HP Tower UPS
User Guide

Abstract

This document is for the person who installs and maintains HP UPS products. HP assumes you are qualified in the installation of electrical equipment and trained in recognizing hazards in products with hazardous energy levels.

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Edition: 1

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.

The Tower UPS models that are covered in this manual are intended for installation in an environment within 0 to 40°C/32 to 100°F, free of conductive contaminant.

For all models:

- FCC/EN55022 Class B IEC62040-2 C1

Certification Standards

- UPS directives: UL 1778 4th edition (UL listed).
- Performance: IEC 62040-3: 2001.
- Radiated emission: FCC CFR 47 part 15 subpart B, Class B, VCCI.
- Surges withstand ability: IEEE ANSI C62.41 Category A2 (UL Listed).

Regulatory Notices

See HP EG regulatory notices at http://www.hp.com/support/Safety-Compliance-EnterpriseProducts.

Special Symbols

The following are examples of symbols used on the UPS or accessories to alert you to important information:

RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.

Important instructions that must always be followed.

Do not discard the UPS or the UPS batteries in the trash.
This product contains sealed lead acid batteries and must be disposed as it's explain in this manual.
For more information, contact your local recycling/reuse or hazardous waste center.

This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

Personal Safety

- The system has an internal battery as a backup power source. Consequently, the power outlets may be energized, even if the system is disconnected from the AC power source.
- Dangerous voltage levels are present within the system. It should be opened exclusively by qualified service personnel.
- The system must be properly grounded.
- There are no user serviceable parts inside except for the replaceable battery.
- The battery supplied with the system contains small amounts of toxic materials.
- To avoid accidents, the directives listed below must be observed:
  - Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
  - When replacing batteries, replace with the same type and number of batteries or battery packs.
  - Do not dispose of batteries in a fire. The batteries may explode.
  - Batteries constitute a danger (electrical shock, burns). The short-circuit current may be very high.

Precautions must be taken for all handling:

- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Product Safety

- The UPS connection instructions and operation described in the manual must be followed in the indicated order.
- A protection circuit breaker must be installed upstream and be easily accessible. The system can be disconnected from the AC power source by opening this circuit breaker.
- Check that the indications on the rating plate correspond to your AC powered system and to the actual electrical consumption of all the equipment to be connected to the system.
- For PLUGGABLE EQUIPMENT, the outlet shall be installed near the equipment and shall be easily accessible.
- Never install the system near liquids or in an excessively damp environment.
- Never let a foreign body penetrate inside the system.
- Never block the ventilation grates of the system.
- Never expose the system to direct sunlight or source of heat.
- If the system must be stored prior to installation, storage must be in a dry place.
- The storage temperature range is -15 to +40ºC/5 to 104°F.
- The system is not for use in a computer room AS DEFINED IN the standard for the Protection of Information Technology Equipment, ANSI/NFPA 75 (US installations only).

Special Precautions

- All handling operations will require at least two people (unpacking, installation in rack system).
- Before and after the installation, if the UPS remains de-energized for a long period, the UPS must be energized for a period of 24 hours, at least once every 6 months (for a normal storage temperature less than 25°C/77°F). This charges the battery, thus avoiding possible irreversible damage.
- During the replacement of the battery module, it is imperative to use the same type and number of element as the original battery module provided with the UPS to maintain an identical level of performance and safety. For questions, contact your HP representative.

Important: Replace the battery module with the same type battery module, available from HP.

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1. Overview

Save these instructions. This document contains important safety instructions that should be followed during installation, operation, and maintenance of the UPS and batteries.

1.1 Environmental protection

Products are developed according to an eco-design approach.

Substances

This product does not contain CFCs, HCFCs, or asbestos.

Packing

To improve waste treatment and facilitate recycling, separate the various packing components.

- The cardboard we use comprises over 50% of recycled cardboard.
- Sacks and bags are made of polyethylene.
- Packing materials are recyclable and bear the appropriate identification symbol 

Materials	Abbreviations	Number in the identification symbols
Polyethylene terephthalat	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

Follow all local regulations for the disposal of packing materials.

End of life

HP processes products at the end of their service lives in compliance with local regulations.
HP works with companies in charge of collecting and eliminating our products at the end of their service lives.

Product

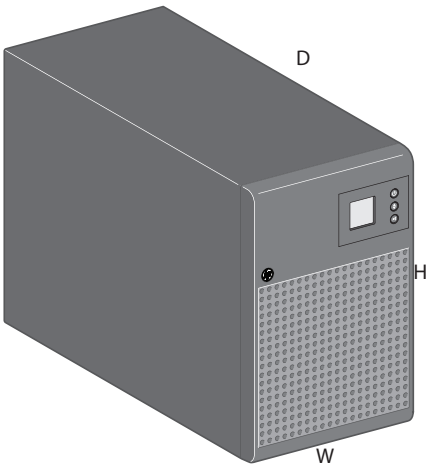
The product is made up of recyclable materials.
Dismantling and destruction must take place in compliance with all local regulations concerning waste.
At the end of its service life, the product must be transported to a processing center for electrical and electronic waste.

Battery

The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.
The battery may be removed to comply with regulations and correct disposal.

1. Overview

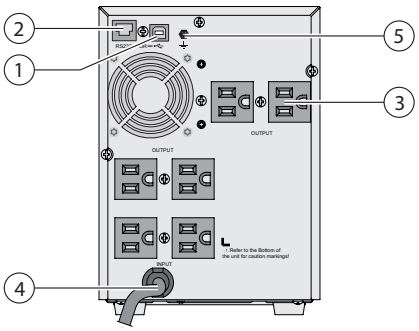
1.2 Weights and dimensions



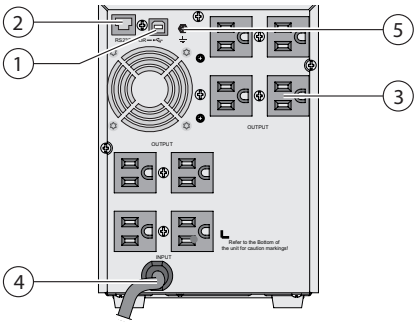
Description	Weights (kg/lb)	Dimensions (mm/inch) D x W x H
HP T750 G4 NA/JP UPS	10.9 kg/24 lb.	345 x 150 x 231 mm/13.6 x 5.9 x 9.1 in.
HP T1000 G4 NA/JP UPS	11.3 kg/25 lb.	345 x 150 x 231 mm/13.6 x 5.9 x 9.1 in.
HP T1500 G4 NA/JP UPS	16.3 kg/36 lb.	445 x 150 x 231 mm/17.5 x 5.9 x 9.1 in.
HP T750 G4 INTL UPS	10.4 kg/23 lb.	345 x 150 x 231 mm/13.6 x 5.9 x 9.1 in.
HP T1000 G4 INTL UPS	10.4 kg/23 lb.	345 x 150 x 231 mm/13.6 x 5.9 x 9.1 in.
HP T1500 G4 INTL UPS	15.2 kg/33.5 lb.	445 x 150 x 231 mm/17.5 x 5.9 x 9.1 in.

1.3 Rear panels

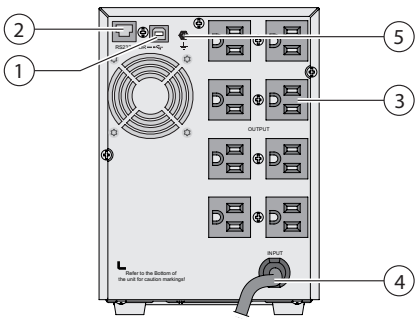
HP T750 G4 NA/JP UPS



HP T1000 G4 NA/JP UPS



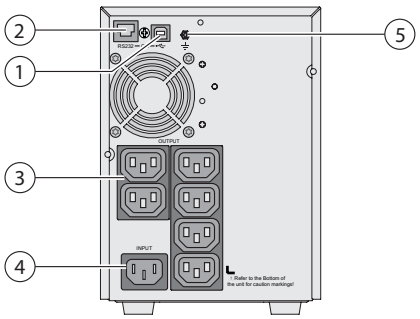
HP T1500 G4 NA/JP UPS



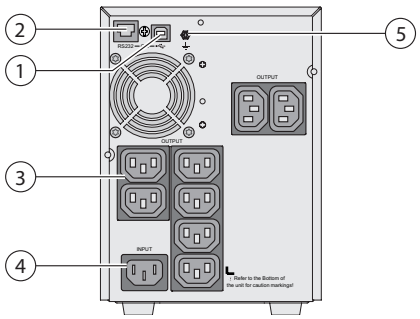
(1) USB communication port
(2) RS-232 communication port
(3) Outlets for connection of critical equipment
(4) Attached 6-ft. input power cord for AC power source
(5) Ground screw

1. Overview

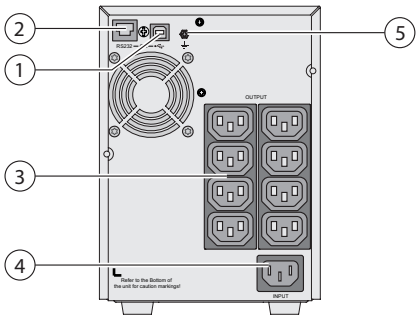
HP T750 G4 INTL UPS



HP T1000 G4 INTL UPS



HP T1500 G4 INTL UPS

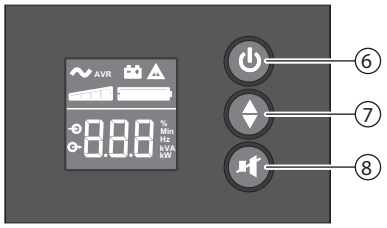


(1) USB communication port
(2) RS-232 communication port
(3) Outlets for connection of critical equipment
(4) Socket for connection to AC power source
(5) Ground screw

2. User Interface

2.1 Control panel

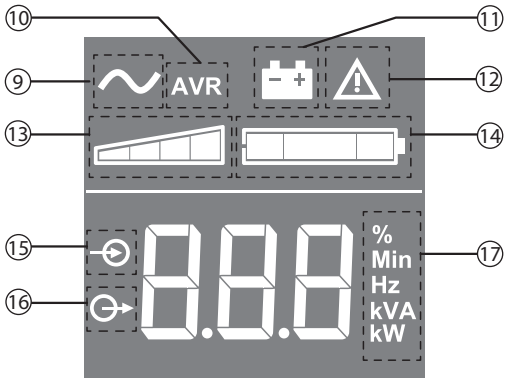
The UPS has a three-button control panel.



⑥ On/Off button
⑦ Scroll
⑧ Mute alarm

2.2 LCD window

The LCD window provides useful information about the UPS, load status, events, measurements, and settings.



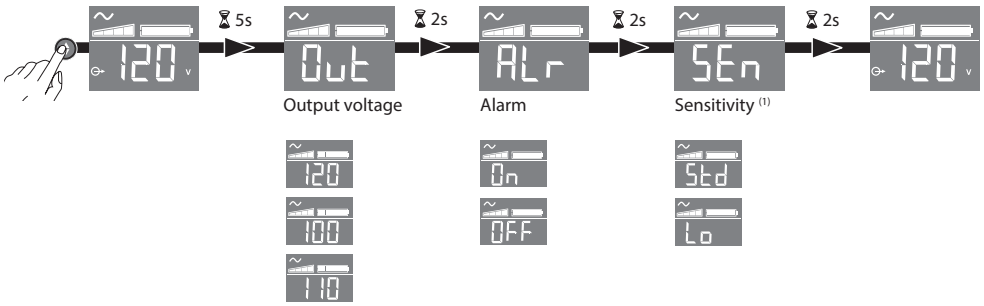
⑨ UPS on line mode
⑩ AVR (Automatic Voltage Regulation) mode
⑪ Battery mode
⑫ Internal fault
⑬ Output load level
⑭ Battery level
⑮ Input measurements
⑯ Output measurements
⑰ Measuring unit

2. User Interface

2.3 UPS setting through the LCD

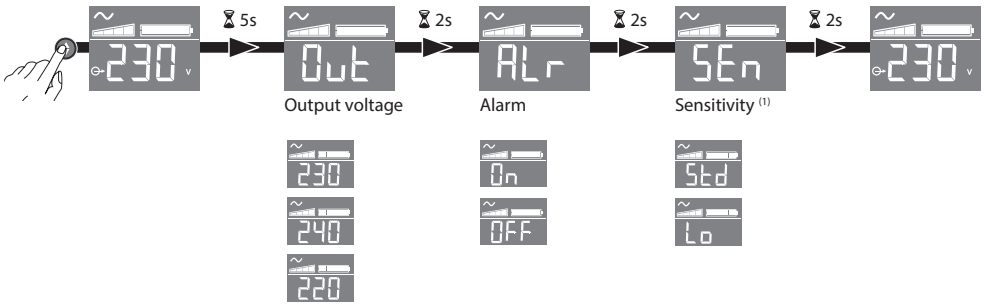
Tower UPS HP T750 G4 NA/JP UPS, HP T1000 G4 NA/JP UPS, HP T1500 G4 NA/JP UPS

Release the scroll down button to select a menu.



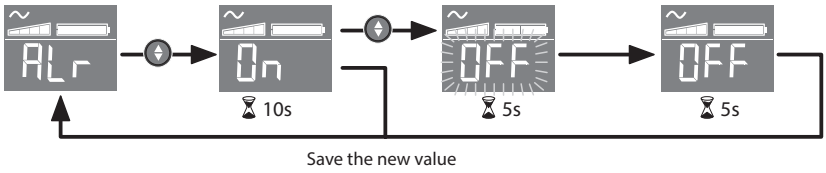
Tower UPS HP T750 G4 INTL UPS, HP T1000 G4 INTL UPS, HP T1500 G4 INTL UPS

Release the scroll down button to select a menu.



Note: In Lo (low sensitivity) mode, the UPS will tolerate more fluctuations in power and goes on battery power less often. If the connected load is sensitive to power disturbances, keep the sensitivity as Std (Standard).

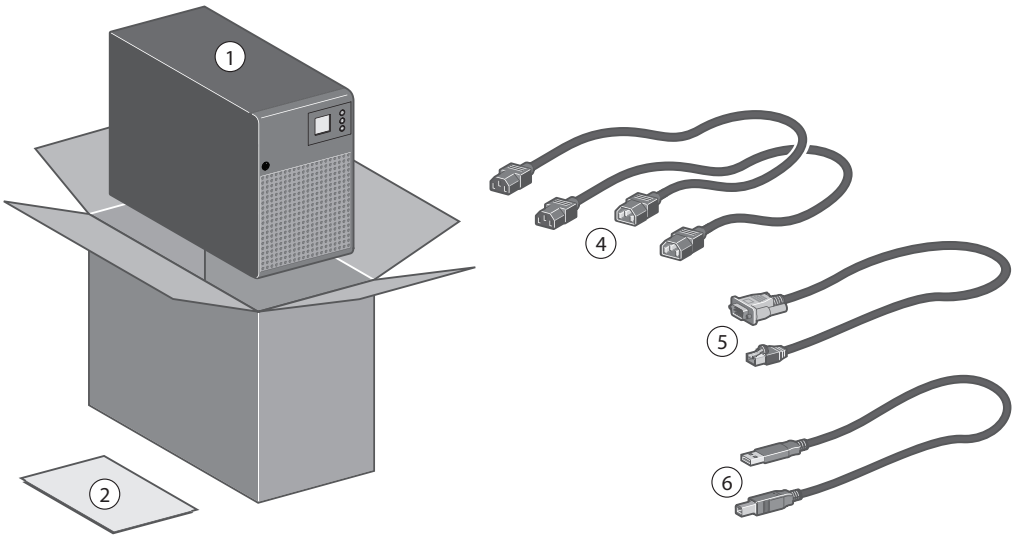
Example of setting



Note: The LCD shuts off if there is no activity for three minutes.

3. Installation

3.1 Unpacking and contents check



(1) HP Tower UPS

(2) Documentation

(4) Two connection cables for protected equipment (HP T750 G4 INTL UPS, HP T1000 G4 INTL UPS, HP T1500 G4 INTL UPS)

(5) RS-232 communication cable

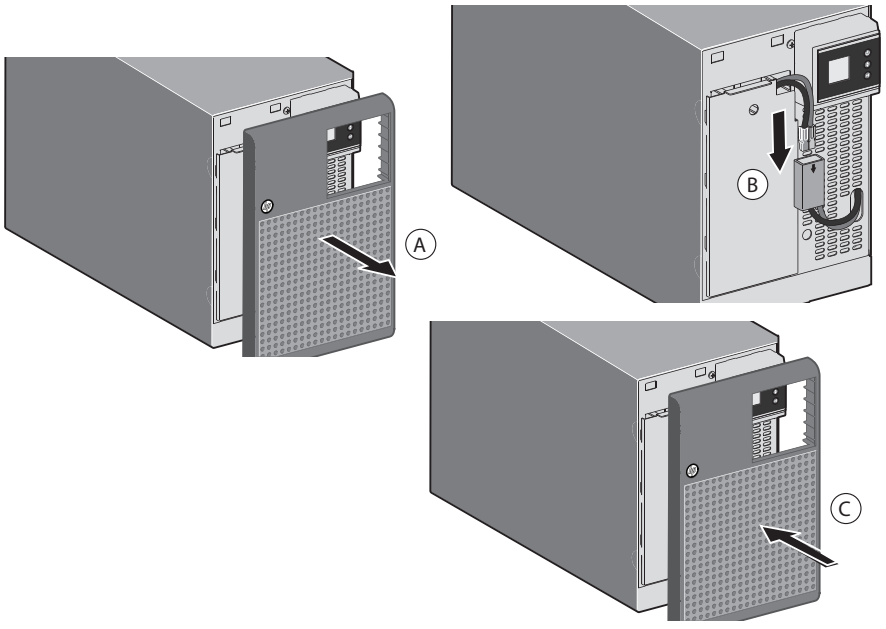
(6) USB communication cable

Packing materials must be disposed of in compliance with all local regulations concerning waste.
Recycling symbols are printed on the packing materials to facilitate sorting.

3.2 Battery module connection

This operation must be performed when the UPS is switched off and unplugged from the AC source. In addition, do not disconnect the connector while the unit is operating from the AC source or in reserve mode.

Note: Before starting the UPS, connect the internal battery. A small amount of arcing may occur when connecting the batteries. This is normal and does not damage the UPS or present any safety concern.



Ⓐ Remove bezel.

Ⓑ Connect the battery module. Never pull on the wires.

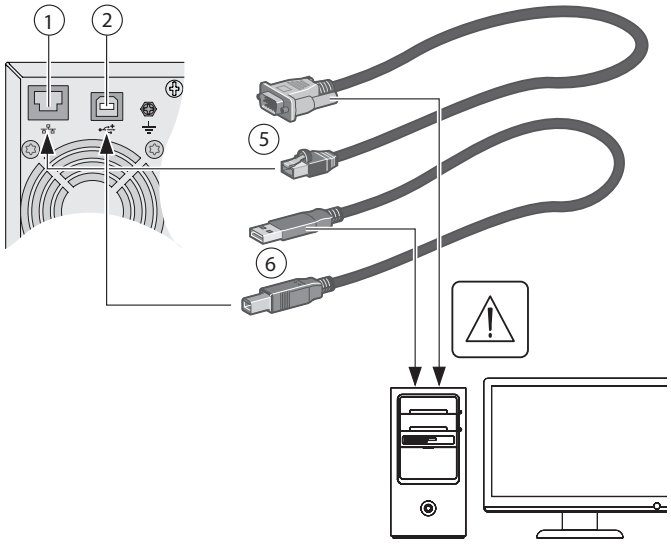
Ⓒ Attach the bezel.

3. Installation

3.3 Communication ports

Connection of RS-232 or USB communication port

The RS-232 and USB communication ports cannot operate simultaneously.

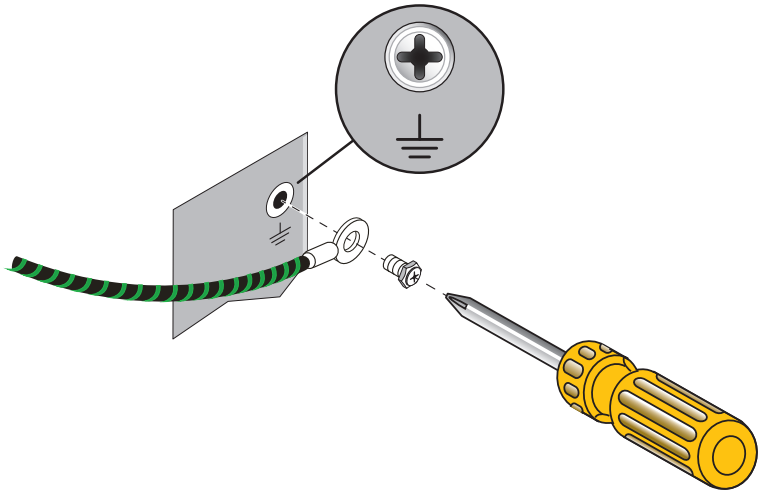


Ⓐ Connect the RS-232 ⑤ or USB ⑥ communication cable to the serial or USB port on the computer equipment.

Ⓑ Connect the other end of the communication cable to the USB ① or RS-232 ② communication port on the UPS.

The UPS can now communicate with HP power management software.

3.4 Ground connection



4. Operation

4.1 Start-up and normal operation

To start the UPS:

1. Verify that the UPS power cord is plugged in.
2. Press the ⏻ button on the UPS control panel for at least two seconds.
3. Check the UPS LCD window display for active alarms.
   If the ⚠ indicator is on, do not proceed until all alarms are cleared.
   Correct the alarms and restart if necessary.
4. Verify that the ∿ indicator illuminates, indicating that the UPS is operating normally and any loads are powered and protected.

4.2 Starting the UPS on battery

Before using this feature, the UPS must have been powered by utility power with output enabled at least once.

To start the UPS on battery:

1. Press the ⏻ button on the UPS control panel until the UPS LCD window display illuminates.
   The UPS cycles through Standby mode to Battery mode. The indicator illuminates.
   The UPS supplies power to your equipment.
2. Check the UPS LCD window display for active alarms. Resolve any active alarms before continuing.
   See "5.1 Troubleshooting", page 13.

4.3 UPS shutdown

To shut down the UPS:

1. Press the ⏻ button on the UPS control panel for three seconds.
2. The audio alarm beeps and shows a status of "UPS shutting OFF...". The UPS then transfers to Standby mode and the ∿ indicator turns off.
3. The audio alarm stops.

4.4 Operation on battery power

Transfer to battery power

- The connected devices continue to be supplied by the UPS when AC input power is no longer available. The necessary energy is provided by the battery.
- The indicator illuminates.
- The audio alarm beeps every 10 seconds.

The connected devices are supplied by the battery.

Low-battery warning

- The indicator illuminates solid.
- The audio alarm beeps every three seconds.
- The remaining battery power is low. Shut down all applications on the connected equipment because automatic UPS shutdown is imminent.

End of battery backup time

- LCD displays "End of backup time."
- All the LEDs go off.
- The audio alarms stops.

4.5 Return of AC input power

Following an outage, the UPS restarts automatically when AC input power returns (unless the restart function has been disabled) and the load is supplied again.

5. Maintenance

5.1 Troubleshooting

Operation status	Possible cause	Action
Overload 	Power requirement exceeds the UPS capacity (greater than 105% of nominal).	Remove some of the equipment from the UPS. The UPS continues to operate, but may shutdown if the load increases. The alarm resets when the condition becomes inactive.
Short-circuit fault 	A short-circuit occurred.	Check device connection or integrity. If the error persists, note the alarm message and the UPS serial number, and then contact your service representative.
Battery fault 	The batteries in the UPS are disconnected.	Verify that all batteries are properly connected. If the error persists, note the alarm message and the UPS serial number, and then contact your service representative.
	The end of battery life is reached.	Contact your service representative for battery replacement.
Fan fault 	The UPS has a fan fault.	Check that no object is blocking the fan. If the error persists, note the alarm message and the UPS serial number, and then contact your service representative.
Charger fault 	The UPS has a charger fault.	The UPS does not charge the battery anymore. Note the alarm message and the UPS serial number, and then contact your service representative.

5.2 Updating the UPS firmware

To update the UPS firmware, see the HP website (http://www.hp.com/go/rackandpower).

5.3 Battery module replacement

Safety recommendations

Warning: To prevent personal injury from hazardous energy:

- This operation must be performed when the UPS is switched off and unplugged from the AC source.
- Do not disconnect the connector while the unit is operating from the AC mains or in reserve mode.
- The battery connection must not be disconnected while running in reserve mode.
- The battery can cause electrocution and high short-circuit currents. The following safety precautions are required before servicing the battery components:
  - Remove watches, rings, bracelets, and all other metal objects from the hands and arms.
  - Use tools with an insulated handle.
  - Do not place tools or metal parts on top of batteries.

5. Maintenance

Replacing the batteries

- Read and observe the requirements in "Important battery safety information" and "Battery care and storage guidelines" in this section before battery module replacement.
- Follow the instructions in this section to replace the battery module.

Note: Replace all battery modules at the same time.

Important battery safety information

Warning: The unit contains sealed lead-acid battery modules. To prevent fire or chemical burns:

- Do not attempt to recharge batteries after removal from the unit.
- 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 (140°F).

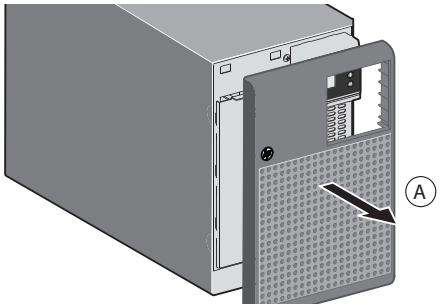
Battery care and storage guidelines

Caution: Because of the short shelf life of the batteries, avoid storing a battery spare as a backup. Do not maintain an inventory of spare batteries on site unless a procedure to keep these batteries charged while in storage is implemented.

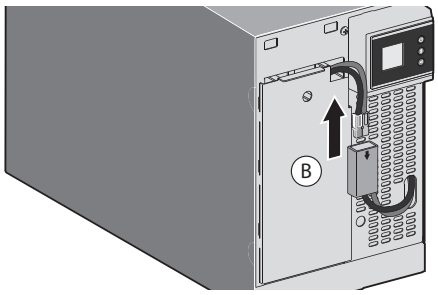
To maintain the batteries:

- Minimize the amount of time the UPS uses battery power by matching the UPS configuration with the utility voltage (see "6.1 HP T750 G4 NA/JP UPS, HP T1000 G4 NA/JP UPS, and HP T1500 G4 NA/JP UPS", page 16 and "6.2 HP T750 G4 INTL UPS, HP T1000 G4 INTL UPS, and HP T1500 G4 INTL UPS", page 17).
- 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.

Battery module removal



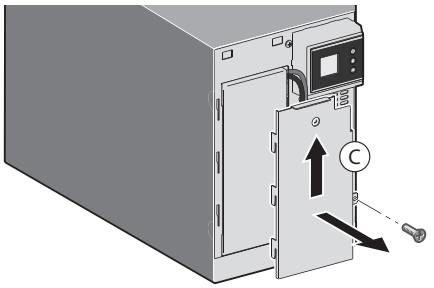
Ⓐ Remove the bezel.



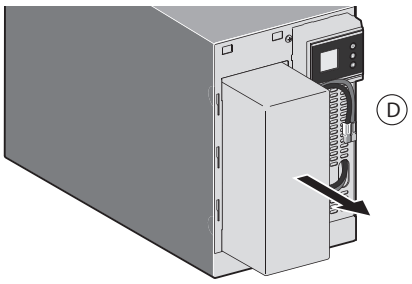
Ⓑ Disconnect the battery module by separating the connectors.
Never pull on the wires.

5. Maintenance

Battery tray removal (cont.)



Ⓒ Remove the plastic protection cover in front of the battery.



Ⓓ Pull the plastic tab to remove the battery block and replace the block.

Installing the new battery module

Perform the removal instructions in reverse order.

- To ensure safety and high performance, only use batteries supplied by HP.
- Take care to firmly press together the two parts of the connector during remounting.

5.4 Spares

Ordering Spares

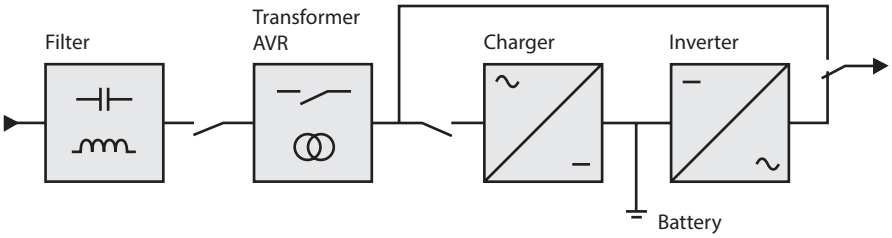
To order a spare, visit the HP website (http://www.hp.com/buy/parts).
To replace parts under warranty, contact an HP authorized service representative.

UPS spare parts list

Item	Spare Part Number
SPS-UPS T750 G4 NA/JP	796774-001
SPS-UPS T750 G4 INTL	796775-001
SPS-UPS T1000 G4 NA/JP	796763-001
SPS-UPS T1000 G4 INTL	796771-001
SPS-UPS T1500 G4 NA/JP	796772-001
SPS-UPS T1500 G4 INTL	796773-001
SPS-BATTERY KIT UPS T750	765781-001
SPS-BATTERY KIT UPS T1000	796779-001
SPS-BATTERY KIT UPS T1500	796780-001

6. Technical Specifications

6.1 HP T750 G4 NA/JP UPS, HP T1000 G4 NA/JP UPS, and HP T1500 G4 NA/JP UPS



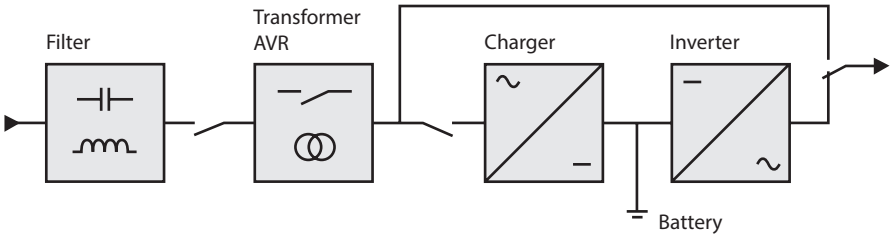
		HP T750 G4 NA/JP UPS	HP T1000 G4 NA/JP UPS	HP T1500 G4 NA/JP UPS
Output Power @ 120V		NA: 750 VA 525W	NA: 1000 VA 700W	NA: 1440 VA 1080W
Output Power @ 110V		NA: 750 VA 525W	NA: 1000 VA 700W	NA: 1440 VA 1080W
Output Power @ 100V		JPN: 750 VA 500W	JPN: 1000VA 680W	JPN: 1200 VA 980W
AC Input power				
• Rated input voltage	Single phase 100-120V			
• Input voltage range	96 to 144V			
• Input frequency range	45 to 55 Hz (50 Hz system), 55 to 65 Hz (60 Hz system)			
Output on battery power				
• Voltage	100/110/120V (-10% to +5%) (1)			
• Frequency	50/60 Hz ±0.1 Hz			
Battery (sealed lead acid, maintenance free)				
• Standard		2 x 12V 7 Ah	2 x 12V 9 Ah	3 x 12V 9 Ah
Environment				
• Operating temperature range	0 to 35°C/32 to 95°F			
• Storage temperature range	-15 to +40°C/5 to 104°F			
• Relative humidity	0 to 90% (without condensation)			
• Noise level	< 40 dBA in normal mode			

(1) Adjustable to 100/110/120V, but must be set to the identical AC power source value.

Caution: To reduce the risk of fire, connect only to a circuit provided with 20A maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70.

6. Technical Specifications

6.2 HP T750 G4 INTL UPS, HP T1000 G4 INTL UPS, and HP T1500 G4 INTL UPS



	HP T750 G4 INTL UPS	HP T1000 G4 INTL UPS	HP T1500 G4 INTL UPS
Output Power @ 230V	750 VA 525W	1000 VA 700W	1500 VA 1100W
AC Input power			
• Rated input voltage	Single phase 220-240V		
• Input voltage range	184 to 276V		
• Input frequency range	45 to 55 Hz (50 Hz system), 55 to 65 Hz (60 Hz system)		
Output on battery power			
• Voltage	220/230/240V (-10% to +5%) (1)		
• Frequency	50/60 Hz ±0.1 Hz		
Battery (sealed lead acid, maintenance free)			
• Standard	1 x 12V 9 Ah	2 x 12V 7 Ah	3 x 12V 9 Ah
Environment			
• Operating temperature range	0 to 35°C/32 to 95°F		
• Storage temperature range	-15 to +40°C /5 to 104°F		
• Relative humidity	0 to 90% (without condensation)		
• Noise level	< 40 dBA in normal mode		

(1) Adjustable to 220/230/240V, but must be set to the identical AC power source value.

When the UPS is used in the EU area, use an external circuit breaker in front of the line with rating 16A, 250V which is IEC/EN 60898-1 standard compliant.

When the UPS is used in th NA area, use an external circuit breaker in front of the line with rating 20A, 250V.

7. Support and other resources

Safety and regulatory compliance

For safety, environmental, and regulatory information, see Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products, available at the HP website (http://www.hp.com/support/Safety-Compliance-EnterpriseProducts).

Warranty information

HP ProLiant and X86 Servers and Options (http://www.hp.com/support/ProLiantServers-Warranties)

Before you contact HP

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

- Active Health System log (HP ProLiant Gen8 or later products)
- Download and have available an Active Health System log for 7 days before the failure was detected. For more information, see the HP iLO 4 User Guide or HP Intelligent Provisioning User Guide on the HP website (http://www.hp.com/go/ilo/docs).
- Onboard Administrator SHOW ALL report (for HP BladeSystem products only)
- For more information on obtaining the Onboard Administrator SHOW ALL report, see the HP website (http://www.hp.com/go/OAlog).
- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Product identification number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For United States and worldwide contact information, see the Contact HP website (http://www.hp.com/go/assistance).
In the United States:

- To contact HP by phone, call 1-800-334-5144. For continuous quality improvement, calls may be recorded or monitored.
- If you have purchased a Care Pack (service upgrade), see the Support & Drivers website (http://www8.hp.com/us/en/support-drivers.html). If the problem cannot be resolved at the website, call 1-800-633-3600. For more information about Care Packs, see the HP website (http://pro-aq-sama.houston.hp.com/services/cache/10950-0-0-225-121.html).

Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the HP website (http://www.hp.com/go/qs).

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