



**MAINTENANCE MANUAL**  
**Frequency Converter**  
**MODEL: UDC-620M**  
**PART NO: 198-15000-65T**

This manual provides installation, operation, troubleshooting, and maintenance information.



**IMPORTANT SAFETY INFORMATION**  
**READ AND SAVE THESE INSTRUCTIONS**

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*Revised: July 21, 2023*

# Unitron, LP

MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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## SAFETY

### IMPORTANT SAFETY INSTRUCTIONS

#### SAVE THESE INSTRUCTIONS

Safety information is provided throughout this manual. Read the complete material before installing, operating, or servicing this unit. Follow all instructions and safety information.

To reduce the risk of fire or electric shock, carefully follow these instructions before use.



**DANGER** - ELECTRIC SHOCK HAZARD: LETHAL LEVELS OF VOLTAGE ARE PRESENT IN UNIT. ONLY QUALIFIED EQUIPMENT MAINTENANCE PERSONNEL WHO HAVE READ, UNDERSTAND, AND FOLLOW THESE INSTRUCTIONS SHOULD PERFORM UNIT INSTALLATION, MAINTENANCE, OR SERVICE.



**DANGER** - ELECTRIC SHOCK HAZARD: HAZARDOUS VOLTAGES ARE PRESENT IN UNIT. DO NOT ATTEMPT TO ACCESS UNIT INTERIOR WHILE POWER IS APPLIED.



**DANGER** - ELECTRIC SHOCK HAZARD: THERE ARE NO OPERATOR SERVICEABLE PARTS INSIDE THE UNIT. MAINTENANCE AND SERVICE MUST BE PERFORMED BY QUALIFIED EQUIPMENT MAINTENANCE PERSONNEL ONLY.



**WARNING** - CONDENSATION HAZARD: CONVERTERS USED OR STORED OUTDOORS, OR IN FACILITIES WITHOUT CLIMATE CONTROL SHOULD BE LEFT IN A STANDBY STATE. THIS WILL HELP PREVENT CONDENSATION FROM FORMING INSIDE THE CONVERTER. IF THE UNIT IS WITHOUT SUPPLIED INPUT POWER IN POSSIBLE ADVERSE CONDITIONS, THE USER MUST PERFORM AN INSPECTION AND DRY OUT ANY CONDENSATION BEFORE OPERATING THE UNIT.



**WARNING** - SAFETY HAZARD: WHEN THE UNIT IS CONNECTED TO A REMOTE DEVICE, IT IS POSSIBLE FOR A REMOTE USER TO TURN THE UNIT ON AND OFF. TAKE APPROPRIATE PRECAUTIONS TO ENSURE USER SAFETY IN THIS MODE OF OPERATION.

### Symbols Used in This Manual



Used to indicate a danger, warning, or caution.



Completely read this material. Follow all instructions and safety information. Save these instructions.

# Unitron, LP

MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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## INTRODUCTION

This introduction provides information regarding organization, scope, purpose, and general contents of this manual, along with the method for using this manual.

### **A. ORGANIZATION OF THIS MANUAL**

This manual is organized in a logical order, separated by chapters and subsections. Each chapter and subsection is listed within the table of contents for quick reference to the location of the material within this manual.

Illustrations are provided throughout this manual near the text associated with the illustration.

### **B. SCOPE**

This manual provides safety, installation, operation, troubleshooting, and maintenance information for the unit listed on the top of this page. This manual covers only the model and part number listed on the top of this page.

### **C. PURPOSE OF THIS MANUAL**

The purpose of this manual is to provide safety, installation, operation, troubleshooting, and maintenance information to qualified installation and equipment maintenance personnel, and to provide safety and operating information to the unit operator.

### **D. CONTENTS OF THIS MANUAL**

This manual is divided into the following chapters.

- Chapter 1 . . . . . General Information, Specifications, and Installation
- Chapter 2 . . . . . Input Power Cable Connections
- Chapter 3 . . . . . Maintenance
- Chapter 4 . . . . . Illustrated Parts Breakdown
- Chapter 5 . . . . . Schematic Diagrams

### **E. HOW TO USE THIS MANUAL**

Individuals installing, operating, troubleshooting, and providing maintenance to the unit should read and follow the steps outlined within this manual. Read the installation and operation chapters of this manual before installation. Before operating the unit, read the entire operation chapter of this manual.

# Unitron, LP

MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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## **CHAPTER 1 - GENERAL INFORMATION, SPECIFICATIONS, AND INSTALLATION**

This chapter provides general information, specifications, and installation procedures for the Frequency Converter, along with a list of standard and optional features.



**DANGER - ELECTRIC SHOCK HAZARD: SAFETY INFORMATION IS PROVIDED THROUGHOUT THIS MANUAL. READ THE COMPLETE MANUAL BEFORE INSTALLING, OPERATING, OR SERVICING THIS UNIT.**



**DANGER - ELECTRIC SHOCK HAZARD: LETHAL LEVELS OF VOLTAGE ARE PRESENT IN UNIT. ONLY QUALIFIED EQUIPMENT MAINTENANCE PERSONNEL WHO HAVE READ, UNDERSTAND, AND FOLLOW THESE INSTRUCTIONS SHOULD PERFORM UNIT INSTALLATION, MAINTENANCE, OR SERVICE.**

### **A. DESCRIPTION**

The unit covered by this manual is designed to provide ground power for aircraft or equipment which operates within the specifications of this unit. (Refer to the specification information within this chapter.)

The unit described in this manual is manufactured by:

Unitron, LP, 10925 Miller Road, Dallas, TX 75238, U.S.A. Phone: +1 800-527-1279

CAGE Code: 3BC99

### **B. SPECIFICATIONS AND CAPABILITIES**

#### **1) Standard Features**

- Indoor/Outdoor (Hangar/Ramp) Use
- Automatic Input Line Monitoring
- Touch Screen Panel, Indoor/Outdoor Color LCD (TSP-4)
- 8000 Event Log/Diagnostic Messages
- Internal Communication Ports - RS485 (MODBUS) & RS232
- External USB Communication Port
- **Emergency Power Off (EPO) Switch**
- Input Voltage and Output Current and Voltage Monitoring
- Internal Digital Elapsed Time Monitoring
- Front Panel Summary Fault Indicators
- Input High Voltage Transient Protection (IEEE, Category B and C)
- Power Regulation
- Output Current Limit Adjust From 150 A to Full Rated Current
- Certification Markings: ETL Certified for UL 1012
- 18-Inch Hazard Area Clearance

## 2) Optional Features

- **Dual Range Input Voltage (Field Adjustable) (Option T-3(MT))**  
Unit is factory configured, as specified by the customer sales order, to accept one of two voltage range conditions: either **208 to 240 VAC** or **380 to 480 VAC**. A temporary information tag is affixed to unit input cable indicating set voltage range. GPU input voltage can be customer reconfigured, if required, to either voltage range.
- **Input Safety Disconnect Contactor with Access Door Interlock (Option S-2)**  
Unit is equipped to control the application of input power to the unit. The circuit includes an access door interlock switch designed to open the input contactor when the front panel access door is open. The interlock switch includes an override feature designed for qualified maintenance personnel only. (Do NOT attempt to override this switch unless you are a qualified maintenance technician, and it is necessary for you to override the switch for servicing the unit.  
A DC link rapid discharge circuit is a second feature of the input contactor option which provides a rapid discharge of the input DC link voltage after the input contactor is open (20 seconds).

## 3) Specifications/Standards Compliance

- ISO 1540 Characteristics of Aircraft Electrical System
- ISO 6858 Aircraft Ground Support Electrical Supplies
- MIL-STD-704F Aircraft Electric Power Characteristics
- MIL-STD-1472 Human Engineering Design Criteria
- NEC 513 Aircraft Hangars

## 4) Input Power Specifications

- Voltage Range (Field Adjustable)..... 208 to 240 V ( $\pm 10\%$ ), 3 $\Phi$ , 3 wire plus ground  
380 to 480 V ( $\pm 10\%$ ), 3 $\Phi$ , 3 wire plus ground
- **\*\* IMPORTANT:** Manual strapping changes are required to change source Input Voltage range. Refer to "Input Voltage Strapping Configuration" on page 23.
- Maximum Input Current at Rated Load..... **Low Voltage Configurations:**  
55 A at 208 V  
47 A at 240 V  
**High Voltage Configurations:**  
30 A at 380 V  
28 A at 400 V  
23 A at 480 V  
(does not consider overload condition)
- Frequency ..... 50/60 Hz ( $\pm 10\%$ )
- Phase Rotation ..... Any
- Protection ..... Over/Undervoltage, Loss of Phase, Overcurrent, Short Circuit  
Voltage transient protection IAW IEEE C62.41, Location Category B/C
- Inrush Current ..... No greater than 100% of full load current

## 5) Environmental

- Acoustical Noise..... < 65 dBA max. at 5 ft (1.5 m) (60 dBA typical)
- Temperature Range ..... -40°C to +55°C
- Relative Humidity ..... 0 to 95% (non-condensing)
- Ingress of Water..... Type 3SX, IP55

## 6) Energy Factors

- Efficiency ..... 95% typical at full load, 93% typical at half load; varies depending on configuration

## 7) DC Output Power Specifications and Capabilities

- Full Load Output Current Rating ..... 600 A continuous
- Overload (10% Duty Cycle) ..... 1000 A for 1 minute
- Engine Start Capacity (10% Duty Cycle) ... 2000 A for 30 seconds
- Voltage ..... Nominal 28 VDC, 2 wire, grounded negative
- Voltage Regulation ..... 100% Continuous rated load and  $\pm 10\%$   
Input Voltage  $\pm 0.5\%$   
No load to rated load with nominal input voltage  $\pm 0.5\%$
- Voltage Transients..... IAW MIL-STD-704F and ISO 6858.6
- Voltage Adjust ..... 28 VDC ( $\pm 10.0\%$ )
- Current Limit..... Adjustable 150 A to full rated current
- Protection ..... Overload, Short Circuit and Over/Undervoltage
- Power Regulation..... 10%

## 8) Mechanical Specifications

- Weight (without cables)..... maximum 311 lbs (141 kg)

## 9) Dimensions

Refer to *Figure 1*.

- Height..... 38.6 in (980 mm)
- Width ..... 35.3 in (897 mm)
- Depth..... 38.5 in (979 mm)

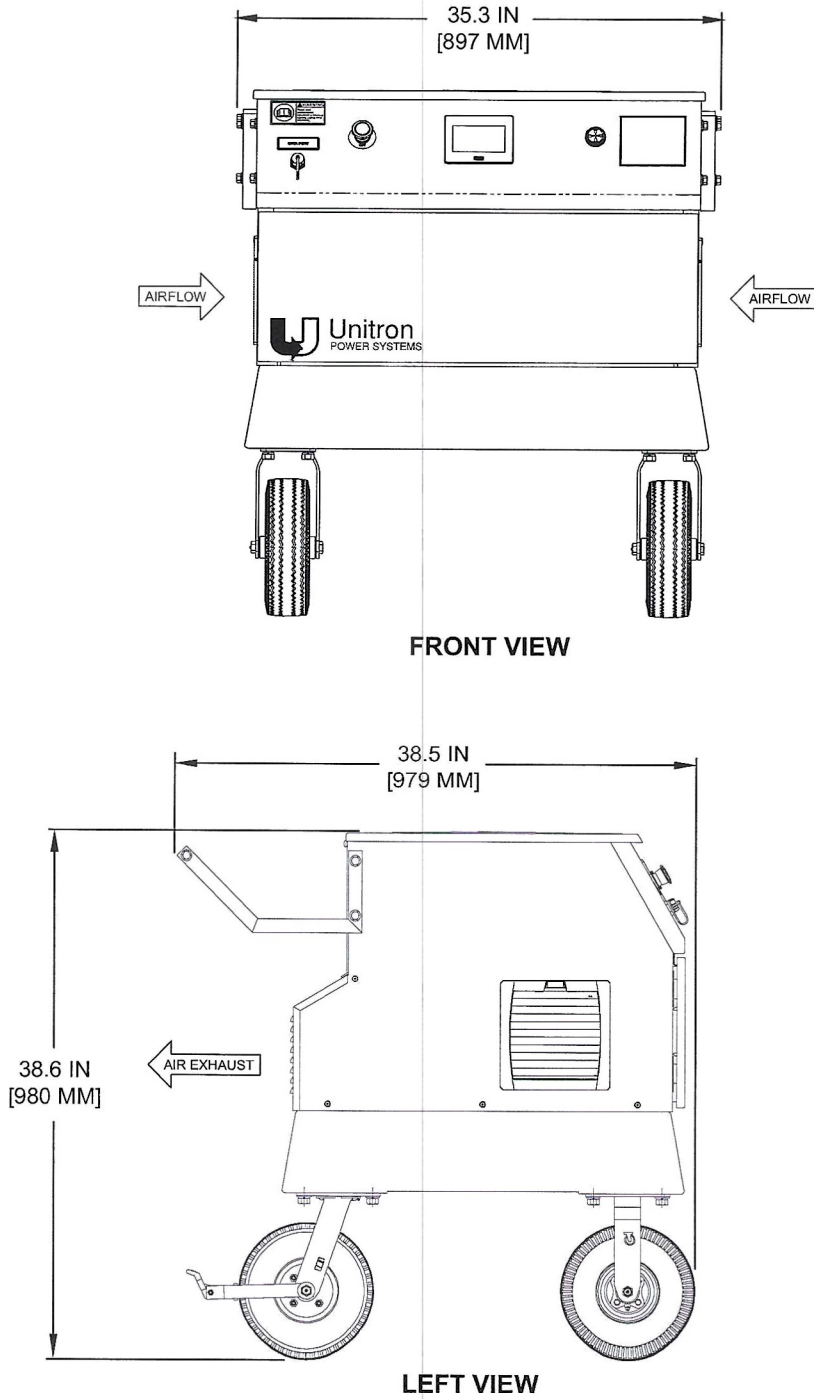


Figure 1. Dimensions UDC-620M

## C. INSTALLATION AND HANDLING



**WARNING:** The UDC-620M weighs a maximum weight of 311 lbs (141 kg), excluding cable. To avoid damage to the unit, keep it on the pallet and move only with a forklift to the final setup location.

### 1) **Storage Requirements Prior to Installation or When Unit is Without Power**

When the unit is to be stored prior to installation or when the unit will be left without input power; the unit requires storage in an environment meeting the conditions defined in the unit specifications "Environmental" on page 13. Protecting the unit from precipitation and excess humidity will ensure optimal operation of the unit when input power is restored.

The unit is shipped in a custom crate, it is best to keep the ground power unit in this original crate for handling prior to installation or if long term storage is required. Once the unit is installed it is recommended that the input power is always supplied to the unit. Condensation and extreme temperatures can present adverse effects to the unit electronics when re-energizing the unit.

### 2) **Handling**

A forklift is recommended for transporting the unit to the final location. The push bar attached to the back of the unit is designed for pushing the unit by hand. Refer to Figure 2.

The rear wheels of the unit are equipped manual brakes. Set the manual brake on each rear wheel when the unit is stationary. For brake location Refer to Figure 3.



**WARNING:** USE EXTREME CAUTION WHEN MOVING THE UNIT. DO NOT MOVE THE UNIT BY ANY MEANS OTHER THAN PUSHING THE UNIT BY HAND USING THE PUSHBAR ATTACHED TO THE BACK OF THE UNIT. DO NOT PUSH THE UNIT FROM THE FRONT OR SIDES. DO NOT TOW THE UNIT BY ANY MEANS. FAILURE TO MOVE THE UNIT PROPERLY MAY CAUSE PERSONAL INJURY AND DAMAGE TO THE UNIT.



Figure 2. Proper Handling of Ground Power Unit

## 3) Locating Cable Access and Connection Points

Unit is routinely shipped with the input and output power cables already installed. However, if it is necessary to install or replace the cables, the unit provides access panels for gaining access to the input and output connection points.

Use this procedure to identify the locations of the Input and Output cable entry and connection points.

### **IMPORTANT:**

- Entry for the input and output wiring/cabling connections can be made through the rear access panel. Refer to *Figure 3*.
- Access to connection points for the power cables can be gained through the top access panel. Refer to *Figure 4*.
- Unit is designed to use 3-phase wires plus safety ground for input power installation.

### **PROCEDURE**



**WARNING: WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

1. When connected to external input power, turn OFF (open) the external input power circuit breaker or disconnect switch. Verify no power is applied to unit. Use the proper lockout/tagout device to ensure the input circuit breaker or disconnect switch remains OFF during maintenance or inspection.
2. Verify unit power cables are not connected to a power source.
3. Remove the unit top and rear access panels.
4. Locate the +28 VDC Positive Busbar and the -28 VDC Negative Busbar. Refer to *Figure 4*.
5. Locate the input power contactor (K1). Refer to *Figure 4*.
6. Locate ground lug (GB1). Refer to *Figure 4*.
7. Verify required conduit port sizes and locations for the rear access panel.



**CAUTION: PROTECT THE INSIDE OF THE UNIT FROM DAMAGE. DO NOT ALLOW METAL FILINGS OR SHAVINGS TO FALL INTO THE UNIT WHILE DRILLING/PUNCHING THE CONDUIT ACCESS PORT(S).**

8. Punch or drill the conduit access ports in the rear access panel as necessary.

### **IMPORTANT:**

- Remove any metal filings or shavings that may fall into the unit.
  - Remove any sharp or burred edges from the ports.
9. Install conduit as identified in *Step 7*.
  10. Reinstall the unit top and rear access panels.

**PROCEDURE COMPLETED**



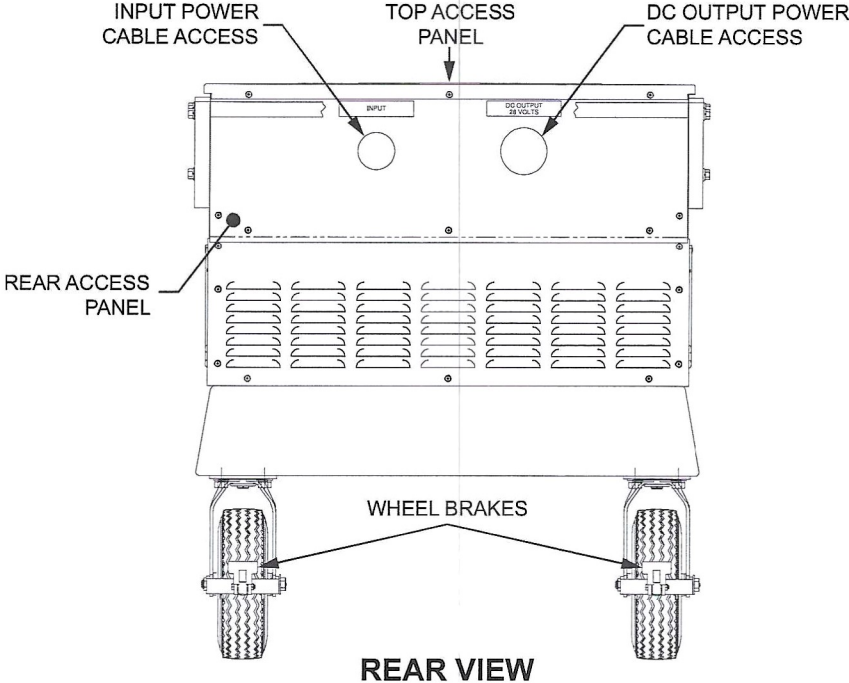
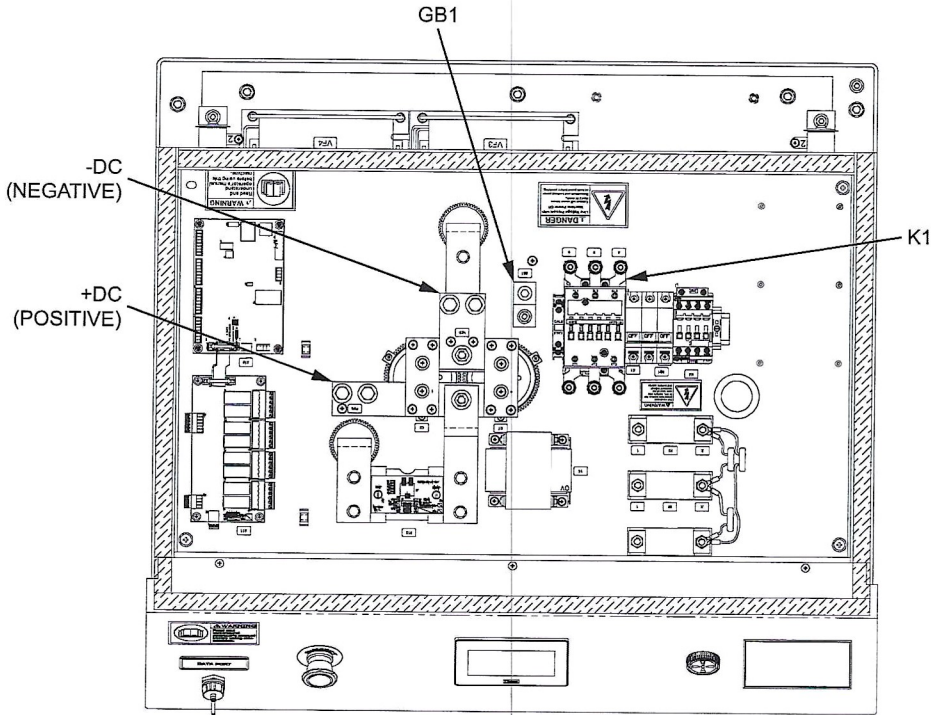


Figure 3. Cable Access Location





**TOP VIEW**  
**FRONT OF UNIT**  
(TOP ACCESS PANEL REMOVED)

Figure 4. Input and Output Connection Points

## 4) Connecting DC Output Power Cable

Unit is routinely shipped with the output power cables installed. However, if it is necessary to install or replace the output power cable, the following guidance is provided. Refer to *Figure 5*.

 **DANGER - ELECTRIC SHOCK HAZARD: ENSURE EXTERNAL INPUT CIRCUIT BREAKER OR DISCONNECT SWITCH IS OFF (OPEN). WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

 **CAUTION: DO NOT ALLOW ANY HARDWARE, TOOLS, PARTS, OR OTHER OBJECTS TO FALL INTO THE UNIT. INSPECT FOR ANY ITEMS THAT MAY HAVE FALLEN INTO THE UNIT DURING INSTALLATION AND REMOVE THEM. STRAY OBJECTS CAN CAUSE SHORT CIRCUITS, RESULTING IN DAMAGE TO THE UNIT AND POSSIBLE INJURY TO THE OPERATOR.**

### **IMPORTANT:**

- During new installation, always connect the output wiring before connecting the input power. This should be done as an added measure of safety for the installer.
- All wiring must comply with the National Electrical Code (NEC), or EU equivalent, and local codes.
- Installation of a cord grip on the cable is recommended.

### **PROCEDURE**

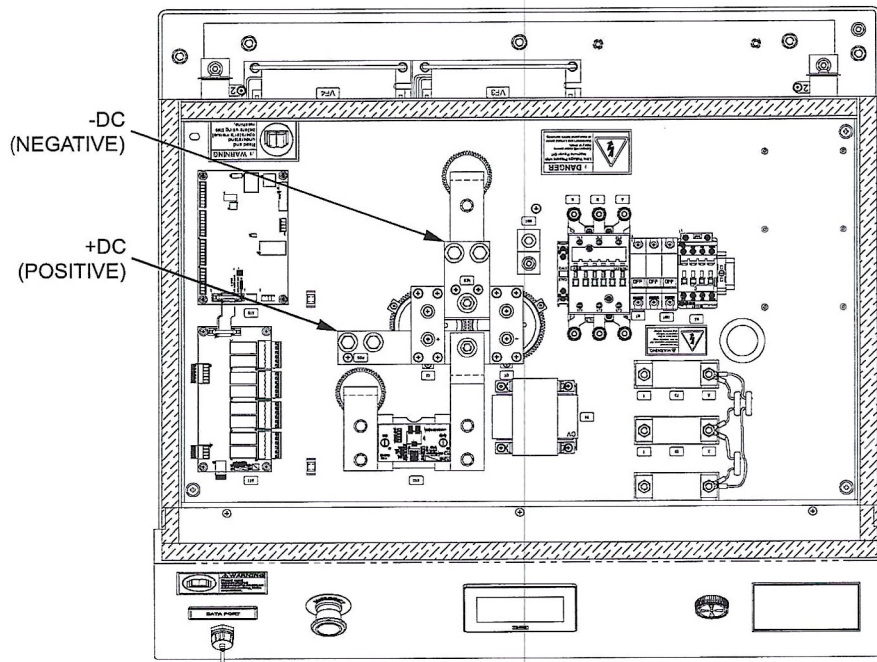
1. When connected to external input power, turn OFF (open) the external input power circuit breaker or disconnect switch. Verify no power is applied to unit. Use proper lockout/tagout device to ensure the input circuit breaker or disconnect switch remains OFF during maintenance or inspection.
2. Verify unit power cables are not connected to a power source.
3. Remove the unit top and rear cable access covers.
4. Route the output cable through the output port to the Positive Busbar, and to the Negative Busbar. Refer to *Figure 5*.
5. Attach the wire to the terminals as follows:

<b>OUTPUT</b>	<b>Cable Wire</b>	<b>Connection Point</b>
•	+28 VDC Positive wire .....	Positive Busbar
•	- 28 VDC Negative wire .....	Negative Busbar

### **IMPORTANT:**

- Unit is shipped with the DC negative connected to chassis ground.
  - Positive and Negative Busbars accept 5/16 inch ring lugs.
6. Confirm all connections are properly tightened and cord clamps are secure.
  7. Confirm output power cable terminal lugs are not shorted to the adjacent terminal.
  8. Reinstall the unit top and rear cable access covers.

**PROCEDURE COMPLETED**



**TOP VIEW**  
**FRONT OF UNIT**  
(TOP ACCESS PANEL REMOVED)

**Figure 5. Output Power Cable Connections**

## 5) Connecting Input Power Cable



**DANGER - ELECTRIC SHOCK HAZARD: ENSURE EXTERNAL INPUT CIRCUIT BREAKER OR DISCONNECT SWITCH IS OFF (OPEN). WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

### **IMPORTANT:**

- During new installation, always connect the output wiring before connecting the input power. This should be done as an added measure of safety for the installer.
- All wiring must comply with the National Electrical Code (NEC), or EU equivalent, and local codes.
- Installation of a cord grip on the cable is recommended.
- Unitron, LP does not specify user-furnished wiring, connectors, circuit breakers, or disconnect switch sizes due to different conditions and codes throughout the world.

### **PROCEDURE**

1. When connected to external input power, turn OFF (open) the external input power circuit breaker or disconnect switch. Verify no power is applied to unit. Use the proper lockout/tagout device to ensure the input circuit breaker or disconnect switch remains OFF during maintenance or inspection.
2. Verify that the unit power cables are not connected to a power source.
3. Remove the unit top and rear cable access panels.
4. Route the wiring through the input cable port. Refer to *Figure 6*.
5. Locate the input contactor (K1) and ground terminal (GB1) in *Figure 6*.
6. Connect the input power wires as follows:

<b>Input</b>	<b>Cable Wire</b>	<b>Connection Point</b>
•	Phase A (black wire).....	Terminal A on input contactor K1
•	Phase B (red wire).....	Terminal B on input contactor K1
•	Phase C (white or tan wire).....	Terminal C on input contactor K1
•	Ground (green wire).....	Ground lug GB1

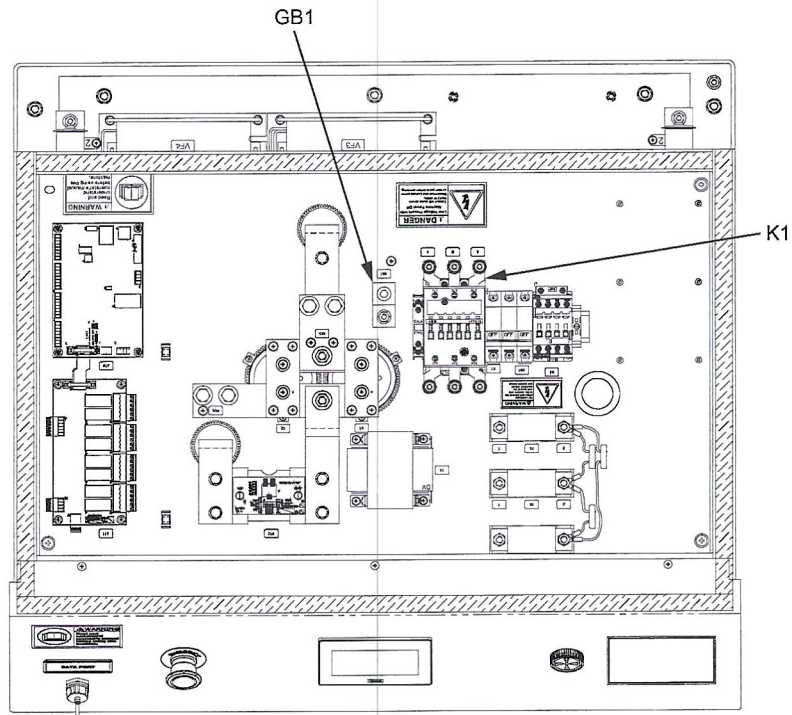
### **IMPORTANT:**

- Input contactor (K1) accepts 1/4 (M12) inch ring lugs.

**NOTE:** The above order is recommended, however, the unit will operate properly regardless of the input power phase rotation (Phase A-B-C or C-B-A).

7. Confirm all connections are properly tightened and cord clamps are secure.
8. Confirm input power cable terminal lugs are not shorted to the adjacent terminal.
9. Reinstall the unit top and rear cable access panels.

### **PROCEDURE COMPLETED**



**TOP VIEW**  
**FRONT OF UNIT**  
(TOP ACCESS PANEL REMOVED)

**Figure 6. Input Power Cable Connections**

## 6) Input Voltage Strapping Configuration

This UDC-620M has been designed to operate in a Low Voltage or a High Voltage range of input voltages:

- Low Voltage Range (LV .....208 to 240 VAC
- High Voltage Range (HV) .....380 to 480 VAC

The input voltage configuration of the unit must conform to the supplied voltage of the facility. When the unit configuration does not conform to the supplied facility voltage, the input voltage may be reconfigured either from Low Voltage to High Voltage, or from High Voltage to Low Voltage.

**IMPORTANT:** This procedure is provided for authorized maintenance personnel, only.

### PROCEDURE

1. Turn the unit power OFF.
2. Turn OFF (open) the external input power circuit breaker or disconnect switch is). Verify no power is applied to unit.

**NOTE:** When the source power is OFF, the unit ON/OFF icon is not lit.

3. Use the proper lockout/tagout device to ensure the external input circuit breaker or disconnect switch remains OFF during maintenance or inspection.
4. Remove the lower rear cover panel on the unit to gain access to the strapping panel. Refer to *Figure 7* for access and location of strapping connections.

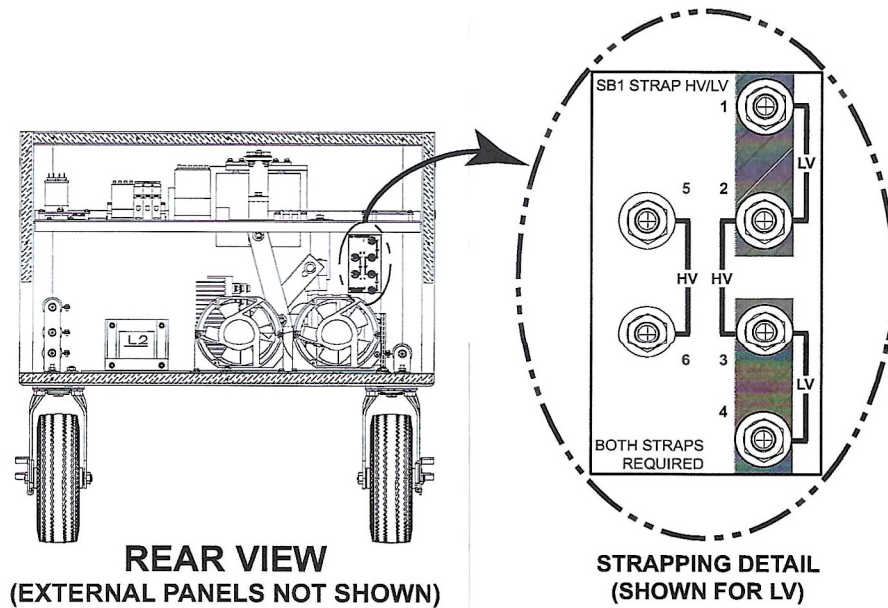
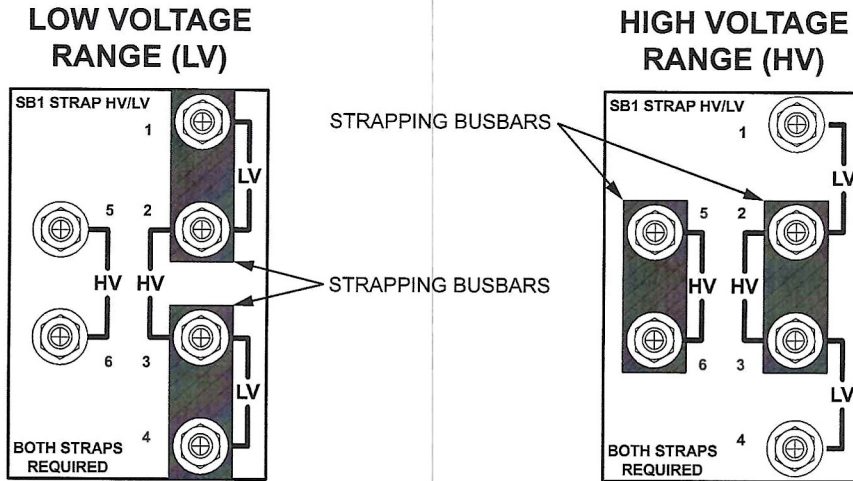


Figure 7. Strapping Access and Connections Input Voltage

5. Review the strapping configuration on the plate decal:
  - Low Voltage Range (LV) ..... Connect busbars across posts 1-2 and 3-4
  - High Voltage Range (HV) ..... Connect busbars across posts 2-3 and 5-6



**IMPORTANT:** Both busbars must be in place for proper operation of unit.



**Figure 8. Low and High Voltage Strapping Configurations for Input**

6. Remove hardware (nut, flat washer, and lock washer) from the posts.
7. Follow the strapping configuration detail shown in *Figure 8* and *step 5*.
8. Replace the hardware and secure the nuts on the strapping lugs.
9. Replace the back access panel when complete.
10. Mark the unit nameplate for the newly configured source input voltage.



**CAUTION** - User is responsible for identifying current configuration of the Input Voltage, if changed from factory configuration.

11. Remove lockout/tagout device from external input circuit breaker or disconnect switch.
12. Make sure the external input power circuit breaker or disconnect switch is ON (closed), and power is applied to the unit.

**NOTE:** When the source power is ON, the unit ON/OFF icon displays red.

**IMPORTANT:** If the unit detects a problem with the input voltage and the strapping configuration, one of the following errors will display across the Home screen.

Error Message	Fault
• DC LINK VOLT FAULT MEASURED.....	Input to GPU is HV, strapped for LV
• INPUT FUSE FAULT .....	Input to GPU is LV, strapped for HV

When either of these error messages occur, remove source power from the unit. Do not operate the unit; call maintenance personnel for service.


**PROCEDURE COMPLETED**




## CHAPTER 2 - OPERATION

This chapter provides a description of the operator controls and indicators, along with operating instructions for the unit.

 **DANGER - ELECTRIC SHOCK HAZARD: SAFETY INFORMATION IS PROVIDED THROUGHOUT THIS MANUAL. READ THIS MANUAL BEFORE OPERATING THIS UNIT.**

 **DANGER - ELECTRIC SHOCK HAZARD: LETHAL LEVELS OF VOLTAGE ARE PRESENT IN UNIT. ONLY QUALIFIED EQUIPMENT MAINTENANCE PERSONNEL WHO HAVE READ, UNDERSTAND, AND FOLLOW THESE INSTRUCTIONS SHOULD PERFORM UNIT INSTALLATION, MAINTENANCE, OR SERVICE. THERE ARE NO OPERATOR SERVICEABLE PARTS OR CONTROLS INSIDE THE UNIT.**

 **WARNING - CONDENSATION HAZARD: UNITS USED OR STORED OUTDOORS, OR IN FACILITIES WITHOUT CLIMATE CONTROL SHOULD BE LEFT IN A STANDBY STATE TO HELP PREVENT CONDENSATION FROM FORMING INSIDE UNIT. IF THE UNIT IS WITHOUT SUPPLIED INPUT POWER IN POSSIBLE ADVERSE CONDITIONS, THE USER MUST PERFORM AN INSPECTION AND DRY OUT ANY CONDENSATION BEFORE OPERATING THE UNIT.**

### A. CONTROLS AND INDICATORS

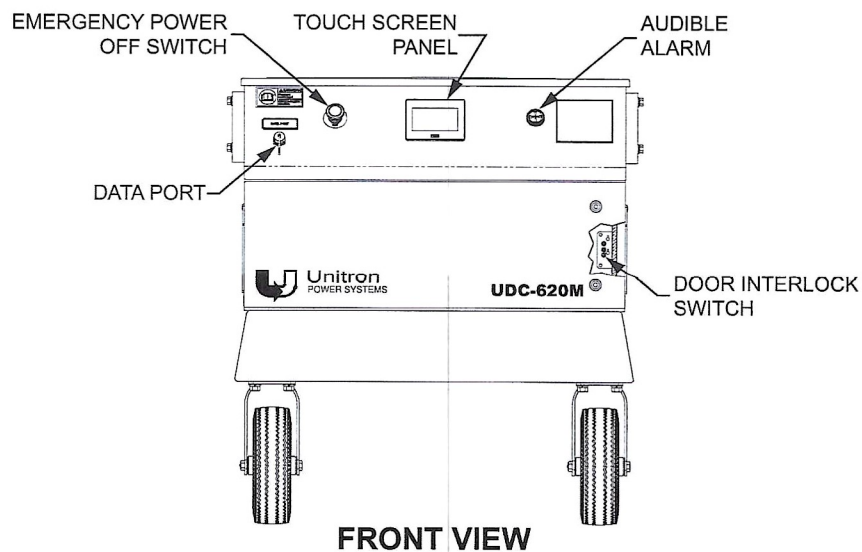


Figure 9. Controls and Indicators

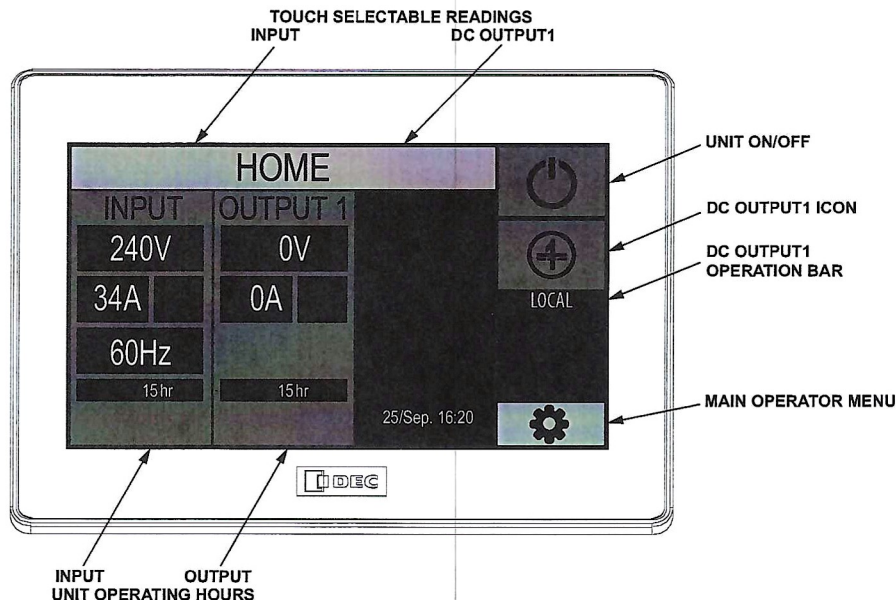


Figure 10. Operator Control Panel Home Screen - Unit OFF with Output OFF

## 1) Unit Operation

Unit operation is achieved using various controls and indicators of the unit.

**IMPORTANT:** Menu pictorials used for this manual may vary depending on the specific configuration of each unit.

### a. Touch Screen Panel

Primary operator interface for navigating through unit operation menus and related buttons to select desired functions (*Figure 10*). Current menu name is displayed at the top of the screen.



**DANGER - ELECTRIC SHOCK HAZARD: ENSURE EXTERNAL INPUT CIRCUIT BREAKER OR DISCONNECT SWITCH IS OFF (OPEN). WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

#### Unit ON/OFF Icon



This selection turns the unit ON and OFF. When connected to input power within acceptable operating limits, the button displays red. Pressing the red ON/OFF icon turns the unit ON, and the icon displays green.

Hours displayed at the bottom of the screen denote accumulated unit operating hours of the Input and Output, respectively.

---

## DC Output 1 Icon



This icon indicates the DC OUTPUT 1 is ON.

## DC Output 1 Operation Bar

Immediately below the DC OUTPUT 1 icon the LOCAL mode of operation is displayed.

## Input/Output Readings

The Home screen displays the Input and Output values.

- Source power voltage, amperage, and frequency display.
- AC Output voltage, amperage, and frequency display.
- DC Output voltage and amperage also display.

Pressing the selectable AC Input column heading opens the Evaluate screen for viewing detailed current values for the AC Input source.

**NOTE:** The DC Output column heading is not selectable.

## Main Menu Icon (Gear Icon)



Pressing and holding this icon for three seconds displays the Main menu. The Main menu displays four additional Operator menus: CONTROL, ADJUST, REPAIR, and EVALUATE. The main screen also displays a BRIGHTNESS control for touch screen illumination, and a Menu Language icon for selecting a display language.

The Home screen displays the current date and time as set in the "ADJUST Screen" on page 34.

## b. Emergency Power Off Switch

The **E**mergency **P**ower **O**ff (EPO) switch opens the input contactor and turns the unit OFF, removing power from the inverter and, therefore, from the output contactor. (Figure 9)

**NOTE:** EPO switch may be pushed in at any time without damage to the unit, BUT must be reset (pulled out) to enable the module(s) to operate.

## c. Audible Alarm

Unit is equipped with an audible alarm which sounds whenever specific fault conditions are detected.

**IMPORTANT:** An Alarm should never be silenced without also being cleared.

## d. Data Port

Unit is equipped with an external USB data port for maintenance purposes only.

## e. Door Interlock Switch

Unit front and right side access doors are equipped with a safety interlock switch to ensure the doors are closed and secured during operation.

**IMPORTANT:** Do **NOT** attempt to override this switch unless a qualified maintenance technician, and it is necessary to override the switch for unit servicing.

## B. UNIT STARTUP AND SHUTDOWN

### 1) Unit Setup

Follow this procedure to prepare the unit for operation.



**DANGER - ELECTRIC SHOCK HAZARD: ENSURE EXTERNAL INPUT POWER CIRCUIT BREAKER OR DISCONNECT SWITCH IS OFF (OPEN). WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

**IMPORTANT:** Before attempting to apply power to or start up the unit, read completely through this chapter.

#### PROCEDURE

1. Turn OFF (open) the external input power circuit breaker or disconnect switch. Verify no power is applied to the unit. Use the proper lockout/tagout device to ensure the input circuit breaker or disconnect switch remains OFF during maintenance or inspection.
2. Ensure **E**mergency **P**ower **O**ff (EPO) switch is positioned in the extended (pulled out) position.
3. Ensure front and side doors are closed and secured.
4. Proceed to "Startup" on page 28.

**PROCEDURE COMPLETED**

### 2) Startup



**DANGER - ELECTRIC SHOCK HAZARD: ENSURE EXTERNAL INPUT POWER CIRCUIT BREAKER OR DISCONNECT SWITCH IS OFF (OPEN). WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

**IMPORTANT:** Before attempting to apply power to or start up the unit, read completely through this chapter.

#### PROCEDURE

1. Compare the location and description of each operator control and indicator to the actual operator control and indicator on the unit.
2. Confirm input power cable is properly connected, and external circuit breaker or disconnect switch is OFF (open) so no power is available to the unit.
3. Confirm unit front and side access doors are closed and secured.

**NOTE:** Input contactors are interlocked with the door interlock switches. The doors must be securely latched before input contactor will close.



**DANGER - ELECTRIC SHOCK HAZARD: ENSURE EXTERNAL INPUT POWER CIRCUIT BREAKER OR DISCONNECT SWITCH IS OFF (OPEN). WHEN UNIT IS CONNECTED TO EXTERNAL INPUT POWER AND TURNED ON, 28 VDC POWER IS AVAILABLE AT OUTPUT CABLE. OUTPUT CABLE SHOULD BE CONNECTED TO LOAD BEFORE TURNING UNIT ON.**

4. Connect DC output power cable to the load.
5. Close the external input circuit breaker, touch screen panel becomes active.  
**NOTE:** When acceptable power is applied to unit, the touch screen panel will display the HOME screen. Refer to *“Unit Operation” on page 26* for an explanation of the controls and indicators on the touch screen panel.
6. To turn unit ON, press the Unit ON/OFF button. When the unit is ON, the HOME screen displays the input and output readings and the Unit ON/OFF button and input readings column will turn green. (*Figure 10*)  
**NOTE:** If an alarm sounds, refer to *“Alarm Operation: SILENCE and CLEAR” on page 35*.  
**IMPORTANT:** If the unit detects a problem with the input voltage and the strapping configuration, one of the following errors will display across the Home screen.

**Error Message**

**Fault**

- DC LINK VOLT FAULT MEASURED .....Input to GPU is HV, strapped for LV
- INPUT FUSE FAULT .....Input to GPU is LV, strapped for HV

If either of these error messages occur, turn OFF (open) the external input power circuit breaker or disconnect switch to remove power to the unit, and DO NOT operate the unit. Contact maintenance personnel for service.

7. Adjust the unit output power parameters as necessary for the attached load. Refer to *Figure 12*, and *“Output Volts and Line Drop” on page 34*.
8. Set the Output 1 Interlock timers as needed. Refer to *Figure 12*, and *“Interlock Timers, Date, and Time” on page 34*.
9. Start the aircraft, or other connected load equipment.
10. When work is complete, shutdown the unit. Refer to *“Normal Shutdown” on page 30*.

**PROCEDURE COMPLETED**



**Figure 11. Home Screen - OFF and ON**

### 3) Normal Shutdown

Follow this procedure to remove power from the load and shut down the unit.

#### PROCEDURE

1. Press the unit ON/OFF button. The Unit ON/OFF button and the input and output readings columns will turn red. Output power is OFF.
2. Open the external input circuit breaker or disconnect switch to remove power to the unit.
3. Disconnect and stow the power cables.
4. Shut down is complete.


**PROCEDURE COMPLETED**

### 4) Emergency Shutdown

Follow this procedure to immediately shut down the unit.

#### PROCEDURE

1. Press the **E**mergency **P**ower **O**ff (EPO) switch. The input contactor will open and all circuit cards will de-energize. The unit cannot be re-started until the EPO switch is returned to the extended (pulled out) position.
2. Open the external input circuit breaker or disconnect switch to remove power to the unit.

 **DANGER - ELECTRIC SHOCK HAZARD: ENGAGING THE ACCESS PANEL SAFETY INTERLOCK OR PRESSING THE EPO SWITCH DOES NOT REMOVE POWER FROM ALL UNIT INTERNAL COMPONENTS. INPUT VOLTAGE, 24 VDC, AND STORED ENERGY IN THE CAPACITORS ARE ALL STILL PRESENT AFTER INTERLOCK/EPO ACTIVATION. THE INPUT CIRCUIT BREAKER(S) (PROVIDED BY OTHERS) MUST BE OPENED TO BEGIN REMOVAL OF ALL POWER FROM UNIT.**

**PROCEDURE COMPLETED**

## C. MONITORING OPERATION

### 1) HOME Screen

During normal operation the HOME screen is the first screen to appear on the touch screen panel display when power is applied to the unit, see *Figure 11*.

When the touch screen panel displays the Screen Saver, touching anywhere on the screen brings up the HOME screen.

**IMPORTANT:** When unit Password Padlock is active, a password is required to access HOME screen.

When the unit is OFF, but is connected to an acceptable power source, the unit ON/OFF buttons display red, and the INPUT column displays top-level readings of the power source.

**NOTE:** Pressing INPUT button displays detailed parameter readings, as seen on EVALUATE screen.

With the unit OFF, pressing the Unit ON/OFF button closes the input contactor, the INPUT button displays green and input voltage, amperage, and frequency are displayed.

With the unit ON, and all output power OFF, the Output ON/OFF buttons will display red. Pressing the output ON/OFF button closes the output contactor, the button turns green, the selected output column turns green, and the output readings are displayed.

**NOTE:** The DC Output column heading is not selectable.

### 2) MAIN MENU Screen

Pressing the GEAR button in the lower right corner of the HOME screen for three seconds displays the MAIN MENU screen. Refer to *Figure 12*.

The menu tree for the operation selections is shown in *Figure 13*.

#### a. BRIGHTNESS

Press a directional arrow button to increase or decrease touch screen panel brightness.

#### b. LANGUAGE

Press the LANGUAGE button to open the language selection screen. Pressing a flag button changes the display language to the prevailing language of that country.

#### c. Operator Menu

There are five Operator Menu buttons: CONTROL, ADJUST, REPAIR, EVALUATE, and TECHNICIAN. Pressing an Operator Menu button displays the corresponding screen.

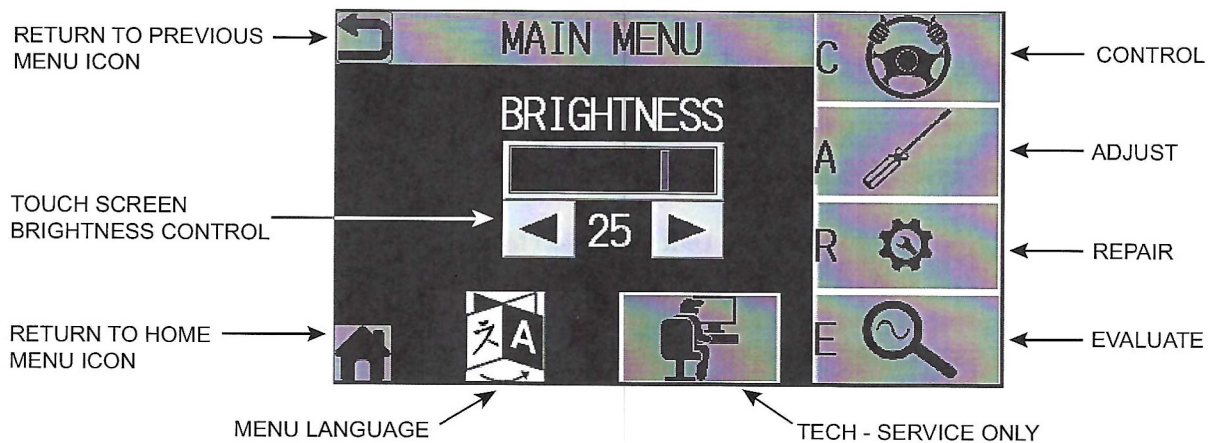
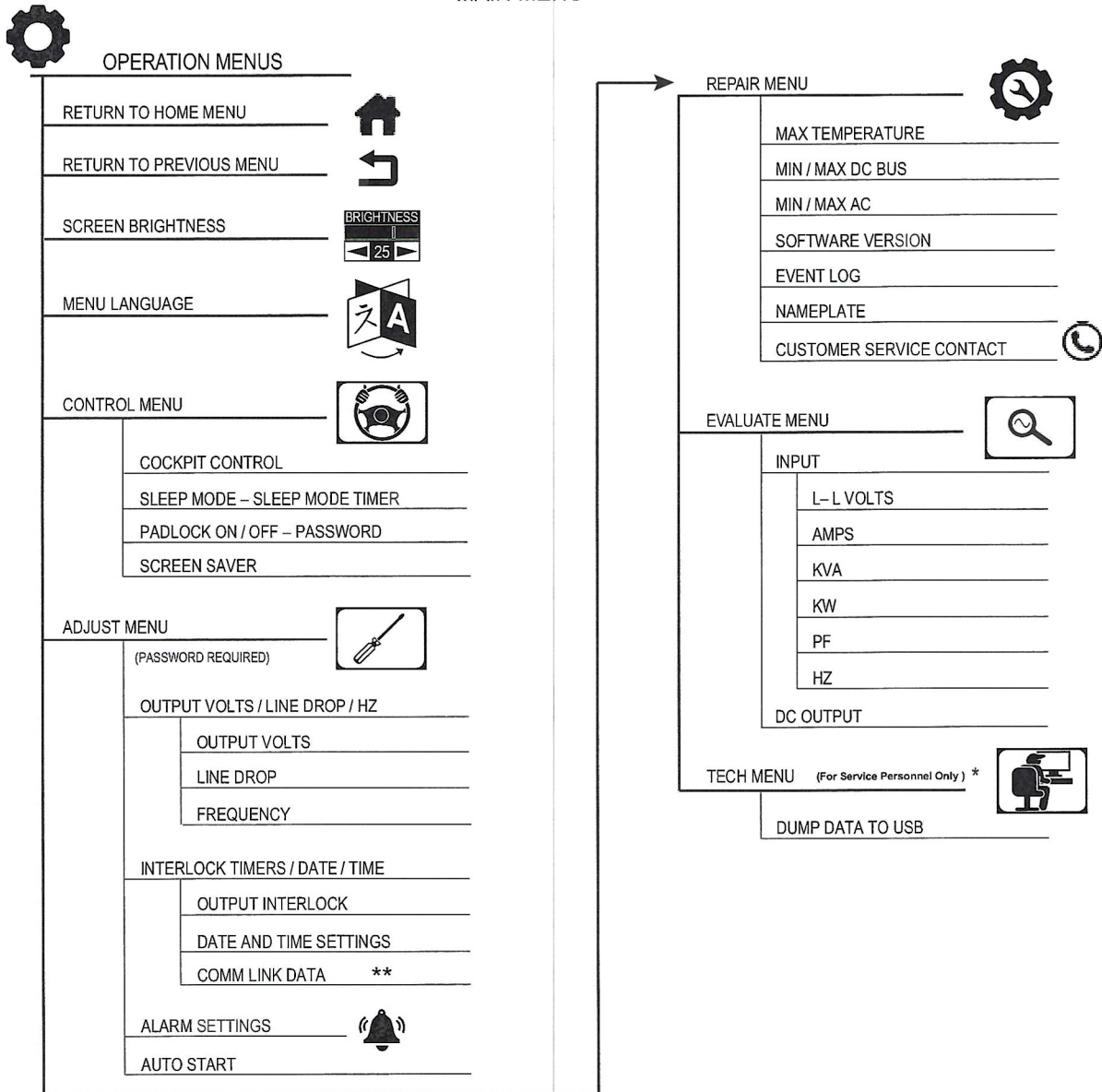


Figure 12. Operation Menu

## MAIN MENU



\*\* FEATURE NOT ACTIVE IN THIS UNIT CONFIGURATION

Figure 13. Unit Operation Menu Tree



## 3) CONTROL Screen

### a. Password Padlock

Allows setting of a password to be entered before the machine can be used.

- The default password is **42**, and can be changed to any number, from one to four digits. For unit password refer to "CONTROL Screen" on page 33.

**NOTE:** If a set password has been lost or forgotten, contact the factory at 1-800-427-1279 or 1-214-340-8600 with the unit serial number for assistance.

### b. COCKPIT CONTROL **IMPORTANT: Not active in this configuration.**

Switches unit output operation mode between LOCAL and COCKPIT modes. When pressed, the COCKPIT CONTROL 1 button will turn from red to green and output control will be switched to the aircraft cockpit.

- By default, output will initialize in LOCAL mode (appears in the Operation Bar immediately below the output ON/OFF button).

#### **LOCAL Mode Operation:**

In LOCAL (manual) mode, connect output power cable to the aircraft (load). Press the OUTPUT ON/OFF button. The output contactor will close, the output button turns green, and LOCAL appears in the Operations Bar below that ON/OFF button. (*Figure 10*)

Output power is controlled from the touch screen panel.

#### **COCKPIT Mode Operation:**

In COCKPIT (remote) mode, connect output power cable to the aircraft (load). Press the COCKPIT CONTROL button on the CONTROL screen. The output contactor will close, the output button turns green, and COCKPIT appears in the Operations Bar below that ON/OFF button. (*Figure 10*)

Operation of the output power is now controlled from the aircraft cockpit.

### c. SLEEP MODE

Once turned ON, automatically detects the opening of the output contactor(s) and starts the timer. If the timer reaches zero and the output contactor has not changed state, unit will remove power to all but a few necessary circuits to keep external communications active.

Pressing the SLEEP button toggles the sleep mode ON and OFF. When OFF, the selection is red, when ON it is green.

To set sleep mode time press the button adjacent to sleep mode indicator. A numeric keypad will display to enter the timer length from 5 to 60 minutes.

**IMPORTANT:** When activated, the unit must first be turned ON before it is able to provide output power again.

### d. DC CURRENT LIMIT

Allows adjustment of the DC output current limit from 150A to the full rated output current for this unit. Refer to "DC Output Power Specifications and Capabilities" on page 13 for upper limit.

By selecting the CURRENT LIMIT box a keypad will be displayed to enter the desired DC current limit value. Press ENTER to accept the entry.

---

e. **SCREEN SAVER**

Allows setting of the inactivity timer. When the inactivity timer reaches the timer limit, the screen saver is activated.

When the Password Padlock is active, the unit password is required for accessing the user interface. The display reopens to the HOME screen.

The range of values for the screen saver timer ranges from 30 to 9999 seconds.

4) **ADJUST Screen**

This screen is password protected, with a default password of **42**. Press the ADJUST button and enter the password for access. Once the password is entered the ADJUST screen will be accessible for 5 minutes or until power is cycled.

a. **Output Volts and Line Drop**

**Output Voltage Adjust**

Allows adjustment of the output voltage by  $\pm 15\%$  of the nominal output voltage.

Use the Output 1 adjustment function to make all adjusts to the output voltage.

**Line Drop Adjust**

Allows adjustment of the output voltage by  $\pm 10\%$  of the nominal output voltage as measured at the end of the output cable.

b. **Interlock Timers, Date, and Time**

**Output Interlock Timer**

**IMPORTANT: Not active in this unit configuration.**

Works in conjunction with both LOCAL and COCKPIT control modes, and serves as an operator safety measure when applying power to an aircraft.

Allows adjustments to the time, in seconds, the unit monitors the output cable for the return of an interlock signal from the aircraft. The selectable range is 5 to 60 seconds.

- When the safety interlock signal **is** returned from the aircraft (load) to the unit within the selected number of seconds, the contactor will use this signal to latch the output contactor closed.
- When the safety interlock signal **is not** returned within the selected number of seconds, the output contactor drops out to disconnect the load. An output interlock warning displays on the screen and remains until the CLEAR button is pressed.

**Sleep Mode Timer**

Allows adjustments to the time, in minutes, unit will activate Sleep mode. The selectable range is 5 to 60 minutes.

If the timer reaches zero and the output contactor has not changed state, unit will remove power to all but a few necessary circuits to keep external communications active.

**IMPORTANT:** When activated, unit must first be turned ON before it is able to provide output power again.

**Date and Time Settings**

Allows adjustment of current local time and date values. Unit uses a 24-hour clock format, UTC/GMT time zone (Coordinated Universal Time/Greenwich Mean Time), and a Day, Month, Year (DD, MM, YYYY) date format.

**Comm Data Link**

**IMPORTANT: Not active in this unit configuration.**

When the unit is equipped with the Gateway option, COMM DATA is enabled. Users may send TCP/IP commands to the unit.

**c. Alarm Settings**

Access Alarm Settings by selecting the bell icon in the Adjust Menu title bar.

This function allows the operator to select the desired audible alarm configuration. The selected alarm will be highlighted green, all others will be highlighted red:

**No Alarm**—Unit does not annunciate an occurring alarm event, however, the event is recorded in the unit Event Log. Selecting this setting causes a No Alarm icon to appear in the upper left corner of the Home screen, to provide a persistent visual cue to the unit operator.

**Warning**—Unit annunciates Warning alarm events, only.

**Fault**—Unit annunciates Fault alarm events, only.

**Alarm Both**—Unit annunciates both Warning and Fault alarm events.

This function allows the operator to select the desired audible alarm configuration. The selected alarm displays green, all others will display red.

**d. Alarm Operation: SILENCE and CLEAR**

When a FAULT condition is detected by the system an error will display on the touch screen. The operator will have an option of selecting Silence followed by an option to Clear the display.

Selecting SILENCE .....causes the horn to no longer sound and Clear to be displayed.

Selecting CLEAR.....allows the alarm to be re-issued, and the horn to sound again if the same issue re-occurs

**IMPORTANT** : An Alarm should never be silenced without also being cleared.

**e. Auto Start**

This option allows the unit to automatically restart when input power has been interrupted. When the input power is restored to within normal operating limits, the unit will automatically restart.

When Auto Start is selected, the icon is highlighted green and reads AUTO START ON.

*Output Interlock Adjust*                      **IMPORTANT: Not active in this unit configuration.**

Allows adjustment of the time, in seconds, unit will wait for the interlock signal to be returned. The acceptable range is 5 to 60 seconds.

**Date and Time Settings**

Allows entry of current local time and date values. The unit uses a 24-hour clock format, UTC/ GMT time zone (Coordinated Universal Time/Greenwich Mean Time), with the date presented in Day, Month, Year (DD, MM, YYYY) format.

***Comm Data Link***                                      **IMPORTANT: Not active in this unit configuration.**

When the unit is equipped with the Gateway option, the MODBUS link is enabled. Users may execute TCP/IP commands to the unit through the MODBUS link.

## 5) **REPAIR Screen**

Allows adjustment of various parameter alarm thresholds and current readings to assist in understanding specific unit operational values.

**NOTE:** Access to service contact information for Unitron, LP is provided by pressing the TELEPHONE button in the menu title bar.

### a. **Max Temperature**

Access to view the alarm threshold for unit heat sink temperature, as read from unit sensor(s).

### b. **Min/Max AC/DC**

Access to view the alarm threshold for voltage, as read from the input and output signals. Maximum current only applies to the unit input.

### c. **Min/Max DC Bus**

Access to view the alarm thresholds for voltage, as read from unit DC Link. Threshold limits typically range from 600 to 800 VDC.

### d. **Software Versions**

Access to retrieve currently loaded software versions for the unit and its touch screen panel.

### e. **Event Log**

Access to retrieve recorded unit alarms and events, used for diagnostic purposes.

### f. **Nameplate Date**

Access to retrieve unit configuration data.

## 6) **EVALUATE Screen**

Displays the current input operating values, used to assist in understanding the unit operational status.

### a. **Input**

Displays the following input power parameters.

- Line-to-Line electrical potential in volts (V)
- Current in amperes (A)
- Apparent power in kilovolt-ampere (kVA)
- Power in kilowatts (kW)
- Power Factor (PF)
- Frequency in hertz (Hz)

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## 7) Tech Menu – *For Service Support Only*

- a. Dump Data to USB

### D. DATA PORT USAGE

Unit is equipped with an external USB connection, used for maintenance purposes only.

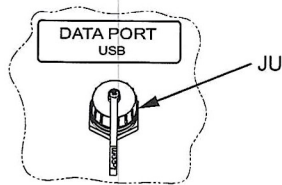


Figure 14. Data Port –External USB Connection

# Unitron, LP

MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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## CHAPTER 3 - MAINTENANCE

### A. COMPLEMENTING SERVICES

Unitron considers proper upkeep and maintenance of the unit to be the best insurance against unscheduled downtime. Therefore, Maintenance Training Courses are offered on an individual basis.

To ensure our customers derive maximum benefit from their unit, Unitron offers a variety of training classes tailored to specific interests and requirements. Maintenance classes can be presented at either the Unitron factory or the customer site. Contact Unitron Customer Service Department to discuss what technical capability and field test equipment would be necessary for field repair of the unit.

### B. SERVICING

This chapter provides information for providing maintenance to the unit.

**IMPORTANT:** This information is provided for qualified equipment maintenance personnel only.



**DANGER - ELECTRIC SHOCK HAZARD: LETHAL LEVELS OF VOLTAGE ARE PRESENT IN UNIT. ONLY QUALIFIED EQUIPMENT MAINTENANCE PERSONNEL WHO HAVE READ, UNDERSTAND, AND FOLLOW THESE INSTRUCTIONS SHOULD PERFORM UNIT INSTALLATION, MAINTENANCE, OR SERVICE.**



**DANGER - ELECTRIC SHOCK HAZARD: HAZARDOUS VOLTAGES ARE PRESENT IN THE UNIT. DO NOT ATTEMPT TO ACCESS UNIT INTERIOR WHILE POWER IS APPLIED.**



**WARNING - EYE INJURY HAZARD: WEAR EYE PROTECTION WHEN BLOWING AIR INTO THE UNIT TO CLEAN AWAY DUST AND DEBRIS.**

#### 1) **Metal Oxide Varistor Protection**

The unit is designed with Metal Oxide Varistor (MOV) protection across the input fuses to protect the unit from input voltage spikes, *see "Input/Output Panel Assembly - A1" on page 52*. As these MOV devices experience voltage spikes they will over time degrade and should be replaced periodically to insure continued input surge protection to the unit. This is especially recommended if the unit is located outside in a high lightning area.

#### 2) **Scheduled Maintenance - Before Each Use**

##### **PROCEDURE**

1. Turn OFF input power at the circuit breaker or disconnect switch to remove power to the unit.
2. Visually inspect the unit for damage. Do not use until all damage is repaired.
3. Inspect and secure all loose parts and access doors.
4. Use low pressure air to blow out accumulated dust and debris within the unit.

**PROCEDURE COMPLETED**

### 3) Scheduled Maintenance - Semiannual

#### PROCEDURE

1. Apply input power to unit, refer to "Startup" on page 28.
2. Test the output voltage and frequency with certified equipment. Output should be within the range specified in the specification chart for the unit. Refer to "DC Output Power Specifications and Capabilities" on page 13.
3. Inspect both (2) air intake filters, one (1) per side, and replace as required. Refer to "Air Filter Replacement" on page 40.
4. Disconnect the output power cable from the load.
5. Turn OFF (open) the external input power circuit breaker or disconnect switch.
6. Disconnect the input power cable from the external power source.
7. Stow the cables when the unit is not in use.

PROCEDURE COMPLETED

### 4) Scheduled Maintenance - Annual

#### PROCEDURE

1. Turn OFF input power at the circuit breaker or disconnect switch box.
2. Inspect unit for damage. If damage is found, do not use unit until all damage is repaired.
3. Inspect all internal terminal block wiring connections and tighten as necessary.

PROCEDURE COMPLETED

### 5) Air Filter Replacement

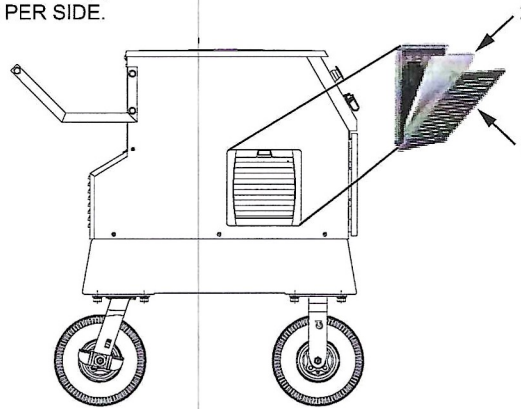
#### PROCEDURE

1. Locate filter location shown in Figure 15; there are a total of 2 filters, 1 filter on each side.  
**IMPORTANT:** Filter mat should only be replaced with Hammond filter mat part no. PF30000.
2. Grasp the upper edge of the louvered filter outside cover (1) and pull outward to expose the filter mat (2).
3. Remove the used filter mat and discard.
4. Replace with a new filter mat; ensure the filter is installed in the proper position.
5. Push the louvered filter outside cover back into position until it snaps closed.

PROCEDURE COMPLETED



\*REPLACE BOTH (2) FILTERS,  
ONE (1) PER SIDE.



**LEFT SIDE VIEW**

**Figure 15. Air Filter Replacement**

## **C. TROUBLESHOOTING**

This section provides information for troubleshooting the unit.

This information is provided for qualified equipment maintenance personnel only.



**DANGER - ELECTRIC SHOCK HAZARD: LETHAL LEVELS OF VOLTAGE ARE PRESENT IN UNIT. ONLY QUALIFIED EQUIPMENT MAINTENANCE PERSONNEL WHO HAVE READ, UNDERSTAND, AND FOLLOW THESE INSTRUCTIONS SHOULD PERFORM UNIT INSTALLATION, MAINTENANCE, OR SERVICE.**



**DANGER - ELECTRIC SHOCK HAZARD: HAZARDOUS VOLTAGES ARE PRESENT IN UNIT. DO NOT ATTEMPT TO ACCESS UNIT INTERIOR WHILE POWER IS APPLIED.**

### **1) Troubleshooting Steps**

**The first step in troubleshooting the unit is to recognize hazards are present from lethal levels of high voltage in unit. Caution should be used during all troubleshooting steps.**

Steps to identify a fault condition include a visual inspection of the indicators on the front panel. Fault indicators on the front panel are used to indicate if a fault is associated with an internal failure in the unit or an external condition, such as input voltage or output load, for example.

Due to the variety of faults, the front panel indicators cannot identify every possible condition which may trigger a fault condition. However, the front panel is the best starting point for troubleshooting the unit.

## 2) Viewing Event Log

The Event Log contains a record of system operations (events, commands, warnings, and faults), and is accessed from the Repair menu. The latest alarm condition will scroll across the display panel.

Follow this procedure to access the Alarm screen and review current and previous alarms or events.

### PROCEDURE

1. Press the gear icon to open the operator Main menu.
2. Select the Repair icon.
3. From the Repair menu, select Event Log. The Alarm screen opens.
4. View the Event Log on the Alarm screen. Refer to *Figure 16* and *Figure 17*.

### PROCEDURE COMPLETED

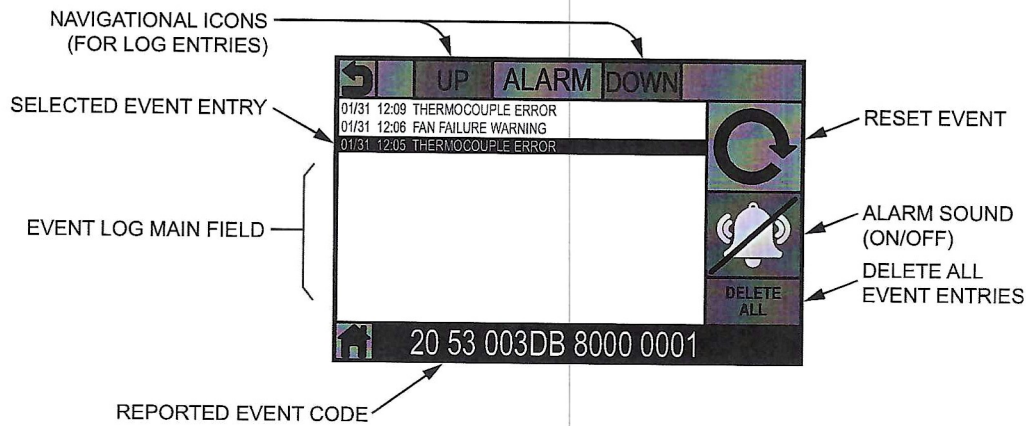


Figure 16. Event Log Screen

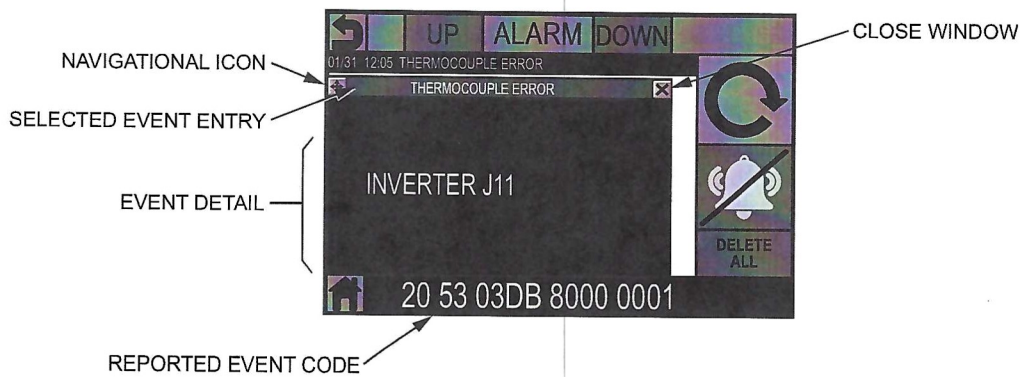


Figure 17. Event Detail

### 3) Managing and Reading Event Log

When an event or alarm occurs, an entry is made in the Event Log. The Event Log is accessed from the Repair menu, and viewed on the Alarm screen. For the purpose of viewing and managing the Event Log, the Alarm Silence and Alarm Clear icons may be ignored.

The Event Log entries, recorded as line items in the main field, may be managed using the Navigational icons, located below the main field.

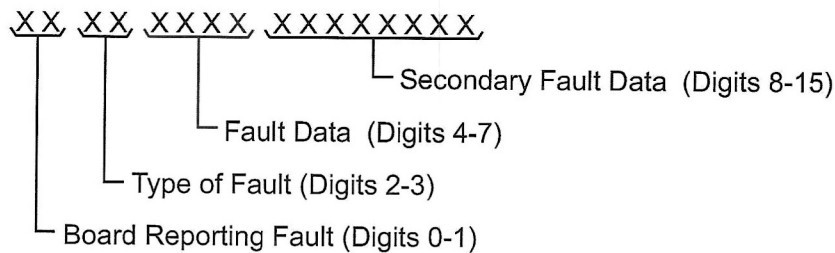
The selected event entry shows the following information:

- Date of the event
- Time of the event
- Event description

### 4) Understanding Event Code

The reported event code for a selected Event Log entry is displayed at the bottom of the Alarm screen as a 16-digit hexadecimal number (0-9, A-F).

The code, shown at the bottom of the Alarm screen, is structured as:



Of particular interest is the location of the reported fault. Designations of the board reporting the fault (Digits 0-1) are:

- 00 ..... Reserved/Internal
- 10 ..... System Board
- 20 ..... Inverter Board
- 30 ..... Converter / Rectifier #1 Board
- 40 ..... Converter / Rectifier #2 Board
- 90 ..... Display Board
- A0 ..... Remote Control
- B0 ..... Ethernet
- C0 ..... Modbus

The following is the interpretation of a reported Event Code.

**EXAMPLE:** Reviewing the Event Code – 30DC 03DE 00F40000

- Digits 0-1 ..... 30 = Converter / Rectifier #1 Board
- Digits 2-3 ..... DC = DC Link Fault
- Digits 4-7 ..... 03DE = Reports a voltage in base 10 of 990 V
- Digits 8-15 ..... 00F40000 = Reports the average volts in base 10 as 244 V

# Unitron, LP

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MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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## CHAPTER 4 - ILLUSTRATED PARTS BREAKDOWN

This chapter contains illustrated parts breakdowns for the unit, along with the manufacturer information.

This information is provided for qualified equipment maintenance personnel only.

### A. INTRODUCTION

The illustrated parts breakdown is provided for ordering replacement parts for repair of the unit. This parts list covers the unit and model number defined by the description listed on the top of this page.

### B. MANUFACTURER IDENTIFICATION

Manufacturers are identified by the Commercial And Government Entity (CAGE) code, formerly known as the Federal Supply Code for Manufacturers (FSCM) number. The following listings provide the code, name, and address of component manufacturers for this unit.

#### 1. Primary Manufacturer of This Ground Power Unit

Table 1: Primary Manufacturer

CAGE CODE	NAME	ADDRESS
3BC99	Unitron, LP	10925 Miller Rd. Dallas, TX 75238

#### 2. Manufacturers with CAGE Code

Table 2: Manufacturers with CAGE Code

CAGE CODE	NAME	ADDRESS
3CYE8	ABB Inc.	1206 Hatton Rd. Wichita Falls, TX 76302
0WBJ2	Allstar Magnetics	6205 NE 63rd St Vancouver, WA 98661
021P3	Ametherm Inc.	3111 N. Deer Run Rd., Suite 4 Carson City, NV 89701
56493	Bell Floyd Associates Inc.	720 Dearborn Park Ln. Columbus, OH 43085-5703
1UW16	Cooper Bussmann, Inc.	1830 Howard St., Suite C Elk Grove Village, IL 60007-2481
14655	Cornell-Dubilier Electronics	1605 E. Rodney French Rd. New Bedford, MA 02744
1DAT2	Cosel USA Inc.	3283 Scott Blvd. Santa Clara, CA 95054
7R7U8	Durable USA/Superior Casters Inc.	2801 E. Abram St. Arlington, TX 76010

Table 2: Manufacturers with CAGE Code

CAGE CODE	NAME	ADDRESS
62292	EBM Inc.	100 Hyde Rd. Farmington, CT 06034
03030	Empro Manufacturing Co., Inc.	10620 E. 59th St. Indianapolis, IN 46226
21574	Ferraz Shawnut Co.	88 Horner Ave., Toronto Ontario, Canada M8Z 5Y3
1MPP4	Hammond Manufacturing Co.	475 Cayuga Rd. Cheektowaga, NY 14225
91929	Honeywell	315 E. Stephenson St. Freeport, IL 61032-4353
SHX73	IDEC	7-31 NISHI-MIYAHARA 1-CHOME YODOGAWA-KU 532-8550 Japan
74829	ILSCO Corp.	4730 Madison Rd. Cincinnati, OH 45227-1426
57027	International Resistive	4222 South Staples St. Corpus Christi TX 78411
1VEL5	Knight Electronics	10557 Metric Dr. Dallas, TX 75243-5514
43321	L-COM	45 Beechwood Dr. N. Andover, MA 01845
90201	Mallory Capacitor Co.	4760 Kentucky Ave. Indianapolis, IN 46206
532A1	Mean Well USA, Inc.	44030 Fremont Blvd. Fremont, CA 94538-6042
60991	Microchip Technology Inc.	2355 W. Chandler Blvd. Chandler, AZ 85224-6199
27264	Molex Inc.	1500 Hancel Parkway Mooresville, IN 46158
63426	NKK Switches of America Inc.	7850 E. Gelding Dr. Scottsdale, AZ 85260
44655	Ohmite Manufacturing Co.	1600 Golf Rd., Suite 850 Rolling Meadows, IL 60008
5Y407	Phoenix Contact, Inc.	586 Fulling mill Rd. Middletown, PA 17057
1NT30	Semikron Inc.	11 Executive Drive Hudson, NH 03051

Table 2: Manufacturers with CAGE Code

CAGE CODE	NAME	ADDRESS
77342	Tyco Electronics Corp.	8010 Piedmont Greensboro, NC 27409-9407
7M138	United Chemi-Con Manufacturing Co.	185 McNeil Rd. Lansing, NC 28643
3BC99	Unitron, LP	10925 Miller Rd. Dallas, TX 75238

## C. ILLUSTRATED PARTS BREAKDOWN

A list of part numbers is located following the illustrations. Use the illustration to locate the part to be serviced or replaced. Once the part is identified, the parts lists can be used to locate the part number, description, quantity, and manufacturer CAGE Code.

The following pages provide detailed illustrations of the component parts and their location within the unit.

For ordering information, contact:

Unitron, LP · 10925 Miller Road · Dallas, TX 75238 · 800-527-1279 · Attn: Customer Service

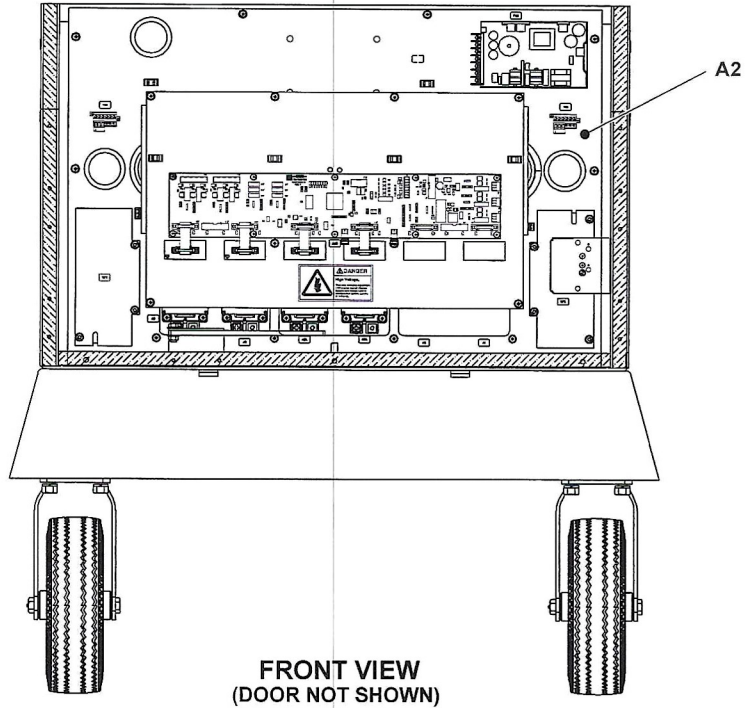
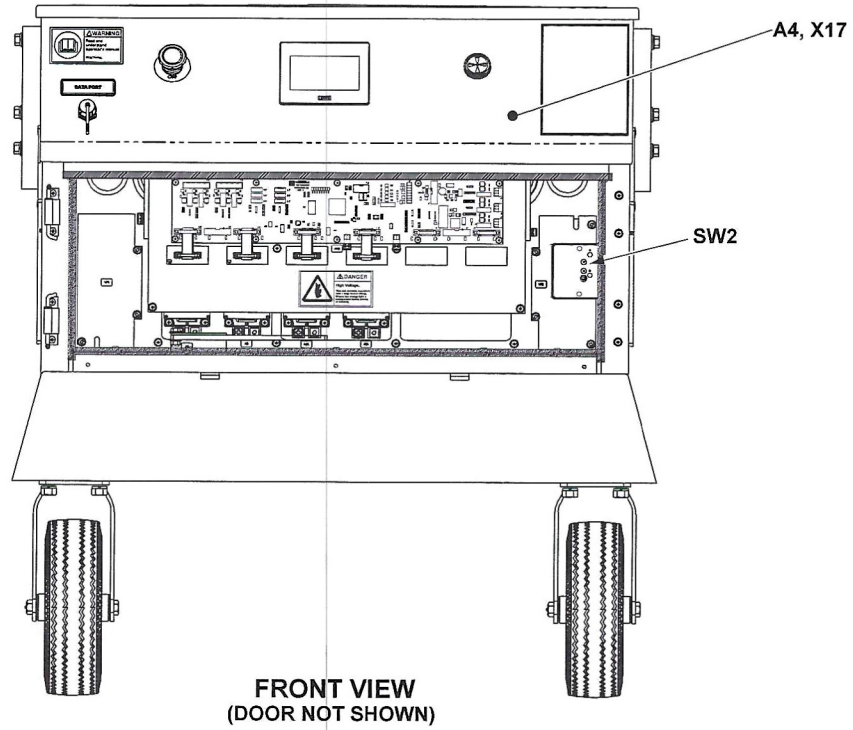
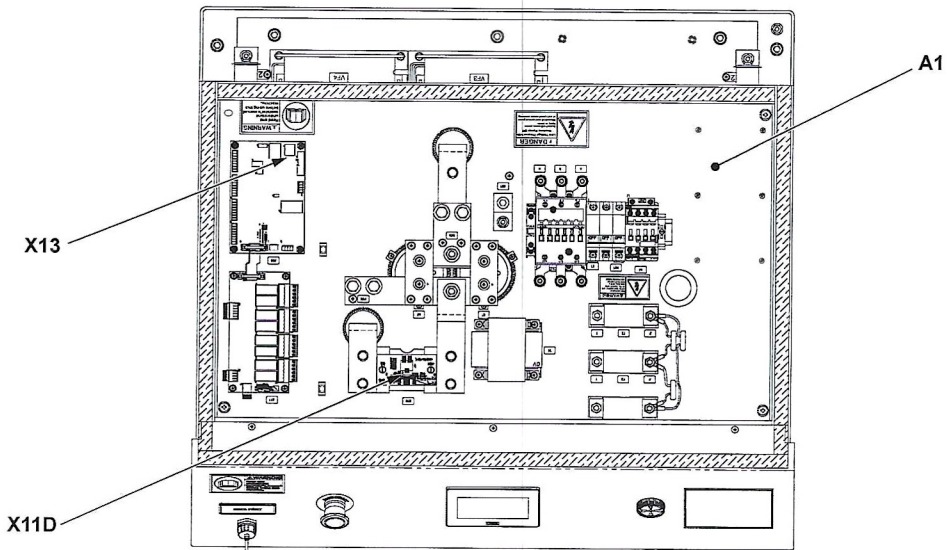
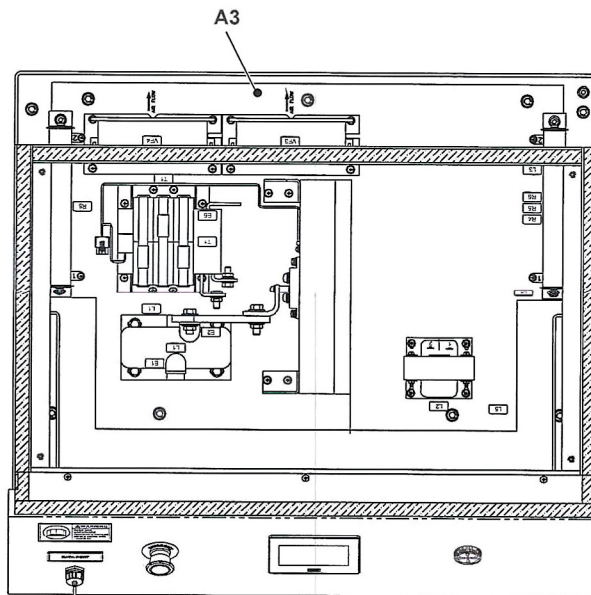


Figure 18. UDC-620M Ground Power Unit, Sheet 1 of 3





TOP VIEW  
(EXTERNAL PANELS NOT SHOWN)



TOP VIEW  
(EXTERNAL PANELS, A1, AND A2 NOT SHOWN)

Figure 18. UDC-620M Ground Power Unit, Sheet 2 of 3

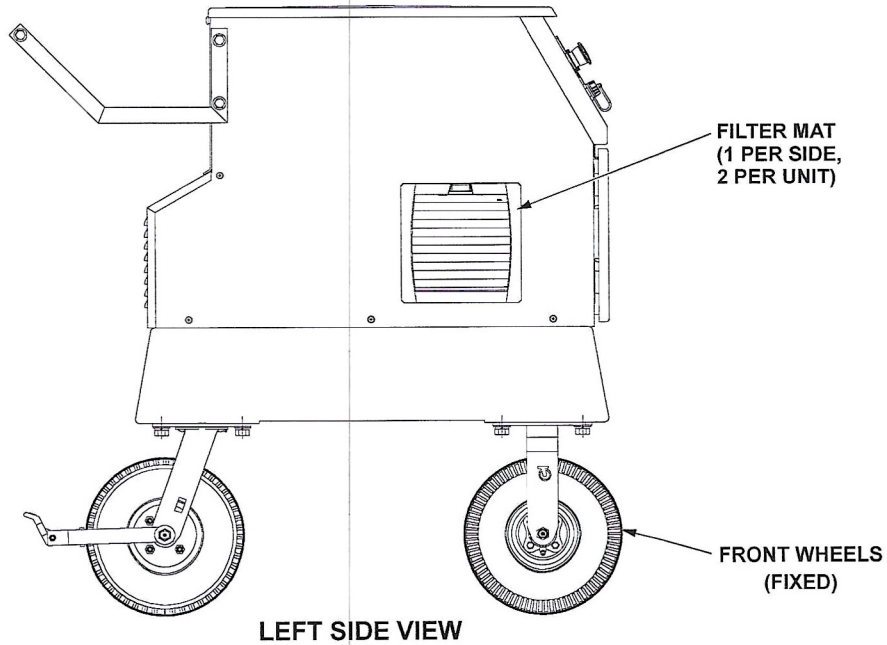
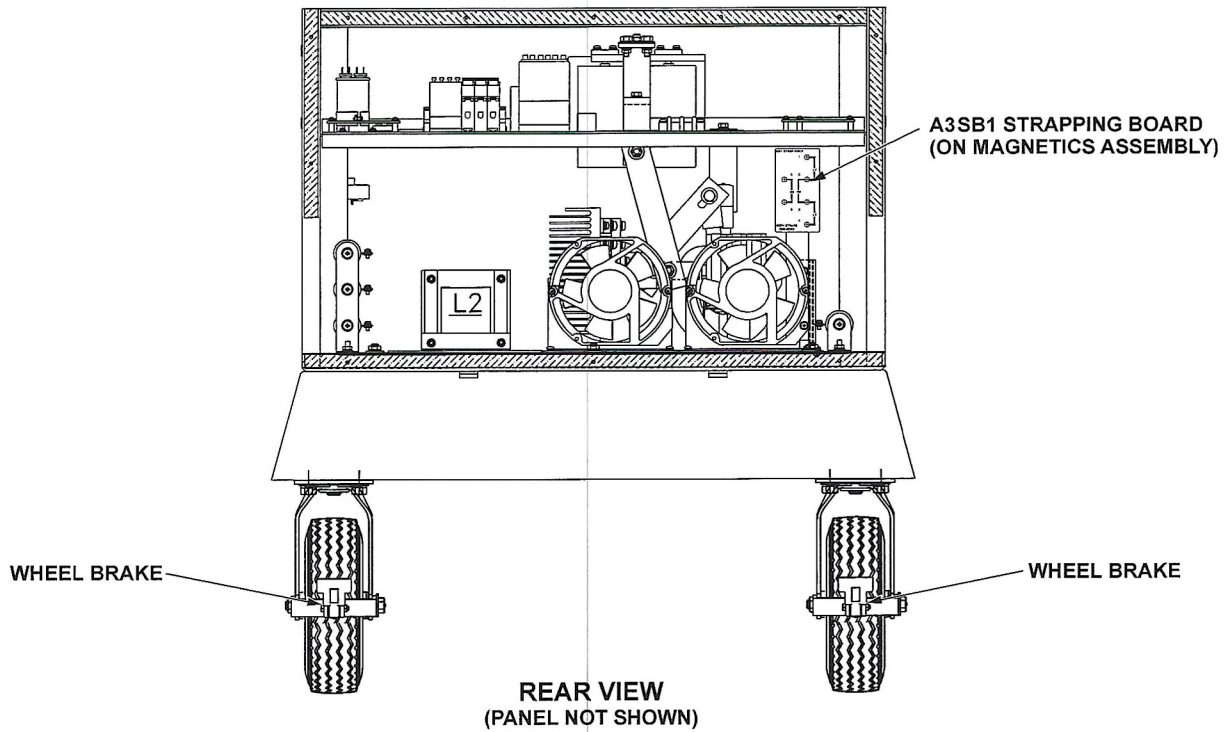
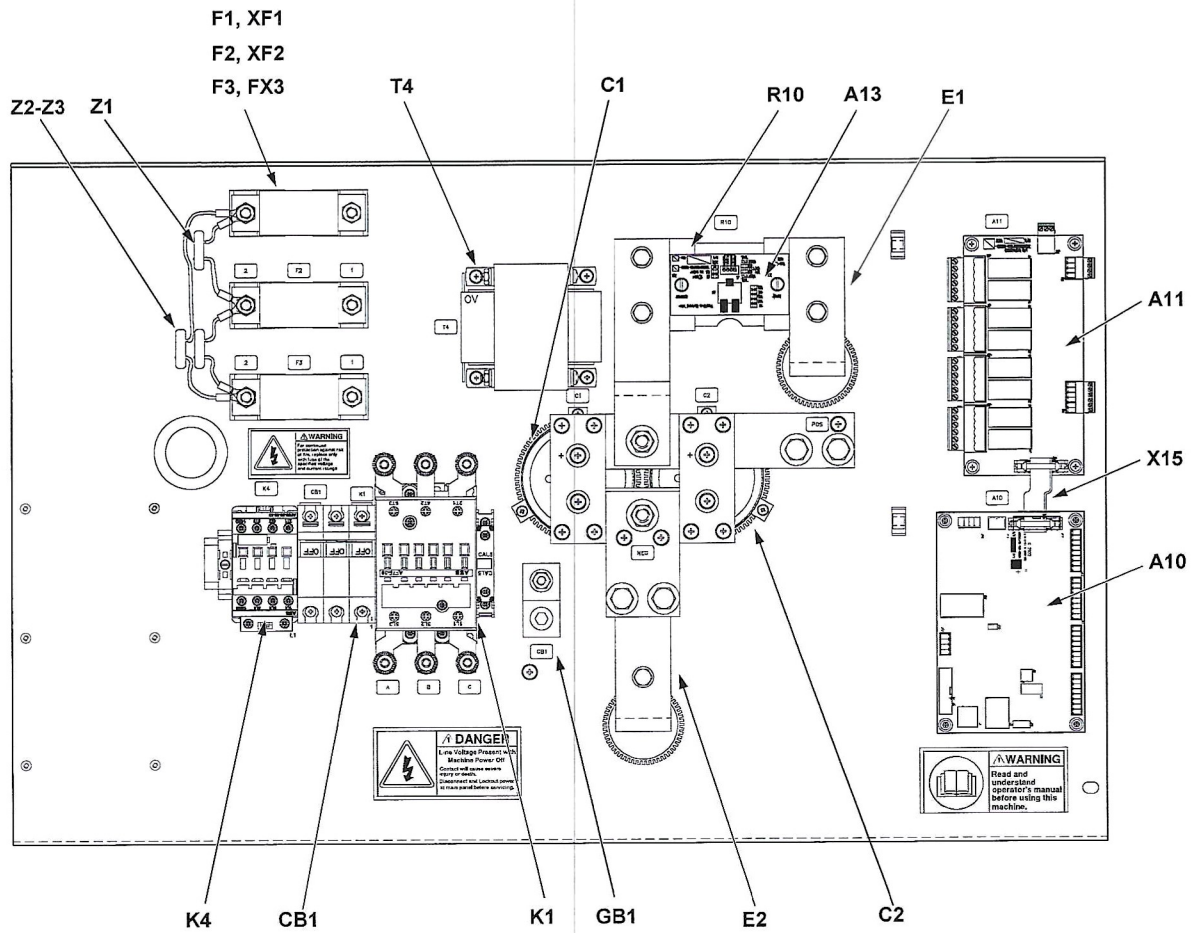


Figure 18. UDC-620M Ground Power Unit, Sheet 3 of 3

# Unitron, LP

MAINTENANCE MANUAL  
 MODEL UDC-620M  
 PART NO. 198-15000-65T  
 DESCRIPTION: Ground Power Unit

Figure/Item	Part Number	Description	Qty.	CAGE Code	Ref. Des.
18	198-15000-65T	UDC-620M, TSP-4, S-2, T-3(MT), ECP-2	REF	3BC99	
1	198-14015-7	. IN/OUT PNL ASSY, UDC, S2, 6P, LV	1	3BC99	A1
2	198-15022-4	. PWR MDL ASSY,600A,UDC,6P (P)	1	3BC99	A2
3	198-15042-3	. MAGNETICS ASSY,UDC,AC FANS, 6P	1	3BC99	A3
4	198-19029-9	. METER PANEL ASSY,TS4,WHT TEX	1	3BC99	A4
5	22AC2	. SWITCH, MS16106-1	1	91929	SW2
6	198-11011-25	. CABLE ASSY, CURRENT TRANSDUCER, 25" L	1	3BC99	X11D
7	198-11014-2	. RIBBON CABLE ASSY, RECTIFIER/INVERTER BUS	1	3BC99	X13
8	E54	. CABLE, USB 3.0, RT ANGLE MALE TO FEMALE, 12"	1	3BC99	X17
9	03-09-1022	. RECEPTACLE, 2-PIN	1	27264	J6
10	03-09-1042	. RECEPTACLE, 4-PIN	1	27264	J7
11	PFA30000BK	. FILTER MAT, IP55, BLACK	2	1MPP4	FILTER MAT
12	68ER10BC5319YY	. CASTER, 10", RIGID, CAREFREE, SILVER RIM	2	3BC99	FRONT WHLS
13	67ER10BCP319FY	. CASTER, 10", CAREFREE, PLNGE BRAKE, LG PLATE	2	3BC99	REAR WHLS



**Figure 19. Input/Output Panel Assembly - A1**

# Unitron, LP

MAINTENANCE MANUAL  
 MODEL UDC-620M  
 PART NO. 198-15000-65T  
 DESCRIPTION: Ground Power Unit

Figure/Item	Part Number	Description	Qty.	CAGE Code	Ref. Des.
19	198-14015-7	IN/OUT PNL ASSY, UDC, S2, 6P	REF	3BC99	A1
1	198-18024-1	. PWA, UFC, SYSTEM CONTROL	1	3BC99	A1A10
2	198-11033-1	. PWA, UFC, I/O EXPANDER	1	3BC99	A1A11
3	198-12039-1	. PWA, DC SHUNT, 1000 A, 28 V, UDC	1	3BC99	A1A13
4	CG333U050X5L	. CAPACITOR, 33k uF, 50 VDC	2	90201	A1C1, A1C2
5	S203-C6	. CIRCUIT BREAKER, 277/480 VAC, 6AAC	1	32353	A1CB1
6	198-12105-1	. BUSBAR, #5, UDC	1	3BC99	A1E1
7	198-12103-1	. BUSBAR, #3, UDC	1	3BC99	A1E2
8	A50QS125-4*	. FUSE, 125 A, 500 VAC, SEMICONDUCTOR	3	21574	A1F1 - A1F3
9	C5268-4	. FUSE BLOCK, ENDS, MODULAR, 1/4-20 X 1"	6	71400	A1XF1 - A1XF3
10	TA250	. LUG, SOLDERLESS	1	74829	A1GB1
11	AF75-30-11-70	. CONTACTOR, 105A, 100-250V COIL	1	3CYE8	A1K1
12	AF09-30-10-13	. CONTACTOR, 3 P, 25A, 100-250VDC, 1 N.O.	1	14655	A1K4
13	B-1000-50	. SHUNT, DC AMMETER	1	03030	A1R10
14	600-12501-00	. AUTOTRANSFORMER, 500 VA, 480V:240V	1	3BC99	A1T4
15	600-12044-00	. RIBBON CABLE ASSY, RECTIFIER PWA LINK	1	3BC99	A1X15
16	198-14298-1	. MOV TRANSIENT, W/1" LEAD	2	3BC99	A1Z2 - A1Z3
17	198-14298-2	. MOV TRANSIENT, W/3" LEAD	1	3BC99	A1Z1

\* FUSES (F1-F3) ARE NOT SUPPLIED WITH INPUT/OUTPUT PANEL ASSEMBLY (198-14015-7).  
 ORDER FUSES SEPARATELY.

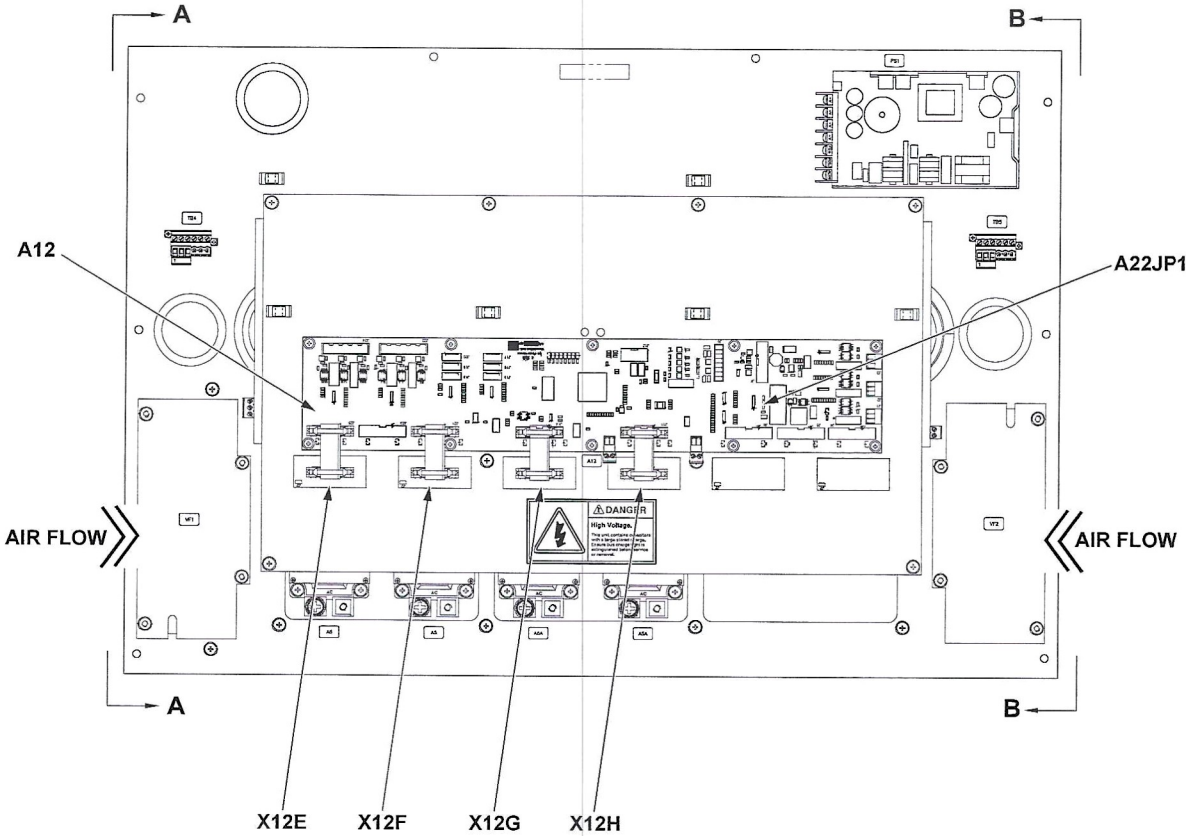


Figure 20. Power Module Assembly – A2, Sheet 1 of 3

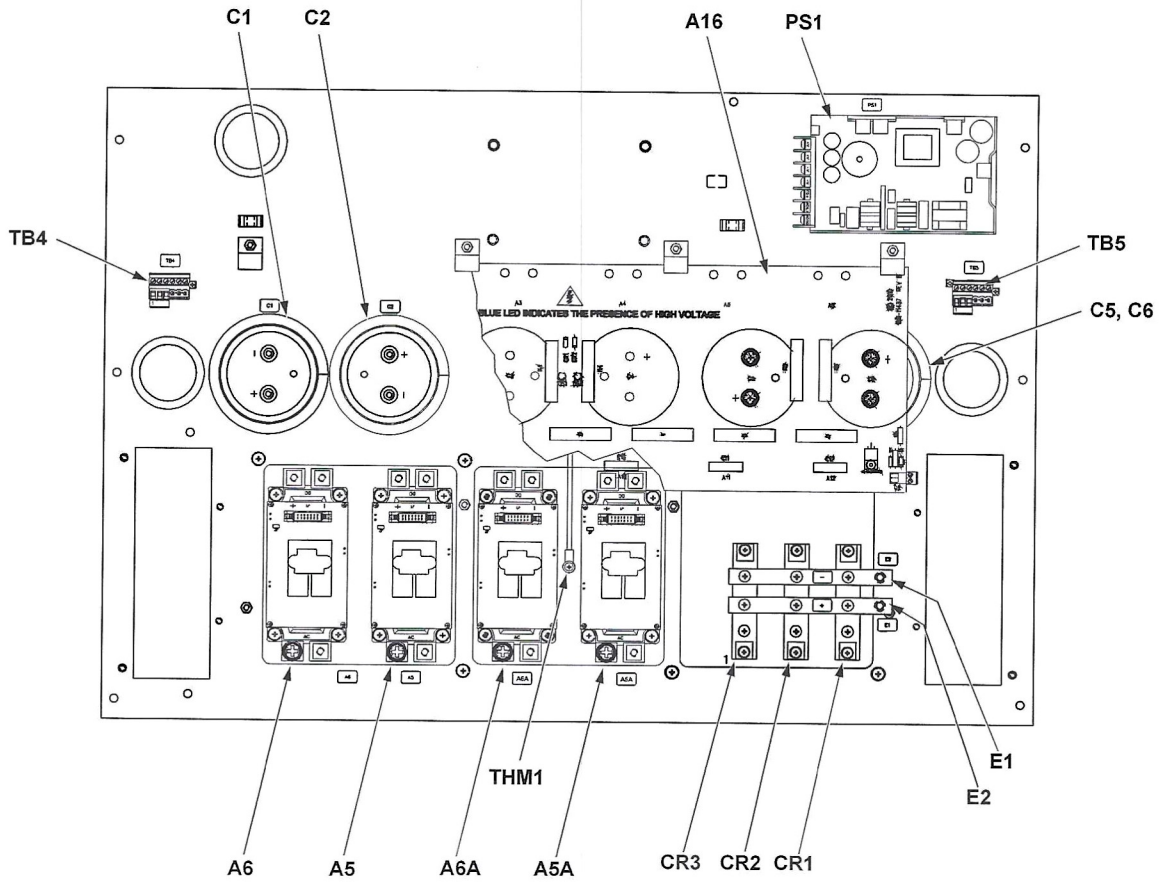
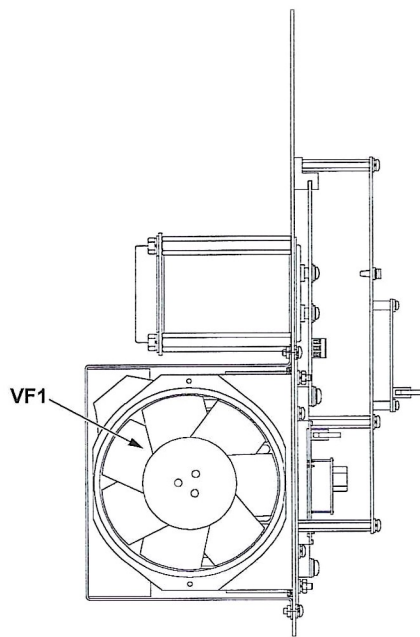
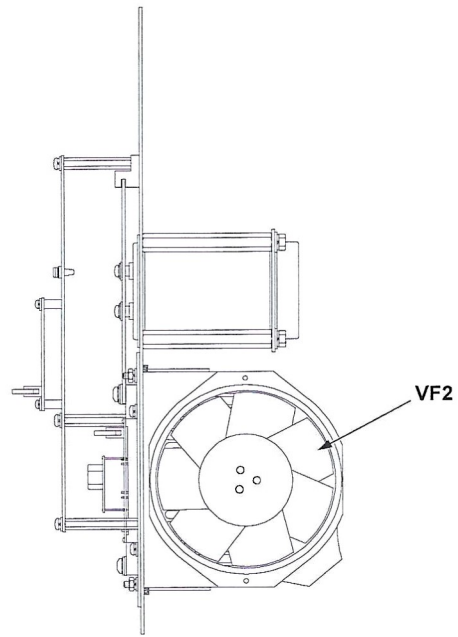


Figure 20. Power Module Assembly – A2, Sheet 2 of 3



SECTION A - A



SECTION B - B

Figure 20. Power Module Assembly – A2, Sheet 3 of 3



# Unitron, LP

MAINTENANCE MANUAL  
 MODEL UDC-620M  
 PART NO. 198-15000-65T  
 DESCRIPTION: Ground Power Unit

Figure/ Item	Part Number	Description	Qty.	CAGE Code	Ref. Des.
20	198-15022-4	POWER MODULE ASSY, 600 A, UDC, 6P, 450 A	REF	3BC99	A2
1	198-16042-2	. IGBT ASSY, 225 A, GEN 7	4	3BC99	A2A5, A2A6 A2A5A, A2A6A
2	198-11032-3	. PWA, UDC, INV/REC CONTROL	1	3BC99	A2A12
3	198-19049-1	. PWA, DC FILTER (45 KVA)	1	3BC99	A2A16
4	1-382811-6	. JUMPER, SHUNT, 2-POSITION, 0.1" PITCH	1	77342	A2A22JP1
5	198-19042-1	. CAPACITOR KIT ASSY, 3300uF, 450 VDC, 3", CORNELL, X4	1	7M138	A2C1, A2C2, A2C5, A2C6
6	SKKD100/16	. MODULE, DUAL DIODE	3	1NT30	CR1-CR3
7	195-85118-1	. BUSBAR, DC RECTIFIER	2	3BC99	A2E1, A2E2
8	PBA100F-24-C	. POWER SUPPLY, 24 VDC, 100 W, w/COATING	1	1DAT2	A2PS1
9	1788570	. HEADER, 5.08 PITCH, PANEL MOUNT, 6-POS.	2	5Y407	A2TB4, A2TB5
10	PANR103395-408	. THERMISTOR, NTC, 10 k OHM, #6 LUG	1	021P3	A2THM1
11	6424H	. FAN, TUBIAL AXIAL, 24 VDC, 282 CFM	1	62292	A2VF1
12	A59-B15A-23T3-000	. FAN, TUBEAXIAL, 230 V, 60 HZ	1	62292	A2VF2
13	198-11012-1	. RIBBON CABLE ASSY, IGBT DRIVE	4	3BC99	A2X12E, A2X12F, A2X12G, A2X12H

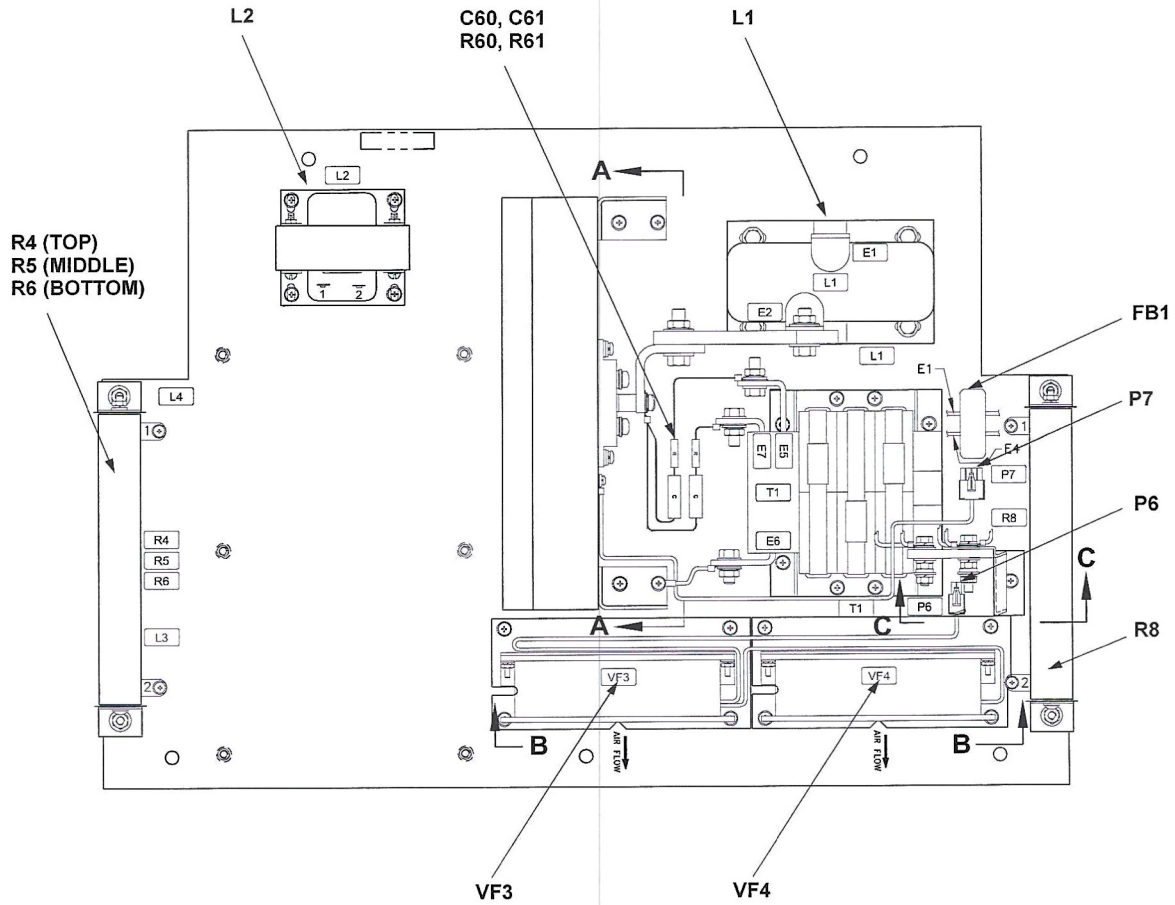
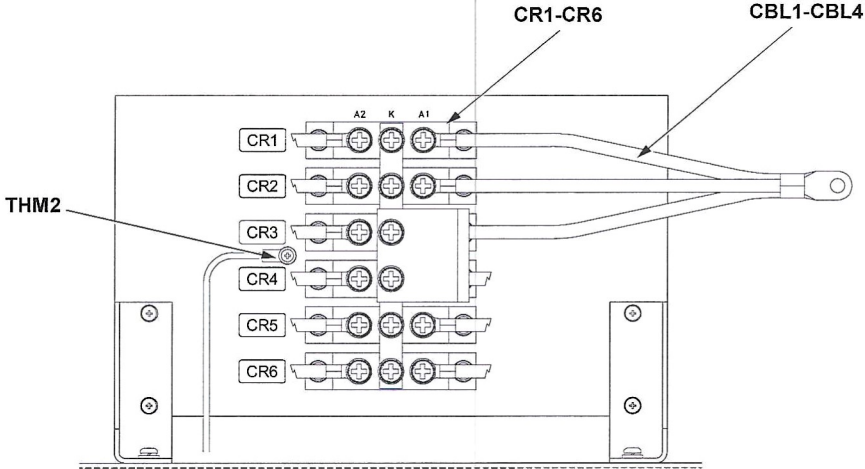
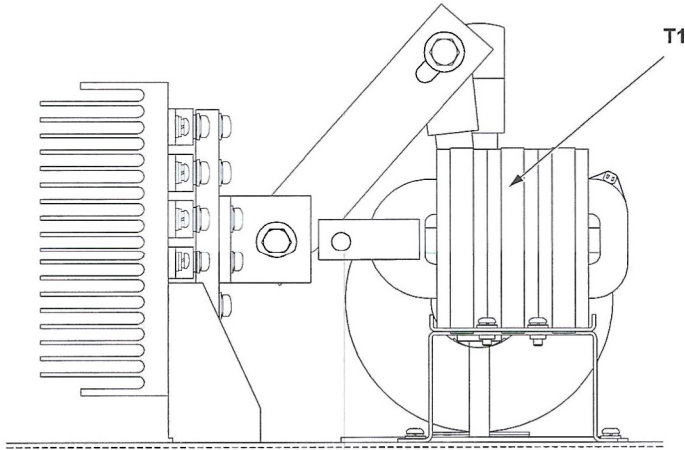


Figure 21. Magnetics Assembly – A3, Sheet 1 of 3



SECTION A - A



SECTION B - B

Figure 21. Magnetics Assembly – A3, Sheet 2 of 3

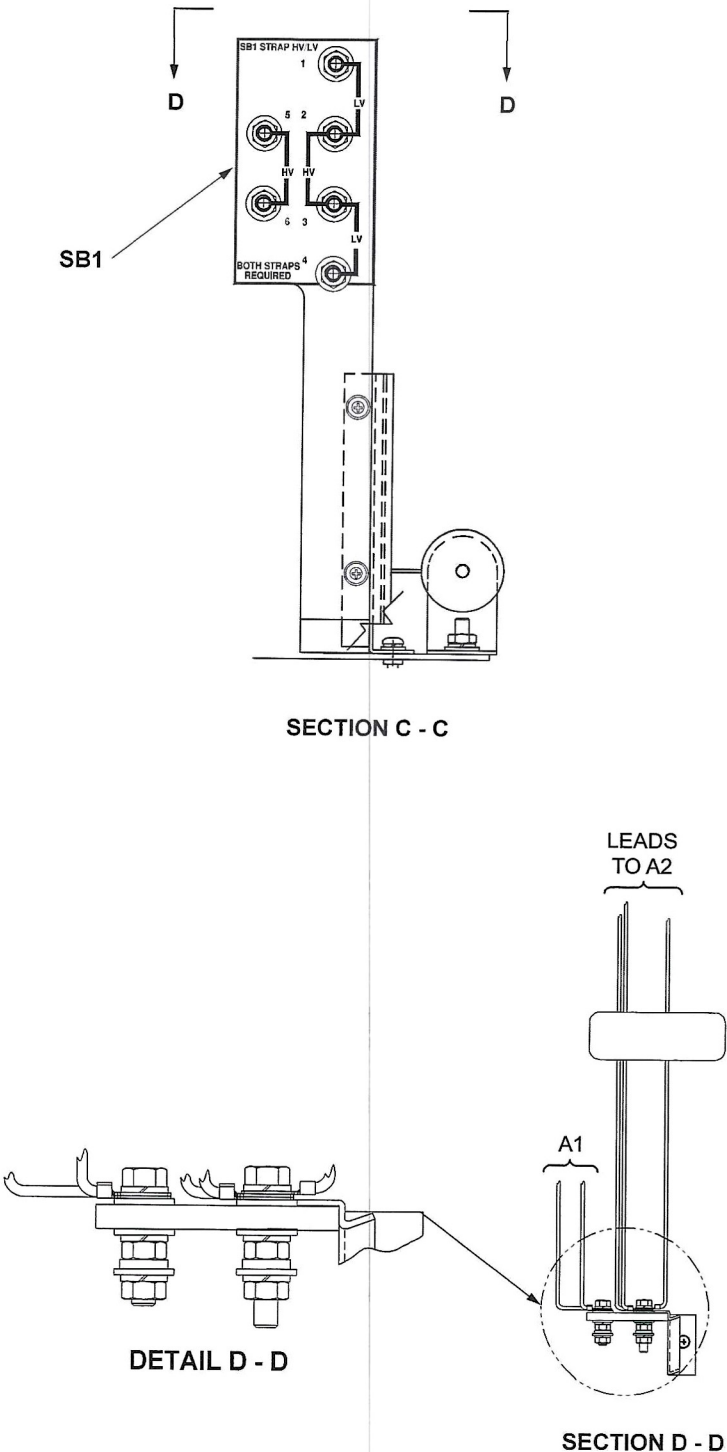


Figure 21. Magnetics Assembly – A3, Sheet 3 of 3

# Unitron, LP

MAINTENANCE MANUAL  
 MODEL UDC-620M  
 PART NO. 198-15000-65T  
 DESCRIPTION: Ground Power Unit

Figure/ Item	Part Number	Description	Qty.	CAGE Code	Ref. Des.
<b>21</b>	<b>198-15042-3</b>	<b>MAGNETICS ASSY, UDC, AC FANS, 6P,</b>	<b>REF</b>	<b>3BC99</b>	<b>A3</b>
1	198-15043-1	. CABLE ASSY, SCHOTTKY DIODES, UDC	4	3BC99	A3CBL1 - A3CBL4
2	942C20S1K-F	. CAPACITOR, 0.01 uF, 2000 VDC	2	14655	A3C60, A3C61
3	BKA400AA10	. BARRIER DIODE MODULE, 400 A, 100 V	6	60991	A3CR1 - A3CR6
4	TX51/32/19-3C90	. FERRITE BEAD	1	0WBJ2	A3FB1
5	198-12511-1	. INDUCTOR, 2.5uH, UDC	1	3BC99	A3L1
6	150-87280-1	. INDUCTOR, DC INPUT, UDC, 35A	1	3BC99	A3L2
7	03-09-2022	. PLUG, 2-PIN	1	27264	A3P6
8	03-09-2042	. CONNECTOR PLUG, 4-PIN	1	27264	A3P7
9	C300K10R	. RESISTOR, 10 OHM, 300 W	3	62292	A3R4 - A3R6
10	L175J10R	. RESISTOR, 10 OHM, 175 W, 10%	1	44655	A3R8
11	942C20S1K-F	. CAPACITOR, 0.01 uF, 2000 VDC	2	14655	A3C60, A3C61
12	198-15122-1	. UDC, T1 STRAP BOARD 1	1	3BC99	A3SB1
13	150-87293-1	. TRANSFORMER, OUTPUT, 28 VDC, 20 kHz, TAPPED 6P	1	3BC99	A3T1
14	PANR103395-408	. THERMISTOR, 10k OHM, #6 LUG	1	021P3	A3THM2
15	A59-B15A-23T3-000	. FAN, TUBEAXIAL, 230 V, 60HZ	2	62292	A3VF3, A3VF4
16	C45-2DC	. FAN CORD, DAISY CHAIN, 2 PLUGS	1	1VEL5	(A3VF3-A3VF4)

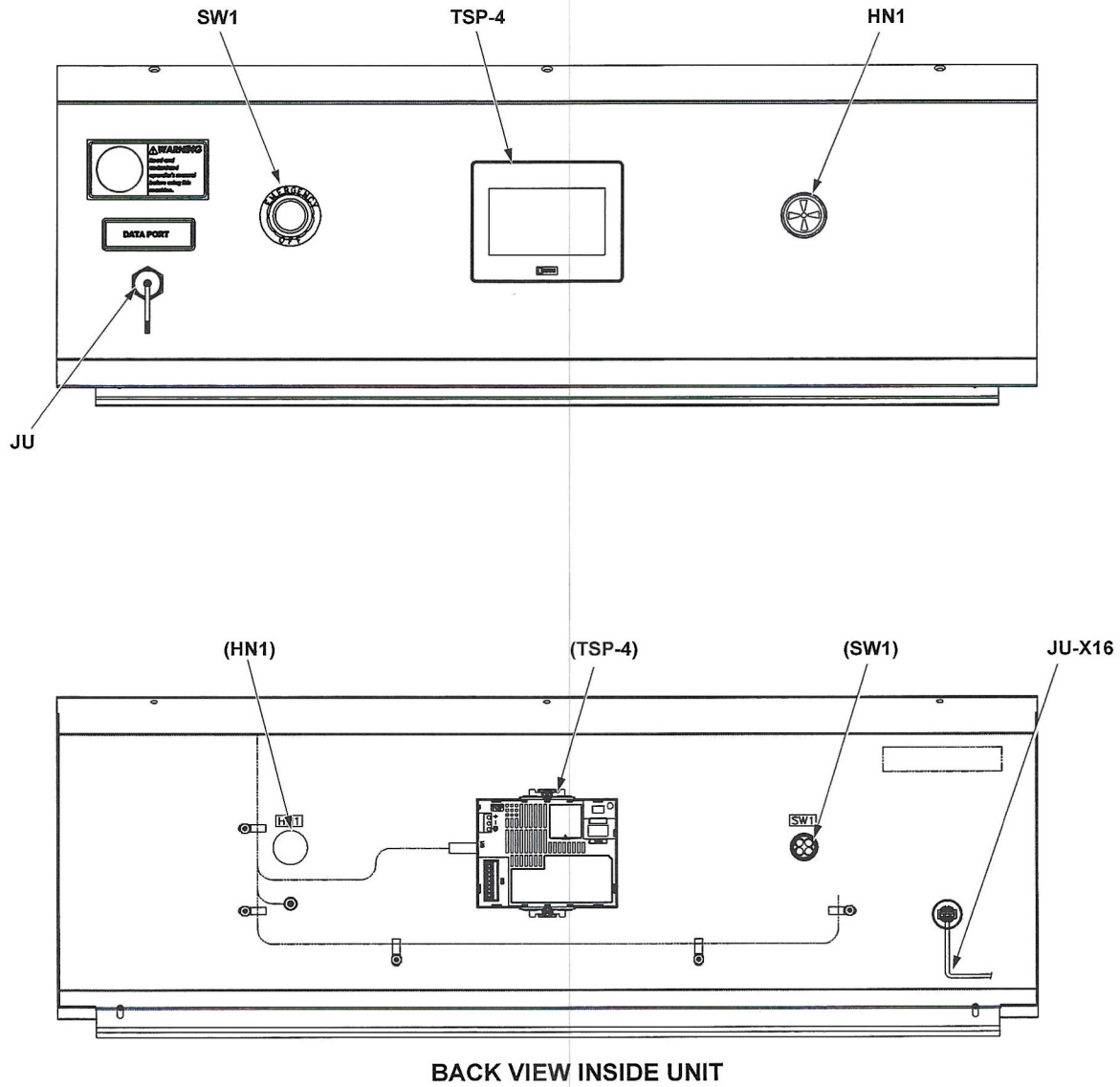


Figure 22. Meter Panel Assembly – A4

# Unitron, LP

MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

Figure/ Item	Part Number	Description	Qty.	CAGE Code	Ref. Des.
22	198-19029-9	METER PANEL ASSY, TS, 4", WHT TEX	REF	3BC99	A4
1	HG1G-4VT22TF-B	. TOUCHSCREEN,4.3,TFT-LCD,BLK BEZEL	1	SHX73	A4TSP-4
2	CE4P-10R-02	. PUSHBUTTON, COMPACT, 40 mm, MUSHROOM	1	32353	A4SW1
3	MW09-550-Q	. AUDIBLE ALARM, 15-50 VAC	1	56493	A4HN1
4	WPUSBAX-2M	. USB CABLE, TYPE A, MALE/FEMALE	1	43321	A4(JU - X16)
5	WPCVR-USB-1394	. WATERPROOF CP FOR USB + IEEE-1394	1	43321	A4JU

# Unitron, LP

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MAINTENANCE MANUAL  
MODEL UDC-620M  
PART NO. 198-15000-65T  
DESCRIPTION: Ground Power Unit

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## **CHAPTER 5 - SCHEMATIC DIAGRAMS**

This chapter provides detailed schematic diagrams for the Ground Power Unit.

A. 198-15300-65T Schematic, UDC-620M, TSP-4, S-2, T-3(MT), ECP-2

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