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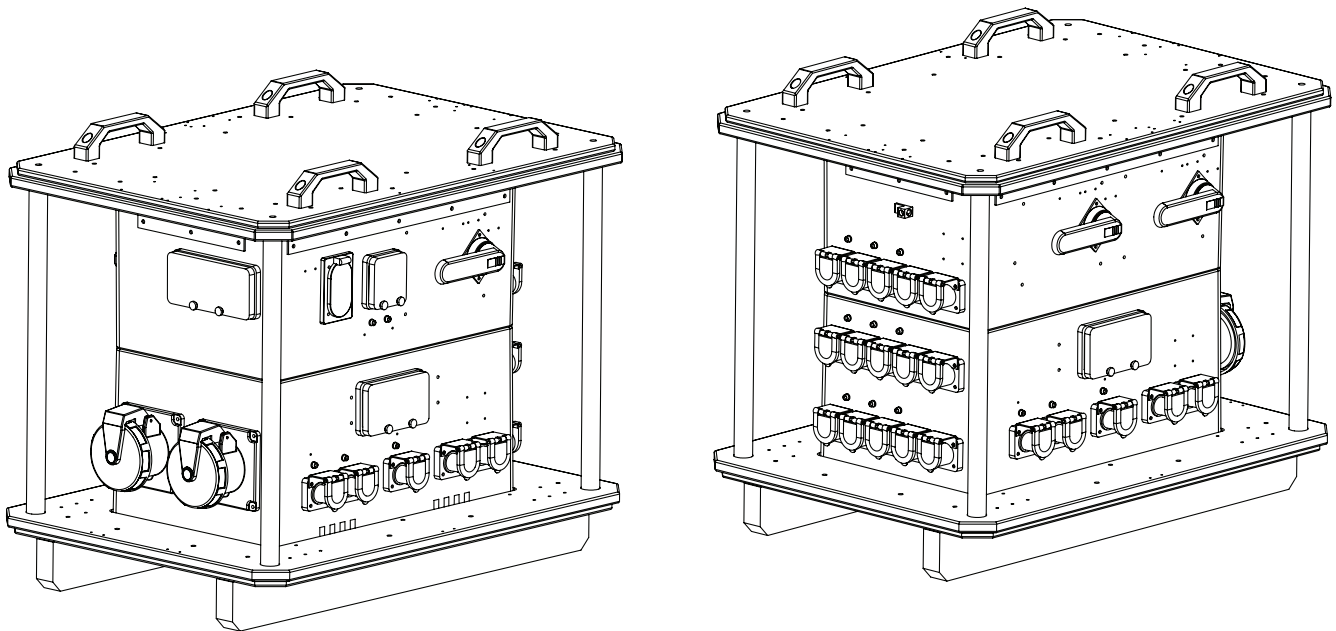
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# US Marine Corps Military Grade 300kW Distribution Box

## OPERATOR'S MANUAL



**Lex Products Corp**  
Military Power Systems Division

Part # DB3500MA-P2WQS3 • Manual Part # LM-MCMR300K

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## 1. Introduction

### 1.1 General Safety Information

#### GENERAL SAFETY PRECAUTIONS

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

#### KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the OFF position. To avoid casualties, always remove power and discharge. GROUND A CIRCUIT BEFORE TOUCHING IT.

#### DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

#### RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.



#### WARNING

This system is only to be used in 120/208 volt, 60 Hz applications.



#### WARNING

Make sure to follow all bonding and grounding procedures as defined by Standard Operating Procedures or by the generator manufacturer.



#### WARNING

Do not attempt to inspect circuits that are "hot". Ensure input power is disconnected. Failure to do so may result in injury or death to personnel.



#### WARNING

Equipment circuits contain high voltage when in operation. Do not attempt inspection or maintenance while equipment is connected to power sources. Failure to do so may result in injury or death to personnel.



**WARNING**

Make sure output breaker is in the “OFF” position prior to making power connections.



**WARNING**

Energize input power sources only after all connections are completed, verified correct and all protective covers are in place and latched. Failure to comply may result in personnel injury or death.



**WARNING**

Breaker cover doors must be secured and access screws tightened to protect breaker from environmental damage. Always close and secure access door after operating breaker.



**WARNING**

Do not attempt input power wiring connection or removal with any power source energized. Failure to comply may result in serious personnel injury or death.



**WARNING**

Do not use a supply source where phase-to-phase voltage exceeds 240V AC. Failure to comply may result in serious personnel injury or death.



**WARNING**

Source sizing, cable sizing and over current protection devices must all be evaluated and chosen for the application and to serve safety functions. Failure to comply may result in serious personnel injury or death.

### 1.2 Scope

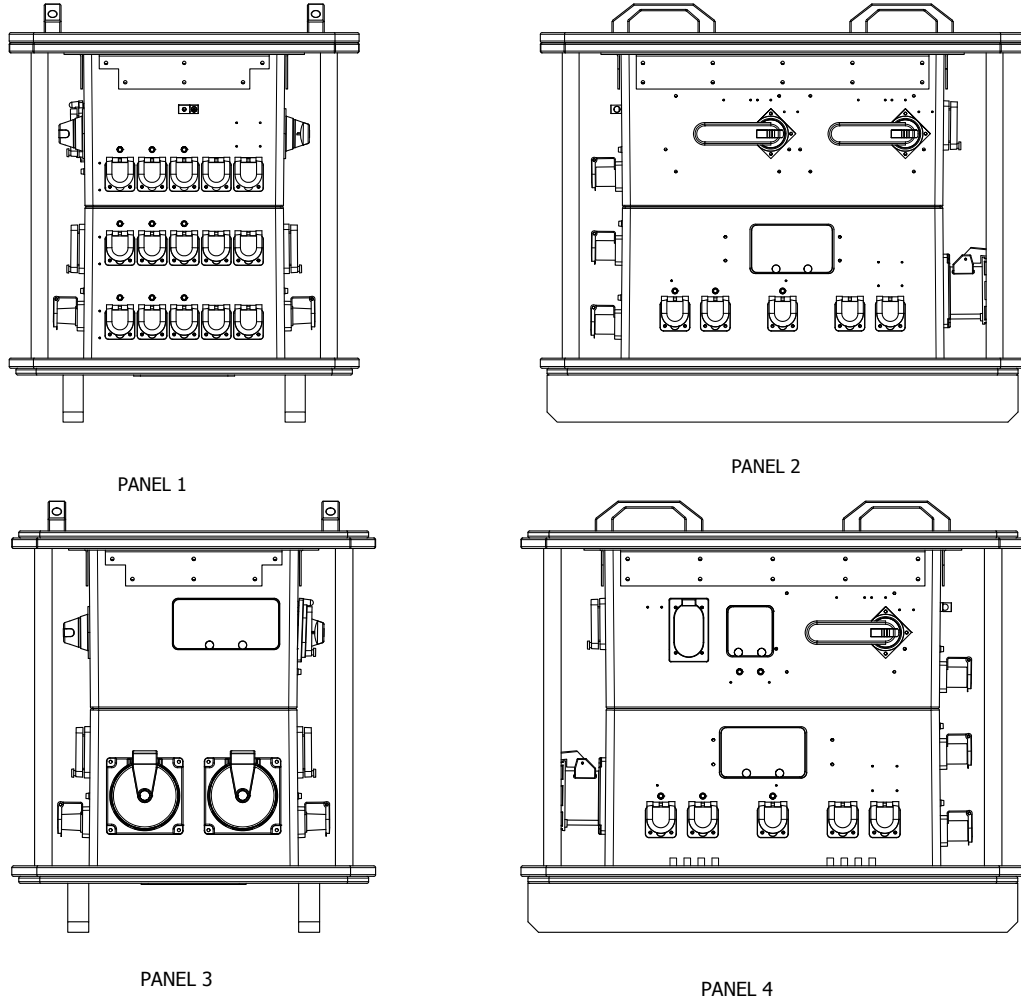
This manual contains operation and maintenance instructions and a troubleshooting guide for a power distribution unit (PDU), model DB3500MA-P2WQS3, manufactured by Lex Products Corp.

### 1.3 Purpose

This manual contains operation and maintenance instructions and a troubleshooting guide for a power distribution unit (PDU), model DB3500MA-P2WQS3, manufactured by Lex Products Corp.

## 2. Description

### 2.1 DB3500MA-P2WQS3 Input/Outputs



**INPUT** (input has corresponding breaker labeled "MAIN")

3 $\phi$  400A 208Y/120V SINGLE POLE CAM TYPE 16 SERIES, 5-WIRE

**OUTPUTS** (all outputs have corresponding circuit breakers labeled "1" to "5")

1 – 3 $\phi$  400A 208Y/120V SINGLE POLE CAM TYPE 16 SERIES, 5-WIRE

2 – 3 $\phi$  100A 208Y/120V IEC60309 Pin & Sleeve

3 – 3 $\phi$  100A 208Y/120V IEC60309 Pin & Sleeve

4 – 1 $\phi$  20A 120V GFCI STRAIGHT BLADE DUPLEX

5 – 3 $\phi$  400A 208Y/120V SINGLE POLE CAM TYPE 16 SERIES, 5-WIRE

## 2.2 System Specifications

| Electrical Power          |          |
|---------------------------|----------|
| Frequency (Hz)            | 60       |
| Voltage V ac              | 208Y/120 |
| Number of Phases          | 3        |
| Maximum Current/Phase (A) | 1200     |
| Maximum Load Output (kW)  | 300      |

| Mechanical   |     |
|--------------|-----|
| Length (in)  | 36  |
| Width (in)   | 26  |
| Height (in)  | 32  |
| Weight (lbs) | 271 |

### Temperature Range:

- Operating: -21°F to 135°F
- Storage: -40°F to 160°F

## 3. Operating Instructions

### 3.1 General

This section provides instructions for the PDU under normal and unusual conditions. Instructions cover various environmental conditions under which equipment operation may be required.

### 3.2 Operation under Normal Conditions

#### 1) Placement

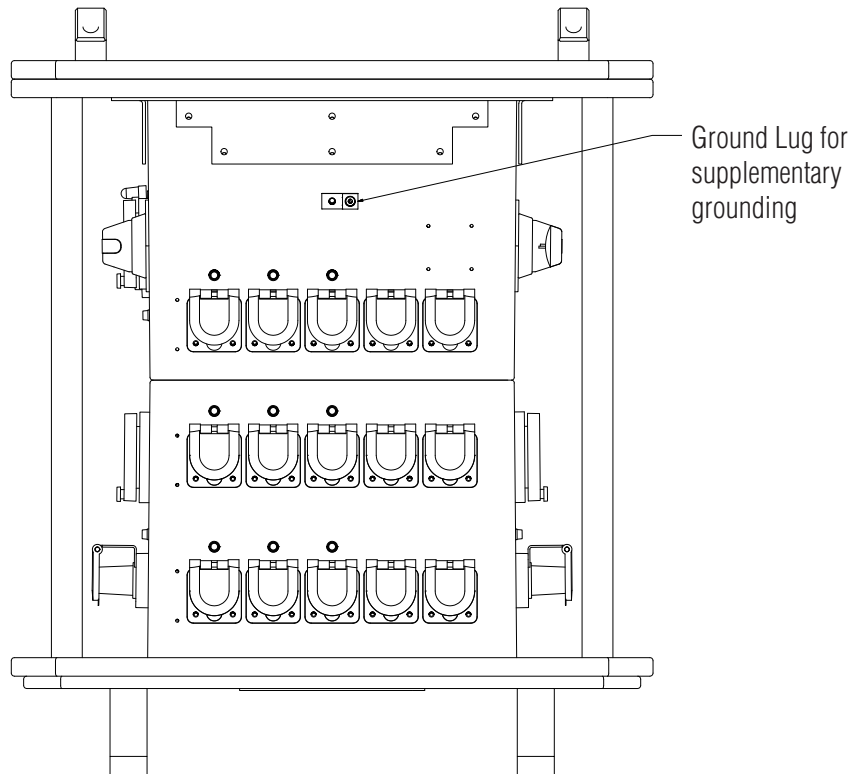
a. Site selection. The operating site should provide structurally sound, higher ground that is relatively level and not subject to flooding. Under no conditions should the PDU be used in a location where standing water can exceed three (3) inches. If the water level exceeds three (3) inches, power should be removed from the PDU until it can be relocated to higher ground.

b. Work space area. The PDU should be located in a safe/secure area away from high traffic areas that might cause accidental mechanical damage. Position the PDU in an adequate distance from sources and loads to allow service of either without interference.

c. Cable positioning. Interconnecting cables should be placed in protected areas, free from vehicle or personnel traffic whenever possible. If the cables require placement in traffic areas, a protective cable cover should be used to prevent cable damage.

## 2) Installation

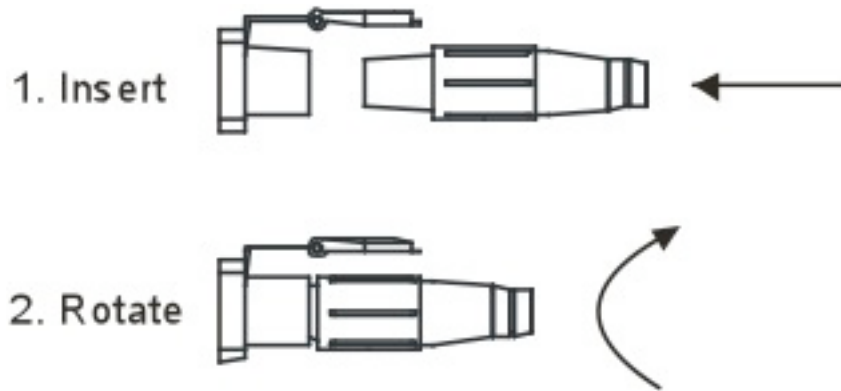
a. Grounding. Grounding is required for the PDU. Consult a qualified electrician for grounding instructions for your particular PDU system installation layout. Refer to figure 2 for the Ground Lug Location.



b. Startup. To insure proper set-up of the PDU the following is to be performed:

- 1) Turn OFF all circuit breakers
- 2) If a supplementary grounding electrode is needed at point of deployment, connect it to the provided ground lug
- 3) Before connecting cables to distribution panel, make sure that the indicator lights on the PDU are off.
- 4) Connect 3 $\phi$  power to all inputs. (see figure 4 for detailed view)
  - a. Open input covers and insert each Cam Type connector to the corresponding Cam Type receptacle and tighten the connector by rotating until tight, and at least 90 degrees. Connections must be made in the following order (disconnected in the reverse order):
    - i. Ground (Green)
    - ii. Neutral (White)
    - iii. Line 3 (Red)
    - iv. Line 2 (Blue)
    - v. Line 1 (Black)

- b. Ensure that the Cam Type connectors are rotated until tight to prevent a loose connection which could cause mechanical disconnection or thermal damage to the connectors.
- 5) Turn on MAIN circuit breaker (Main must be ON for control circuits to operate)
- 6) Connect desired output cables
  - a. For 3 $\phi$  Cam Type connections, follow steps 3.2-2-b-4 above
  - b. For 3 $\phi$  100-Amp IEC60309 connections, lift cover, align plug & receptacle, and insert. Be sure plug is completely seated in receptacle
  - c. For 20-Amp NEMA 5-20 GFCI receptacle, lift cover, align plug & receptacle, and insert.
- 7) Turn on desired output breakers and secure breaker cover.



### 3.3 Operation beyond Normal Operating Range

- 1) Operation Under Emergency Conditions. Not applicable
- 2) Operation under Unusual Conditions. This paragraph contains instructions for equipment operating in rain or snow. Operating the PDU under unusual conditions is as follows:
  - a. Extreme cold operation. If the temperature is below -21°F, try to keep connecting cables as warm as possible until needed.
  - b. Standing water. If standing water is present, place the PDU on elevated ground.
  - c. Extreme heat. If the PDU is to be operated above 125°F, shield the equipment from direct exposure to sun.

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## 4. Shut Down

To insure proper set-up of the PDU the following is to be performed:

- 1) Open output breakers on PDU.
- 2) Open input breakers on PDU.
- 3) Remove power from the PDU by opening generator contactors or opening breaker on upstream PDU.
- 4) Verify indicator lights are not illuminated.
- 5) Remove and stow interconnecting cables.
- 6) Disconnect ground connection if present.

## 5. Preparation for shipment and use

### 5.1 Handling

The following procedure provides instructions to prepare the PDU for use.

1. Unloading instructions. The PDU can be shipped palletized. Using a forklift or suitable lifting device, remove the pallet from the truck bed or train flat car.
2. Uncrating. If the equipment is in a crate, uncrate it on accordance with the following procedure:
  - a. Ensure the container is standing with proper side up in accordance with the container reference markings.
  - b. Open container.
3. Unpacking. Remove PDU in accordance with the following procedure:
  - a. Insert the slings under the top panel of the PDU between the rods.



#### **WARNING**

**Do not put lifting straps through the handles.**

- b. Secure the slings to a forklift or lifting device.
- c. Place the PDU on a level surface.

### 5.2 Servicing

Service the PDU prior to operation in accordance with the following procedure:

1. Cleaning. Clean all external surfaces with a clean, lint-free cloth dampened with a solution of mild detergent and water. Wipe dry with a clean cloth.
2. Lubrication. Lubrication of the PDU is not required prior to operation.

### 5.3 Initial checkout and adjustment

Upon receipt of the PDU, the operator must perform the following:

1. Visually inspect equipment to ensure connectors are securely in place.
2. Inspect unit housing for dents gouges, punctures, distortion, or signs of leaks (in case there is fluid inside the PDU).
3. Inspect the input and output receptacles for signs of cracking.
4. Verify that the circuit breakers are in the OFF position.

### 5.4 Transportation of equipment

The procedure provides instructions for transporting the equipment to a new site:

1. Disconnecting. Disconnect the equipment in accordance with the following procedure:
  - a. Shut off the circuit breakers, shut off input power and disconnect the input cables.
  - b. Disconnect the interconnecting cables from equipment.
  - c. Ensure that all circuit breaker covers are secure.
  - d. Ensure that all output caps are secure.
2. Packing. Palletize the equipment in accordance with the following procedure:
  - a. Insert the slings under the top panel of the PDU between the rods.



**WARNING**

**Do not put lifting straps through the handles.**

- b. Secure the slings to a forklift or lifting device.
    - c. Lift the PDU onto a pallet.
    - d. Remove the slings from the equipment.
    - e. Secure the PDU to the pallet with strapping.
    - f. Wind cable around the PDU inside of the support rods.
    - g. Secure cable end to ensure cable will not unravel.
3. Loading. Load the equipment in accordance with the following procedures:
  - a. Using a forklift or lifting device, place equipment on truck bed or train flat car.
  - b. Place all PDUs upright on their skids.
  - c. Secure equipment to truck bed or train flat car using rope or cabling.

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4. Transportation of equipment. The methods for equipment transportation are as follows:

- a. Truck
- b. Train
- c. Airlift
- d. Seaborne

## **6. Maintenance**

### **6.1 Preventive Maintenance Services**

To insure proper operation the MEPDIS-R unit is to be periodically maintained to reduce the possibility of functional failure. In general the following preventive measures are to be taken:

- 1. Insure all circuit breaker and device covers are fully secured to maintain environmental protection.
- 2. Inspect exterior components for damage or excessive wear.
- 3. Keep unit dry and clean.
  - a. Clean the input and output receptacles with a soft bristle brush or steel wool.
  - b. Dry thoroughly with a clean, dry, lint free cloth.
  - c. PDU panels should be wiped down with a wet cloth and allowed to dry.
- 4. Check all screws for tightness.

### **6.2 Repair**

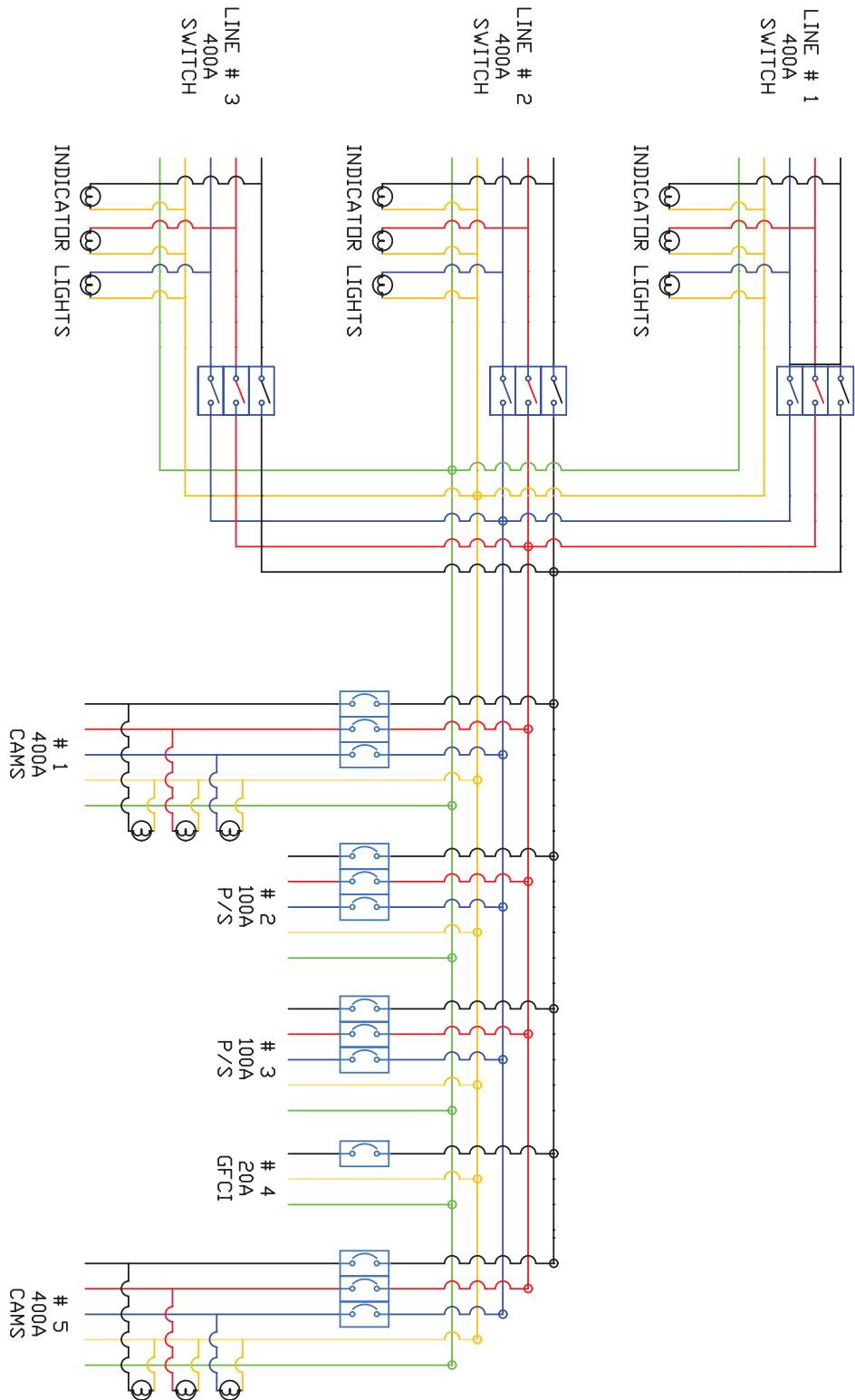
Repair is limited to damaged or worn components on the exterior of the unit. Major repairs are to be performed by Lex Products Corp.

### 6.3 Troubleshooting Guide

Table 4 indicates possible causes and solutions to issues seen by the end user.

| <b>Power Distribution Units</b>              |   |  |
|--|---|--|
| <b>Symptom</b>                               | <b>Probable Cause</b>                           | <b>Corrective Action</b>   |
| Input phase indicators do not light          | Source power not connected                      | Connect power source cables  |
|  | Dropped phase                                   | Check voltage across wires   |
|  | Broken/defective wires or light                 | Return to Lex for repair   |
| Outputs not providing power                  | Generator not connected/on                      | Insure all connections of generator are correct prior to inserting input connectors to PDU and turn on generator |
|  | Circuit breakers OFF                            | Turn on MAIN circuit breaker as well as circuit breaker corresponding to output                                  |
|  | Defective breaker                               | Replace defective breaker  |
|  | Defective receptacle                            | Replace defective receptacle   |
|  | Loose wire connections                          | Remove receptacle and verify proper wire connections   |
|  | Defective wire harness                          | Return to Lex for repair   |
| Circuit breaker switches in TRIP position    | Breaker not set to ON position                  | Set circuit breaker switch first to OFF position, and then to ON position  |
|  | Circuit is overloaded                           | Verify that circuit is not overloaded  |
|  | Circuit breaker switch broken/defective         | Replace defective circuit breaker switch   |
|  | Loose wire connections or short in wire harness | Return to Lex for repair   |
| GFCI receptacle not functioning              | Outlet is tripped; make sure phase is present   | Push "reset" button  |
| Fan operation indicator does not light       | Indicator light defective                       | Replace Indicator Light  |
| Fan Power Available Indicator does not light | Indicator light defective                       | Replace Indicator Light  |
| Cooling Fan not functional                   | Thermostat Switch inoperative                   | Return to Lex for repair   |

## 7. Wire diagram



**8. Repair parts list**

| <b>DB350MA-P2WQS3</b>  |                                 | <b>300KW DISTRIBUTION BOX</b> |            |
|------------------------|---------------------------------|-------------------------------|------------|
| <b>LEX PART NUMBER</b> | <b>DESCRIPTION</b>              | <b>USE</b>                    | <b>EMU</b> |
| 10-1000-61             | FILTER, HOFFMAN                 | 1                             | EA         |
| 2 SC                   | CABLE 2 SC ENTERTAINMENT        | 27                            | FT         |
| 2-0-13R1               | RINGTRM N-INSU 2/0-1/2IN STUD   | 2                             | EA         |
| 209316242100HV         | BKR 100A 3P 125/240V MAGNETIC   | 2                             | EA         |
| 250MCM W               | CABLE 250 MCM TYPE W 1 COND     | 18                            | FT         |
| 4-0-13R1               | RINGTRM N-INSU 4/0 1/2IN STUD   | 39                            | EA         |
| 4/0 SC                 | CABLE 4/0 SC ENTERTAINMENT      | 10                            | FT         |
| 505509                 | FLEXIBAR ERICO 5 X 24X1 3 METER | 2                             | FT         |
| 559681                 | INSULATOR 2INX2IN ERICO 5/8-11  | 9                             | EA         |
| 6 SC GREEN             | CABLE 6 SC ENTERTAINMENT GRN    | 1                             | FT         |
| 6-13R1                 | RINGTRM N-INSU #6-1/2IN STUD    | 1                             | EA         |
| 6-6R1                  | RINGTRM N-INSU #6-1/4IN STUD    | 1                             | EA         |
| 69405K57               | RING TERMINAL 12-10 HT #10      | 8                             | EA         |
| 69405K58               | RING TERMINAL 12-10 HT 1/4      | 1                             | EA         |
| 78/15VZ                | WIRE SHOE #4 GAUGE              | 18                            | EA         |
| 79/15VZ                | WIRE SHOE #2 GAUGE              | 6                             | EA         |
| 900604                 | COVER WINDOW 4 MODULES          | 1                             | EA         |
| 900606                 | COVER WINDOW 6 MODULES          | 2                             | EA         |
| 900610                 | COVER WINDOW 10 MODULES         | 1                             | EA         |
| A-GUARD6               | FINGER GUARD FOR 6IN FAN        | 1                             | EA         |
| A0004                  | SHIM COPPER 16/18 SR CAM (10PK) | 3                             | EA         |
| AP20A1P240V            | BKR 20A 1P 240V MAGNETIC        | 1                             | EA         |
| ATEMNO                 | THERMO SW HOFFMAN NO 15A        | 1                             | EA         |
| BUS BAR-300KW          | BUS BAR COPPER 2INX1/2IN        | 3                             | EA         |
| C300R1                 | PARALLEL SPICE                  | 3                             | EA         |

| <b>DB350MA-P2WQS3</b>  |                                     | <b>300KW DISTRIBUTION BOX</b> |            |
|------------------------|-------------------------------------|-------------------------------|------------|
| <b>LEX PART NUMBER</b> | <b>DESCRIPTION</b>                  | <b>USE</b>                    | <b>EMU</b> |
| CL40FRSBML-A           | CAM 16 SER F PM EXT STUD 2/0-4/0 BK | 2                             | EA         |
| CL40FRSBML-B           | CAM 16SER F PM EXT STUD 2/0-4/0 WHT | 2                             | EA         |
| CL40FRSBML-C           | CAM 16SER F PM EXT STUD 2/0-4/0 RED | 2                             | EA         |
| CL40FRSBML-D           | CAM 16SER F PM EXT STUD 2/0-4/0 BLU | 2                             | EA         |
| CL40FRSBML-E           | CAM 16SER F PM EXT STUD 2/0-4/0 GRN | 2                             | EA         |
| CL40MRBML-A            | CAM 16 SER M PM EXTSTUD 2/0-4/0 BK  | 3                             | EA         |
| CL40MRBML-B            | CAM 16SER M PM EXTSTUD 2/0-4/0 WHT  | 3                             | EA         |
| CL40MRBML-C            | CAM 16SER M PM EXT STUD 2/0-4/0 RED | 3                             | EA         |
| CL40MRBML-D            | CAM 16 SER M PM EXT STUD 2/0-4/0 BL | 3                             | EA         |
| CL40MRBML-E            | CAM 16SER M PM EXTSTUD 2/0-4/0 GRN  | 6                             | EA         |
| CL40WTC-L-125A         | CAM COVER SNPBCK PM BLK             | 5                             | EA         |
| CL40WTC-L-125B         | CAM COVER SNPBCK PM WHT             | 5                             | EA         |
| CL40WTC-L-125C         | CAM COVER SNPBCK PM RED             | 5                             | EA         |
| CL40WTC-L-125D         | CAM COVER SNPBCK PM BLU             | 5                             | EA         |
| CL40WTC-L-125E         | CAM COVER SNPBCK PM GRN             | 5                             | EA         |
| CLL 4/0 -W-1/2         | RING TERMINAL, 4/0 W-1/2-45 LP      | 29                            | EA         |
| FS-300K                | SCREEN FAN                          | 1                             | EA         |
| FVL1210-13R2           | RINGTRM INS 1210 1/2IN STUD         | 21                            | EA         |
| GFR5352BKAMI           | RECP 15/20A GFCI 125V BLK           | 1                             | EA         |
| GROUND LUG             | LUG, 14 TO 2/0 AWG                  | 1                             | EA         |
| H945SS2RGSS            | HANDLE, SS MEPDIS-R                 | 4                             | EA         |
| HBL5100R9W             | RECP PINSLV 100A 120/208V 4P5W BLU  | 2                             | EA         |
| HBL5221M1              | COVER TERMPASTIC WR GFCI GRY        | 1                             | EA         |
| HNDL-SPACER            | SPACER HANDLE 1/2IN HDPE BLK        | 8                             | EA         |
| L79D-R125-W            | INDICATOR LED RED WP THREADED 5/16  | 17                            | EA         |
| LBM-001-0100           | LABEL LEXPWRDISTRNONUL BIG          | 1                             | EA         |
| LBM-001-0104           | LABEL FOR BRANCH CIRCUIT....        | 1                             | EA         |
| LBM-001-0180           | LABEL OFF                           | 3                             | EA         |
| LBM-001-0181           | LABEL ON                            | 3                             | EA         |
| LBM-001-1006           | LABEL PORTABLE POWER DIS...         | 1                             | EA         |
| LBM-001-1007           | LABEL WARNING RISK OF...            | 1                             | EA         |

| <b>DB350MA-P2WQS3</b>  |                              | <b>300KW DISTRIBUTION BOX</b> |            |
|------------------------|------------------------------|-------------------------------|------------|
| <b>LEX PART NUMBER</b> | <b>DESCRIPTION</b>           | <b>USE</b>                    | <b>EMU</b> |
| LBM-001-2102           | LABEL - A B C                | 3                             | EA         |
| LBM-005-0002           | LABEL WARNING TURN OFF...    | 1                             | EA         |
| LBM-100-0003           | LABEL- 400A INPUT 1          | 1                             | EA         |
| LBM-100-0004           | LABEL- 400A INPUT 2          | 1                             | EA         |
| LBM-100-0021           | LABEL INPUT 1                | 1                             | EA         |
| LBM-100-0022           | LABEL INPUT 2                | 1                             | EA         |
| LBM-100-3002           | LABEL- 3P 2 100A             | 1                             | EA         |
| LBM-300-0001           | LABEL BIG 300 KW             | 1                             | EA         |
| LBM-300-0005           | LABEL- 400A INPUT 3          | 1                             | EA         |
| LBM-300-0006           | LABEL, 1                     | 1                             | EA         |
| LBM-300-0007           | LABEL, 5                     | 1                             | EA         |
| LBM-300-0008           | LABEL, 2 3                   | 1                             | EA         |
| LBM-300-0009           | LABEL, 4                     | 1                             | EA         |
| LBM-300-0010           | LABEL, 3P 5 400A             | 1                             | EA         |
| LBM-300-0011           | LABEL, A-FAN CKT ON A-FAN ON | 1                             | EA         |
| LBM-300-0020           | LABEL, 320 LBS.              | 1                             | EA         |
| LBM-300-0023           | LABEL- INPUT 3               | 1                             | EA         |
| LBM-300-2110           | LABEL- A B C                 | 2                             | EA         |
| LBM-300-3001           | LABEL- 3P 1 400A             | 1                             | EA         |
| LBM-300-3003           | LABEL- 3P 3 100A             | 1                             | EA         |
| LBM-300-3004           | LABEL- A 4 20A               | 1                             | EA         |
| LBM-ROTATE             | LABEL, ROTATE CAM            | 3                             | EA         |
| LBM-UID                | LABEL MILITARY UID           | 1                             | EA         |
| N350030                | WIRE SHOE -2 AWG 30MM        | 10                            | EA         |
| OTK400B4-280           | SWITCH DISCONNECT 3 PH 400 A | 3                             | EA         |
| PR1125.00AXXS          | BKR AP PUSH TO RESET 5A      | 1                             | EA         |
| RB10D                  | LOUVER BLK ANODIZED 1 INCH   | 12                            | EA         |
| RG-1S.160.84           | HANDLE RG SERIES BLK         | 4                             | EA         |
| ROD-DBL-A60            | ROD 100K & 300K              | 4                             | EA         |
| S5N400ML               | BKR 400A 3 POLE MAGN TRIP    | 2                             | EA         |
| W2S130-AA25-01         | FAN, EBMPAPST 150X55 120V    | 1                             | EA         |

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## NOTES

**NOTES**

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## NOTES

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*Portable Distribution Boxes*