COMPAQ

3000 Series UPS
Operation and Reference Guide

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Compaq 3000 Series UPS Operation and Reference Guide
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Specifications

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About This Guide

This guide is designed to be used as step-by-step instructions for installation and as a reference for operation, troubleshooting, and future upgrades.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase.
Type	When you are instructed to *type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed to *enter* information, type the information and then press the **Enter** key.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

> ⚠ **WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

> △ **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

> **IMPORTANT:** Text set off in this manner presents clarifying information or specific instructions.

> **NOTE:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

> ⚠ ⚡ Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.
> **WARNING:** To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

> ⚠ 🏋 Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to
> 132 lb   handle safely.
> 60 kg   **WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.

Precautions

WARNING: There is a risk of electric shock from high earth conductor leakage current when connecting multiple pieces of Information Technology Equipment to Compaq 3000 Series Uninterruptible Power Systems (UPS):

The summation of the input power for multiple pieces of Information Technology Equipment through the use of a UPS can result in high earth conductor leakage current. For UPS products that have detachable AC power cords, the total combined earth conductor leakage current should not exceed 3.5 mA.

WARNING: There is a risk of personal injury from the hazardous energy levels associated with UPS batteries. The maintenance and replacement of batteries must be carried out by qualified service personnel.

WARNING: The 3000 Series UPS models weigh 132 lb (60 kg) when fully assembled. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.

- Obtain adequate assistance to lift and stabilize the chassis during installation or removal.

- Remove the battery pack to reduce the overall weight of the product by approximately 60 lb (27 kg).

- Adhere to the precautions and guidelines set forth in the "Rack Stability" section to follow.

> **IMPORTANT:** Please refer to the ⛟ **Important Safety Information** (included with the UPS kit) before installing this product.

Rack Stability

> ⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, take the following precautions:
>
> - The 3000 Series UPS models MUST be installed at the bottom of the rack. If placed in the rack with existing equipment, the rack must be re-configured to allow installation of the UPS at the bottom of the rack.
> - Do not use slides to mount the UPS in the rack.
> - Use the fixed rails supplied in the installation kit.
> - Use a minimum of two people to place the UPS on the rails.

> ⚠ **WARNING:** Make sure that the rack containing the UPS is stable. The following conditions must be met:
>
> - The leveling feet are extended to the floor.
> - The full weight of the rack rests on the leveling feet.
> - The stabilizing feet are attached to the rack, if it is a single rack installation.
> - The racks are coupled together in multiple rack installations.
> - A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Technical Support

You are entitled to free hardware technical telephone support for your product for as long as you own the product. A technical support specialist will help you diagnose the problem or guide you to the next step in the warranty process.

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ[1]. This service is available 24 hours a day, 7 days a week.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for world wide Technical Support Centers are listed on the Compaq website. You can access the Compaq website at: http://www.compaq.com

Be sure to have the following information available before you call Compaq:

■ Technical support registration number (if applicable)

■ Product serial number(s)

■ Product model name(s) and number(s)

■ Applicable error messages

■ Add-on boards or hardware

■ Third-party hardware or software

■ Operating system type and revision level

■ Detailed, specific questions

Compaq Website

The Compaq website has information on this product as well as the latest drivers and Flash ROM images. You can access the Compaq website at: http://www.compaq.com

Compaq Authorized Reseller

For the name of your nearest Compaq authorized reseller:

■ In the United States, call 1-800-345-1518.

■ In Canada, call 1-800-263-5868.

■ Elsewhere, access the Compaq website at: http://www.compaq.com

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[1] For continuous quality improvement, calls may be recorded or monitored.

Overview

This chapter contains information on the following topics:

■ Compaq 3000 Series Uninterruptible Power System (UPS) models

■ 3000 Series UPS front panels

■ 3000 Series UPS rear panels

■ 3000 Series UPS features

■ Warranties

Compaq 3000 Series UPS Models

The Compaq 3000 Series includes the following UPS models:

Table 1-1
3000 Series UPS Models

UPS Model	Part Number	Comments
R3000	242705-001	Domestic; low voltage; Rack-mountable
R3000j	242705-291	Japanese; low voltage; Rack-mountable
R3000h	242705-002	International; high voltage; Rack-mountable
R3000h-Int	242705-B33	International; high voltage; Rack-mountable with non-detachable IEC-309 15A power cord
R3000h-NA	242705-003	Domestic; high voltage; Rack-mountable

Front Panels

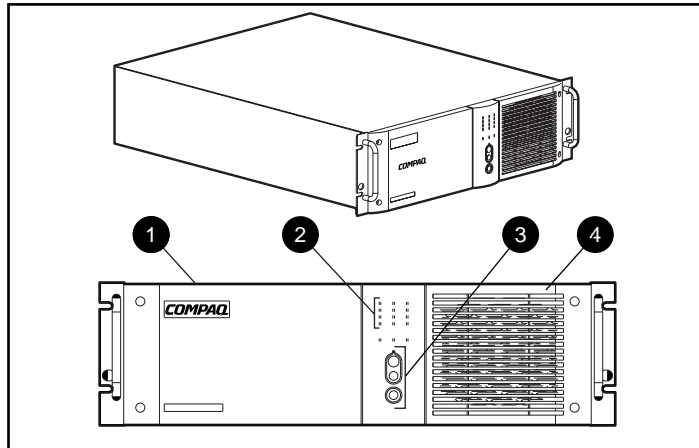The 3000 Series UPS models are rack-mountable.

Figure 1-1. Front panel configuration

❶   Battery compartment   ❸   Control buttons

❷   LED display   ❹   Air vents

Rear Panels

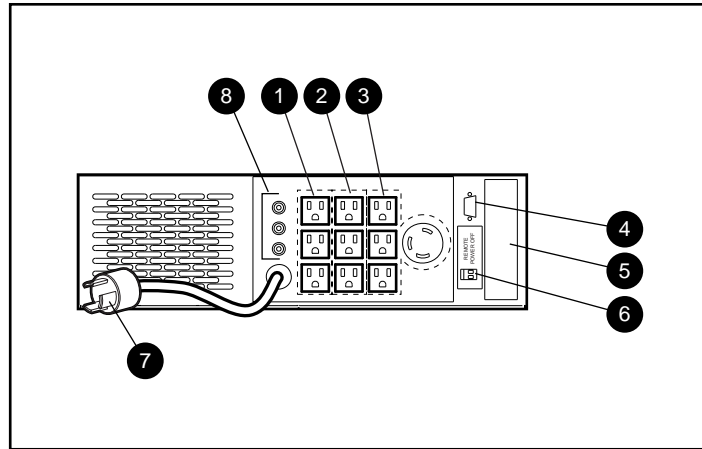The 3000 Series UPS models feature the following rear panel configurations:

Figure 1-2. Rear panel of R3000

❶	Load segment 1	❺	Option slot
❷	Load segment 2	❻	REPO port
❸	Load segment 3	❼	Power cord with L5-30p plug
❹	Communications port	❽	Output circuit breakers

Figure 1-3. Rear panel of R3000j

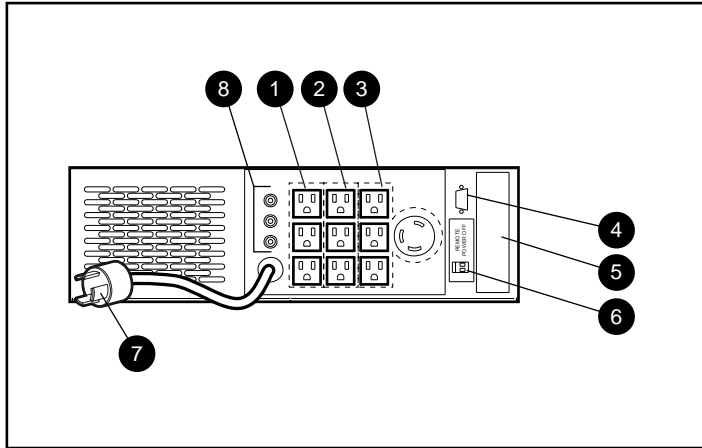|			
❶	Load segment 1	❺	Option slot
❷	Load segment 2	❻	REPO port
❸	Load segment 3	❼	Power cord with L6-30p plug
❹	Communications port	❽	Output circuit breakers

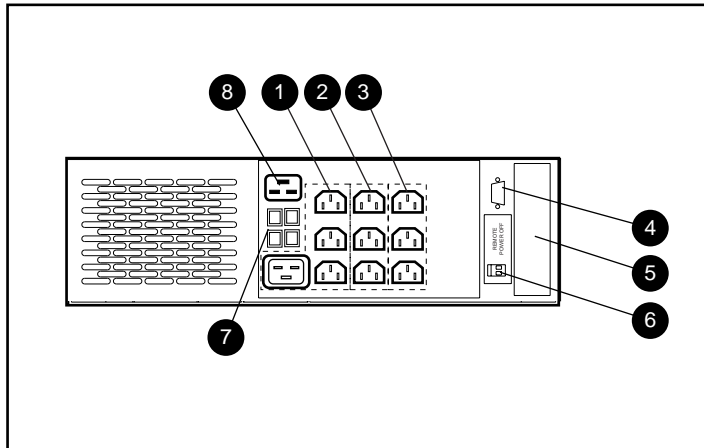Figure 1-4. Rear panel of R3000h

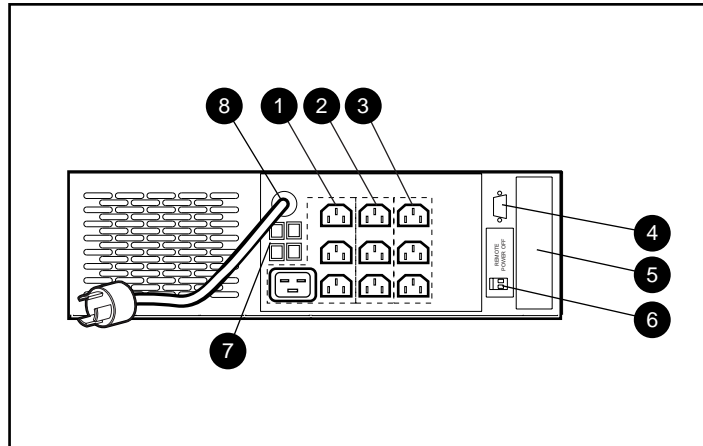|			
❶	Load segment 3	❺	Option slot
❷	Load segment 2	❻	REPO port
❸	Load segment 1	❼	Input/Output circuit breakers
❹	Communications port	❽	IEC-320-C19 16A power inlet

Figure 1-5. Rear panel of R3000h-International

❶ Load segment 3   ❺ Option slot

❷ Load segment 2   ❻ REPO port

❸ Load segment 1   ❼ Input/Output circuit breakers

❹ Communications port   ❽ Power cord with IEC-309 15A plug
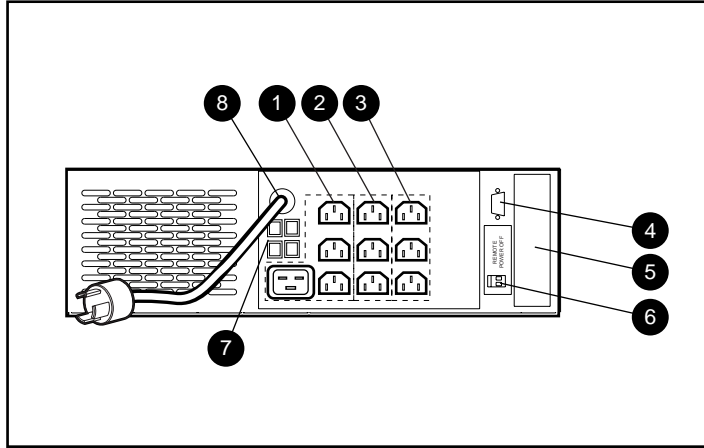
Figure 1-6. Rear panel of R3000h-NA

❶	Load segment 3	❺	Option slot
❷	Load segment 2	❻	REPO port
❸	Load segment 1	❼	Input/Output circuit breakers
❹	Communications port	❽	Power cord with L6-30p plug

Standard UPS Features

The 3000 Series UPS models provide the following features:

■ Communications port for data exchange with the host computer

■ Power protection for loads up to 3000VA

■ Load segment control

■ Support for power management software

■ Support for Compaq hardware option cards, extending the power management capabilities of the UPS

■ Support for Remote Emergency Power Off (REPO) circuitry

Communications Port

The 3000 Series UPS includes a communications port for data exchange with the host computer. The power management software supplied by Compaq enables the user to access status reporting and power management features.

> △ **CAUTION:** Use only cables supplied by Compaq to connect the communications port to the host computer. Use of standard RS-232 cables may cause equipment damage.

Power Management Software

With each UPS, Compaq supplies a CD containing several power management software applications, to address a variety of installations:

■ Compaq Power Management Software is a comprehensive Microsoft Windows-based power management application that is tightly integrated with Compaq Insight Manager.

■ LanSafe III provides UPS power management capabilities in a network environment.

■ FailSafe III provides UPS power management capabilities in a standalone computer environment.

■ Compaq OnliNet Centro provides UPS power management capabilities in a multi-platform network environment (supplied only with the Compaq SNMP-EN Internal Adapter).

Compaq Power Management Software

Compaq Power Management Software allows system administrators to monitor, and to manage, the power being supplied to an entire network of servers and workstations.

Software capabilities include:

■ Monitoring utility power, and the power supplied by the UPS.

■ Logging events, such as utility power blackouts and brownouts.

■ Prioritizing protected devices.

■ Powering up and powering down protected devices.

For example, if Compaq Power Management Software detects an extended utility power blackout, it will initiate the prioritized shutdown sequence specified by the system administrator.

This sequence might include:

■ Saving work-in-progress throughout the network.

■ Powering down non-critical devices, to extend the battery power available to other devices.

■ After saving the necessary information, completing the orderly device shutdown.

For more information on using Compaq Power Management Software, refer to the Compaq Power Products Software Reference Guide section of the Power Products Documentation CD (included with the UPS kit).

Hardware Option Cards

The 3000 Series UPS include an option slot that will accommodate one of these hardware option cards:

■ Compaq Multi-Server UPS Card (option kit part number 123508-B21)

■ Compaq Scalable UPS Card (option kit part number 123509-B21)

■ Compaq SNMP-EN Internal Adapter (option kit part number 347225-B21)

Compaq Multi-Server UPS Card

A standard UPS can communicate directly with a single host computer. The Multi-Server UPS Card expands the communications capability of the UPS so that a single UPS that can exchange data with up to three host computers.

Compaq Power Management Software enables a single UPS with a Multi-Server UPS Card to protect up to three servers. Individual server control can be obtained by connecting the servers to different UPS load segments.

For example, if a network includes three servers (with one running Windows NT, one running Unix, and one running NetWare), a Multi-Server Card can be used to establish direct communications between the UPS and all three servers. Use a single UPS load segment to supply power to a particular server and to the devices associated with that server.

Compaq Scalable UPS Card

The Scalable UPS Card makes up to three UPS units appear as a single virtual UPS to the host computer and, with Compaq Power Management Software, allows scaling up the level of power protection available to the system.

For example, connecting three R3000 UPS units to a Scalable UPS Card creates a virtual 9000VA UPS. Since the R3000 UPS each have three load segments, the virtual UPS will have nine independently controlled load segments.

However, no single load can be greater than the lowest rated UPS. For instance, connecting three 1KVA UPSs with a Scalable UPS Card could not support a single 1200VA load.

Compaq SNMP-EN Internal Adapter

In a network environment, the SNMP-EN Internal Adapter provides a user interface, allowing communication between the UPS and the server (when the SNMP-based power management software, Compaq OnliNet Centro, is installed). For workstations or other peripheral equipment that cannot be interrupted by a network management system, a UPS with the SNMP-EN Internal Adapter option installed can also provide a power management solution.

Using the SNMP-EN Internal Adapter SNMP communication interface, system administrators can quickly ascertain if power-related problems exist anywhere on the network. A Compaq UPS, connected by an SNMP-EN Internal Adapter to power management software, can virtually eliminate costly downtime due to power outages or surges, and decrease day-to-day network management annoyances like spontaneous rebooting, lost files and corrupted data—issues resulting from inconsistent power.

Compaq OnliNet Centro software is a versatile application that can schedule network component shutdowns or, in case of a utility power outage, perform graceful, sequential shutdown of network components.

Remote Emergency Power Off (REPO) Port

The 3000 Series UPS models include a Remote Emergency Power Off (REPO) port. The REPO feature allows the UPS to be shut down from a remote location. To use this feature, the REPO port must be connected to a remote, normally open switch (not supplied). When this switch is closed, the UPS immediately disconnects power from its load segments.

To shut down the entire network in the event of an emergency, the REPO ports of multiple UPS units can be connected to a single switch.

> **IMPORTANT:** The REPO port meets the requirements of NFPA Articles 645-10 and 645-11 for a Disconnecting Means.

> **IMPORTANT:**
>
> ■ If the remote switch is closed, the REPO feature shuts down protected devices immediately and does not utilize the orderly shutdown procedure initiated by Compaq Power Management Software.
>
> ■ The REPO feature shuts down UPS units operating under either utility or battery power.
>
> ■ If the UPS was operating on battery power when the remote switch was closed, no power will be available to the devices until utility power is restored.

Warranties

$25,000 Computer Load Protection Guarantee

To back up the wide range of features offered with the UPS, Compaq provides a three-year limited warranty. In addition, Compaq offers a $25,000 Computer Load Protection Guarantee (provided by the original equipment manufacturer).

> **IMPORTANT:** The warranty card supplied with the UPS must be filled in and returned to qualify for the $25,000 Computer Load Protection Guarantee.

The $25,000 Computer Load Protection Guarantee only applies if:

■ The UPS is plugged into a suitably grounded and wired outlet using no extension cords, adapters, other ground wires, or other electrical connections.

■ The UPS installation complies with all applicable electrical and safety codes specified by the National Electrical Code (NEC).

■ The UPS is used under normal operating conditions. Users comply with all instructions and labels.

■ The UPS is not damaged by accident (other than a utility power transient), misuse, or abuse.

Pre-Failure Battery Warranty

The Pre-Failure Battery Warranty, standard on all Compaq Uninterruptible Power System (UPS) units, extends the advantage of a Compaq three-year limited warranty by applying it to the battery before it actually fails. Specifically, the Pre-Failure Battery Warranty ensures that when customers receive notification from Compaq Power Management Software that the battery may fail, the battery is replaced free of charge under the warranty.

Compaq maintains the highest standards in the industry, as evidenced by the Compaq Pre-Failure Battery Warranty. The Pre-Failure Battery Warranty is beneficial in at least two significant ways:

■ Reduced total cost of ownership

■ Reduced downtime

Chapter **2**

Installation

This chapter provides information on the following topics:

■ Installation requirements

■ Procedures to complete before starting the UPS

■ Starting the UPS

■ Completing the installation

Installation Requirements

This section lists items needed to install the Compaq 3000 Series UPS models.

Item(s) not supplied with the UPS kit

Tools

A medium flat-bladed and Phillips screwdriver may be needed.

Other Hardware

A number of screws, cage nuts, and a cage nut-fitting tool (supplied with the rack) are required.

Item(s) supplied with the UPS kit

The UPS kit should contain the following components:

Software/Reference Material

- The Power Products Documentation CD containing the 3000 Series UPS Operation and Reference Guide and the Compaq Power Products Software Reference Guide

- The *Compaq Power Management Software Installation Instructions* (a booklet included with the CD) containing information on the installation requirements for Compaq Power Management Software

- ⚠ **Important Safety Information** to be reviewed before installing this product

Hardware

The UPS ships with one or more of the following:

- Depth-adjustable fixed rails kit

- Front handles and mounting brackets (2)

- REPO terminal and connector block

■ Cable(s)

  ❑ The R3000 and R3000j models ship with a non-detachable input power cord; a 6-foot UPS/computer interface cable, Compaq part number 295245-004; and two 10-amp, 6-foot, IEC to IEC power cords, Compaq part number 142263-001, for load equipment power.

  ❑ The R3000h, R3000h-International, and R3000h-NA models ship with a non-detachable input power cord (the R3000h model only ships with a detachable input power cord); a 12-foot UPS/computer interface cable, Compaq part number 295245-004; two 10-amp, 6-foot, IEC to IEC power cords, Compaq part number 142263-001; two 8-foot IEC to IEC power cords, Compaq part number 142263-002; and two 10-foot IEC to IEC power cords, Compaq part number 142263-003, for load equipment power.

All models ship with a computer interface cable. The computer interface cable is not needed for normal operation. If power management of the UPS is desired, connect the interface cable between the UPS communications port and the serial port on the host computer.

> **IMPORTANT:** If the UPS does not include a power cord that is suitable for your application, contact an authorized Compaq service representative to obtain the appropriate power cord. Please refer to the "Precautions for Power Products" section of the ⚠ **Important Safety Information** (included with the UPS kit).

Before Starting the UPS

This section provides installation steps to be completed before starting the UPS.

Determine the steps required for the application:

■ Rack-mounting the UPS

■ Connecting the UPS communications port to the host computer

■ Connecting the Remote Emergency Power Off

> **NOTE**: Although these steps can be carried out after the UPS is installed, the UPS will need to be powered down to safely perform these tasks.

Rack Mounting the UPS

The 3000 Series UPS models must be mounted on fixed rails. Refer to the appropriate installation card (supplied with the UPS kit) to obtain instructions.

> ⚠ **WARNING:** The 3000 Series UPS models weigh 132 lb (60 kg). To reduce the risk of personal injury or damage to the equipment, take the following precautions:
>
> ■ The 3000 Series UPS models MUST be installed at the bottom of the rack. If placed in the rack with existing equipment, the rack must be re-configured to allow installation of the UPS at the bottom of the rack.
>
> ■ Do not use slides to mount the UPS in the rack.
>
> ■ Use the fixed rails supplied in the installation kit.
>
> ■ Use a minimum of two people to place the UPS on the rails.

> ⚠ **WARNING:** Make sure that the rack containing the UPS is stable. The following conditions must be met:
>
> ■ The leveling feet are extended to the floor.
>
> ■ The full weight of the rack rests on the leveling feet.
>
> ■ The stabilizing feet are attached to the rack, if it is a single rack installation.
>
> ■ The racks are coupled together in multiple rack installations.
>
> ■ A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

Connecting to the Communications Port

The 3000 Series UPS models include a communications port for data exchange with the host computer.

> **IMPORTANT:** Compaq Power Management Software, LanSafe III, and FailSafe III require the communications port to be appropriately cabled to the host computer.

Connect the UPS/computer interface cable (supplied) from the communications port on the UPS to the appropriate communications port on the host computer.

> ⚠ **CAUTION:** To avoid damaging the equipment, do not use the communications cables (part numbers 142260-001 and 142260-002) supplied with earlier UPS models. The UPS/computer interface cable is required to carry power and is wired differently than earlier communications cables.
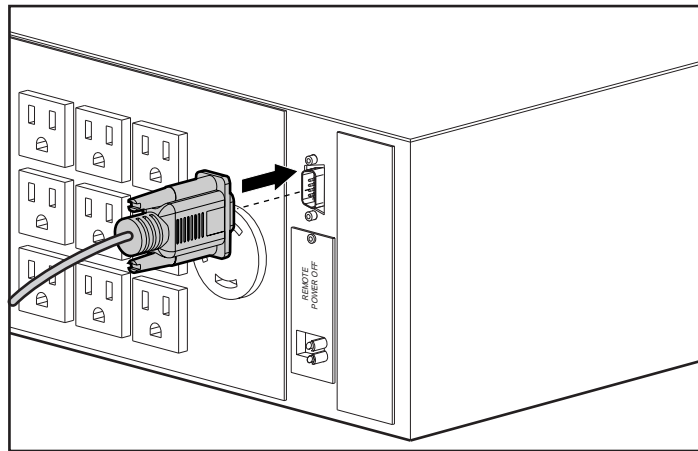
Figure 2-1. Connecting the UPS/computer interface cable

Connecting the Remote Emergency Power Off

The 3000 Series UPS models include a Remote Emergency Power Off (REPO) port. When properly wired, the REPO port allows the power to the UPS output receptacles to be switched off from a remote location.

Use this procedure to activate the REPO port:

1. Install a suitable switch at the required remote location.

2. Remove the connector block from the REPO port.
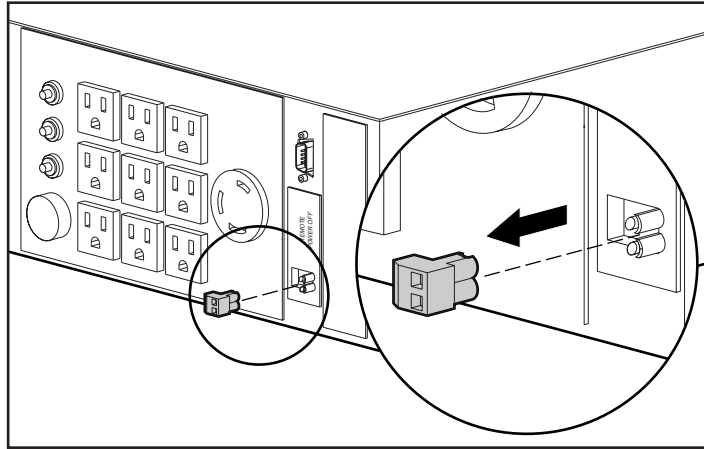
Figure 2-2. Removing the connector block

3. Wire the connector block using stranded, non-shielded wire (AWG #22 - #18, or equivalent).

4. Replace the connector block in the REPO port.
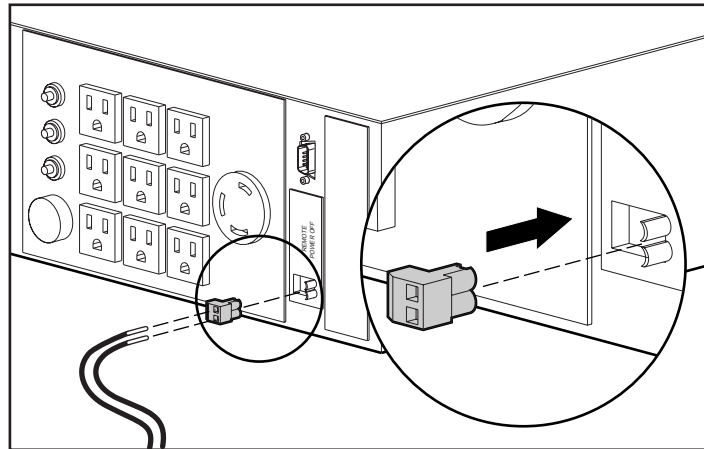
Figure 2-3. Replacing the connector block

IMPORTANT: The remote switch must be in the OFF (open) position to enable power to the output receptacles.

Starting the UPS

Starting the UPS for the first time requires the following procedures:

■ Checking the Battery Recharge Date label on the UPS shipping carton

■ Connecting the UPS to utility power via the input power cord

■ Connecting devices to the UPS

■ Powering up the UPS

■ Monitoring the automatic self-test to verify that the installation was successful

Checking the Battery Recharge Date Label

Check the battery recharge date specified on the Battery Recharge Date label. This label is affixed to the UPS shipping carton.

> **IMPORTANT:** Do not use the UPS if the battery recharge date has expired. If the date on the Battery Recharge Date label has passed without the batteries being recharged, contact an Authorized Compaq Service Representative.

THIS PRODUCT CONTAINS
A NONSPILLABLE BATTERY
Next Recharge Date:

14-DEC-04

Please refer to Maintenance Section
of Owner's Manual enclosed inside
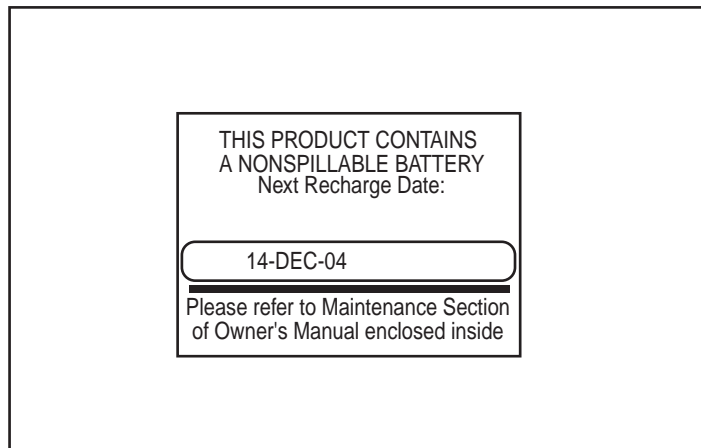
Figure 2-4. The Battery Recharge Date label

Connecting the UPS to Utility Power

Connect the UPS to a grounded utility power outlet.

> ⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment, take these precautions:
>
> ■ Plug the input line cord into a grounded (earthed) electrical outlet that is installed near the equipment and is easily accessible.
>
> ■ Do not disable the grounding plug on the input line cord. The grounding plug is an important safety feature.
>
> ■ Do not use extension cords.

Connecting Devices to the UPS

Before connecting devices, verify that the UPS will not overload by making sure that the total VA rating of the devices (the load) does not exceed the VA rating of the UPS.

Volts x Amps = VA per device

If the devices list the power in Watts, use the following conversion equation:

Watts x 1.35 = VA
VA/1000 = KVA

You may use RackBuilder Pro as an alternate conversion tool. RackBuilder Pro may also be obtained from the Compaq website:

http://www.compaq.com

After verifying that the UPS will not overload, connect the power cords from the devices to the appropriate output receptacles of the UPS.

> ⚠ **WARNING:** To reduce the risk of electric shock, the combined earth conductor leakage current from all connected devices must not exceed 3.5 mA.

> △ **CAUTION:** Do not plug laser printers into the UPS. The instantaneous current drawn by this type of printer may overload the UPS.

IMPORTANT: To provide additional receptacles, plug a Compaq Power Distribution Unit (PDU) into the high current receptacle associated with load segments 1, 2, or 3. To connect the devices to the PDU, use IEC-320 jumper cords (part number 295633-B21).

Powering up the UPS

When the unit is plugged in for the first time, the UPS automatically initiates a self-test. The front panel LED display lights will go on and off during the self-test. If the self-test is completed successfully, the UPS enters Standby mode.

> **NOTE:** The self-test initiates when the UPS is plugged in for the first time. Afterward, when the UPS is disconnected from utility power, the unit will come back up in the mode it was in when utility power was lost.
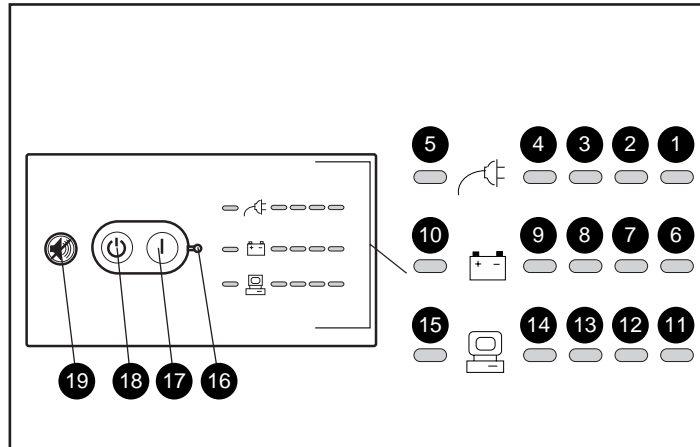

Figure 2-5. The front panel LED display and controls

		Symbol
❶–❹	AC Input level	Power cord
❺	Site Wiring Fault indicator	
❻–❾	Battery Charge level	Battery
❿	Battery Service indicator	
⓫–⓮	Load level	Load devices
⓯	Communications	
⓰	ON LED	
⓱	ON button	⃠
⓲	STANDBY button	
⓳	TEST/ALARM RESET button	

Check the front panel LED display:

- LED 16 (ON LED, ❶⑥) should be off, indicating that no power is available at the UPS output receptacles.

- Either AC Input LED 2 or 3 should be green, indicating the utility voltage is suitable.

- LEDs 6, 7, 8, and 9 indicate the battery charge level.

  - ❑ LED 9 warns that the batteries are low—approximately three to five minutes of battery backup remain

  - ❑ LED 8 only = 33 percent charged

  - ❑ LEDs 7 and 8 = 66 percent charged

  - ❑ LEDs 6, 7, and 8 = 67 percent to 100 percent charged

For more information on the front panel LED display, see Chapter 3, "Operation."

> **IMPORTANT:** If any of the LEDs on the front panel are red (indicating an alarm condition), press the TEST/ALARM RESET button to clear the red LEDs. If this does not clear the red LEDs, see Chapter 6, "Troubleshooting."
>
> Red LEDs may be accompanied by an audio alarm. For information on silencing the alarm, see Chapter 3, "Operation."

Completing the Installation

With the UPS in Standby mode, allow the batteries to charge before putting the UPS into service.

> **IMPORTANT:** The batteries will charge to 90% of their capacity within approximately 4 hours. Compaq recommends allowing the batteries to charge for 24 hours before using them to supply backup power to devices.

Placing the UPS in Operate mode

Press and hold the ON button (❷) until the LED 16 (❶, ON LED) turns green, indicating that power is available at the UPS output receptacles. The UPS will acknowledge compliance with a short beep.
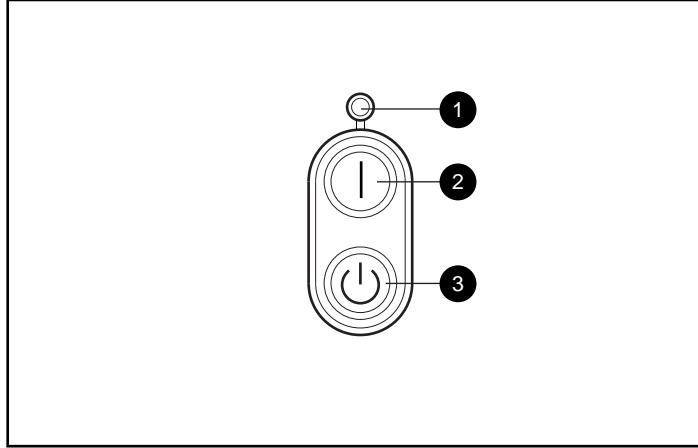
Figure 2-6. Operate mode controls

❶	ON LED	❸	STANDBY button
❷	ON button		

The Installation is Now Complete

■ For information on operating the UPS, see Chapter 3, "Operation."

■ For information on changing the configuration of the UPS, see Chapter 4, "Configuration."

■ Use the Compaq website as an additional information source: http://www.compaq.com

Chapter **3**

Operation

This chapter contains information on the following topics:

■ Precautions to be observed when using the UPS

■ UPS modes of operation

■ Front panel controls

■ Front panel indicators

■ Overcurrent protection

■ Placing the UPS in Operate mode

■ Returning to Standby mode

■ Initiating a self-test

■ The audio alarm

Precautions

Observe these precautions when using the Compaq 3000 Series UPS models.

> ⚠ **WARNING:** To reduce the risk of electric shock from earth conductor leakage current:
>
> - Do not operate a UPS that is disconnected from the utility power source.
>
> - Disconnect protected devices from the UPS before disconnecting the UPS from utility power.
>
> - Use the TEST/ALARM RESET button to test the batteries rather than unplugging the UPS. See "Initiating a Self-test" in this chapter for more information.

Modes of Operation

The 3000 Series UPS models have four modes of operation:

Standby Mode

- No power is available at the UPS output receptacles.

- The UPS charges the batteries as necessary.

Operate Mode

- Power is available at the UPS output receptacles.

- The UPS charges the batteries as necessary.

Configure Mode

- Power is available at the UPS output receptacles.

- The UPS charges the batteries as necessary.

- The user can update the UPS configuration.

> **NOTE:** For more information on configuring the UPS, see Chapter 4, "Configuration."

Sleep Mode

By default, Sleep mode is disabled.

When Sleep mode is disabled:

■ If the batteries have been fully discharged, power may not be automatically restored to the output receptacles when utility power is restored.

> ⚠ **CAUTION:** The UPS Sleep mode default setting is OFF (disabled). When Sleep mode is OFF (disabled), if the UPS is supplying battery power, the batteries can be fully discharged before the UPS will shut down. If the batteries become fully discharged, they may be unrecoverable (damaged).

NOTE: For information on enabling Sleep mode, see Chapter 4, "Configuration."

When Sleep mode is enabled:

■ If the UPS is supplying battery power and the load on the UPS is less than 10 percent, the UPS shuts down.

■ Power is automatically restored to the output receptacles when utility power is restored.

Front Panel Controls

The 3000 Series UPS front panel includes the controls required to:

■ Place the UPS in Operate mode.

■ Place the UPS in Standby mode.

■ Place the UPS in Configure mode.

■ Initiate a self-test.

■ Silence an audio alarm.

NOTE: For information about changing the configuration on the UPS, or simply checking the current configuration, see Chapter 4, "Configuration."

The front panel includes the following LED indicators and button controls:
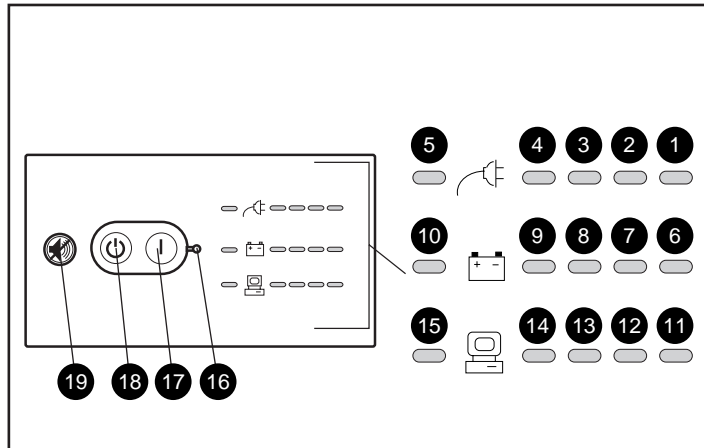
Figure 3-1. The front panel LED display and controls

		Symbol
❶–❹	AC Input level	Power cord
❺	Site Wiring Fault indicator	
❻–❾	Battery Charge level	Battery
❿	Battery Service indicator	
⓫–⓮	Load level	Load devices
⓯	Communications	
⓰	ON LED	
⓱	ON button	⊘
⓲	STANDBY button	⊚
⓳	TEST/ALARM RESET button	⊛

Front Panel Indicators

The front panel LED display colors indicate the UPS status:

■ Green LEDs indicate normal conditions

■ Red LEDs provide warning of existing or potential problems

LEDs are referred to as LED 1 through 16, as described in this documentation.

When the UPS is in Configure mode, the LEDs do not operate as they do in the Standby and Operate modes (see Chapter 4, "Configuration").

Front Panel LEDs in the Standby and Operate Modes

Each LED (and the condition it indicates in the Operate and Standby modes) is described in the following tables:

AC Input (LEDs 1-4)

Table 3-1
AC Input LEDs

LED	Color	Meaning
1	Red	The utility voltage is higher than the voltage range for which the UPS has been configured. The UPS is supplying battery power. The audio alarm will sound.
	Flashing Red	Utility voltage has returned to the voltage range for which the UPS has been configured. The UPS is supplying utility power. The audio alarm should be reset.
2	Green	Utility voltage is within the voltage range for which the UPS has been configured.
3	Green	Utility voltage is lower than the current UPS configuration expects. The UPS is compensating and providing power to the loads without the use of batteries.
4	Red	The utility voltage is lower than the voltage range for which the UPS has been configured. The UPS is supplying battery power. The audio alarm will sound.
	Flashing Red	Utility voltage has returned to the voltage range for which the UPS has been configured. The UPS is supplying utility power. The audio alarm should be reset.

Site Wiring Fault (LED 5)

Table 3-2
Site Wiring Fault LED

LED	Color	Meaning
5	Red	No ground connection between utility power and the UPS.
		The line and neutral connections between utility power and the UPS are reversed.
		The UPS voltage configuration may be incorrect.

Note: For units factory-configured for 208V, the Site Wiring Fault function has been disabled. If reconfiguring a 230V unit to operate at 208V, the Site Wiring Fault function must be manually disabled. See the section "Changing Configuration Parameters" in Chapter 4, "Configuration."

Battery Charge (LEDs 6-9)

Table 3-3
Battery Charge LEDs

LED	Color	Meaning
6	Green	Batteries are between 67% and 100% charged. (LEDs 7 and 8 are also green)
7	Green	Batteries are approximately 66% charged. (LED 8 is also green)
8	Green	Batteries are approximately 33% charged.
9	Red	Batteries are low; approximately three to five minutes of battery backup remain.

Battery Service (LED 10)

Table 3-4
Battery Service LED

LED	Color	Meaning
10	Red	Potential battery failure.

Note: When LED 10 is red, the audio alarm will sound, indicating the UPS has detected a potential battery failure. The UPS batteries may need to be replaced in 30 to 60 days.

Load Level (LEDs 11-14)

Table 3-5
Load Level LEDs

LED	Color	Meaning
11	Red	Load on the UPS exceeds the maximum power available.
12	Green	Load on the UPS is approximately 67% to 100% of the maximum power available. (LEDs 13 and 14 are also green)
13	Green	Load on the UPS is approximately 66% of the maximum power available. (LED 14 is also green)
14	Green	Load on the UPS is approximately 33% of the maximum power available.

Communication (LED 15)

Table 3-6
Communication LED

LED	Color	Meaning
15	Green	The communication link between the UPS and the host computer is active.
	Flashing Green	Data is being transferred between the UPS and the host computer.

On (LED 16)

If LED 16 is green, power is available at the UPS output receptacles.

Overcurrent Protection

Overcurrent protection is provided via resettable circuit breakers located on the rear panel. The following models have overcurrent protection:

Table 3-7
Overcurrent Protection

UPS Model	Device
R3000	Circuit breaker for each load segment
R3000j	Circuit breaker for each load segment
R3000h	Input circuit breaker Circuit breaker for each load segment
R3000h-Int	Input circuit breaker Circuit breaker for each load segment
R3000h-NA	Input circuit breaker Circuit breaker for each load segment

Placing the UPS in Operate Mode

The Compaq 3000 Series UPS may be placed in Operate mode if either of the following conditions apply:

■   The UPS is powered up and in Standby mode (LED 16 is off)

■   The UPS is powered off; no utility power is available

Press and hold the ON button (❷) until the LED 16 (ON LED ❶) turns green, indicating that power is available at the UPS output receptacles. The UPS acknowledges compliance with a short beep.

> **IMPORTANT:** If using battery power (no utility power present), press the ON button and hold for three seconds. The UPS will conserve battery power by omitting the self-test.
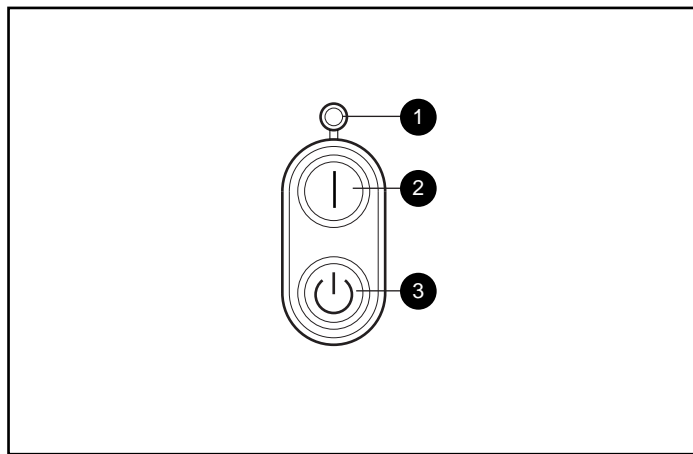
Figure 3-2. Operate mode controls

❶   ON LED

❷   ON button

❸   STANDBY button

Returning to Standby Mode

When the UPS is in Operate mode (LED 16, ❶, is green), pressing the STANDBY button (❷) will place the UPS in Standby mode. The UPS will acknowledge compliance with a short beep. LED 16 (❶) will extinguish, and power to the loads will cease.
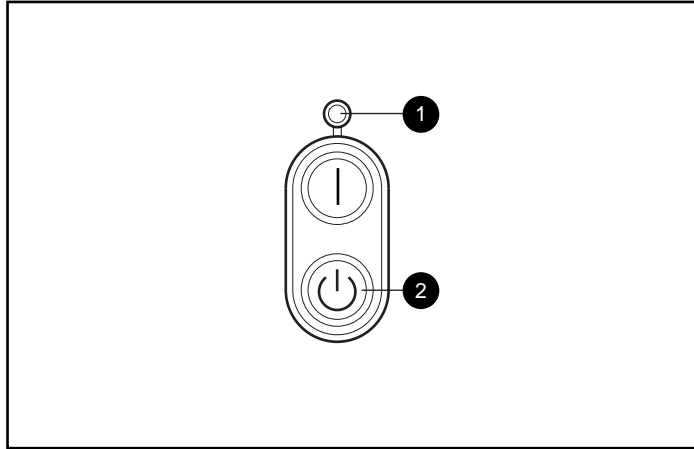
Figure 3-3. Standby mode controls

❶   ON LED

❷   STANDBY button

IMPORTANT:

■   While in Standby mode, the UPS maintains the charge on the batteries, but no power is available at the output receptacles.

■   The UPS remains in Standby mode until an alternate mode is selected, or until utility power is removed.

Initiating a Self-test

To initiate a self-test, press the TEST/ALARM RESET button and hold for three seconds. The UPS acknowledges compliance with five beeps.
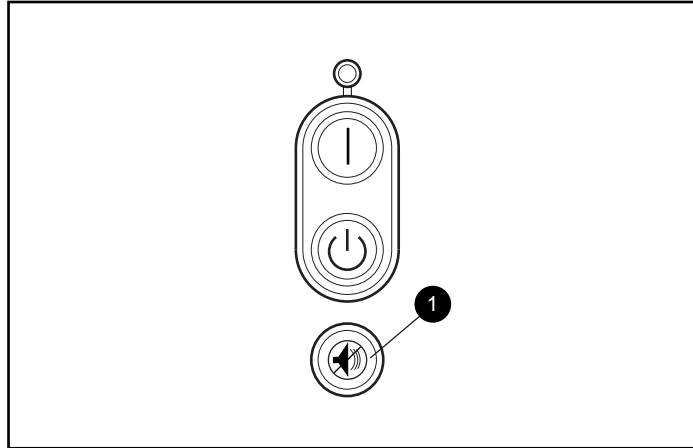
Figure 3-4. The TEST/ALARM RESET button

❶   TEST/ALARM RESET button

IMPORTANT: A portion of the self-test requires battery power; the self-test cannot be initiated if the batteries are less than 90% charged.

During the self-test, it is normal for the UPS to turn on individual LEDs momentarily; however, if an alarm condition is detected, the UPS will turn on the appropriate LED and may sound an audio alarm.

⚠ **WARNING:** To reduce the risk of electric shock from earth conductor leakage current, use the self-test procedure to check the UPS batteries (rather than unplugging the UPS).

- For the meaning of individual LEDs, see "Front Panel LEDs in the Standby and Operate Modes," in this chapter.

- For information on what to do if the self-test detects a problem, see Chapter 6, "Troubleshooting."

Audio Alarm

The UPS may sound an audio alarm to warn the user that an alarm condition exists.

> **IMPORTANT:** Certain audio alarms can be disabled. See Chapter 4, "Configuration," for more information.

Table 3-8
Audio Alarm Conditions

Alarm Condition	LED Activity	Can be disabled?
Utility power failure	LED 1 or LED 4 red	Yes
Site Wiring Fault	LED 5 on red	Yes
Battery Service	LED 10 on red	Yes
Internal UPS overvoltage	LED 10 flashing red	No

Silencing an Audio Alarm

To silence the alarm, press the TEST/ALARM RESET button.
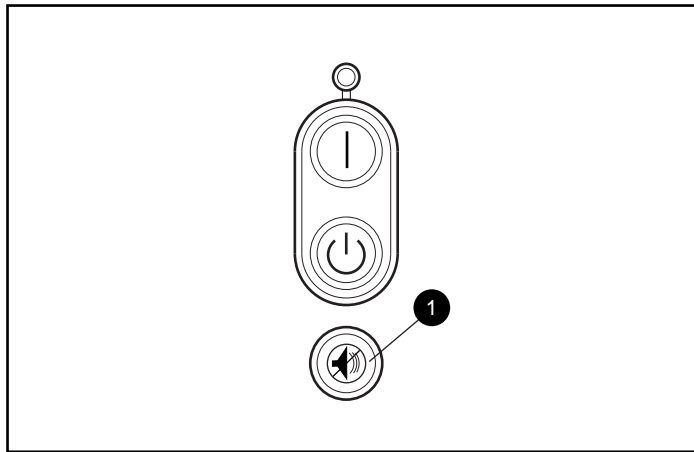
Figure 3-5. The TEST/ALARM RESET button

❶   TEST/ALARM RESET button

IMPORTANT:

■ Even though an audio alarm may be silenced, the condition that caused the alarm may still exist. For information on procedures to follow if the UPS detects an alarm condition, see Chapter 6, "Troubleshooting."

■ If a utility power failure caused the alarm (AC Input LED 1 or LED 4 red), the alarm will be silenced after utility power is restored.

Chapter **4**

Configuration

This chapter contains information on the following topics:

■ Placing the UPS in Configure mode

■ Configuration parameters and their LED indicators

■ Using the front panel LED display and controls to monitor and change configuration parameters

■ Using the UPS configuration parameters to optimize battery life by matching utility voltage

Placing the UPS in Configure Mode

The Compaq 3000 Series UPS can enter the Configure mode while in the Operate or Standby mode.
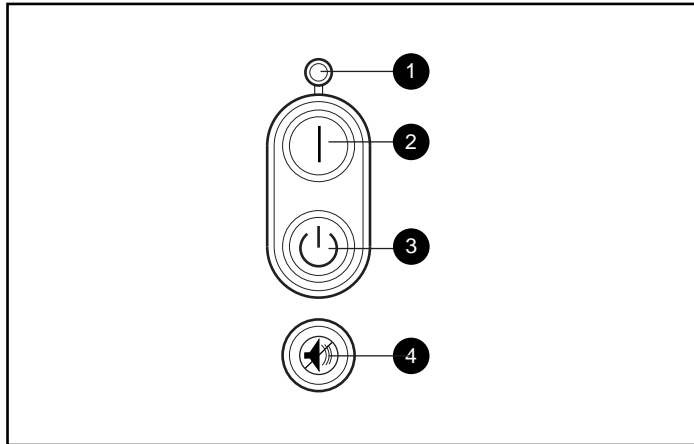
Figure 4-1. Configure mode controls

❶   ON LED (LED 16)

❷   ON button

❸   STANDBY button

❹   TEST/ALARM RESET button

To place the UPS in Configure mode, press the ON (❷) and TEST/ALARM RESET (❹) buttons simultaneously. Release the buttons when the acknowledgement beep sounds.

> **IMPORTANT:** If the STANDBY button is pressed while in the Configure mode, the UPS will enter Standby mode, and power to the load segments will cease.

In the Configure mode, the front panel LED display changes function. The LED display and button controls allow the user to monitor, and to change, the UPS configuration parameters.

Configuration Parameters and their LED Indicators

In the Configure mode, the front panel LEDs 1 to 15 are assigned to eleven configuration parameters[1], detailed in the following table. (LED 16 indicates the ON or OFF status of each parameter.)
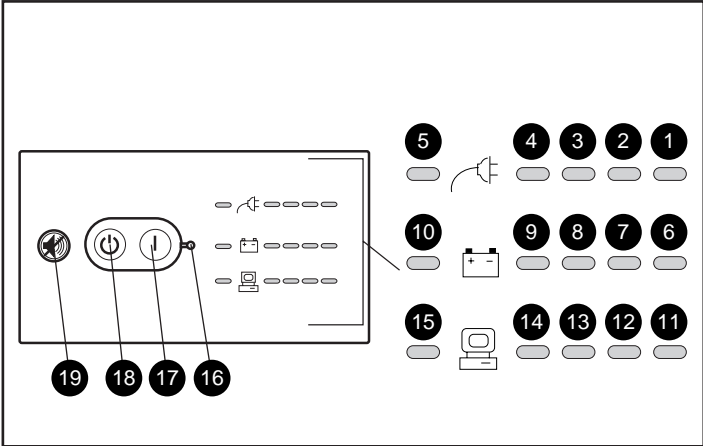
Figure 4-2. The front panel LED display and controls

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[1] Configuration parameters 11 to 14 are reserved for future use.

Table 4-1
Configuration Parameters/LED Indicators

Parameter (LED)	Parameter Name	LED 16 Status	Explanation
1	120/230 Nom	On[1]	Nominal utility voltage level is 120/230 VAC. (Default for R3000, R3000h, and R3000h-Int)
2	110/220 Nom	On[1]	Nominal utility voltage level is 110/220 VAC.
3	127/240 Nom	On[1]	Nominal utility voltage level is 127/240 VAC.
10	100/208 Nom	On[1]	Nominal utility voltage level is 100/208 VAC. (Default for R3000j and R3000h-NA)
4	Extended Voltage	On	UPS will supply utility power if the utility voltage is within +20% to −35% of the nominal voltage. If the utility voltage is outside this range, the UPS will supply battery power. (This option not available on the R3000j and R3000h-NA)
		Off (default)	UPS will supply utility power if the utility voltage is within ±20% of the nominal voltage. If the utility voltage is outside this range, the UPS will supply battery power.
5	Wiring Fault	On (default)	Enables an audio alarm if ground is missing, or if line and neutral connections have been reversed. (This option not available on the R3000j and R3000h-NA)
		Off	Disables the audio alarm for this event. (Default for R3000j and R3000h-NA)
6	Low Battery	On (default)	Enables an audio alarm 3 minutes before battery shutdown.
		Off	Enables an audio alarm 5 minutes before battery shutdown.

Table 4-1
Configuration Parameters/LED Indicators *continued*

Parameter (LED)	Parameter Name	LED 16 Status	Explanation
7	Shutdown Delay	On (default)	Enables a 5-second delay before turning off power to the output receptacles after receiving a shutdown command from the host.
		Off	Enables a 3-minute delay.
8	AC Input Failure	On (default)	Enables an audio alarm when the utility voltage is outside the UPS operating range.
		Off	Disables the audio alarm for this event.
9	Sleep Mode	On	Enables Sleep mode.
		Off (default)	Disables Sleep mode.
11-14	Reserved		Reserved for future use.
15	Reset Defaults	On	Defaults are restored[2].
		Off	Configuration selected by the user overrides defaults.

Notes: [1] Only one nominal utility voltage can be configured.
[2] If model R3000j voltage defaults to 120, change the voltage to 100.
If model R3000h-NA voltage defaults to 230, change the voltage to 208.

Changing Configuration Parameters

The Configure mode may be entered from the Operate or Standby mode.

IMPORTANT: If the STANDBY button is pressed while in the Configure mode, the UPS will enter Standby mode, and power to the load segments will cease.
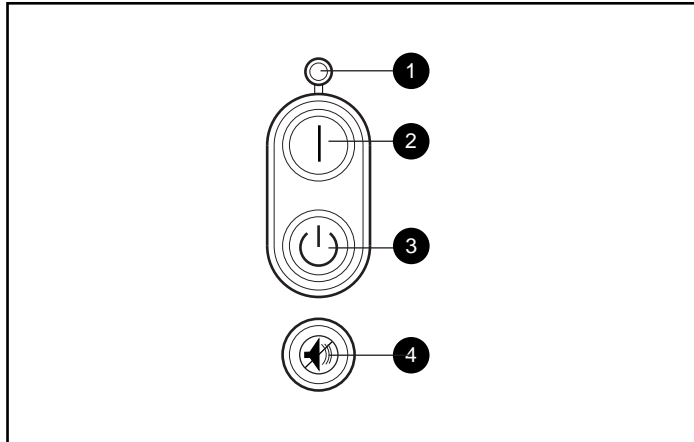
Figure 4-3. Configure mode controls

❶   ON LED (LED 16)

❷   ON button

❸   STANDBY button

❹   TEST/ALARM RESET button

To change configuration parameters:

1. Place the UPS in Configure mode by pressing the ON (❷) and TEST/ALARM RESET (❹) buttons simultaneously. Release the buttons when the acknowledgement beep sounds.

2. The top left LED on the front panel LED display should begin to blink, indicating that configuration parameter 1 is selected.

3. To determine if the selected configuration parameter value is ON or OFF, check LED 16 (❶)—if LED 16 is ON, the selected parameter is also ON.

4. To toggle the selected configuration parameter value, press the TEST/ALARM RESET button (❹). The UPS will acknowledge compliance with a short beep.

   NOTE: For nominal voltage configuration parameters 1, 2, 3, and 10—selecting an ON value for any one parameter automatically sets the other three possibilities to OFF.

5. To scroll through the configuration parameters, press the ON button (❷). The UPS acknowledges confirmation with a short beep. Monitor the LED display (see Figure 4-2; LED 1 blinks to indicate that parameter 1 is selected, LED 2 blinks when parameter 2 is selected, and so on).

6. Repeat Steps 2 through 5 as required. Continue until all changes have been made.

7. To exit the Configure mode at any time:

   ❑ Press the ON (❷) and TEST/ALARM RESET buttons (❹) simultaneously, or

   ❑ after parameter 15 is accessed, press the ON (❷) button.

The UPS will acknowledge compliance with a short beep.

Optimizing Battery Life
by Matching the Utility Voltage

Optimize UPS battery life by using the configuration parameters to select the best nominal voltage range for the UPS installation.

When utility voltage is outside the selected operating range, the UPS supplies battery power to the load segments. Maximize the UPS battery life by configuring the UPS so that the utility voltage is normally within the selected operating range.
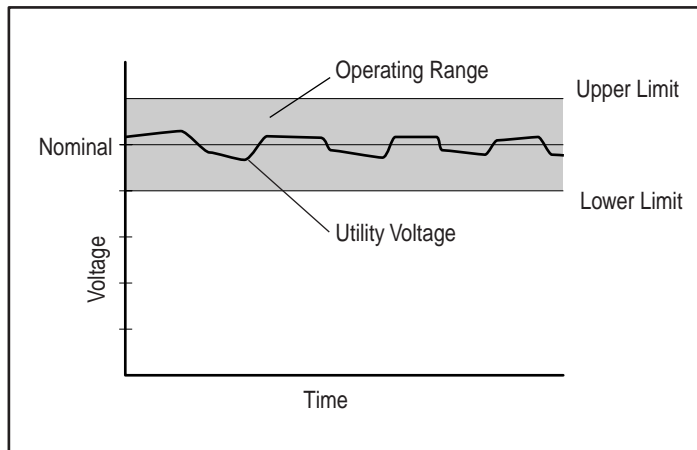
Figure 4-4. Optimal—Utility voltage fluctuating within the UPS operating range
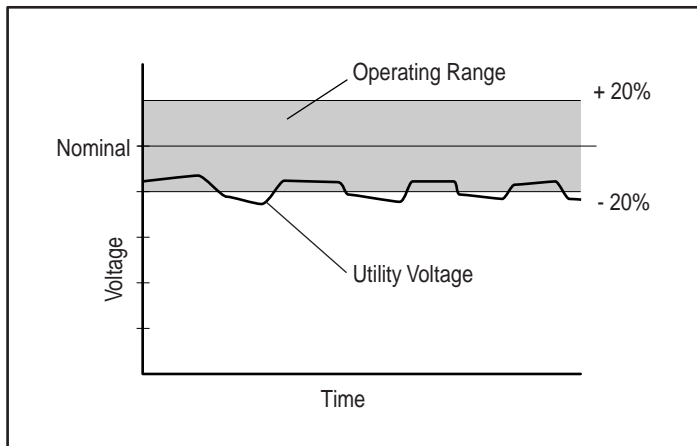
Figure 4-5. Utility voltage fluctuation indicating a shift in nominal voltage range may be necessary
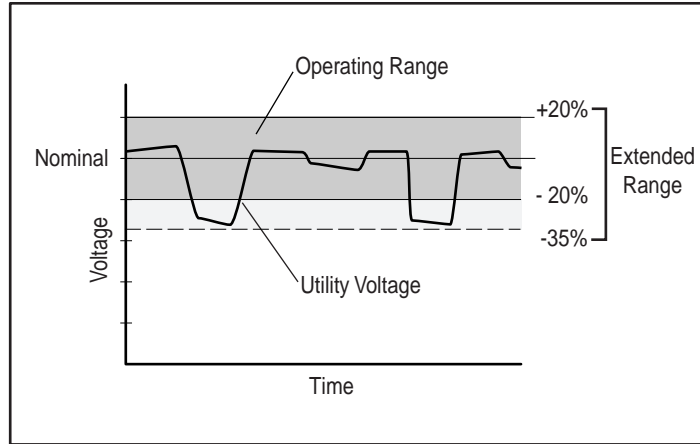
Figure 4-6. Utility voltage fluctuation indicating a possible need for extended range setting

To match the utility voltage, the UPS operating range can be modified in two ways:

■ If the utility voltage differs from the currently configured nominal voltage, but stays within a ±20% band (see Fig 4-5), consider shifting the nominal voltage parameter selection to match the measured utility voltage range.

■ If the utility voltage frequently varies outside the UPS operating range (see Fig 4-6), consider changing from normal to extended range (+20% to –35%). This provides more tolerance to brief utility voltage fluctuations.

To update the nominal voltage and operating range parameters:

 1. Have a qualified electrician monitor utility voltage.

 2. Use the following tables to identify the operating range that most closely matches requirements:

Table 4-2
Operating Ranges (VAC) – North America and Japanese Models

Nominal Level	Normal Range	Extended Range
100	80 to 120	Not applicable for R3000j
110	88 to 132	72 to 132
120	96 to 144	78 to 144
127	102 to 152	83 to 155

Table 4-3
Operating Ranges (VAC) – All High Voltage Models

Nominal Level	Normal Range	Extended Range
208	166 to 250	Not applicable for R3000h-NA
220	176 to 264	143 to 264
230	184 to 276	150 to 276
240	192 to 288	156 to 288

3. For nominal voltage level setting, select configuration parameters 1, 2, 3, or 10 (see Table 4-1).

4. Access parameter 4 to switch from normal to extended range (see Table 4-1).

Chapter **5**

Battery Maintenance

This chapter contains information on the following topics:

- Precautions to be observed when maintaining or replacing batteries

- Charging batteries

- When to replace batteries

- Pre-Failure Battery Warranty

- Obtaining new batteries

- Replacing batteries

- Care and storage of batteries

Precautions

⚠ **WARNING:** There is a risk of personal injury from the hazardous energy levels associated with UPS batteries. The maintenance and replacement of batteries must be carried out by qualified service personnel.

Replace the batteries with the Compaq spare designated for the UPS. The spare battery kit part number is 295462-001.

⚠ **WARNING:** The UPS contains sealed lead-acid batteries. To reduce the risk of fire or chemical burns take the following precautions:

- Do not attempt to recharge batteries after removal from the UPS.

- Do not disassemble, crush, or puncture the batteries.

- Do not short the external contacts of the batteries.

- Do not immerse the batteries in water.

- Do not expose to temperatures higher than 60°C.

⚠ **WARNING:** To reduce the risk of personal injury from hazardous energy, take these precautions:

- Remove watches, rings, or other metal objects.

- Use tools with insulated handles.

⚠ **WARNING:** The 3000 Series UPS models weigh approximately 132 lb (60 kg). Make sure that the rack containing the UPS is stable. The following conditions must be met:

- The leveling feet are extended to the floor.

- The full weight of the rack rests on the leveling feet.

- The stabilizing feet are attached to the rack, if it is a single rack installation.

- The racks are coupled together in multiple rack installations.

- A rack may become unstable if more than one component is extended. Extend only one component at a time.

Charging Batteries

The Compaq 3000 Series UPS models automatically charge the batteries when connected to utility power. No user intervention is required while the UPS is in use.

■ For information on charging the batteries when installing the UPS, see "Completing the Installation" in Chapter 2, "Installation."

■ For information on keeping the batteries charged while the UPS is in extended storage, see "Care and Storage of Batteries" in this chapter.

When to Replace Batteries

When the Battery Service indicator (LED 10) turns red, batteries may need to be replaced within 30 to 60 days.

NOTE: If the audio alarm parameter is enabled, the Battery Service indicator will be accompanied by an audio alarm.
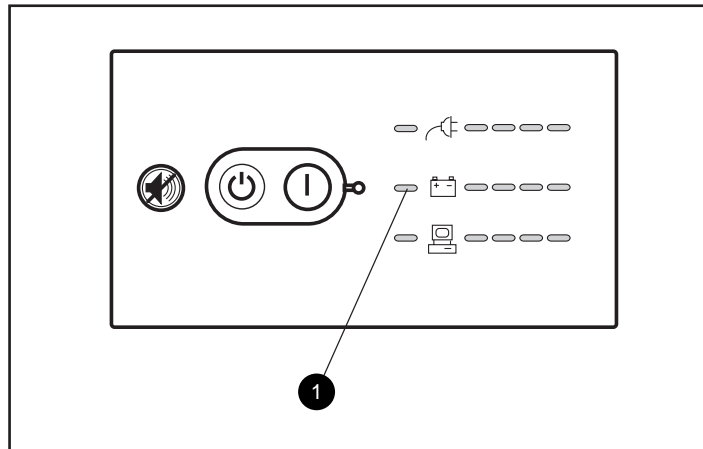
Figure 5-1. The Battery Service indicator (LED 10)

❶ Battery Service indicator (LED 10)

Verify that battery replacement is required by initiating a UPS self-test. If LED 10 remains red, replace the batteries.

NOTE: Depending on usage and environmental conditions, the batteries should last three to six years.

For information on initiating a self-test, see Chapter 3, "Operation."

Pre-Failure Battery Warranty

The Pre-Failure Battery Warranty, standard on all Compaq Uninterruptible Power System (UPS) units, extends the advantage of a Compaq three-year limited warranty by applying it to the battery before it actually fails. Specifically, the Pre-Failure Battery Warranty ensures that when customers receive notification from Compaq Power Management Software that the battery may fail, the battery is replaced free of charge under the warranty.

Compaq maintains the highest standards in the industry, as evidenced by the Compaq Pre-Failure Battery Warranty. The Pre-Failure Battery Warranty is beneficial in at least two significant ways:

■ Reduced total cost of ownership

■ Reduced downtime

Obtaining New Batteries

Compaq supplies spare battery packs for 3000 Series UPS models. Obtain spare batteries for the UPS when the Battery Service indicator (LED 10) illuminates, meaning that new batteries may be required within 30 to 60 days.

The 3000 Series UPS spare battery kit is part number 295462-001.

> **IMPORTANT:** Compaq recommends that an inventory of spare batteries not be maintained onsite unless a procedure to keep these batteries charged while in storage is implemented.

For information on the Battery Service LED function, see Chapter 3, "Operation."

Replacing Batteries

There are two options for replacing UPS batteries:

■ Powering off the UPS before removing the batteries

■ In certain circumstances, hot-swapping the batteries without powering off the UPS

> ⚠ **CAUTION:** While hot-swapping batteries, there is no protection in the event of a utility power failure.

Step 1: Preparing the UPS

To replace batteries with the UPS Off

1. Shut down all load devices.

2. Press the STANDBY button to take the UPS out of Operate mode. The ON LED extinguishes, and power to the load receptacles ceases.

3. Disconnect the UPS from utility power.

4. Wait at least 60 seconds, while the UPS internal circuitry discharges.

To replace batteries with the UPS in Operate mode (hot-swapping)

Batteries may be replaced (hot-swapped) without powering off the UPS if both of the following conditions are met:

■ The UPS is not charging the batteries (Battery Charge LEDs 6, 7, and 8 are all green, indicating that the batteries are fully charged).

   NOTE: Older batteries may be fully charged but still incapable of providing adequate backup for devices. Therefore, the battery charge LEDs can indicate the batteries are fully charged, while the UPS diagnostics have determined that the batteries need to be replaced.

■ The UPS is not supplying battery power to devices (AC Input LEDs 1 and 4 are green, indicating that the UPS is supplying utility power).

Step 2: Removing the Battery Pack

Follow this procedure to remove the battery pack:

1. To obtain access to the battery pack, remove the four screws holding the faceplate; detach the faceplate sufficiently to disconnect the LED display cable.
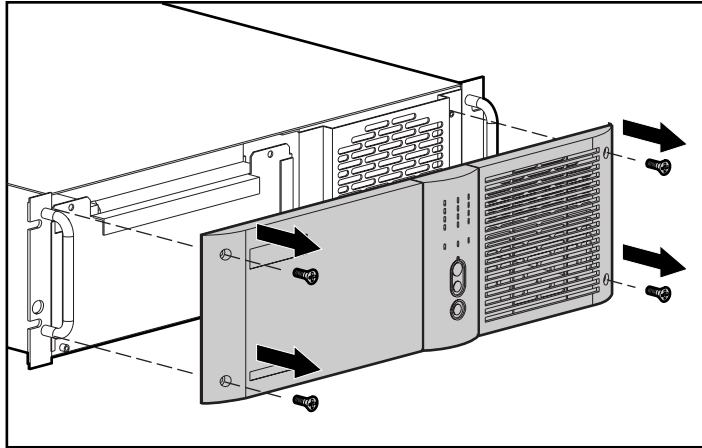
Figure 5-2. Removing the faceplate

2. Disconnect the LED display cable from the faceplate, and set the faceplate aside, exercising care to avoid damaging the printed circuit board behind the LED display.
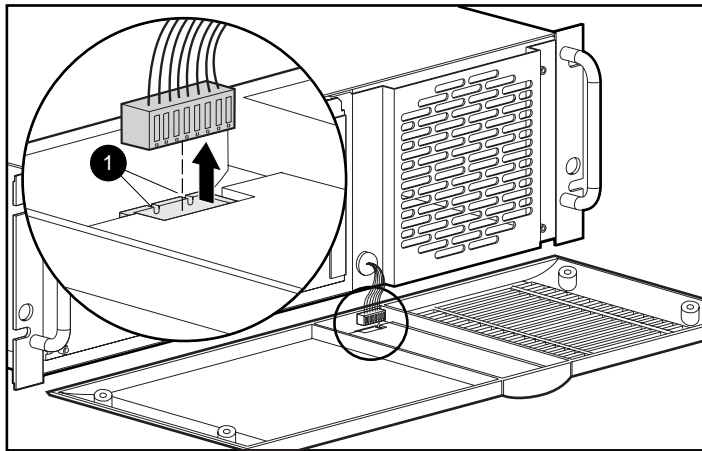
Figure 5-3. Disconnecting the LED display cable

❶   Faceplate attachment slots

> **IMPORTANT:** Protect the LED display cable from damage during the remaining steps of this procedure.

3. Remove two screws to access the battery pack.
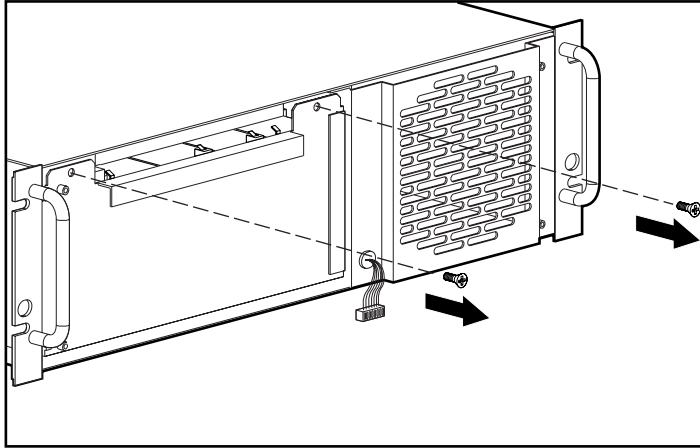
Figure 5-4. Accessing the battery pack

4. Slide the battery pack partially out of the UPS chassis to access the battery terminals.
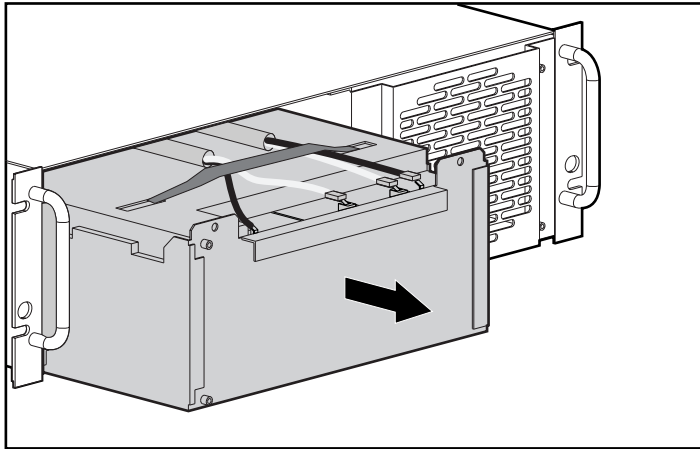
Figure 5-5. Partially removing the battery pack

5. Disconnect the negative (black) battery pack terminal connections.

> **WARNING:** To reduce the risk of short-circuits or arcing, disconnect the negative (black) battery lead before disconnecting the positive (red) battery lead.
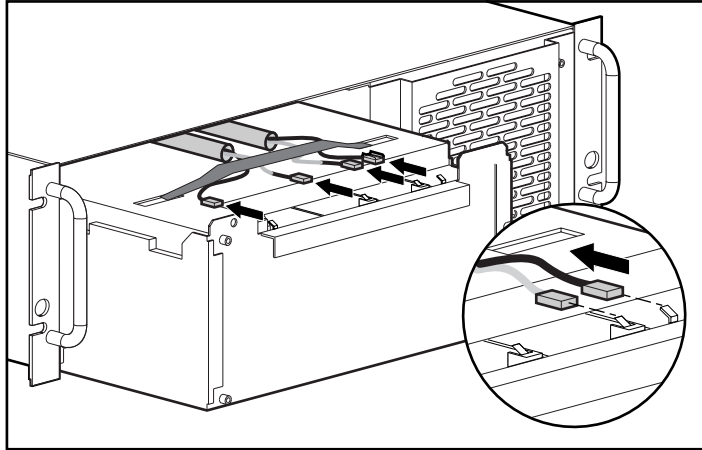
Figure 5-6. Disconnecting the battery pack terminal connections

6. Disconnect the positive (red) battery pack terminal connections.

7. Slide the battery pack out approximately 6 inches, to access the battery cable retainer bracket. Remove the screw and battery cable retainer bracket.
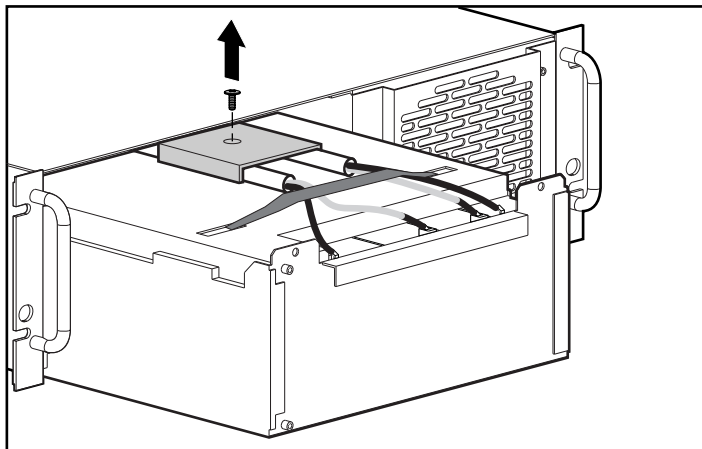
Figure 5-7. Removing the screw and battery cable retainer bracket

⚠️ **WARNING:** The 3000 Series battery pack weighs 60 lb. Prepare the area and observe all materials handling procedures for removing the battery pack.

8. Carefully slide the battery pack out only until the second plastic handle is accessible.
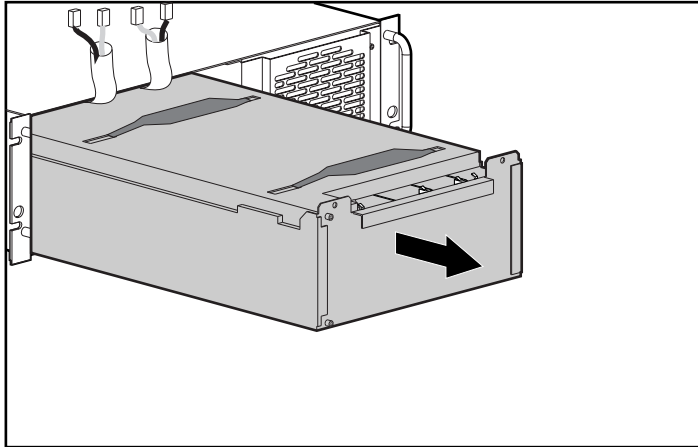
Figure 5-8. Sliding the battery pack out to reveal the second handle

9. Set aside the used battery pack for proper disposal. See "Step 5: Disposing of Used Batteries," in this chapter.

Step 3: Installing New Batteries

To install new batteries, reverse the procedure for "Removing the Battery Pack."

1. Slide the new battery pack into the chassis, leaving room to replace the battery cable retainer bracket. When installing the bracket, position the cables to lie flat, and to run under the plastic handling strap.
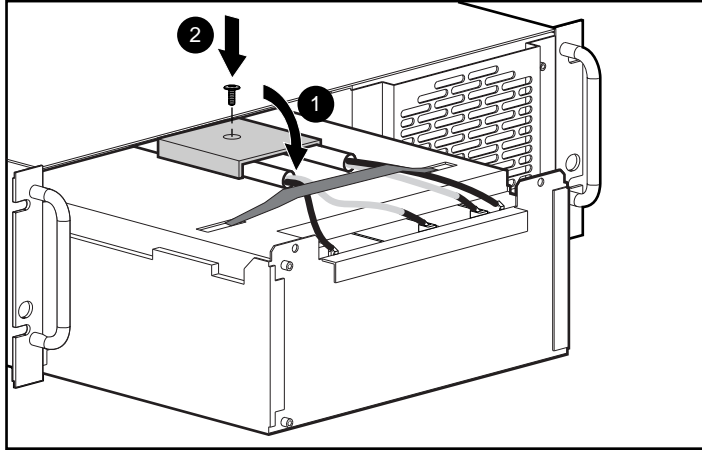
Figure 5-9. Replacing the battery cable retainer bracket

❶   Battery cables   ❷   Battery cable retainer bracket

2. Reconnect the battery cable terminal connectors, positive (+, red lead) first.

> ⚠ **WARNING:** To reduce the risk of short-circuits or arcing, connect the positive (red) battery lead before connecting the negative (black) battery lead.

IMPORTANT: The first inch of each positive battery cable is reinforced with a black material. To reveal the lead colors, slide the protective cable shroud back.

3. Reinstall the screws holding the battery pack to the chassis.

4. Reinstall the faceplate. Attach the LED display cable to the LED display, aligning the two alignment pins on the smooth side of the connector with the slots at the bottom of the receptacle.
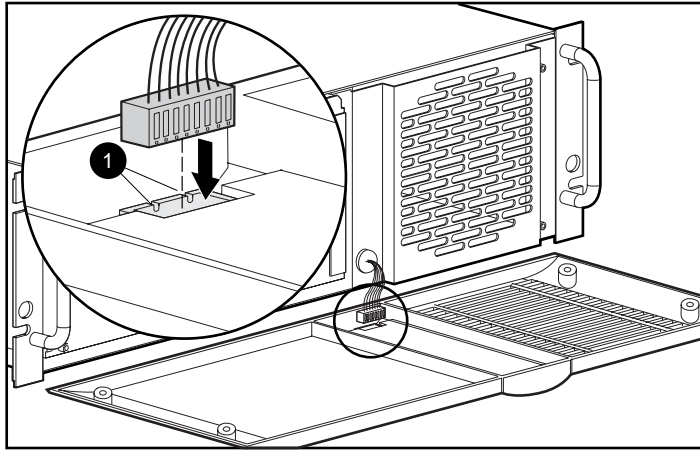
Figure 5-10. Reattaching the LED display cable

❶   Faceplate attachment slots

5. Replace the four screws holding the faceplate to the chassis, taking the necessary precautions to avoid damaging the LED display cable when repositioning the faceplate.

> **IMPORTANT:** Take the appropriate precautions when installing the new battery pack in order to avoid damaging the LED display cable.

Step 4: Testing New Batteries

After installing the new batteries, press the TEST/ALARM RESET button. See Chapter 3, "Operation," for information on running a self-test.

> **IMPORTANT:** The UPS will not execute a self-test until the batteries are 90% charged.

If the installation has been successful, the green Battery Charge indicators (LEDs 6 to 8) show that the UPS is charging the batteries. This means that the installation is now complete.

If the installation has not been successful, the Battery Service indicator (LED 10) will turn red. If this occurs, check the battery terminal connections. If the Battery Service indicator is still red, see Chapter 6, "Troubleshooting," for more information.

Step 5: Disposing of Used Batteries

The spare battery kit includes the instructions and packaging required to return used batteries to the appropriate location for disposal.

Do not dispose of used batteries with general office or household waste. Return the used module for proper disposal to either:

■ Compaq, authorized Compaq Partners, or their agents.

■ A recycling center that meets all local environmental standards.

Care and Storage of Batteries

To maximize the life of batteries:

■ Minimize the amount of time the UPS uses battery power by matching UPS configuration with utility voltage. For more information, see Chapter 4, "Configuration."

■ Keep the area around the UPS clean and dust-free. If the environment is very dusty, clean the outside of the UPS regularly with a vacuum cleaner.

■ Maintain the ambient temperature at 25°C (77°F).

■ If storing a UPS for an extended period, recharge the batteries every six months:

   a. Connect the UPS to utility power.

   b. Allow the UPS to remain in Standby mode.

   c. Allow the UPS to charge the batteries for 24 hours.

   d. Update the Battery Recharge Date label.

Chapter **6**

Troubleshooting

This chapter provides information on the following topics:

■   Troubleshooting problems that occur during UPS start

■   Troubleshooting problems that occur after start

■   Repairing the UPS

Troubleshooting During Start

If problems occur when starting the Compaq 3000 Series UPS models, select the appropriate symptom for possible causes and actions suggested.

Table 6-1
Troubleshooting Guide (UPS Start)

Symptom	Possible Cause	Suggested Action
UPS will not start	No utility power	Check power at the utility power receptacle or contact a qualified electrician.
	UPS power cord disconnected	Connect the power cord.
	UPS input circuit breaker open	Press the circuit breaker button to reset. If the breaker trips repeatedly, contact an authorized service provider. (high models only)
LED 5 is red (Site Wiring Fault)	Utility power receptacle ungrounded or no ground wire in UPS power cord	Contact a qualified electrician to correct the condition.
	Line and neutral wires reversed in utility power receptacle or in UPS power cord	For units factory-configured for 208V, the Site Wiring Fault function has been disabled. If reconfiguring a 230V unit to operate at 208V, the Site Wiring Fault function must be manually disabled. (high models only)
LED 10 is red (Battery Service)	Battery voltage is low because the UPS has been out-of-service for a long period	Allow the UPS to charge the batteries for 24 hours. Initiate a self-test: if LED 10 does not turn off, replace the batteries.
	The UPS was powered on with the Sleep mode disabled, draining the batteries	

Troubleshooting After Start

For problems that occur after the UPS has gone through the startup self-test sequence, these suggested actions address possible causes.

Table 6-2
Troubleshooting Guide (After Start)

Symptom	Possible Cause	Suggested Action
Audio Alarm	Alarm condition exists	Identify the red LED associated with this alarm condition. Check this troubleshooting guide to determine the cause of the alarm.
LED 1 is red (Input Power)	Utility voltage is too high	The utility voltage is higher than the UPS operating range. The UPS switches to battery power. If this happens repeatedly, update the configuration.
		Contact a qualified electrician to make sure that utility power is suitable for the UPS.
LED 1 is flashing red	Alarm may need to be reset	The utility voltage has returned within the UPS operating range. Press the TEST/ALARM RESET button.
LED 4 is red (Input Power)	Utility voltage is too low	The utility voltage is lower than the UPS operating range. The UPS switches to battery power. If this happens repeatedly, update the configuration.
		Contact a qualified electrician to make sure that utility power is suitable for the UPS.
LED 4 is flashing red	Alarm may need to be reset	The utility voltage has returned within the UPS operating range. Press the TEST/ALARM RESET button.

Table 6-2
Troubleshooting Guide (After Start) *continued*

Symptom	Possible Cause	Suggested Action
UPS frequently switches between utility and battery power	Utility power variations	The utility voltage is frequently outside the UPS operating range. Update the configuration.
		Contact a qualified electrician to make sure that utility power is suitable for the UPS.
LED 11 is red (Load Level)	Protected devices are exceeding the UPS power rating	Remove one or more devices to reduce the power requirements.
	(UPS may switch from utility to battery power)	Make sure that the devices are not defective.
LED 9 is red (Battery Charge)	Low battery voltage	If the UPS is supplying battery power, save current work and shut down the system. Allow the batteries to charge.
		If the UPS is supplying utility power, no user intervention is required. Allow the batteries to charge.
Insufficient warning of low batteries	Battery service required	Allow batteries to charge for 24 hours, then initiate self-test. If LED 10 is red, replace batteries.
	Shutdown Delay configuration inappropriate	Update the Shutdown Delay from 5-seconds to 3-minutes.
		Use Compaq Power Management Software to specify a suitable delay.

continued

Table 6-2
Troubleshooting Guide (After Start) *continued*

Symptom	Possible Cause	Suggested Action
LED 10 is red (Battery Service)	Potential battery failure detected	Allow batteries to charge for 24 hours, then initiate self-test. If LED 10 is red, replace batteries.
	New batteries improperly connected	Check connections.
LED 10 is flashing red; audio alarm cannot be silenced	Internal UPS overvoltage condition exists	Shut down the UPS. Contact an authorized service provider.

Repairing the UPS

Repairs to the UPS must be carried out by Compaq or a Compaq Authorized Service Provider. Other than battery replacement, there are no user-serviceable parts.

*Appendix **A***

Regulatory Compliance Notices

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (that is, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

■ Reorient or relocate the receiving antenna.

■ Increase the separation between the equipment and receiver.

■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

■ Consult the dealer or an experienced radio or television technician for help.

**Declaration of Conformity for Products Marked
with the FCC logo - United States Only**

This device complies with Part 15 of the FCC Rules. Operation is subject to
the following two conditions: (1) this device may not cause harmful
interference, and (2) this device must accept any interference received,
including interference that may cause undesired operation.

For questions regarding your product, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

or call 1-800-652-6672 (1-800-OK COMPAQ[1]).

For questions regarding this FCC declaration, contact:
Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

or call (281) 514-3333.

To identify this product, refer to the Part, Series, or Model number found on
the product.

Modifications

The FCC requires the user to be notified that any changes or modifications
made to this device that are not expressly approved by Compaq Computer
Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic
RFI/EMI connector hoods in order to maintain compliance with FCC Rules
and Regulations.

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[1] For continuous quality improvement, calls may be recorded or monitored.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

■ EN55022 (CISPR 22) - Electromagnetic Interference

■ EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity

■ EN60950 (IEC950) - Product Safety

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Taiwanese Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Battery Replacement Notice

Your UPS is provided with a Sealed Lead Acid battery pack. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Replacement is to be done by a Compaq Authorized Service Provider using the Compaq spare designated for this product. For more information about battery replacement or proper disposal, contact your Compaq authorized reseller or your Authorized Service Provider.

> **WARNING:** Your UPS contains a Sealed Lead Acid battery pack. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:
>
> ■ Do not attempt to recharge the battery.
>
> ■ Do not expose to temperatures higher than 60°C.
>
> ■ Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
>
> ■ Replace only with the Compaq spare designated for this product.
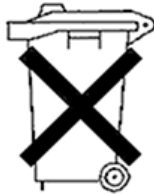
Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, please use the public collection system or return them to Compaq, your authorized Compaq Partners, or their agents.

Appendix **B**

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

■ Avoid hand contact by transporting and storing products in static-safe containers.

■ Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

■ Place parts on a grounded surface before removing them from their containers.

■ Avoid touching pins, leads, or circuitry.

■ Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

■ Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ±10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

■ Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

■ Use conductive field service tools.

■ Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have a Compaq authorized reseller install the part.

> **NOTE:** For more information on static electricity, or assistance with product installation, contact your Compaq authorized reseller.

Appendix C

Specifications

This appendix provides specifications that apply to Compaq 3000 Series UPS models:

■ Physical specifications

■ Input specifications

■ Output specifications

■ Overcurrent protection

■ Battery specifications

■ Battery runtime

■ Environmental specifications

Physical Specifications

Table C-1
Physical Specifications – 3000 Series UPS Models

Feature		U.S.	Metric
Dimensions	Width	19.0 in	483 mm
	Height	5.25 in	133 mm
	Depth	22.3 in	566 mm
Weight		132 lb	60 kg

Input Specifications

Table C-2
Input Specifications – 3000 Series UPS Models

UPS Model	Utility Voltage Frequency (Hz)	Nominal Utility Voltage (VAC)	Power Cord Supplied
R3000	50	100	Non-detachable cord with L5-30p plug
	60	100, 110 120, 127	
R3000j	50	100	Non-detachable cord with L6-30p plug
	60	100, 110 120, 127	
R3000h	50/60	208, 220 230, 240	Detachable cord with country-specific plug
R3000h-Int	50/60	208, 220 230, 240	Non-detachable cord with 15A IEC309p plug
R3000h-NA	50/60	208, 220 230, 240	Non-detachable cord with L6-30p plug

Output Specifications

Table C-3
Output Specifications – 3000 Series UPS Models

UPS Model	Nominal Power Rating (VA)	Load Segment #	Output Receptacles
R3000	2880	1	3 x 5-15R
		2	3 x 5-15R
		3	3 x 5-15R 1 x L5-30R
R3000j	2880	1	3 x 5-15R
		2	3 x 5-15R
		3	3 x 5-15R 1 x L6-30R
R3000h R3000h-Int R3000h-NA	2880	1	3 x IEC-320, C14
		2	3 x IEC-320, C14
		3	3 x IEC-320, C14 1 x IEC-320, C20

Table C-4
Output Specifications – 3000 Series UPS Models

Characteristics	Utility Voltage (VAC)	Nominal Output Voltage (VAC)
Voltage	100	102
	110 to 127	115
	208	204
	220 to 240	230
	Source of Power	**Regulation**
Output	Utility power (normal range)	±8% of nominal output voltage rating (within the guidelines of the Computer Business Equipment Manufacturers Association)
	Utility power (extended range)	+10% to -15% of nominal output voltage rating (within the guidelines of the Computer Business Equipment Manufacturers Association)
	Battery power	±5% of nominal output voltage rating
	Feature	**Specification**
Other features	On-line efficiency	96%
	Voltage wave shape	Sine wave; less than 3% distortion with linear load
	Surge suppression	High energy 6500A peak
	Noise filtering	MOVs and line filter for normal and common mode use

Overcurrent Protection

Table C-5
Overcurrent Protection - Per Model

UPS Model	Input Protection
R3000	Circuit breaker for each load segment
R3000j	Circuit breaker for each load segment
R3000h	Input circuit breaker Circuit breaker for each load segment
R3000h-Int	Input circuit breaker Circuit breaker for each load segment
R3000h-NA	Input circuit breaker Circuit breaker for each load segment

Battery Specifications

Table C-6
Battery Specifications – 3000 Series UPS Models

Feature	Specification
Type	Sealed lead-acid; maintenance-free
Voltage	Internal batteries – 48 VDC
Charging	3 to 8 hours to full charge
	Less than 3 hours to 90% capacity at default nominal utility voltage and no load

Battery Runtime

Table C-7
Estimated Battery Runtime

Load (VA)	Battery Runtime (Minutes)
700	80
800	56
900	50
1000	45
1200	38
1400	32
1500	30
1800	21
2000	19
2200	17
2400	14
3000	11

If a device list the power in Watts, use the following conversion equation:
Volts x Amps = VA per device

If only Watts are given:
Watts x 1.35 = VA
VA/1000 = KVA

Environmental Specifications

Table C-8
Environmental Specifications – 3000 Series UPS Models

Feature	Specification
Operating temperature	0° to 40°C (32° to 104°F)
	UL-tested at 25°C (77°F)
Relative humidity	0% to 95%; non-condensing
Operating altitude	Up to 3000 m (10,000 ft) above sea level
Audible noise	Less than 45 dBA

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