COMPAQ

Compaq Pro UPS 500

Uninterruptible Power System (UPS)

Operation and Reference Guide

First Edition (September 1999)
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Compaq Computer Corporation

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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.

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.

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

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ (1-800-652-6672)[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. 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 model number(s).
- Product model name(s) and number(s).
- Applicable error messages.
- Third-party hardware or software.
- Operating system type and revision level.
- Detailed, specific questions.

Compaq Website

The Compaq website has information on the Compaq Pro UPS 500. 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, see the Compaq website for locations and telephone numbers.

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

Chapter 1

Introduction

This chapter provides information on the following topics:

- Compaq Pro UPS 500 Models.
- Compaq Pro UPS 500 Features.
- Warranties.

Compaq Pro UPS 500 Models

The Compaq Pro UPS 500 includes the following models:

Table 1-1
Compaq Pro UPS 500 Models

UPS Model	Part Numbe	Comments
500	136387-001	120V; North America
500	136387-191	100V; Japan
500	136387-002	230V; International

Compaq Pro UPS 500 Features

- 500 VA of reliable battery backup supports critical loads, such as computers and monitors.
- Special Surge-Protected Receptacle(s) safeguard non-critical equipment, including laser printers, without devoting battery power for their support.
- Automatic Voltage Regulation (Boost) supports connected equipment through periods of low voltage (brownouts) without using battery power.
- Intelligent communications port and Compaq Power Manager Pro UPS software provide unattended shutdown and power condition monitoring.
- Surge-Protected RJ11 Phone/Fax connection (available on select models) safeguards equipment on-line.

Communications Port

The Compaq Pro UPS 500 includes a communications port for data exchange with a host computer. Compaq Power Manager Pro UPS software (supplied with the UPS) enables the user to access status reporting and power manager features.

Compaq Power Manager Pro UPS Software

Compaq supplies power management software with each UPS. Software capabilities include:

- Monitoring utility power, as well as the power supplied by the UPS.
- Logging events.
- Setting up messaging and protective actions in response to events.
- Checking and resetting alarms.
- Managing orderly shutdown of operating systems when an extended utility power failure occurs.
- Powering down battery-protected devices.

For example, if the software detects an extended utility power blackout, the program initiates messaging across the system and starts an operating system shutdown.

For more information on using the Compaq Power Manager Pro UPS Software, see Chapter 4, "Software," or refer to the *Compaq Power Products Software Reference Guide.*

NOTE: Compaq Power Manager Pro UPS software is year 2000 ready.

NOTE: Compaq NeoServers have UPS software pre-installed. NeoServer customers do not install this software.

Phone/Fax Surge Protector

Select Compaq Pro UPS 500 models include a Phone/Fax Surge Protector t protect communications equipment (such as a fax machine or a modem) from transient spikes and surges present on telephone lines.

Warranties

$25,000 Computer Load Protection Guarantee

To back up the wide range of features offered with the UPS, Compaq provides a two-year limited warranty. In addition, Compaq offers a $25,000 Computer Load Protection Guarantee.

The $25,000 Computer Load Protection Guarantee applies only in the following circumstances:

- 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 Systems (UPS), extends the advantage of a Compaq two-year limited warranty by applying warranty coverage to the battery before the battery actually fails. Specifically, the Pre-Failure Battery Warranty ensures that when customers receive notification from Compaq Power Manager Pro UPS software that the battery may fail, the unit 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:

- Items Supplied with the UPS Kit.
- UPS Location Requirements.
- Connecting the UPS Communications Port.
- Installing Compaq Power Manager Pro UPS Software.
- Connecting the UPS Phone/Fax Surge Protector (available on select models).
- Verifying a Safe UPS Load.
- Connecting Devices to the UPS.
- Circuit Requirements.
- Connecting the UPS to Utility Power: 120V and 100V Models.
- Connecting the UPS to Utility Power: 230V Model.
- Connecting the UPS to an AC Generator.
- Selecting the UPS Operating Mode.

Items Supplied with the UPS Kit

Installation Guide

Compaq Pro UPS 500 models are shipped with important installation instructions to help qualified personnel complete the installation. Save these instructions.

Software

Refer to *Software Installation Instructions* (insert included in the CD packaging) for information on the installation requirements for the Compaq Power Manager Pro UPS software.

Battery

Compaq Pro UPS 500 models are shipped with the battery already installed.

Power Cords and UPS/Computer Interface Cable

Compaq Pro UPS 500 models ship with an RS-232 UPS/computer interface cable.

The 120V and 100V models ship with a non-detachable power cord.

The 230V model ships with one IEC-320 jumper cord. For more information about power cords, see "Connecting the UPS to Utility Power" in the chapter entitled "Installation."

UPS Location Requirements

- Confirm the power at the outlet for the UPS does not routinely get shut off. The UPS interprets any AC line failure as a blackout and will operate accordingly. Even with the connected load equipment turned off, if the UPS inverter is enabled, the battery charge will slowly deplete.
- For best performance, keep the indoor temperature between 32°F and 104°F (between 0°C and 40°C).
- Compaq Pro UPS 500 models are intended for installation in a temperature-controlled, indoor area free of conductive contamination. The unit must be kept dry at all times. Avoid exposing the UPS to high heat or humidity.
- Do not block the cooling vents on the unit. These vents must be open for the UPS to operate properly.
- Position the UPS at least 6 inches away from any monitors or floppy disks. Small magnetic fields present during backup operation can cause monitor interference and can disrupt information on disks.

Connecting the UPS Communications Port

The Compaq Pro UPS 500 includes a communications port for data exchange with a host computer.

Connect the RS-232 UPS/computer interface cable (supplied) from the communications port on the UPS to the appropriate communications port on a host computer. See Figure 2-1.

CAUTION: The Compaq Pro UPS 500 uses a standard RS-232 cable. To avoid damaging the equipment, do not use the communications cables supplied with other UPS models.

IMPORTANT: The Compaq Power Manager Pro UPS software requires the communications port to be appropriately cabled to a host computer.

NOTE: Communications port connection is optional. Your UPS will function properly without this connection. However, without this connection, the Compaq Power Manager Pro UPS software will be unable to shut down connected equipment in the event of a blackout.

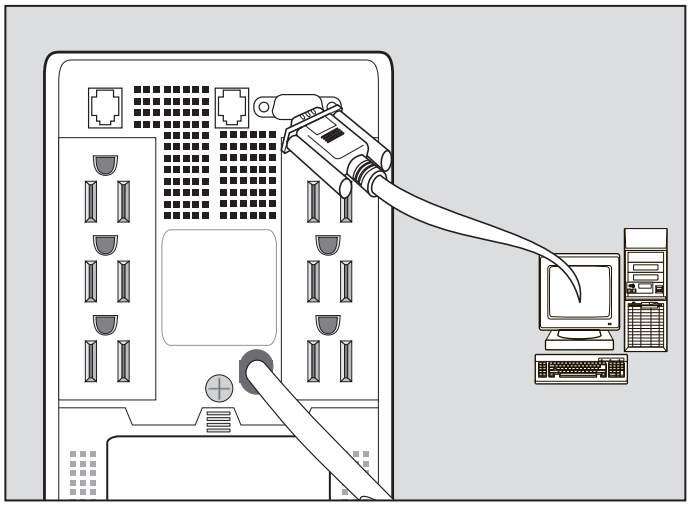


Figure 2-1. Connecting the UPS communications port

Installing Compaq Power Manager Pro UPS Software

Refer to *Software Installation Instructions* (insert included in the CD packaging) for information on the installation requirements for the Compaq Power Manager Pro UPS software.

Connecting the UPS Phone/Fax Surge Protector (Available on Select Models)

Select Compaq Pro UPS 500 models include a Phone/Fax Surge Protector that allows the UPS to protect a communications device from surges on a single phone line.

Connect a phone cord (user supplied) from the wall jack to the UPS connector labeled "IN." Connect a phone cord from your equipment to the UPS connector labeled "OUT." See Figure 2-2.

CAUTION: To avoid damaging the equipment, do not connect the Phone/Fax Surge Protector to a digital PBX line. Connect to an analog phone line.

NOTE: Phone/Fax Surge Protector connection is optional. Your UPS will function properly without this connection.

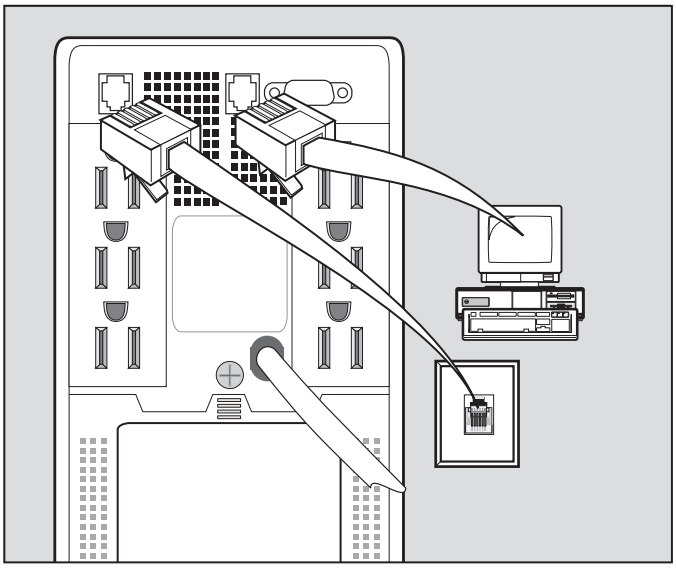


Figure 2-2. Connecting the UPS Phone/Fax Surge Protector

Verifying a Safe UPS Load

Before connecting any devices, verify that the Battery- and Surge-Protected Receptacles of the UPS will not be overloaded. The cumulative VA rating of the devices (the load) to be connected to the Battery- and Surge-Protected Receptacles cannot exceed 500 (the VA rating of all Compaq Pro UPS 500 models).

- For devices rated in Amps, use the following conversion equation:

  Volts x Amps = VA per device

- For devices rated in Watts, use the following conversion equation:

  Watts x 1.35 = VA per device

NOTE: Verifying a Safe Load does not include the devices connected to the Surge-Protected Receptacle(s).

Connecting Devices to the UPS

After verifying that the UPS will not overload, connect the power cords from the devices to the appropriate receptacles of the UPS. Observe the following precautions:

WARNING: Do not use the Compaq Pro UPS 500 for life support applications in which a malfunction or failure of a Compaq Pro UPS 500 could cause failure or significantly alter the performance of a life support device.

CAUTION: Do not plug laser printers into the Battery- and Surge-Protected Receptacles of the Compaq Pro UPS 500. The instantaneous current drawn by this type of printer may overload the UPS circuit.

Never plug a UPS into itself. This WILL result in damage to the unit.

If the device is equipped with a three-prong grounded plug, always use it. Do not use an adapter or otherwise bypass the ground pin.

Using an external surge protector plugged into the OUTPUT of the UPS may cause the UPS to become overloaded when operating from battery power. Since the UPS already has surge suppression circuitry, adding extra surge suppression is not recommended.

The load equipment must be turned OFF before plugging into the UPS.

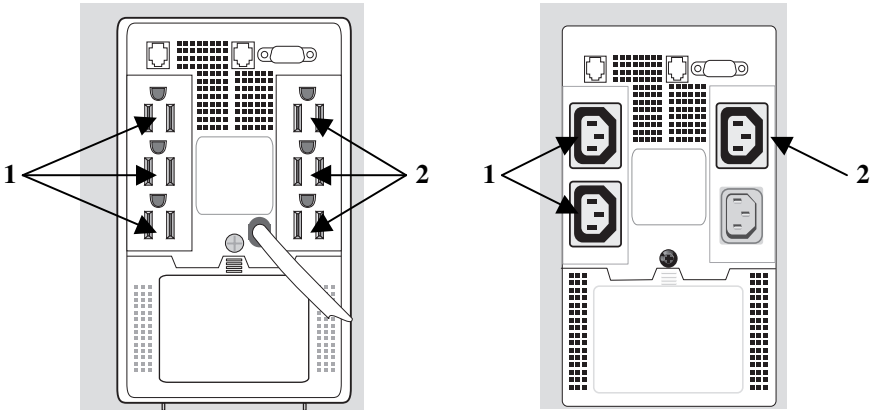
Connecting Devices to Battery- and Surge-Protected Receptacles

Plug the equipment which needs battery backup support in the event of a blackout (such as your computer, monitor and external modem) into the Battery- and Surge-Protected Receptacles on the UPS rear panel. See Figure 2-3.

Connecting Devices to Surge-Protected Receptacle(s)

Plug non-critical equipment (such as printers and peripherals) into the Surge-Protected Receptacle(s) on the UPS rear panel. See Figure 2-3. The Surge-Protected Receptacle(s) will provide connected peripherals with surge protection without committing valuable battery power to support the peripherals during blackouts.

NOTE: When the UPS is connected to utility power, all receptacles will immediately be energized regardless of the UPS Operating Mode selected by the UPS ON/STANDBY button. All receptacles provide AC line power during normal operation and complete surge and line noise protection.



120V and 100V Models 230V Model

Figure 2-3. Connecting Devices to the UPS

1. Battery- and Surge-Protected Receptacles.
2. Surge-Protected Receptacle(s).

Circuit Requirements

WARNING:

- To reduce the risk of fire, connect 120V and 100V models only to a circuit provided with at least 15 amperes maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70, or any other electrical codes that apply to your area.
- To reduce the risk of fire, connect 230V models only to a circuit provided with at least 10 amperes maximum branch circuit overcurrent protection in accordance with local electrical codes.

WARNING: Use of the Compaq Pro UPS 500 as a power source requires connection to an appropriate electrical circuit to maintain ground continuity for networks, and to safety shield the male plug. Consult a licensed electrician regarding ground requirements.

Connecting the UPS to Utility Power: 120V and 100V Models

The 120V and 100V models ship with a non-detachable input power cord with a NEMA 5-15 plug.

Connect the UPS to a grounded utility power outlet.

After connecting the UPS to utility power, check the front panel indicators. The green LINE STATUS indicator will either be illuminated constantly or flashing, depending on the UPS Operating Mode selected. (See "Selecting the UPS Operating Mode" in this Chapter.) If the UPS is in the "Standby" Mode, an audio alarm will sound. If any indicators are red, see Chapter 6, "Troubleshooting."

WARNING: To reduce the risk of personal injury resulting from electrical shock or to avoid damage to the equipment:

- 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 an extension cord.

IMPORTANT: When the UPS is connected to utility power, all receptacles will be immediately energized regardless of the UPS Operating Mode selected by the UPS ON/STANDBY button.

IMPORTANT: If the UPS does not include a power cord that is suitable for the application, contact an authorized Compaq service representative to obtain the appropriate power cord.

See Chapter 3, "Operation," for more information on the front panel indicators and controls.

Connecting the UPS to Utility Power: 230V Model

The 230V model ships with one IEC-320 jumper power cord. After exchanging the UPS IEC-320 jumper cord with your computer power cord, connect your computer to the UPS and the UPS to an electrical outlet. See Figure 2-4.

- Connect the male plug of the UPS IEC-320 jumper cord (A) into a UPS receptacle. Connect its female plug into your computer male input.
- Connect the female plug of your computer power cord (B) into the UPS male input. Connect its male plug into a utility wall outlet.

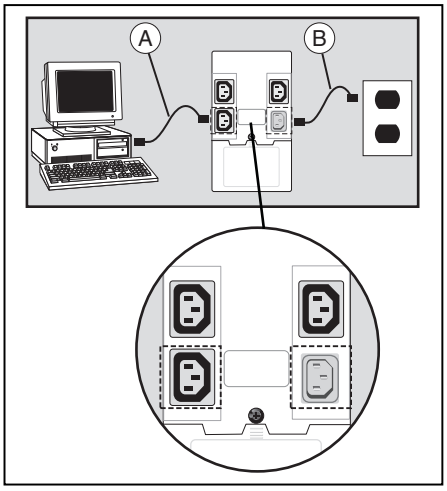


Figure 2-4. Connecting the UPS to utility power: 230V model

A. IEC-320 jumper cord.
B. Computer power cord.

After connecting the UPS to utility power, check the front panel indicators. The green LINE STATUS indicator will be either illuminated constantly or flashing, depending on the UPS Operating Mode selected. (See "Selecting the UPS Operating Mode" in this Chapter.) If the UPS is in the "Standby" Mode, an audio alarm will sound. If any of the indicators are red, see Chapter 6, "Troubleshooting."

WARNING: To reduce the risk of personal injury resulting from electric shock or to avoid damage to the equipment:

- 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.

IMPORTANT: When the UPS is connected to utility power, all receptacles will be immediately energized regardless of the UPS Operating Mode selected by the UPS ON/STANDBY button.

NOTE: If the UPS does not include a power cord that is suitable for the application, contact an authorized Compaq service representative to obtain the appropriate power cord.

See Chapter 3, "Operation" for more information on the front panel indicators and controls.

Connecting the UPS to an AC Generator

CAUTION: Some motor-powered AC generators have voltage and frequency outputs that can fluctuate beyond nominal accepted ranges and can cause damage to the UPS if connected to the generator output. Consult the generator manufacturer or Compaq (see Chapter 1, "Introduction") before connecting the UPS to a generator.

Selecting the UPS Operating Mode

Select the UPS Operating Mode appropriate to your area (see "UPS Operating Mode Recommendations" below) using the ON/STANDBY button.

The ON/STANDBY button is a momentary switch that toggles between two UPS Operating Modes ("ON" and "STANDBY"). Press the ON/STANDBY button and hold for 2 seconds until you hear a beep to toggle back and forth between the two modes.

"ON" Mode

Function: ENABLES battery backup. **UPS Conditions:** The UPS battery is charging. Power is ON at the UPS receptacles. The green LINE STATUS indicator is illuminated. **Setting Advantages** Provides battery backup in the event of a blackout or brownout.

"STANDBY" Mode

Function: DISABLES battery backup. **UPS Conditions:** The UPS battery is charging. Power is ON at the UPS receptacles. The green LINE STATUS indicator is flashing. The UPS audio alarm is sounding once per minute. **Setting Advantages:** Continues to charge the battery when power is present, while turning the inverter OFF to prevent battery backup operation when equipment is not in use.

UPS Operating Mode Recommendations

USA, Canada and Western Europe

- Place the UPS in the "ON" Mode and leave the UPS in that mode at all times.

All Other Countries

- Place the UPS in the "STANDBY" Mode when you **are not using** connected equipment.
- Place the UPS in the "ON" Mode when you **are using** connected equipment.

CAUTION: When the UPS is in the "STANDBY" Mode, the UPS will not provide battery backup during a blackout or severe brownout.

NOTE: The Compaq Pro UPS 500 can be used as a stand-alone power source when utility power is not present. See "Start-On-Battery (Cold-Start) Operation" in Chapter 3.

Chapter 3

Operation

This chapter provides information on the following topics:

- Operation Precautions.
- Front Panel Overview.
- Front Panel Controls (ON/STANDBY Button).
- Front Panel Controls (TEST/ALARM RESET Button).
- Front Panel Indicators and Audio Alarms.
- Rear Panel Overview.
- Rear Panel Features.

Operation Precautions

Observe these precautions when using the UPS.

WARNING: To reduce the risk of personal injury from earth conductor leakage currents:

- 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). Refer to "Initiating a Self-test," in this chapter, for more information.

Front Panel Overview

Compaq Pro UPS 500 models feature the same front panel which includes the controls required to select UPS Operating Modes, initiate a self-test of the UPS battery and silence an audio alarm. The front panel also includes indicator lights that alert you to UPS operating conditions.

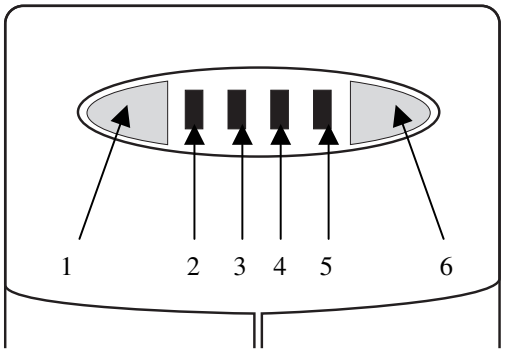


Figure 3-1. Front panel controls and indicators

1. ON/STANDBY button.
2. LINE STATUS indicator.
3. ON BATTERY indicator.
4. BATTERY LOW/REPLACE indicator.
5. UPS LOAD indicator.
6. TEST/ALARM RESET button.

Front Panel Controls (ON/STANDBY Button)

The ON/STANDBY button is a momentary switch that toggles between two UPS Operating Modes (ON and STANDBY) when utility power is present. Press the ON/STANDBY button and hold for 2 seconds until you hear a beep to toggle back and forth between the two modes.

IMPORTANT: When the UPS is connected to utility power, all receptacles will be immediately energized regardless of the UPS Operating Mode selected by the UPS ON/STANDBY button.

NOTE: The ON/STANDBY button can also be used to turn the UPS OFF and place it in a de-energized "IDLE" Mode. The UPS battery charger will be turned OFF. Power will be turned OFF at all UPS receptacles, and all indicators will be turned OFF. Before the UPS can be placed in the IDLE Mode, however, utility power must be absent and the UPS must be either in the STANDBY Mode, BATTERY OPERATE Mode or an overload condition must exist. To place the UPS in the IDLE Mode, press the ON/STANDBY button and hold for 2 seconds until you hear a beep. The UPS will return to the ON Mode once utility power is restored.

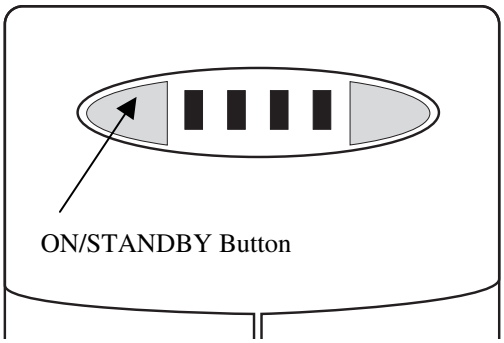


Figure 3-2. Select the UPS Operating Mode

"ON" Mode

Function: ENABLES battery backup. **UPS Conditions:** The UPS battery is charging. Power is ON at the UPS receptacles. The green LINE STATUS indicator is illuminated. **Setting Advantages** Provides battery backup in the event of a blackout or brownout.

"STANDBY" Mode

Function: DISABLES battery backup. **UPS Conditions:** The UPS battery is charging. Power is ON at the UPS receptacles. The green LINE STATUS indicator is flashing. The UPS audio alarm is sounding once per minute. **Setting Advantages:** Continues to charge the battery when power is present, while turning the inverter OFF to prevent battery backup operation when equipment is not in use.

UPS Operating Mode Recommendations

USA, Canada and Western Europe

- Place the UPS in the "ON" Mode and leave the UPS in that mode at all times.

All Other Countries

- Place the UPS in the "STANDBY" Mode when you **are not using** connected equipment.
- Place the UPS in the "ON" Mode when you **are using** connected equipment.

CAUTION: When the UPS is in the "STANDBY" Mode, the UPS will not provide battery backup during a blackout or severe brownout.

NOTE: The "ON," "STANDBY" and "IDLE" UPS Operating Modes can be manually selected by the user. There are, however, three additional UPS Operating Modes which occur automatically:

Battery Operate Mode: While the UPS is in the "ON" Mode and a blackout or severe brownout occurs, the UPS will automatically switch to battery power. The yellow ON BATTERY indicator will be illuminated. AC power from the UPS battery is available at the Battery- and Surge-Protected Receptacles. AC power is not available at the Surge-Protected Receptacles. An audio alarm sounds (the alarm can be muted).

Automatic Shutdown Mode: When the UPS detects that less than 2 minutes of battery power is available during a prolonged blackout or brownout at approximately full load, the UPS will automatically enter Automatic Shutdown Mode. The red BATTERY LOW/REPLACE indicator is illuminated. Less than 2 minutes of AC Power is available at the Battery- and Surge-Protected Receptacles. A non-silenceable alarm sounds as the UPS prepares for shutdown.

Automatic Voltage Regulation (Boost) Mode: When an undervoltage occurs, the UPS will automatically correct the voltage level without switching to battery power. When this occurs, the UPS may emit a clicking sound. The more the UPS adjusts the voltage level, the more the UPS will click. This is a normal, automatic operation of the UPS, and no action is required.

Start-On-Battery ("Cold-Start") Operation

Compaq Pro UPS 500 models have special circuitry that allows them to be used as stand-alone power sources when utility power is not present: Start-On-Battery ("Cold-Start") operation. The Battery- and Surge-Protected Receptacles will supply AC power for the time limits of the internal battery. The Surge-Protected Receptacles, however, will not supply AC power until utility power returns.

- To "Cold-Start" the UPS when you first plug in the unit and power is not present, momentarily press the ON/STANDBY button and release the button after the UPS emits a beep.
- To "Cold-Start" the UPS when the unit is plugged in and operating i the "STANDBY" Mode, press the ON/STANDBY button and release the button after the UPS emits a beep; press the ON/STANDBY button a second time and release the button after the UPS emits a beep.

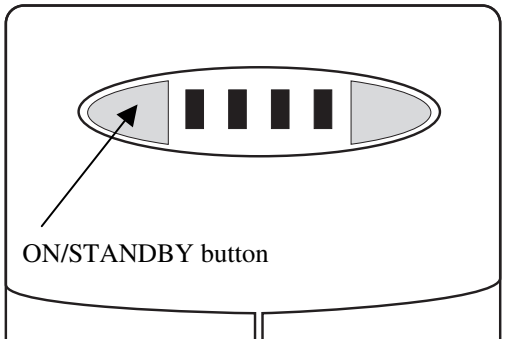


Figure 3-3. Select Start-On-Battery ("Cold-Start") Operation

WARNING: Verify safety grounding. Leave the UPS connected to building electrical circuit to maintain ground continuity for networks and to safety shield the male plug, unless a qualified electrician determines that ground is not needed.

IMPORTANT:

- Performing a "Cold-Start" with load present requires more power than keeping an already-operating load running. You may not be able to start as large a load as usual when performing a "Cold-Start" using the Compaq Pro UPS 500.
- After performing a "Cold-Start," the UPS drains the charge on the batteries; runtime is very limited.
- If utility power returns, power WILL BE SUPPLIED at the Surge-Protected Receptacles if the unit is connected to the utility outlet.

Front Panel Controls (TEST/ALARM RESET Button)

The TEST/ALARM RESET button is a momentary switch that allows you to initiate a UPS self-test or silence an audio alarm.

Initiating a UPS Self-Test

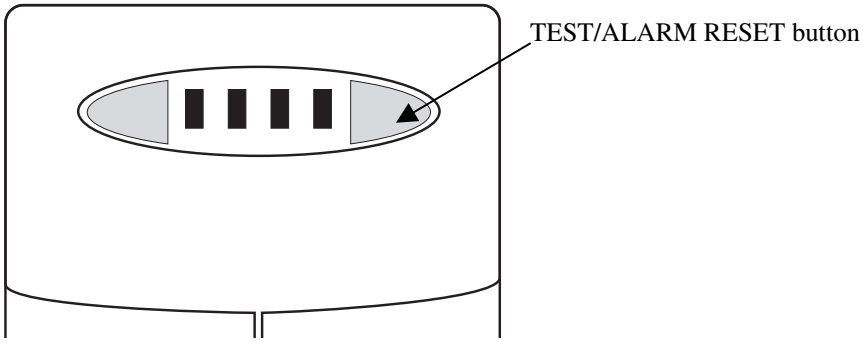


Figure 3-4. Initiating a UPS Self-Test

In the "ON" Mode, pressing and holding the TEST/ALARM RESET button (until the UPS acknowledges with a beep) will initiate a sophisticated self-test of the UPS batteries, full function of the backup system and the load condition of the Battery- and Surge-Protected Receptacles. During the test period, the load connected to the Battery- and Surge-Protected Receptacles is powered from the batteries for about 10 seconds. All indicator lights will illuminate briefly and an audio alarm will sound.

- If battery replacement is indicated by the internal microprocessor circuitry of the UPS, the BATTERY LOW/REPLACE indicator will illuminate. The audio alarm will sound once every 10 seconds until cleared by a successful self-test. The alarm will be muted and will not resume if the UPS switches to Battery Operate Mode or is placed in the STANDBY Mode.
- If the Battery- and Surge-Protected Receptacles are overloaded, the UPS LOAD indicator will illuminate. Remove the excess load immediately.

CAUTION: Do not initiate the self-test procedures while critical computer or load functions are being performed.

IMPORTANT: For the Compaq 500 UPS, the only method of checking the battery and circuitry functionality is by performing a UPS self-test on a routine basis.

Silencing an Audio Alarm

The UPS may sound an audio alarm to warn the user that an alarm condition exists. Momentarily press and release the TEST/ALARM RESET button to silence the alarm.

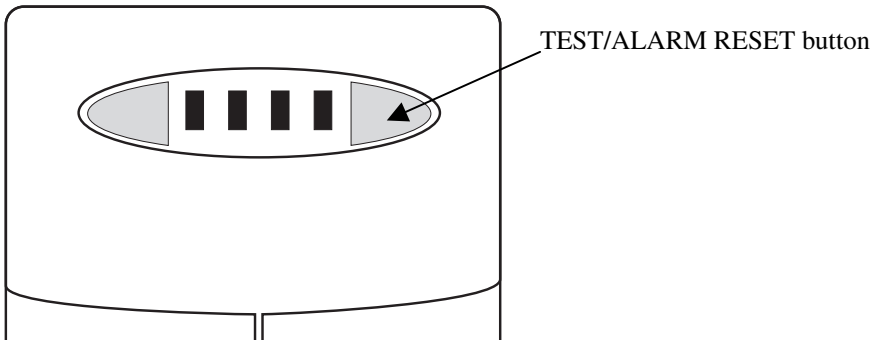


Figure 3-5. Silencing an Audio Alarm

IMPORTANT:

- While an audio alarm may be silenced, the condition that caused the alarm may still exist. See Chapter 6, "Troubleshooting," for information on procedures if the UPS detects an alarm condition.
- When the UPS is operating from the battery and battery power is nearly depleted, the alarm cannot be silenced. This alerts the user to immediately shut down connected equipment.

Front Panel Indicators and Audio Alarms

The front panel indicators signal the status of the UPS:

LINE STATUS Indicator (Green)

Illuminates whenever the UPS is connected to acceptable AC utility line power.

While the UPS is in the “ON” Mode, this light will remain illuminated constantly to indicate that battery backup is enabled and will be available at the Battery- and Surge-Protected Receptacles in the event of a blackout or brownout.

While the UPS is in the “Standby” Mode, this light will flash (and an alarm will sound once per minute) to indicate that battery backup is disabled and will not be available at the Battery- and Surge-Protected Receptacles in the event of a blackout or brownout. The alarm can be silenced by momentarily pressing the TEST/ALARM RESET button.

NOTE: If the UPS is disconnected from utility power, the UPS will return to the mode (ON or STANDBY) the UPS was in when power was lost.

ON BATTERY Indicator (Yellow)

Illuminates whenever the UPS is operating from internal batteries. After 10 seconds of continuous battery operation, an audio alarm will sound consisting of 4 short beeps, followed by an 8-second pause. The alarm can be silenced by momentarily pressing the TEST/ALARM RESET button. When the battery is nearly depleted, both the ON BATTERY and BATTERY LOW/REPLACE indicators will illuminate and the alarm will resume (and cannot be silenced) to alert the user to immediately shut down connected equipment.

BATTERY LOW/REPLACE Indicator (Red)

Illuminates when the internal processor detects a low or weak battery.

The Battery Low/Replace indicator will illuminate constantly to indicate low battery charge. This indicator will flash, after a self-test is initiated, to indicate the need to replace the battery. An audio alarm will sound once per 10 seconds. The alarm can be silenced by momentarily pressing the

TEST/ALARM RESET button. If the BATTERY LOW/REPLACE indicator flashes, allow the UPS to recharge for 12 hours and repeat the self-test. See "Initiating a UPS Self-Test" in this chapter.

UPS LOAD Indicator (Red)

Illuminates automatically under the following conditions: utility power is absent, the UPS is operating from the battery and an overload condition exists. Flashes when the UPS detects overload conditions of 100 percent of rated load. The UPS will shut down and the indicator will illuminate continuously if the UPS load exceeds 100 percent of rating. Remove excess load immediately and initiate a self-test to clear the shutdown latch.

You can detect the presence of an overload by conducting a self-test. See "Initiating a UPS Self-Test" in this chapter.

Rear Panel Overview

Compaq Pro UPS 500 models have the following rear panel configurations:

IMPORTANT: There are no user-serviceable parts inside the UPS. Do not open the UPS for any reason.

Compaq Pro UPS 500: 120V and 100V Models

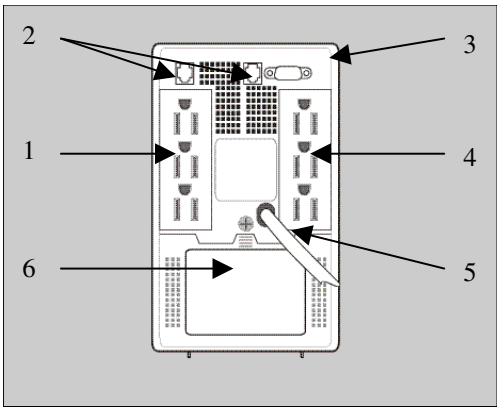


Figure 3-6. Rear panel of Compaq Pro UPS 500: 120V and 100V models

1) Battery- and Surge-Protected receptacles.
2) RJ11 Phone/Fax surge protector (available on select models).
3) DB9 Communications port.
4) Surge-Protected receptacles.
5) Non-detachable power cord with NEMA 5-15 plug.
6) Battery Replacement Door.

Compaq Pro UPS 500: 230V Model

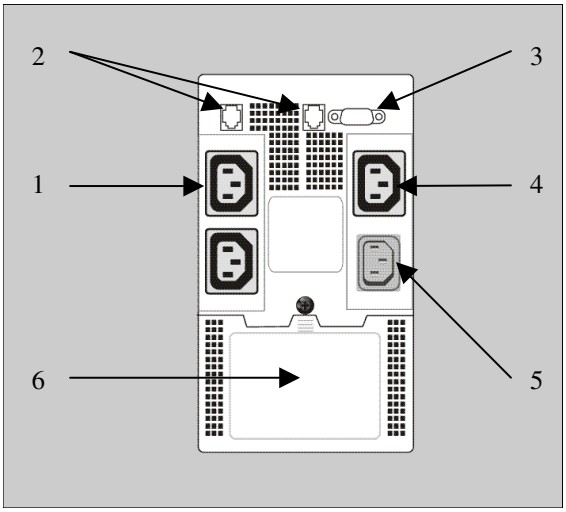


Figure 3-7. Rear panel of Compaq Pro UPS 500: 230V model

1) Battery- and Surge Protected receptacles.
2) RJ11 Phone/Fax surge protector (available on select models).
3) DB9 Communications port.
4) Surge-Protected receptacle.
5) AC Power Input receptacle.
6) Battery Replacement Door.

Rear Panel Features

The rear panels of all models contain the following features:

Battery- and Surge-Protected Receptacles

These receptacles provide connected equipment with AC line power during normal operation. They also protect your equipment against damaging surges and line noise. Connect your computer, monitor and other critical equipment to these receptacles. They will provide battery power during blackouts and brownouts only if the UPS is in the “ON” Mode [see “Front Panel Controls (ON/STANDBY button)” in this chapter].

RJ11 Phone/Fax Surge Protector

Select Compaq Pro UPS 500 models include a Phone/Fax Surge Protector t protect communications equipment (such as a fax machine, or a modem) from transient spikes and surges present on telephone lines.

DB9 Communications Port

The DB9 Communications port connects your UPS to any computer or workstation. Use with Compaq Power Manager Pro UPS software to enable automatic shutdown and complete power management functionality.

Surge-Protected Receptacle(s)

These receptacles provide connected equipment with AC line power during normal operation. They also protect your equipment against damaging surges and line noise. Connect your printer and other non-critical peripherals to these receptacles. They will not provide battery backup during blackouts and brownouts. They always supply AC power, when present, regardless of the UPS Operating Mode selected by the ON/STANDBY button.

AC Power Input Receptacle (230V Model Only)

This receptacle accepts a detachable IEC-320 power cord. See Chapter 2 “Installation” for details.

Battery Replacement Door

Under normal conditions, the battery supplied in your UPS will last several years. Battery replacement should be performed only by qualified service personnel.

Chapter 4

Software

This chapter provides information on the following topics:

- Software Overview.
- Software Functions.
- Configuration Parameters.

Software Overview

Compaq Power Manager Pro UPS software is a web-based interface. Using either Netscape Navigator 3.0 or later, or Microsoft Internet Explorer 4.0 or later, system administrators can monitor and manage power being supplied by UPS units.

Refer to *Software Installation Instructions* (insert included in the Compaq Power Manager Pro UPS Software and Documentation CD packaging) for information on the installation requirements for the Compaq Power Manager Pro UPS software.

NOTE: Compaq Power Manager Pro UPS software is year 2000 ready.

NOTE: Compaq NeoServers have UPS software pre-installed. NeoServer customers do not install this software.

Software Functions

Compaq Power Manager Pro UPS software performs the following functions:

- Displays UPS status.
- Manages orderly shutdown of operating systems when an extended utility power failure occurs.
- Executes messaging functions to operators, system administrators and users.

Displaying UPS Status

View the status of any UPS on the network, including:

- UPS communications.
- Line state.
- Operating system shutdown countdown.
- UPS self-test results.
- Battery state.
- Battery capacity.
- Input voltage state.
- Load state.
- Event log summary.

UPS Control Functions

Perform the following UPS control functions, using the software security features, to protect access:

- Execute UPS self-test.
- Shut down operating system and UPS.

Configuration Parameter

System administrators and operators can configure Compaq Power Manager Pro UPS software parameters through the web-based interface, including:

- Communication setting.
  - Poll rate.
- Broadcast settings.
  - Wait time before broadcasting message.
  - Enable/disable broadcasting.
- Shutdown settings.
  - Configured time delay before system shutdown when on battery.
  - Configured time delay before system shutdown due to low battery.
  - Enable/disable shutdown.
- Security settings.
  - Password protection.
  - Enable/disable password.

Chapter 5

Battery Maintenance

This chapter provides information on the following topics:

- Battery Precautions.
- Charging Batteries.
- When to Replace Batteries.
- Pre-Failure Battery Warranty.
- Obtaining New Batteries.
- Care and Storage of Batteries.
- Disposing of Used Batteries.

Battery Precautions

There are no user-serviceable parts inside the Compaq Pro UPS 500. Do not open the UPS for any reason. Contact an authorized Compaq service provider.

WARNING: There is 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 who understand the procedures, hazards, and precautions involved.

WARNING: The UPS contains sealed lead-acid batteries. To reduce the risk of fire or chemical burns, qualified service personnel must take the following precautions:

- Set the UPS on a flat, level surface and unplug the UPS.
- Use tools with insulated handles and replace the existing batteries with new batteries of the same number and type.
- 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 dispose of the batteries in a fire.
- Do not attempt to add external batteries.

Charging Batteries

The UPS automatically charges the batteries while the UPS is connected to utility power at nominal voltage levels. No user-intervention is required while the UPS is in use. See “Care and Storage of Batteries” in this chapter for information on keeping the batteries charged while the UPS is in extended storage.

When to Replace Batteries

If the BATTERY LOW/REPLACE indicator illuminates during a self-test, the UPS may require service. The indicator will be accompanied by an audio alarm.

Verify that battery replacement is required by allowing the UPS to charge the battery for 12 hours, then initiate a confirming self-test. See Chapter 3, "Operation," for information on initiating a self-test.

NOTE: Depending on usage and environmental conditions, batteries should last 3-6 years.

Pre-Failure Battery Warranty

The Pre-Failure Battery Warranty, standard on all Compaq Uninterruptible Power Systems (UPS), extends the advantage of a Compaq two-year limited warranty by applying warranty coverage to the battery before the battery actually fails. Specifically, the Pre-Failure Battery Warranty ensures that when customers receive notification from Compaq Power Manager Pro UPS software that the battery may fail, the unit 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

Contact an authorized Compaq service provider when the BATTERY LOW/REPLACE indicator illuminates during the confirming self-test, indicating that new batteries will be required.

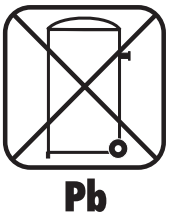
Care and Storage of Batteries

To maximize the life of batteries:

- Minimize the amount of time the UPS is using battery power.
- 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 about 25°C (77°F).
- If storing a UPS for an extended period, recharge the batteries every 6 months:
  - Connect the UPS to utility power.
  - Allow the UPS to charge the batteries for 12 hours.

Disposing of Used Batteries

Replacement equipment includes the instructions and packaging required to return used batteries/units 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.

Chapter 6

Troubleshooting

This chapter provides information on the following topics:

- Troubleshooting During Start.
- Troubleshooting After Start.
- Repairing the UPS.

Troubleshooting During Start

Use the actions suggested in this table if problems occur when starting the UPS.

Table 6-1
Troubleshooting Guide (UPS Start)

Symptom	Possible Cause	Suggested Action
Indicators: none Alarm: none	UPS power cord disconnected.	Connect power cord.
	No utility power.	Contact a qualified electrician to check power at the utility power receptacle. If desired, the UPS can be used as a stand-alone power source. See "Start-On-Battery ("Cold-Start") Operation" in Chapter 3.
Indicators: BATTERY LOW/REPLACE LINE STATUS Alarm: none	Battery voltage is low because the UPS has been stored for an extended period of time without charging.	Allow the UPS to charge the batteries for 12 hours. Initiate a self-test: if indicators illuminate again, replace the batteries.
	Battery voltage is low because UPS supported a load (and performed shutdown) during a blackout.	

Troubleshooting After Start

Use the actions suggested in this table if problems occur after the UPS is started.

Table 6-2
Troubleshooting Guide (After Start)

Symptom	Possible Cause	Suggested Action
Indicators: LINE STATUS (flashing) Alarm: 1 per minute (can be silenced)	UPS in "STANDBY" Mode.	Press and hold the ON/STANDBY button for 2 seconds until you hear a beep to switch UPS to "ON" Mode.
Indicators: ON BATTERY BATTERY LOW/REPLACE Alarm: continuous (cannot be silenced)	Battery voltage is low. Automatic shutdown is imminent.	Immediately shut down connected equipment.
Indicators: UPS LOAD Alarm: none Output: none	Extreme overload condition existed. Battery-protected devices are exceeding the UPS power rating. The UPS has automatically shut down.	Remove excess load as quickly as possible. Press TEST/ALARM RESET button to initiate self-test and reset the UPS.

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

Symptom	Possible Cause	Suggested Action
Indicators: UPS LOAD (flashing) ON BATTERY (continuous) Alarm: 1 per 10 seconds (can't be silenced) Output: available	Battery-protected devices are loaded to the maximum UPS power rating.	Reduce load on UPS as quickly as possible until indicators extinguish.
Indicators: LINE STATUS BATTERY LOW/REPLACE Alarm: none	Battery voltage is low, but line power is present and the battery is charging.	No action is required.
Indicators: LINE STATUS BATTERY LOW/REPLACE (flashing) Alarm: 1 per 10 seconds (can be silenced)	Battery has failed a UPS self-test, indicating low voltage or a weak battery.	Press TEST/ALARM RESET button to silence alarm. Allow battery to charge for 12 hours, then initiate a second self-test. If BATTERY LOW/REPLACE indicator illuminates again, arrange for battery replacement.

Repairing the UPS

The UPS has no user-serviceable parts. All repairs to the UPS, including battery replacement, must be carried out by Compaq or a Compaq authorized service provider.

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.

All Compaq Pro UPS 500 models are Class B devices.

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 77269-200

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 77269-200

or call (281) 514-3333.

To identify this product, refer to the part, series or model number found on the product.

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

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.

FCC Part 68 Notice

If your Fax Modem Protector causes harm to the telephone network, the Telephone Company may temporarily discontinue your service. If possible, they will notify you in advance. If advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper operation of your equipment. If your Telephone Company does, you will be given advance notice to give you an opportunity to maintain uninterrupted service. If you experience trouble with this equipment, Fax Modem Protector, please contact Compaq for repair/warranty information. The Telephone Company may ask you to disconnect this equipment from the network until the problem has been corrected or you are sure the equipment is not malfunctioning. There are no repairs that can be made by the customer to the Fax Modem Protector. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. (Contact your state public utility commission or corporation commission for information.)

Canadian Notice (Avis Canadien)

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 (the equivalent international standards are in brackets):

- 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：

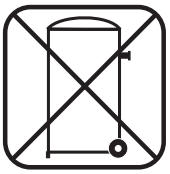
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Battery Replacement Notice

Your UPS is provided with a Sealed Lead Acid battery. 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 dispose of the battery in a fire.
- 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

Specifications

This appendix provides the following specifications:

- Physical Specifications.
- Input Specifications.
- Output Specifications.
- Battery Specifications.
- Environmental Specifications.

Physical Specifications

Table B-1
Physical Specifications – 120V, 100V and 230V Models

Feature		U.S.	Metric
Dimensions	Height	8.4 in	21.34 cm
	Width	5.1 in	12.95 cm
	Depth	7.1 in	18.03 cm
Weight		16 lb	7.4 kg

Input Specifications

Table B-2
Input Specifications – Per Model

UPS Model	Nominal Input Voltage / Frequency	Input Current	On Line Voltage Range
500 (120V)*	120VAC 60 Hz	10A	-30% to +22% of nominal input voltage
500 (100V)*	100VAC 50/60 Hz, auto-sensing	10A	-20% to +23% of nominal input voltage
500 (230V)**	230VAC 50/60 Hz, auto-sensing	5.3A	-30% to +22% of nominal input voltage

* Non-detachable cord with NEMA 5-15 plug. ** IEC-320 jumper cord to replace device power cord.

Output Specifications

Table B-3
Battery- and Surge Protected Output Specifications - Per Model

Model	Capacity (VA/Watts)	Output Receptacles	
		Battery- and Surge-Protected	Surge-Protected
500 (120V)	500 / 300	3 x 5-15R	3 x 5-15R
500 (100V)	500 / 300	3 x 5-15R	3 x 5-15R
500 (230V)	500 / 300	2 x IEC-320 (10A)	1 x IEC-320 (10A)

Table B-4
Output Current Specifications - Per Model

Model	Output Current	
	Battery- and Surge-Protected Receptacles	Surge-Protected Receptacles
500 (120V)	2.5A	7.25A
500 (100V)	3A	5.6A
500 (230V)	1.3A	7.25A

Output Specifications

Table B-5
Output Specifications - 120V, 100V, and 230V models

	Source of Power	Regulation
	Automatic voltage regulated output during on line operation	Output is increased by 14% in the following voltage ranges: 83V to 104V (120V model); 80V to 91V (100V model); 159V to 199V (230V model)
	Battery power output	±5% RMS
	Feature	**Specification**
Other Features	On-line efficiency	96%
	Transfer time	2-4 ms (typical)
	Voltage wave shape	Simulated sine wave
	Surge suppression	Up to 6,000V spikes at current levels up to 27,000 A. Spike suppression starts at voltages above nominal peak line values. Handles up to 240 joules (120V and 100V models) or 340 joules (230V model). Clamping response time: less than 1 ns. Spike suppression in all three modes: Hot to Neutral, Hot to Ground and Neutral to Ground
	Noise filtering	Full time EMI/RFI noise suppression with attenuation exceeding 40dB @ 1MHz
	Phone/Fax Surge Protection (Available on select models)	Clamping voltage: 235V peak ±10% Response time: 5 ns. Peak transient input voltage: 6Kv 10 ms. Single-line modem/fax protection covers center two wires of RJ11 connection

Battery Specifications

Table B-6
Battery Specifications - 120V, 100V, and 230V models

Feature	Specification
Type	Sealed lead-acid; maintenance-free
Voltage	Internal batteries - 12 VDC
Battery Recharge Rate (discharged with 50% load)	2 to 4 hours

Environmental Specifications

Table B-7
Environmental Specifications – 120V, 100V, and 230V 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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