2nd Ed.
Line Conducted Emissions.....	FCC20780 pt.15J Curve A EN55022 Class A
Fast Transient Immunity	EN61000-4-4
Surge Immunity	EN61000-4-5

ENVIRONMENTAL

Operating Temp. Range	-20°C to 50°C
Storage Temp. Range.....	-40°C to +85°C
Humidity.....	0% to 90%, Non-Condensing

PHYSICAL SPECIFICATIONS

Case Material/Finish.....	Steel/Black Powder Coat
Dimensions, Inches (mm)	5.1h x 16.75w x 11.5d (43.2 x 425.5 x 292.1)
Rack Mounting.....	19" or 23", 3U High
Weight	23lbs (10.5Kg)

FIELD WIRING CONNECTIONS

Input (L1, L2, L3, N, GND).....	Cable Compression, #2AWG max.
Output (L & LN)	No. 6-32 Screws
Output (Ground)	No. 8-32 Screws

8.0 FRONT PANEL DESCRIPTION

The front panel of the PDUAC3U, shown in Figure 3 below, consists of two sections. The left section contains the output circuit breakers; there are 4, 8 or 12 fitted depending on the exact model. They are each rated at 25A as standard. The right section accommodates an optional surge protection feature. When this option is not fitted blanking panels are installed.

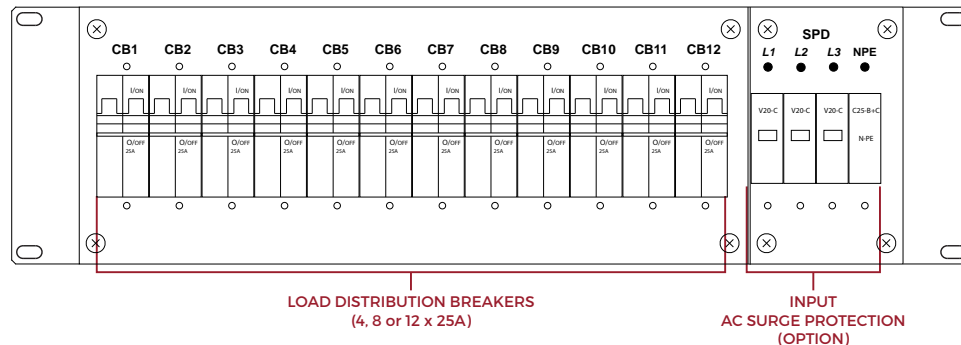


Figure 3. Front Panel View

9.0 BACK PANEL DESCRIPTION

9.1 Back View. Figure 4 shows the back of of the PDUAC3U. Inputs are at the left hand end. The outputs are to the right of this and consist of three barrier strips with associated ground screws. There are sufficient connections for connecting to a total of 3 rectifier shelves, each with 4 separate AC inputs.

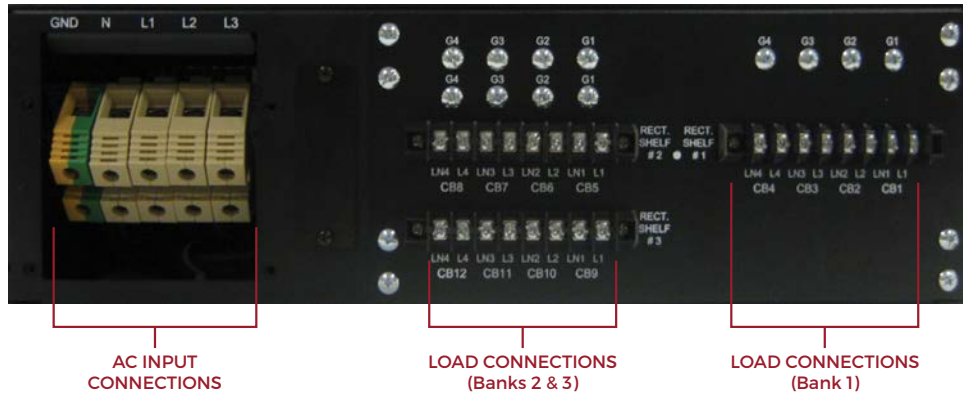


Figure 4. Back Panel View

9.2 Input Connections. The AC power inputs to the PDU are made through the five compression terminal blocks marked GND, N, L1, L2 & L3. The recommended cable size for these connections is #2AWG.

9.3 Output Connections. Output connections are shown in Figure 4. There are 3 sets of barrier strip terminals. The connections are numbered to correspond with the numbers of the front panel breakers. Each barrier strip is intended for making output connections to a single rectifier shelf. Above the barrier strips are separate screws which are used to make the ground connections.

Barrier strip connection use No. 6-32 screws. Recommended wire size is #10AWG. Figure 5 below shows detailed spacing of the terminals.

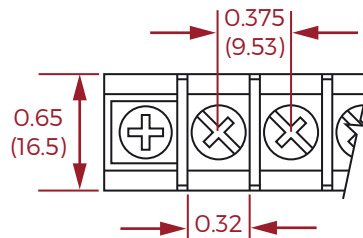


Figure 5. Output Barrier Strip Detail

The ground connections use No. 8-32 screws. The recommended wire size for these connections is #10AWG. Note that it is important to use separate wires for each ground connection to the rectifier shelf.

10.0 UNPACKING AND INSPECTION

- 10.1 This PDUAC3U Series PDU was carefully tested, inspected and packaged for shipment from our factory. 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 unit without proper packing.

11.0 INSTALLATION

- 11.1 **Mounting.** This PDU can be mounted in 19-inch racks by using the supplied brackets. Mount it from the front of the rack using the correct offsets to align with existing rack-mounted equipment.
- 11.2 **Input Connections.** Input connections should be made with stripped end wire of size #2AWG. See Section 9.2.

Connections should be made according to the source voltage as follows:

120VAC Line-Neutral

Connect each phase to L1, L2 & L3 respectively. Connect neutral to N.

208VAC Line-Line

Connect each phase to L1, L2 & L3 respectively. Connect neutral to N.

230VAC Line-Neutral

Connect each phase to L1, L2 & L3 respectively. Connect neutral to N.

- 11.3 Output connections are made to barrier strip connectors and grounding screws. See Section 9.3 and Figure 5.

Each output provides a single phase voltage of 120VAC, 208VAC or 230VAC depending on the model. Models with 4 output breakers fitted use CB1-4, those with 8 breakers use CB1-8 and those with 12 breakers use CB1-12.

The internal wiring of the PDU ensures that the phases are distributed as evenly across the outputs as possible. Make ALL connections to each rectifier shelf from a single barrier strip even if the system does not initially have a full compliment of rectifiers. This will ensure proper load balancing across the input phases and also allow rectifiers to be added at a later date without the need to install additional cables.

11.4 Checking Connections. Carefully check the input connections to the PDU and output connections to the load before operating the panel. In particular pay attention to the input wiring as described in section 11.2. Incorrect connections will not harm the PDU but may cause serious harm to the load. Check to make sure that the safety ground connections is made. Make sure that all connections are clean and secure to minimize contact resistance.

11.5 UL Requirements. The following should be adhered to when installing this PDU:

Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing this PDU in an environment compatible with the maximum specified ambient temperature.

Reduced Air Flow - Installation of this PDU in a rack should be such that the amount of air flow required for safe operation of this PDU is not compromised.

Mechanical Loading - Mounting of this PDU in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of this PDU to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of PDU nameplate ratings should be used when addressing this concern.

Reliable Earthing - Reliable earthing of this rack-mounted PDU should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).”

13.0 SETUP AND TESTING

- 13.1 It is not necessary to have the PDU 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 PDU. Set all circuit breakers to on.
- 13.3 Turn on the input power source. Check the output voltage at each set of output terminals with a digital voltmeter.
- 13.4 Switch off all circuit breakers and disconnect the AC source.
- 13.5 The PDU may now be connected to its intended application.
- 13.6 If the distribution panel did not operate properly in the above tests, go back and double check the connections 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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APPENDIX 1 - Extract from UL Test Report

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	NWGQ2, NWGQ8 (Information Technology Equipment Including Electrical Business Equipment)
Product:	AC Power Distribution Unit
Model:	AC Power Distribution Unit: Models PDUAC3U-200, PDUAC3U-LOW, PDUAC3U-HIGH and PDUAC3U-xxx-yy-SP where 'xxx' represents the input single or three phase voltage, 'yy' represents other options that do not affect safety.
Rating:	<p>PDUAC3U-230-yy-SP 230/400Vac, 100A per phase, 50-60Hz, 3ph, 4W+G; Output: 200-240Vac, max. 20A per output (L-N, 4 outputs per phase)</p> <p>PDUAC3U-120-yy-SP 120/208Vac, 100A per phase, 50-60Hz, 3ph, 4W+G; Output: 100-130Vac, max. 20A per output (L-N, 4 outputs per phase)</p> <p>PDUAC3U-208-yy-SP 120/208Vac, 100A per phase, 50-60Hz, 3ph, 4W+G; Output: 200-240Vac, max. 20A per output (L-L, 4 outputs per phase)</p> <p>Model PDUAC3U-200 200-240Vac, 40A, 50-60Hz, Single Phase Output: 240Vac, 50-60Hz, CB1-4: 12A; CB5: 4A CB6: 8A; 120Vac, 50-60Hz, CB7: 4A GFI, CB8A, CB9, CB10: 4A Output Total Max Amps: 32A (per leg)</p> <p>Model PDUAC3U-HIGH 200-240Vac, 64A, 50-60Hz, Single Phase Output: 240Vac, 50-60Hz, CB1-4: 12A; CB5: 4A; CB6: 8A; 120Vac, 50-60Hz, CB7: 4A GFI, CB9-10: 8A Output Total Max Amps: 51.2A (per leg)</p> <p>Model PDUAC3U-LOW 200-240Vac, 64A, 50-60Hz, Single Phase Output: 240Vac, 50-60Hz, CB1-4: 12A; CB5: 4A; 120Vac, 50-60Hz, CB8A: 4A, CB9, CB10: 8A Output Total Max Amps: 51.2A (per leg)</p>