



02/15/01

POWERWARE® 5119 RM

User's Guide

1000-3000 VA

Requesting a Declaration of Conformity

The EC Declaration of Conformity is available upon request for products with a CE mark. For copies of the EC Declaration of Conformity, contact:

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FIN-02920 Espoo
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Phone: +358-9-452661
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EMC Statement

Some configurations are classified under EN50091-2 as "Class-A UPS for Unrestricted Sales Distribution." For these configurations, the following applies:

WARNING This is a Class A-UPS Product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take additional measures.

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Class A Statement for FCC and ICES (2000 VA - 3000 VA)

For Users in the United States Only

NOTE This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this 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 instruction manual, 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 his/her own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For Users in Canada

This Class A Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

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

Self-Certified Class B Statement for FCC and ICES (1000 VA - 1500 VA)

For Users in the 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 THAT MAY CAUSE UNDESIRE OPERATION.

NOTE This equipment has been tested and found to comply with the limits for a Class B device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 the receiver.
- Connect equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- Ensure that mounting screws, connector attachment screws, and all ground wires are secured and tight.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

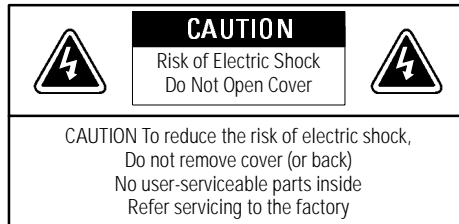
For Users in Canada

This Class B Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

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

Special Symbols

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



RISK OF ELECTRIC SHOCK - Indicates that a risk of electric shock is present and the associated warning should be observed.



CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.



This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. The UPS may contain sealed, lead-acid batteries. Batteries must be recycled.



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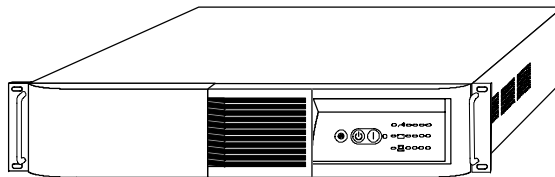
CHAPTER 1

POWERWARE 5119 RACK MOUNT – ONE OF THE BEST!

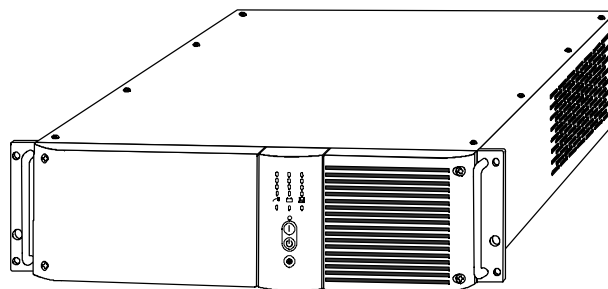
The Powerware® 5119 Rack Mount uninterruptible power system (UPS) protects your sensitive electronic equipment from basic power problems such as power failures, power sags, power surges, brownouts, and line noise.

Power outages can occur when you least expect it and power quality can be erratic. These power problems have the potential to corrupt critical data, destroy unsaved work sessions, and damage hardware — causing hours of lost productivity and expensive repairs.

With the Powerware 5119 Rack Mount, you can safely eliminate the effects of power disturbances and guard the integrity of your equipment. The Powerware 5119 Rack Mount's flexibility to handle an array of network devices makes it the perfect choice to protect your LANs, servers, and workstations.



1000-1500 VA



2000-3000 VA

Figure 1. Powerware 5119 Rack Mount

Because an integral part of power protection is power management software, the Powerware 5119 Rack Mount comes fully equipped with a communication port, serial cable, and a CD containing both LanSafe III for networked systems and FailSafe III for standalone systems.

Providing outstanding performance and reliability, the Powerware 5119 Rack Mount's unique benefits include the following:

- Compact design conserves valuable space for other rack equipment such as hubs, routers, disk arrays, and servers.
- Advanced Battery Management (ABM™) doubles battery service life, optimizes recharge time, and provides a warning up to 60 days before the end of useful battery life.
- Buck and Double Boost regulation ensures consistent voltage to your load by correcting voltage fluctuations without using battery power.
- Hot-swappable batteries simplify maintenance by allowing you to replace batteries safely without powering down the critical load.
- Start-on-battery compatibility allows you to power up the UPS even if utility power is not available.
- Optional power communication cards provide enhanced communication capabilities for increased power protection and longer battery backup times.
- The Powerware 5119 Rack Mount is backed by worldwide agency approvals.



CHAPTER 2

INSTALLATION

This section explains:

- Equipment inspection
- Safety precautions
- UPS installation
- UPS rear panels

Inspecting the Equipment

If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.

To file a claim for shipping damage or concealed damage: 1) File with the carrier within 15 days of receipt of the equipment; 2) Send a copy of the damage claim within 15 days to your service representative.

Safety Precautions

Read the following before you install the UPS.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

WARNING



- This UPS contains its own energy source (batteries). The output receptacles may carry live voltage even when the UPS is not connected to an AC supply.
- Do not remove or unplug the input cord when the UPS is turned on. This removes the safety ground from the UPS and the equipment connected to the UPS.
- To reduce the risk of fire or electric shock, install this UPS in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 40°C (104°F). Do not operate near water or excessive humidity (95% max).
- The sum of earth leakage current from the load connected to the UPS must not exceed 1.5 mA.

Mounting the UPS in a Rack

The UPS fits in a 19-inch rack. Follow the steps below to install the UPS in the rack.

CAUTION



The UPS is heavy (132 lb/60 kg). A minimum of two people are required to lift the UPS into the rack.



NOTE Disconnect all cables from the UPS before continuing. Remove all self-adhesive pads from the underside of the unit if already fitted.

1. Place the UPS on a flat, stable surface with the front of the UPS facing toward you.
2. If the mounting brackets are not already installed, position the mounting bracket over the mounting holes on one side of the unit and secure with the provided screws (see Figure 2).
If the mounting handles are not already installed, position the mounting handle over the bracket and secure with the provided screws (see Figure 3).
3. Repeat Step 2 for the other side of the UPS.
4. Using at least two people, lift the UPS and slide it into the rack.
5. Secure the UPS by screwing the mounting angles to the rack face (screws not provided). The UPS is now secured in the rack.

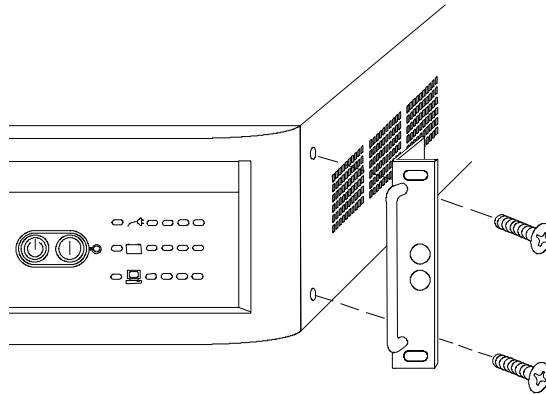


Figure 2. Attaching the Mounting Bracket (1000-1500 VA)

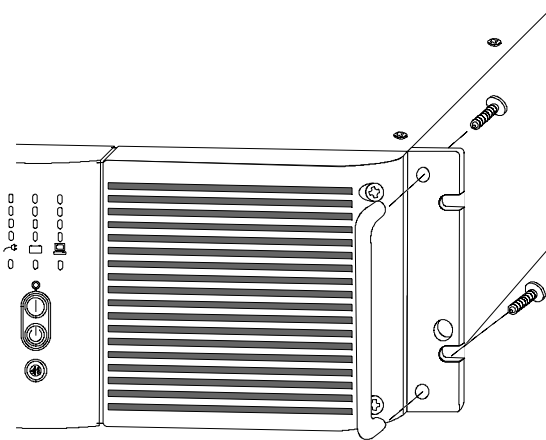


Figure 3. Attaching the Mounting Handle (2000-3000 VA)

Installing the UPS

The following steps explain how to install the UPS. Figure 5 on page 7 shows a typical installation only. See “UPS Rear Panels” on page 8 for the rear panel of each model.



NOTE Do not make unauthorized changes to the UPS; otherwise, damage may occur to your equipment and void your warranty.

1. If you are installing power management software, connect your computer to the UPS communication port using the supplied communication cable.

Some power management software has a Load Segment feature that allows you to control UPS output receptacles. If you plan to use this feature, read the appropriate sections of your power management software manual before you install the UPS.

2. For 230V models and 1000-1500 VA/120V models, plug the UPS power cord into the input connector on the UPS rear panel.

Customer-supplied power cords must correctly rated for the UPS (see “Specifications” on page 29). You can also use the power cord from the largest load if it is correctly rated.

3. Plug the UPS power cord into a wall outlet or power source.

The UPS conducts a self-test and enters Standby mode. If a red Site Wiring Fault or Battery Service indicator stays on, see Table 11 on page 33.

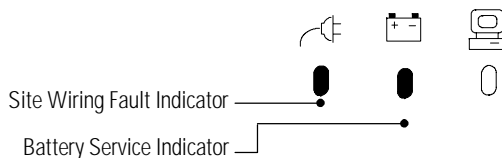


Figure 4. Fault Indicators



NOTE Low voltage models may not recognize 50-Hz outlets. If the UPS does not start when connected to a 50-Hz outlet, unplug the UPS. Press and hold the On | button for 3 seconds to start the UPS on battery and reconfigure the nominal input voltage to either 100V or 110V (see “Configuration Mode” on page 17). Turn the UPS off. Wait for 30 seconds. Then plug the UPS into the outlet.

4. Plug the equipment to be protected into the UPS output receptacles.

DO NOT protect laser printers with the UPS because of the exceptionally high power requirements of the heating elements.

5. Start the UPS by pressing the On | button as shown in Figure 5. The Power On indicator illuminates indicating that power is available from the rear receptacles.

The installation is complete. To learn how to operate the UPS, see “Operation” on page 13. To change the factory-set defaults, see “Configuration” on page 17.



NOTE The UPS charges to 90% in approximately 4 hours. However, it is recommended that the UPS charge for 24 hours after installation or long storage.

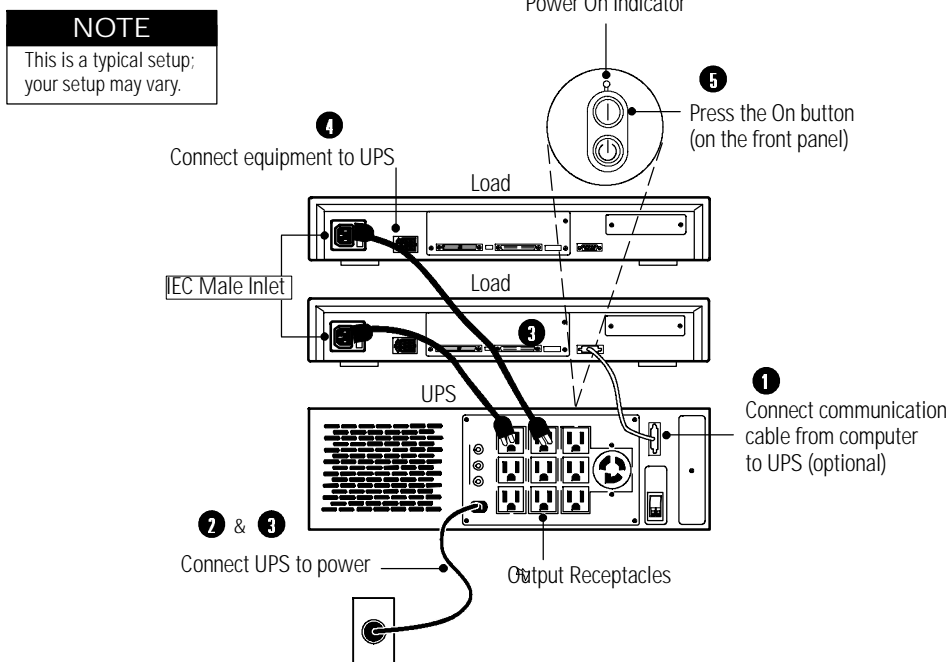


Figure 5. Typical UPS Installation (120V Model Shown)

UPS Rear Panels

This section shows the rear panels of all Powerware 5119 Rack Mount models.

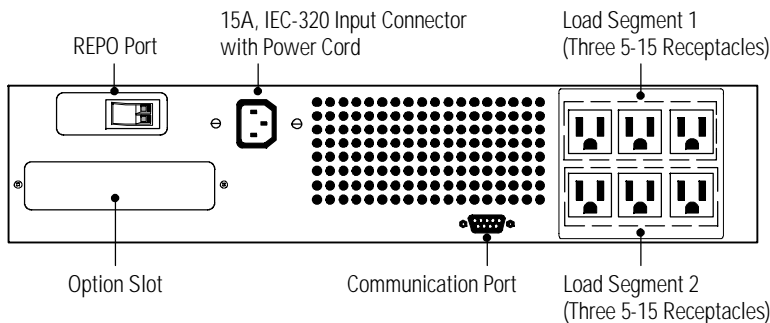


Figure 6. 1000-1500 VA, 120V Rear Panel

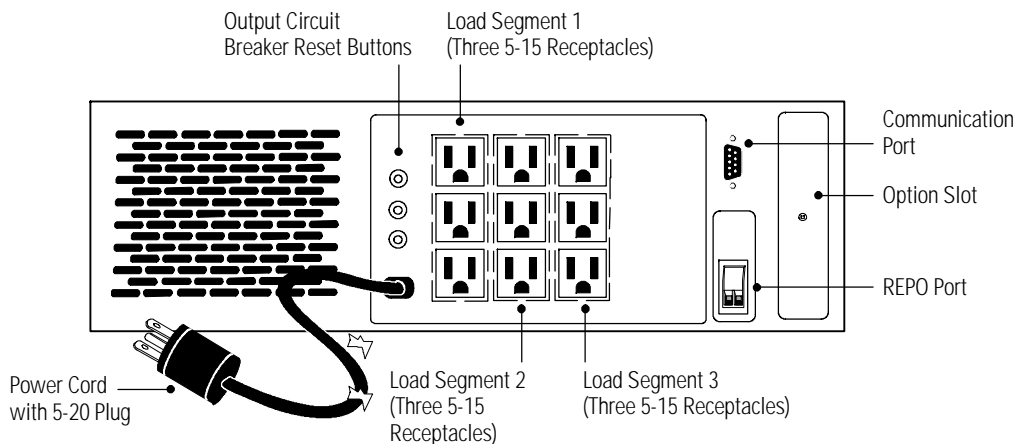


Figure 7. 2000 VA, 120V Rear Panel

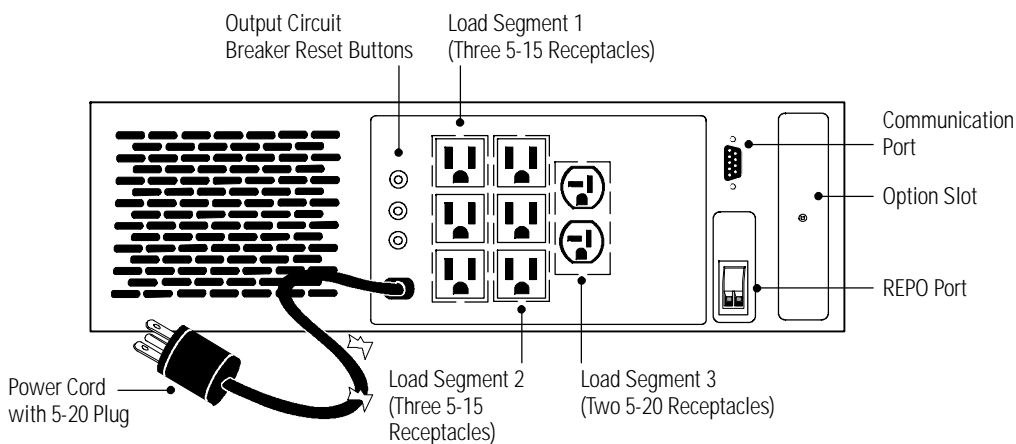


Figure 8. 2000 VA 5-20R, 120V Rear Panel

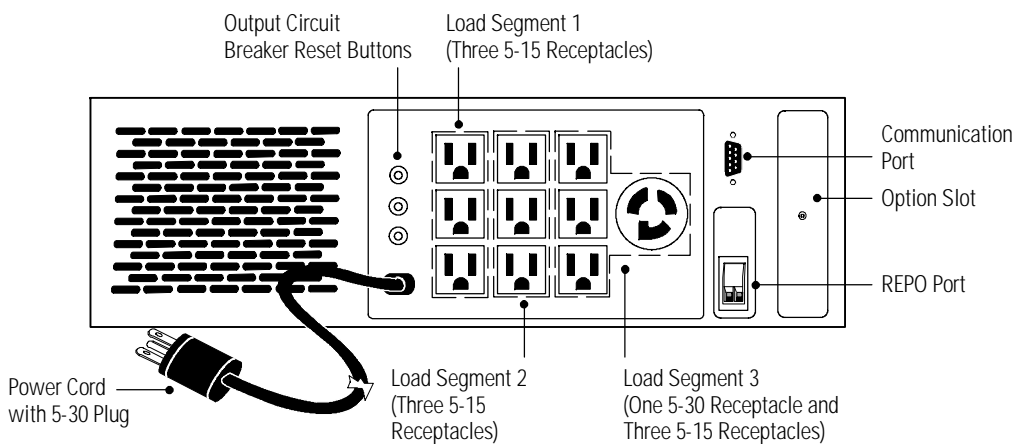


Figure 9. 3000 VA, 120V Rear Panel

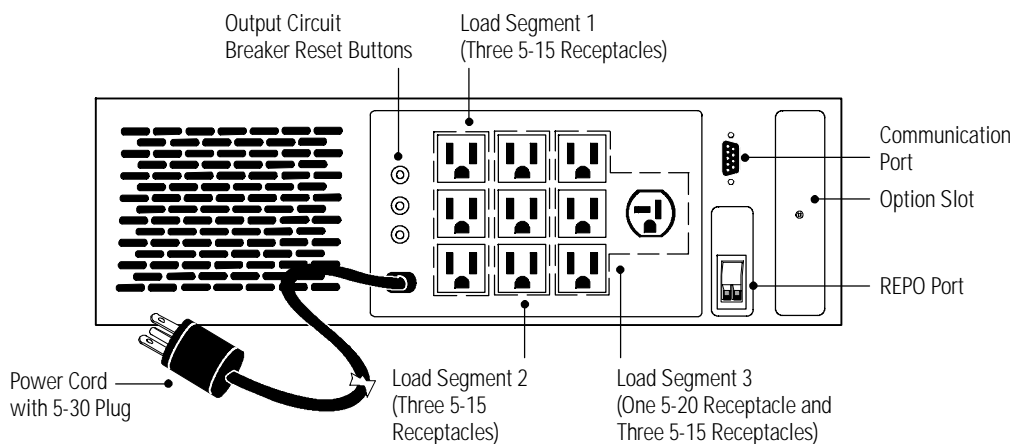


Figure 10. 3000 VA 5-20R, 120V Rear Panel

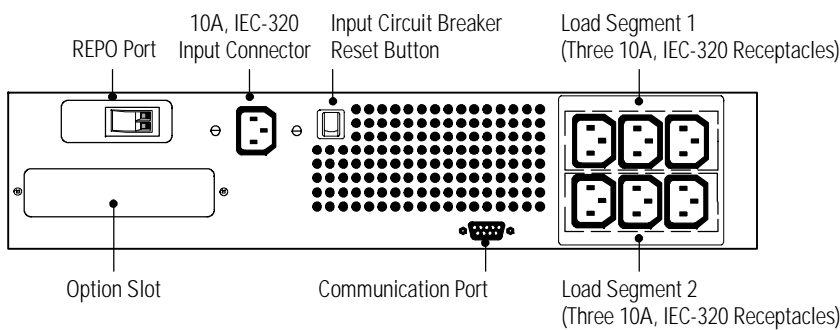


Figure 11. 1000-1500 VA, 230V Rear Panel

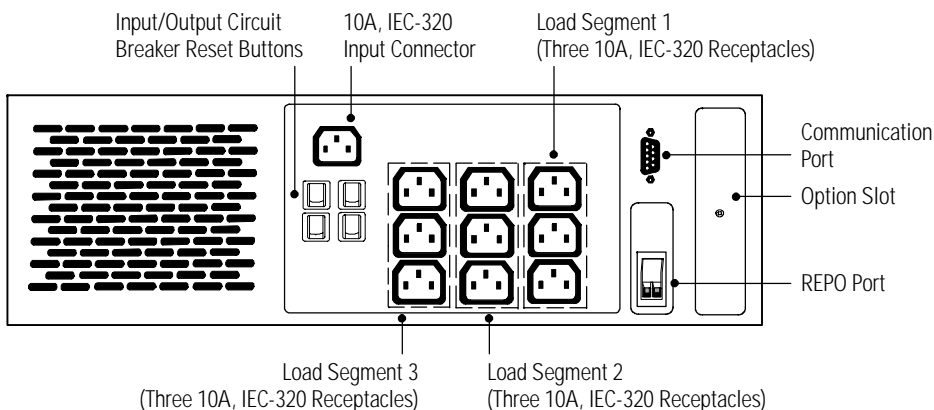


Figure 12. 2000-2400 VA, 230V Rear Panel

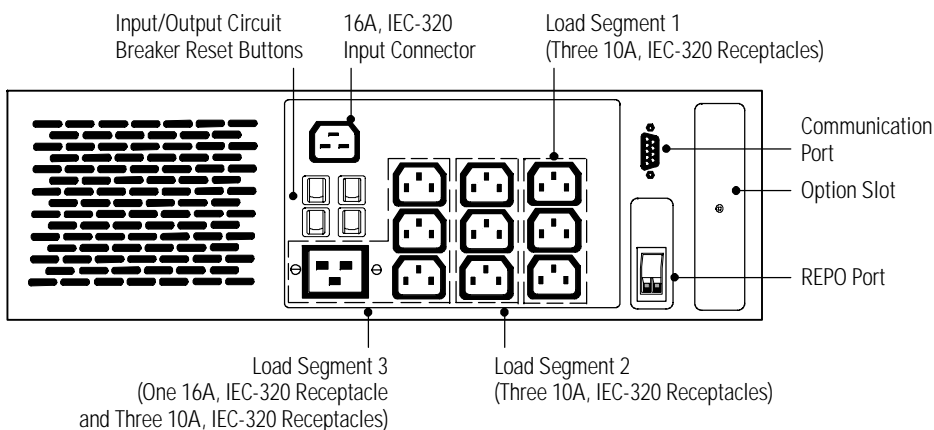


Figure 13. 3000 VA, 230V Rear Panel



CHAPTER 3

OPERATION

This section describes:

- Turning the UPS on and off
- Starting the UPS on battery
- Standby mode
- The UPS front panel and LEDs
- Initiating the self-test


Turning the UPS On

After the UPS is connected to a power source, it conducts a self-test and enters Standby mode. To turn on the UPS, press the On | button on the front panel (shown in Figure 14). The Power On indicator illuminates indicating that power is available from the rear receptacles.

Starting the UPS on Battery

To turn on the UPS without using utility power, press and hold the On | button for three seconds. When the UPS starts on battery, it does not conduct a self-test to conserve battery power.

Turning the UPS Off

To turn off the UPS, press the Off  button on the front panel and then unplug the UPS from the power source. If you do not unplug the UPS, it remains in Standby mode.

Standby Mode

When the UPS is turned off and plugged into a wall outlet or other power source, the UPS is in Standby mode. The battery recharges when necessary and the Power On indicator is off, indicating that power is not available from the rear receptacles.

UPS Front Panel

The UPS front panel LEDs indicate how the UPS is operating and also alert you of potential power problems. Figure 14 shows the UPS front panel indicators and controls.

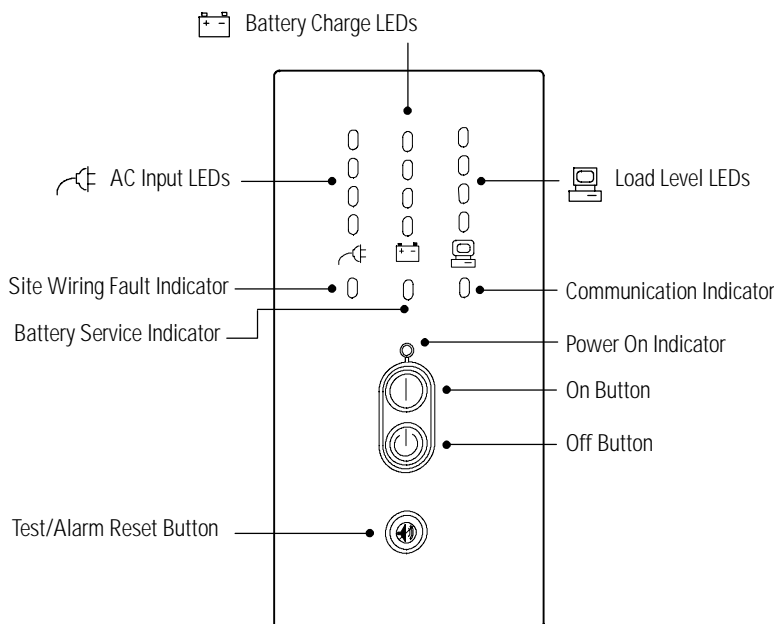


Figure 14. UPS Front Panel

The following sections describe the LED functions during normal operation. If any LEDs are red, see Table 11 on page 33 to identify and correct the problem.



NOTE The front panel is rotated clockwise 90 degrees on some models.

AC Input LEDs

The AC Input LEDs show information about the utility power coming into the UPS (see Figure 15).

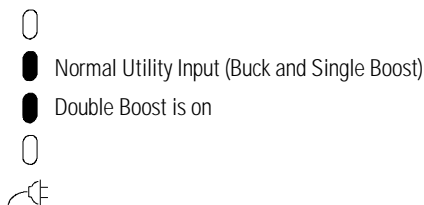


Figure 15. AC Input LEDs (Normal Mode)

The second LED indicates that the UPS is operating normally from utility power. The UPS is providing consistent voltage with the Buck and Single Boost feature.

The third LED indicates that the UPS is using the Double Boost feature to automatically correct voltage fluctuations.

If any AC Input LEDs are red, see page 34 for more information.

Battery Charge LEDs

The Battery Charge LEDs show information about the UPS batteries (see Figure 16).

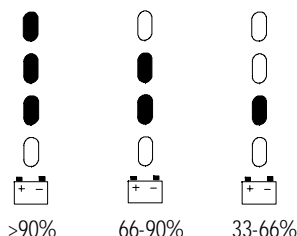


Figure 16. Battery Charge LEDs (Normal Mode)

Each LED represents the approximate percentage of battery charge. When the battery is fully charged (greater than 90%), the top three LEDs illuminate. If the battery capacity is between 66% and 90%, the second and third LED illuminate. The third LED illuminates if the battery charge is between 33% and 66%.

If any Battery Charge LEDs are red, see pages 34 and 35 for more information.

Load Level LEDs

The front panel displays the total load current or watts plugged into the UPS (see Figure 17).

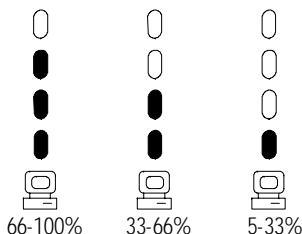



Figure 17. Load Level LEDs (Normal Mode)

Each LED represents 1/3 of a full load rating. When the UPS is approximately fully loaded (66-100%), all three LEDs illuminate. If the load is 33-66% of UPS capacity, the third and fourth LED illuminate. The last LED illuminates if the load is between 5% and 33%.

If any Load Level LEDs are red, see page 35 for more information.

Initiating the Self-Test

Press and hold the  button for three seconds to initiate the self-test. During the test, individual LEDs illuminate as various parts of the UPS are checked. If the UPS finds a problem, an LED indicates where the problem is. For more information, see “Troubleshooting” on page 33.



NOTE All three Battery Charge LEDs should be lit and the UPS must not be in Battery mode to perform the self-test.



CHAPTER 4

CONFIGURATION

This section explains:

- Why you may want to change factory defaults
- How to reconfigure options

Why Change Factory Defaults?

Nominal Input Voltage

When the utility power consistently fluctuates, the UPS repeatedly corrects the input voltage by switching to battery power when the nominal input range is:


- Higher than +20% of 120V or 230V nominal
- Lower than -30% of 120V or 230V nominal
- Higher than +20% and lower than -30% of 120V or 230V nominal

You can configure the UPS to more closely match the nominal input voltage by selecting a different input voltage or extending the input voltage range. See Table 1 on page 19 for a list of available options.

Other Settings



You can change the UPS default configurations for alarms and shutdown parameters, including: timing for the low battery alarm, the time delay for an unconditional shutdown, alarms for loss of utility power or site fault, and controlling loads that use less than 5% of the current when the UPS is on battery. See Table 1 on page 19 for a list of available options.




Configuration Mode


When the UPS is in Configuration mode, the LEDs represent the configuration options. The control buttons (On | button and  button) are used to modify the UPS configuration. Figure 18 shows the LEDs and Table 1 explains the corresponding options.


CAUTION





DO NOT press the Off  button while the UPS is in Configuration mode; pressing the Off  button removes all power to your equipment.

1. Press and hold the On |  button and the  button simultaneously for one beep. The UPS switches to Configuration mode.
2. Press the On |  button to scroll through the options. Each time you press the button, the UPS beeps. The LED for the selected option blinks (see Figure 18 and Table 1).

If you press the On |  button and nothing happens, the UPS is still in Operation mode. Repeat Step 1 for one beep ONLY to enter Configuration mode, and then perform Step 2.

3. Press the  button ONCE to toggle the selected option on or off. The Power On indicator corresponds with the current setting.

Repeat Steps 2 and 3 for each option.

4. Press the On |  button and the  button simultaneously to return to Operation mode at any time. Scrolling past the last LED also returns the UPS to Operation mode.

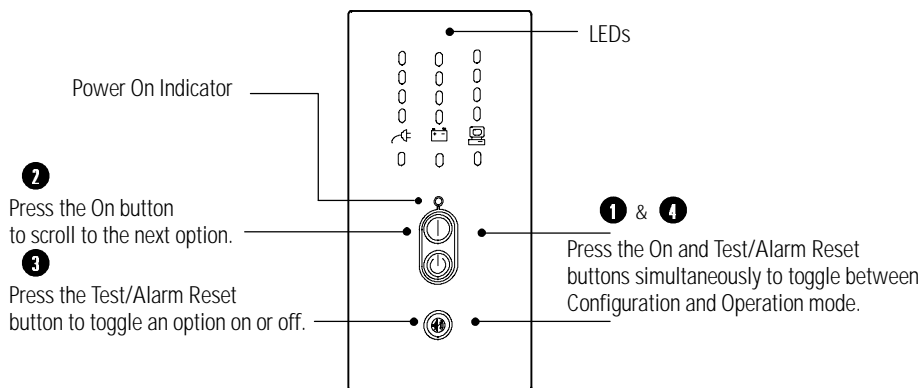


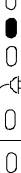





Figure 18. Using the Configuration Mode



NOTE The front panel is rotated clockwise 90 degrees on some models.

Table 1. Configuration Mode LEDs and Options

LED	Option	Power On Indicator	Explanation
	120/230V Nominal Input Voltage	ON (default)	Nominal input voltage on low voltage models is 120V and on high voltage models is 230V; all other nominal input voltages are disabled.
		OFF*	120/230V is disabled; one of the other input voltage options is selected. *This is the default for models that are factory-configured for 100V or 208V (see the rating on the UPS rear panel).
	110/220V Nominal Input Voltage	ON	Selecting this option changes the nominal input voltage on low voltage models to 110V and to 220V for high voltage models.
		OFF (default)	110/220V is disabled; one of the other input voltage options is selected.
	127/240V Nominal Input Voltage	ON	Selecting this option changes the nominal input voltage on low voltage models to 127V and to 240V for high voltage models.
		OFF (default)	127/240V is disabled; one of the other input voltage options is selected.
	120/230V Extended Voltage Mode	ON	The UPS accepts an input voltage within -35% to +20% of 120V or 230V nominal input voltage before switching to battery.
		OFF (default)	The UPS accepts an input voltage within -30% to +20% of 120V or 230V nominal input voltage before switching to battery.
	Site Wiring Fault Alarm	ON (default)	Alarm sounds when the polarity of the outlet is reversed or the ground connection is missing; have a qualified electrician repair the outlet wiring.
		OFF*	Alarm DOES NOT sound when the polarity of the outlet is reversed or the ground connection is missing. *Site Wiring Fault is not available for 100V or 208V models; OFF is the default.
	Low Battery Alarm	ON (default)	Alarm sounds approximately 3 minutes before battery shutdown.
		OFF	Alarm sounds approximately 5 minutes before battery shutdown.

LED	Option	Power On Indicator	Explanation
<div> <div>0</div> <div>●</div> <div>0</div> <div>0</div> <div> <div>0</div> <div>0</div> </div> <div>0</div> </div>	Shutdown Delay	ON (default)	5-second delay before unconditional shutdown after the UPS receives a signal from a computer via the communication port.
		OFF	180-second delay before unconditional shutdown after the UPS receives a signal from a computer via the communication port. When this LED is not enabled, the user can also create a new delay time by reconfiguring the communication port. See "Communication Port Configurations" on page 25 for more information.
<div> <div>0</div> <div>0</div> <div>●</div> <div>0</div> <div>0</div> <div> <div>0</div> <div>0</div> </div> <div>0</div> </div>	AC Input Failure	ON (default)	Alarm sounds when there is an AC input failure.
		OFF	Alarm DOES NOT sound when there is an AC input failure.
<div> <div>0</div> <div>0</div> <div>0</div> <div>●</div> <div> <div>0</div> <div>0</div> </div> <div>0</div> </div>	Sleep Mode	ON (default)	When the UPS is on battery and the load is drawing less than 5% of the current, the UPS shuts down the load. This feature conserves battery power.
		OFF	Select this option if you want a load less than 5% of the current to be protected by battery power.
<div> <div>0</div> <div>0</div> <div>0</div> <div>0</div> <div> <div>0</div> <div>0</div> </div> <div>●</div> </div>	100/208V Nominal Input Voltage	ON*	Selecting this option changes the nominal input voltage on low voltage models to 100V and to 208V on high voltage models. *This is the default for factory-configured 100V or 208V models (see the rating label on the UPS rear panel).
		OFF (default)	100/208V is disabled; one of the other input voltage options is selected.
<div> <div>●</div> <div>0</div> <div>0</div> <div>0</div> <div> <div>0</div> <div>0</div> </div> <div> <div>0</div> <div>0</div> </div> <div>0</div> </div>	100/208V Extended Voltage Mode	ON	Select this option to extend the input voltage within -25% to +25% of 100V or 208V nominal input voltage before switching to battery (available on units that were specifically ordered with this option).
		OFF (default)	The UPS accepts an input voltage within -20% to +20% of 100V or 208V nominal input voltage before switching to battery.
<div> <div>0</div> <div>0</div> <div>0</div> <div>0</div> <div> <div>0</div> <div>0</div> </div> <div> <div>0</div> <div>0</div> </div> <div>●</div> </div>	Reset Defaults	ON (default)	All factory-set defaults are active.
		OFF	One or more factory-set defaults have been changed.



CHAPTER 5

UPS MAINTENANCE

This section explains how to:

- Care for the UPS and batteries
- Replace the batteries
- Test new batteries
- Recycle used batteries

UPS and Battery Care


For the best preventive maintenance, keep the area around the UPS clean and dust-free. If the atmosphere is very dusty, clean the outside of the system with a vacuum cleaner.

For full battery life, keep the UPS at an ambient temperature of 25°C (77°F).

Storing the UPS and Batteries


If you store the UPS for a long period, recharge the battery every 12 months by plugging the UPS into a power outlet. The UPS charges to 90% in approximately 4 hours. However, it is recommended that the UPS charge for 24 hours after long storage.

When to Replace Batteries

When the Battery Service indicator illuminates, the batteries may need replacing (see Figure 14 on page 14). Conduct a self-test by pressing the  button. If the indicator stays on, contact your service representative to order new batteries.

Replacing Batteries

The hot-swappable battery feature allows you to replace the UPS batteries easily without turning the UPS off or disconnecting the load.

If you prefer to remove input power to change the battery: 1) Press the Off  button and then unplug the UPS; 2) Wait 60 seconds while the internal processor shuts down before you disconnect the battery.

WARNING



- Batteries can present a risk of electrical shock or burn from high short circuit current. The following precautions should be observed: 1) Remove watches, rings, or other metal objects; 2) Use tools with insulated handles; 3) Do not lay tools or metal parts on top of batteries.
- ELECTRIC ENERGY HAZARD. Do not attempt to alter any battery wiring or connectors. Attempting to alter wiring can cause injury.

CAUTION



The UPS and batteries are heavy. You must support the front of the unit while replacing the batteries.



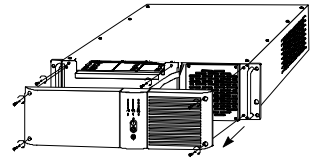
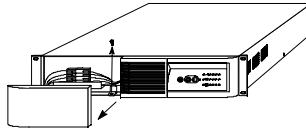
NOTE When the UPS is online, all three Battery Charge LEDs should be lit before hot-swapping the batteries. DO NOT DISCONNECT the batteries while the UPS is in Battery mode.

Figure 19 shows how to replace the UPS batteries. Consider all warnings, cautions, and notes before replacing batteries.

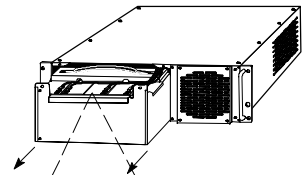
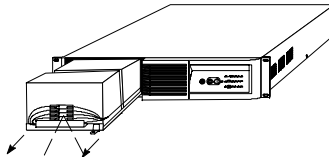
1000-1500 VA Models

2000-3000 VA Models

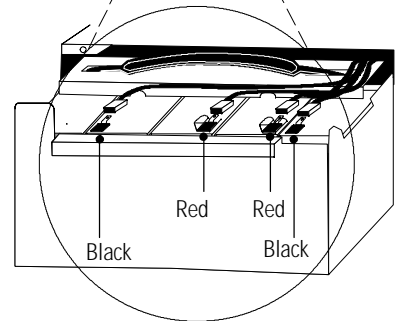
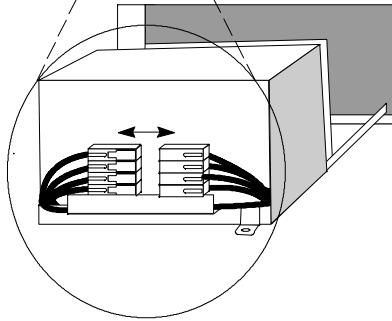
- 1**
Remove the face plate.



- 2**
Pull out the battery tray.
Tray may be heavy.




- 3**
Disconnect the battery cables and remove the battery tray. Install the new battery tray and connect the battery cables.



- 4**
Replace the faceplate.

Figure 19. Replacing Batteries

Testing New Batteries

Press and hold the  button for three seconds to initiate a self-test. After the test is finished, the red Battery Service indicator should turn off and the Battery Charge LEDs should show a charge. If the Battery Service indicator stays on, check the battery connections. See the troubleshooting guide on page 33 or call your service representative if the problem persists.

Recycling the Used Battery

Contact your local recycling or hazardous waste center for information on proper disposal of the used battery.

WARNING



- Do not dispose of battery or batteries in a fire. Batteries may explode. Proper disposal of batteries is required. Refer to your local codes for disposal requirements.
- Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

CAUTION



Do not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed of properly. For more information, contact your local recycling or hazardous waste center.



CHAPTER 6

ADDITIONAL UPS FEATURES

This section describes:

- UPS communication capabilities
- How to install the Remote Emergency Power-Off switch
- Load segments
- Option modules

Communication Port Configurations

To establish communication between the UPS and a computer, connect your computer to the UPS communication port using the supplied communication cable.



CAUTION

To prevent damage to your equipment, connect only a factory-supplied cable or a cable built to factory specifications (see Table 2) to the communication port. A standard serial cable may damage your computer.

When the communication cable is installed, power management software can exchange data with the UPS. The software polls the UPS for detailed information on the status of the power environment. If a power emergency occurs, the software initiates the saving of all data and an orderly shutdown of the equipment.

Communication Indicator

When the UPS receives a command from the computer to establish communication, the Communication indicator on the UPS front panel illuminates (see Figure 14 on page 14). When data is transferring, the Communication indicator flashes.

Pin Out

As shown in Table 2, Pins 1 and 2 operate in two modes: Basic Alarms mode and Serial Data mode. Basic Alarms mode has AC fail alarm and output shutdown. Serial Data mode is UPS Code II compliant.

The system always starts in Basic Alarms mode. When serial data is received at Pin 1, the function of Pin 1 and Pin 2 changes to Serial Data mode.

If serial data has not been received before going to battery power, serial communication is disabled until AC input power returns.

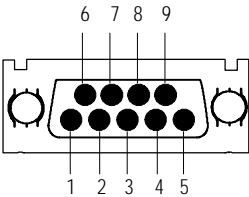


Figure 20. Communication Port

Table 2. Communication Port Configuration

Pin	Signal Type	Function
1	Basic Alarms Mode - Input: RS-232 level high (+12V) pulse 4 to 5 seconds	Remote UPS off. In absence of AC power, output is turned off until normal AC power returns
	Serial Data Mode - Input: RS-232 data	RS-232 serial communication input. 1200 baud, 8 bits, No parity, 1 stop bit, 1 start bit
2	Basic Alarms Mode - Output: RS-232 level high (+12V)	AC Input failure
	Serial Data Mode - Output: RS-232 data	RS-232 serial communication output. 1200 baud, 8 bits, No parity, 1 stop bit, 1 start bit
3	Output: Open collector transistor ON, 50 mA, 40 Vdc rating	AC Input failure
4	Signal Common	Signal Common
5	Output: Open collector transistor ON, 50 mA, 40 Vdc rating	Impending low battery
6	Input: RS-232 RTS	Plug-and-play software enable trigger (activates when pin changes from +12V to -12V)
7	Input: Relay contact or RS-232 level	Remote Emergency Power-Off: UPS total output can be kept off with low signal or closing relay contact
8	Output: 8 to 25 Vdc, 5W constant power (0.63A max. @ 8V)	Auxiliary Control Power
9	Chassis	Connection to chassis

Remote Emergency Power-Off (REPO)

The UPS has a REPO connector that can be wired to a device for turning the UPS off from a remote location. The following instructions explain how to wire the REPO switch.

WARNING



Connect the REPO port to dry isolated normally-open contacts rated at 60 Vdc maximum, 30 Vac RMS maximum, and 20 mA maximum. Failure to conform to these guidelines may create dangerous conditions for the operator by disabling the safety insulation of the equipment.



NOTE The REPO function activates when the dry isolated normally-open REPO contacts close.

1. Remove the REPO connector from the REPO port on the rear panel of the UPS.
2. Connect dry isolated normally-open contacts across the REPO device to pin 1 and pin 2 (see Figure 21). Use stranded, non-shielded wiring, size #22 through #18.
3. Reconnect the REPO connector to the UPS.

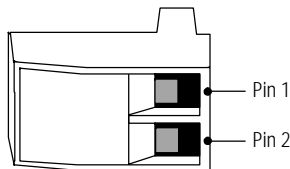


Figure 21. REPO Connector

Load Segments

Load segments are sets of receptacles that can be turned on individually using power management software. For example, during a power outage, you can keep key pieces of equipment running while you turn off other equipment. This feature allows you to save battery power. See your power management software manual for details.

Option Modules

Option modules help your UPS communicate in a variety of networking environments and are installed in the UPS option slot. See the manual that accompanies each module for more information, or contact your sales representative.



CHAPTER 7

SPECIFICATIONS

This section provides the following specifications for the Powerware 5119 Rack Mount models:

- Electrical input and output
- Weights and dimensions
- Environmental and safety
- Indicators and controls
- Battery

Table 3. Model List

	120V Models	230V Models
UPS Models	PW5119 1K RM PW5119 1.5K RM PW5119 2K RM PW5119 2K RM20R PW5119 3K RM PW5119 3K RM20R	PW5119 1Ki RM PW5119 1.5Ki RM PW5119 2Ki RM PW5119 2.4Ki RM PW5119 3Ki RM

Table 4. Electrical Input

	120V Models	230V Models
Nominal Voltage	120V default; 100, 110, 120, 127V selectable	230V default; 208, 220, 230, 240V selectable
Voltage Range	-30% to +20% at full load for nominal voltage; -35% to +20% user-selectable, extended range	
Nominal Frequency	60 Hz; 50/60 if 100V or 110V selected	50/60 Hz
Noise Filtering	MOVs and line filter for normal and common mode noise	
Connections	1000-1500 VA: 15A, IEC-320 input connector with detachable 5-15P power cord 2000 VA: 5-20P power cord 3000 VA: 5-30P power cord	1000-2400 VA: 10A, IEC-320 input connector 3000 VA: 16A, IEC-320 input connector

Table 5. Electrical Output

	120V Models	230V Models
Power Levels (rated at nominal inputs)	PW5119 1K RM: 1000 VA, 670W PW5119 1.5K RM: 1440 VA, 960W PW5119 2K RM: 1920 VA, 1400W PW5119 2K RM20R: 1920 VA, 1400W PW5119 3K RM: 2880 VA, 2250W PW5119 3K RM20R: 2880 VA, 2250W	PW5119 1Ki RM: 1000 VA, 670W PW5119 1.5Ki RM: 1500 VA, 960W PW5119 2Ki RM: 2000 VA, 1400W PW5119 2.4Ki RM: 2300 VA, 1600W PW5119 3Ki RM: 3000 VA, 2250W
Regulation Online	-10% to +6% of nominal voltage (-15% to +10% using extended range)	
Regulation On-Battery (Nominal Voltage $\pm 5\%$)	120V for 110, 120, 127V; 100V for 100V	230V for 220, 230, 240V; 208V for 208V
Voltage Waveform	Sine wave; <3% distortion with linear load	
Overcurrent Protection	Online: Branch-rated or resettable circuit breaker; On-Battery: Active current limit and short circuit protection	
Output Receptacles	1000-1500 VA: Six 5-15 2000 VA: Nine 5-15 or Six 5-15, Two 5-20 3000 VA: Nine 5-15, One 5-30 or Nine 5-15, One 5-20	1000-1500 VA: Six 10A IEC-320 2000-2400 VA: Nine 10A IEC-320 3000 VA: Nine 10A IEC-320, One 16A IEC 320

Table 6. Weights and Dimensions

UPS Dimensions (WxHxD)	1000-1500 VA: 19.0 x 3.5 (2U) x 18.6 inches (48.2 x 8.9 x 47.2 cm) 2000-3000 VA: 19.0 x 5.3 (3U) x 22.3 inches (48.2 x 13.3 x 56.6 cm)
UPS Weights	1000-1500 VA: 58 lb (26 kg) 2000-3000 VA: 132 lb (60 kg)

Table 7. Environmental and Safety

	120V Models	230V Models
Operating Temperature	0°C to 40°C (32°F to 104°F); UL tested 25°C (77°F)	
Storage Temperature	-20°C to 60°C (-4°F to 140°F)	
Relative Humidity	5-95% noncondensing	
Operating Altitude	Up to 3,000 meters above sea level	
Audible Noise	Less than 45 dBA typical	
Surge Suppression	IEEE 587/ANSI C62.41 Category B	
Safety Conformance	UL 1778; CSA C22.2, No. 107.1	UL1778; CSA C22.2, No. 107.1; EN 50091-1 and IEC 60950
Safety Markings	UL, CSA	UL, CSA, CE
EMC	FCC, VCCI	EN 50091-2

Table 8. Indicators and Controls

Serial Communication	Intelligent serial communication to provide alarms with history, measured parameters, self-test, and many other features; contact your authorized dealer for UPS/computer communication software options
Interface	Ergonomic Indicators: Wiring Fault, Battery Service, Communication, Operation, System Normal Bar Graphs: Input Level, Battery Charge Level, % Load
Contact Closures	AC Input Failure, Low Battery

Table 9. Battery

Configuration	Internal batteries
Voltage	1000-1500 VA: 24 Vdc 2000-3000 VA: 48 Vdc
Type	Sealed, maintenance-free, valve-regulated, lead-acid
Charging	Advanced charging for faster recovery; approximately 4 hours to 90% usable capacity at nominal line and no supplementary power supply load
Monitoring	Advanced monitoring for earlier failure detection and warning

Table 10. Battery Run Times (in Minutes)

Load (VA)	1000 Model	1500 Model	2000 Model	2400 Model	3000 Model
300	40	67	112	187	187
500	20	32	68	112	112
700	12	23	48	80	80
1000	7	13	27	45	45
1500		7	18	30	30
2000			11	19	19
2400				14	14
3000					11

NOTE Battery times are approximate and vary depending on the load configuration and battery charge.



CHAPTER 8

TROUBLESHOOTING

This section explains:

- UPS alarms and conditions
- How to silence an alarm
- Service and support

Audible Alarms and UPS Conditions



















The UPS has an audible alarm feature to alert you of potential power problems. Use Table 11 to determine and resolve the UPS alarms and conditions.









Silencing an Audible Alarm

To silence the alarm for an existing fault, press the  button. If UPS status changes, the alarm beeps, overriding the previous alarm silencing.

Table 11. Troubleshooting Guide

Alarm or Condition	Possible Cause	Action
The Power On indicator is not on; the UPS will not start.	A circuit breaker or an input fuse on the rear panel is open.	Push the circuit breaker button or replace the fuse (see “UPS Rear Panels” on page 8).
	The line cord is not connected.	Connect the line cord.
	The wall outlet is dead.	Have a qualified electrician test and repair the outlet.
	The UPS may be unable to recognize a 100V, 50-Hz wall outlet.	See “Specifications” on page 29 to verify that your UPS accepts 100V nominal input. Unplug the UPS. Start the UPS on battery and reconfigure the nominal input voltage for 100V (see “Configuration Mode” on page 17). Turn off the UPS for 30 seconds. Plug the UPS into the outlet.
	A battery fuse or circuit breaker is open.	Contact your service representative.
The UPS switches frequently between battery and AC input.	Input voltage in your area differs from the UPS nominal.	Change the UPS input voltage to match your local voltage; see “Configuration Mode” on page 17.

Alarm or Condition	Possible Cause	Action
The Low Battery Alarm does not give enough warning.	The batteries need charging or service.	Plug the UPS into a wall outlet for 24 hours to charge the battery. After charging the battery, press and hold the  button for 3 seconds; then check the Battery Service indicator. If the Battery Service indicator is still on, see “UPS Maintenance” on page 21 to replace the battery.
	The Low Battery Alarm is not set appropriately.	Change the alarm setting. See “Configuration Mode” on page 17.
 AC input high    	The AC input voltage is too high. The UPS is running on battery power.	Correct the input voltage, if possible. The UPS continues to operate on battery until the battery is completely discharged. If the condition persists, the input voltage in your area may differ from the UPS nominal. Change the UPS input voltage to match your local voltage (see “Configuration Mode” on page 17).
    AC input low 	The line voltage is too low. The UPS is running on battery power.	Correct the input voltage, if possible. The UPS continues to operate on battery until the battery is completely discharged. If the condition persists, the input voltage in your area may differ from the UPS nominal. Change the UPS input voltage to match your local voltage (see “Configuration Mode” on page 17).
  Site Wiring Fault	Ground wire connection does not exist in the wall outlet or the line and neutral wires are reversed in the wall outlet.	Have a qualified electrician correct the wiring. To disable this alarm, see “Configuration Mode” on page 17.
    Low Battery Charge 	The battery is running low.	3 to 5 minutes or less of battery power remains (depending on load and battery charge). Prepare for a shutdown. Save your work and turn off your equipment.

Alarm or Condition	Possible Cause	Action
 Battery Service	The battery may be fully discharged because of a long storage period or failing because of age.	Plug the UPS into a wall outlet for 24 hours to charge the battery. After charging the battery, press and hold the  button for 3 seconds; then check the Battery Service indicator. If the Battery Service indicator is still on, see "UPS Maintenance" on page 21 to replace the battery.
	The battery is not connected correctly.	Check connections or call your service representative.
 Battery Service	The DC voltage is high; the alarm does not clear.	Contact your service representative.
 Overload    	Power requirements exceed UPS capacity or the load is defective.	Remove some of the equipment from the UPS. You may need to obtain a larger capacity UPS.

Service and Support

If you have any questions or problems with the UPS, call your **Local Distributor** or the **Help Desk** at one of the following telephone numbers and ask for a UPS technical representative.

In the United States	1-800-365-4892
In Canada	1-800-461-9166
All other countries	1-919-870-3149

Please have the following information ready when you call the Help Desk:

- Model number
- Serial number
- Version number (if available)
- Date of failure or problem
- Symptoms of failure or problem
- Customer return address and contact information

If repair is required, you will be given a Returned Material Authorization (RMA) Number. This number must appear on the outside of the package and on the Bill Of Lading (if applicable). Use the original packaging or request packaging from the Help Desk or distributor. Units damaged in shipment as a result of improper packaging are not covered under warranty. A replacement or repair unit will be shipped, freight prepaid for all warrantied units.



NOTE For critical applications, immediate replacement may be available. Call the **Help Desk** for the dealer or distributor nearest you.
