

Endurance Series

User's Manual



Table of Contents

Introduction	1
1. Important Safety Warning	2
1-1. Transportation	2
1-2. Preparation	2
1-3. Installation	2
1-4. Operation	2
1-5. Maintenance, service and faults	3
2. Installation and setup	4
2-1. Rear panel view	4
2-2. Operating principle	5
2-3. Install the UPS (Only for RT Models)	6
2-4. Setup the UPS	7
2-5. Battery Replacement	9
3. Operations	11
3-1. Button operation	13
3-2. LCD Panel	14
3-3. Audible Alarm	15
3-4. LCD display wordings index	15
3-5. UPS Setting	16
3-6. Operating Mode Description	18
3-7. Faults Reference Code	19
3-8. Warning indicator	19
4. Troubleshooting	20
5. Storage and Maintenance	21
6. Specifications	22
7. Warranty	24
A1 Declaration of Conformity	26

Introduction

Thank you for purchasing a MINUTEMAN power protection product. It has been designed and manufactured to provide many years of trouble-free service.

**IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS!
CONSIGNES DE SÉCURITÉ IMPORTANTES
SAUVEGARDEZ CES CONSIGNES!**

Please read this manual and comply with all warnings and instructions before installing your Endurance Series UPS as it provides important information that should be followed during its installation and maintenance, allowing you to correctly set up your UPS for the maximum safety and performance.

Veillez lire ce manuel et vous conformer à tous les avertissements et instructions avant d'installer votre UPS Endurance Series car il fournit des informations importantes qui doivent être suivies lors de son installation et de sa maintenance, vous permettant de configurer correctement votre UPS pour une sécurité et des performances maximales.

WARNINGS AND CAUTION STATEMENTS:

Risk of Electrical Shock. There are hazardous live parts inside these power supplies that are energized from the battery even when the AC input is disconnected. Do not attempt to disassemble the UPS as it contains no user serviceable parts except for battery replacement. Repairs and Battery replacement must be performed by QUALIFIED SERVICE PERSONNEL ONLY.

This UPS series is only intended to be installed in an indoor temperature-controlled environment that is free of conductive contaminants, dust or direct sunlight. Never install the UPS near liquids, damp locations or where there is potential for contact with liquids.

The ambient operating temperature range for this UPS series is 32° ~ 104°F (0° ~ 40°C)

To ensure the proper ventilation and cooling of the UPS, do not block any of the ventilation cutouts on the UPS. Adequate space must be provided around all sides of the UPS to allow for proper air flow.

Only connect the UPS to a two pole, three wire grounded AC wall outlet that includes appropriate branch circuit protection (circuit breaker or fuse) in accordance with NEC ANSI/NFPA 70 and CEC, Part I, C22.2. Do not plug the UPS into itself or use extension cords, adapter plugs, or surge strips as it may damage the UPS or connected devices.

Batteries can present a risk of electrical shock. Observe proper cautions and do not bridge the battery terminals at any time. Follow all precautions and instructions for battery replacement and disposal in the BATTERY REPLACEMENT section of this manual.

1. Important Safety Warning

It is critical that the user strictly comply with all warnings and operating instructions in this manual. Read this manual carefully, following the instructions, before the installation and operation of the UPS. After installation, keep this manual in a safe place for future reference.

1-1 Transportation

- Please transport the UPS system only in its original package to protect against shock and impact.

1-2 Preparation

- Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate to the new environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near a heater.
- Do not block the ventilation holes in the UPS housing.

1-3 Installation

- Do not connect appliances or devices which would overload the UPS system, (e.g. laser printers), to any of the UPS output receptacles.
- Place input and output cables in such a way as to avoid a tripping hazard
- Do not connect any domestic appliances, such as hair dryers or vacuums, to UPS output receptacles.
- The UPS should only be operated by authorized individuals.
- The UPS system must be connected to an earth-ground and must be easily accessible to the UPS system.
- Please use only VDE-tested, UL-marked power cables to connect devices to the UPS system.
- When installed, the sum of the leakage current for the UPS and its connected devices should not exceed 3.5mA.
- The maximum acceptable ambient temperature range for operation of the UPS is 40°C (104°F).

! CAUTION: The unit is heavy. Lifting the unit requires a minimum of two people.

1-4 Operation

- Do not disconnect the input power cable on the UPS or the building earth-ground outlet (shockproof socket outlet) during its operation. Doing so will cancel the protective grounding of the UPS and of all connected loads.

- The UPS features its own, internal current source (batteries). The UPS output receptacles may be electrically charged even if the UPS system is not connected to input power.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect input power then disconnect the internal batteries of the UPS.
- Do not allow any potential exposure of fluids or foreign objects inside the UPS.

1-5 Maintenance, service and faults

- The UPS system contains hazardous voltages. Repairs may only be carried out by qualified maintenance personnel.

! Caution - Risk of electric shock. Even after the unit is disconnected from the mains, (building wiring outlet), components inside the UPS system are still connected to the internal batteries and are electrically live and dangerous.

- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present, and no hazardous voltage exists in the terminals of high capability capacitors such as the BUS-capacitors.
- To avoid electrical shock, turn off the unit and unplug it from the AC power source before servicing the battery.
- Only authorized personnel who are adequately familiar with batteries and with the required precautionary measures may replace the internal batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.

! Caution - Risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is present before contacting.

★ **Warning** - Do not dispose of batteries in a fire. The batteries may explode.

★ **Warning** - Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - a) Remove watches, rings, or other metal objects.
 - b) Use tools with insulated handles.
 - c) Wear rubber gloves and boots.
 - d) Do not lay tools or metal parts on top of batteries.
 - e) Disconnect the charging source and connected loads prior to installing or maintaining the battery.
 - f) Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

- When changing batteries, install the same number and same type of batteries or battery packs.

Manufacturer	Type	Rated
Voltronic Power	LIFE-247500	25.6 VDC, 7.5 Ah
	LIFE-485000	48.0 VDC, 5.0 Ah
	LIFE-722500	76.8 VDC, 2.5 Ah

- When necessary, replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.
 - ★ **WARNING:** This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

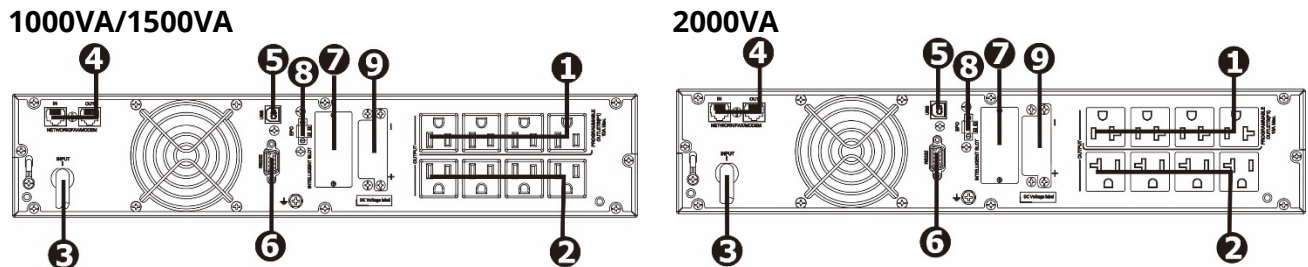
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the 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 their own expense.

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

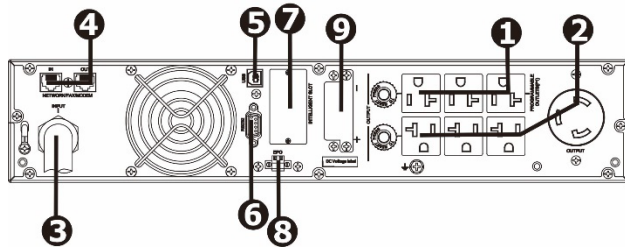
2. Installation and Setup

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

2-1 Rear panel view



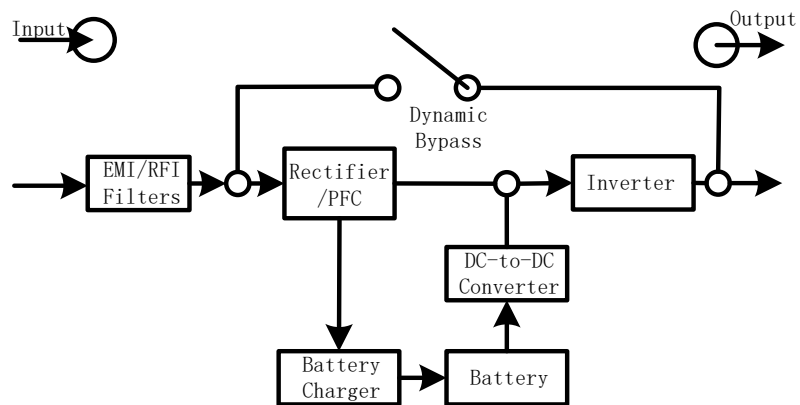
3000VA



1. Programmable outlets: connect to non-critical loads
2. Output receptacles: connect to mission-critical loads
3. AC input
4. Network/Fax/Modem surge protection
5. USB communication port
6. RS-232 communication port
7. SNMP intelligent slot
8. Emergency power off function connector (EPO)
9. External battery connection

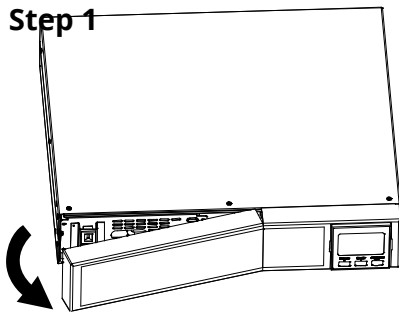
2-2 Operating principle

The operating diagram of the UPS is shown as below:

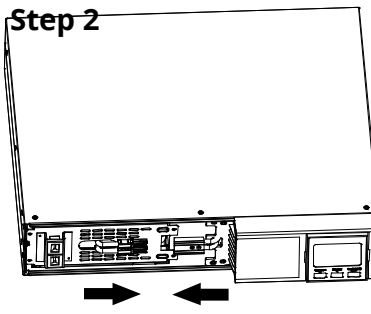


2-3 Install the UPS (Only for RT Models)

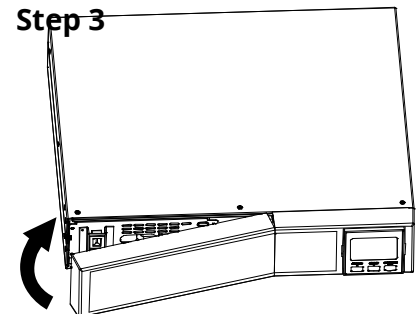
To prevent accidental discharge, the UPS is shipped with batteries disconnected from the UPS. Prior to installation of the UPS, follow the steps below to reconnect the battery wires.



Remove the front panel.



Connect the AC input and re-connect battery wires.

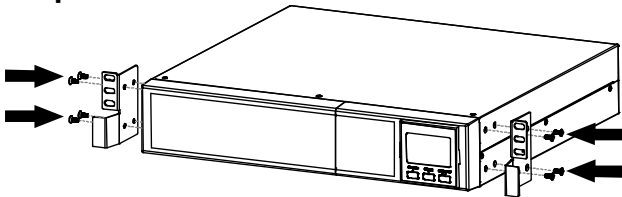


Replace the front panel on the unit.

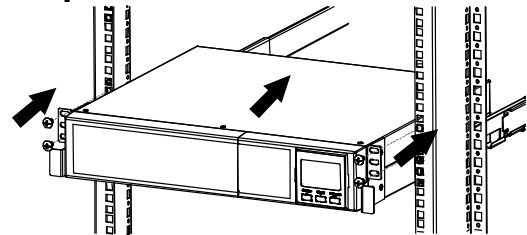
This UPS can be installed either on the desk or mounted in a 19" rack chassis. Please choose proper installation format for this UPS.

Rack-mount Installation

Step 1

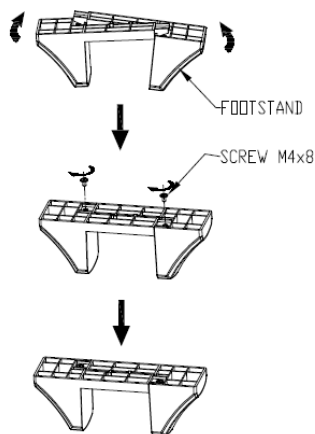


Step 2

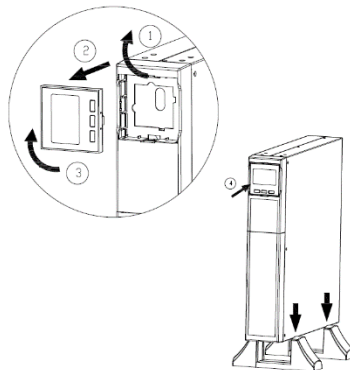


Tower Stand Installation

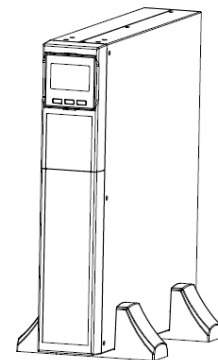
Step 1



Step 2



Step 3



2-4 Setup the UPS

Read the instructions below to select the proper location to install the UPS.

1. The UPS should be placed on the flat and clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive and conductive contaminants. Install the UPS indoors in a clean environment, where it is away from windows and doors. Maintain a minimum clearance of 4 inches along the bottom of the UPS to avoid dust accumulation and high temperatures.
2. The maximum altitude for the normal operation of the UPS, without de-rating, is 10,000 feet.
3. The UPS has internal fans used for cooling, place the UPS in a well-ventilated area to prevent blockage of airflow. The minimum airflow clearance is 4 inches in the front and 12 inches in the back and two sides of the UPS for heat dissipation and easy maintenance.

Step 1: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.

- The input power cord is attached to the UPS using a strain-relief connection. The input cord types for each model are:

Model	Input Power Cord	Length
END1000RT2U-L	NEMA 5-15P	6-Feet
END1500RT2U-L	NEMA 5-15P	6-Feet
END2000RT2U-L	NEMA 5-20P	6-Feet
END3000RT2U-L	NEMA L5-30P	6-Feet

- To reduce the risk of fire, connect only to a circuit provided with maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70 and the Canadian Electrical Code, Part I, C22.1.

Model	Input Circuit Breaker Rating
END1000RT2U-L	20A
END1500RT2U-L	20A
END2000RT2U-L	20A
END3000RT2U-L	30A

Note: Verify the site wiring fault indicator is not active on the LCD panel. It will be illuminated when the UPS is plugged into an improperly wired utility power outlet (Refer to Troubleshooting section).

Step 2: UPS output connection

There two types of output receptacles: Programmable receptacles and Always-On receptacles. Connect non-critical devices to the Programmable receptacles and critical devices to the Always-On receptacles. During a power failure event, the backup time to critical devices can be extended by programming the shutdown of non-critical devices.

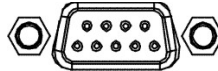
Step 3: Communication connection

Communication port:

USB port



RS-232 port



Intelligent slot



For status monitoring and unattended UPS shutdown and restart, connect one end of a communication cable to the USB or RS232 port of the UPS and the other end to the USB or RS-232 port of a PC. When monitoring software is installed, the UPS status can be monitored and managed through the PC.

The UPS is also equipped with an optional card slot, used for either an Ethernet-based communication card or a programmable contact-closure card. When installed in the UPS, either the SNMP card or the AS400 card will provide advanced communication and monitoring options.

Step 4: Network Surge Protection

Network/Fax/Phone surge port

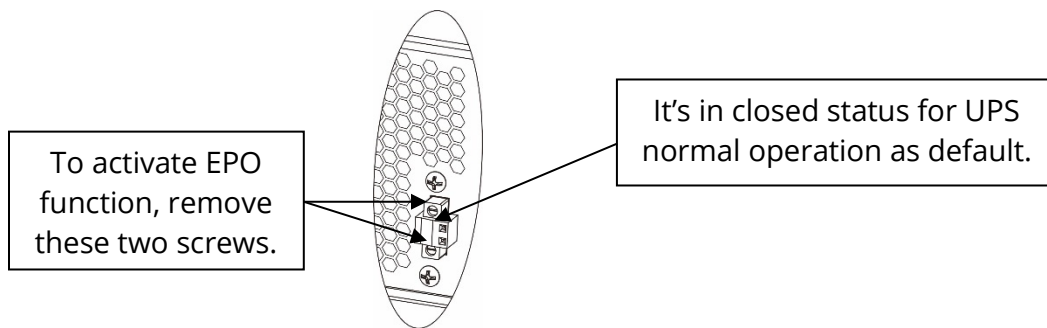


To provide network spike and surge protection for the UPS, connect a single RJ11/45 line into surge-protected "IN" outlet on the back panel of the UPS unit. Connect another RJ11/45 line to "OUT" port going to the equipment with another network/modem/fax/phone line cable.

Step 5: Disable and enable EPO function

This UPS is equipped with EPO function. The default setting for the UPS is with Pin 1 and pin 2 closed (a metal plate is connected to Pin 1 and Pin2) for UPS normal operation. To activate the EPO function, remove two screws on EPO port and metal plate can then be removed. (Replace the screws after the plate removal)

Note: The EPO function logic can be set up using the front panel LCD control. Please refer to **EPO Logic Setting** on Page 18 in UPS Setting section for the details.



Step 6: Turn on the UPS

Press the ON/Mute button on the front panel for two seconds to power on the UPS.

Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capacity during this initial charge period.

Step 8: Install Software

For optimal computer system protection, install the Envision UPS monitoring software to fully configure UPS shutdown. Use the supplied RS-232 or USB communication cable to connect RS-232/USB port of UPS and RS-232/USB port of PC. Follow the installation instructions found in Envision software User Manual.

2-5 Battery Replacement

Battery replacement is needed when the icons  and  are flashing on the LCD display and the alarm is sounds every 2 seconds. Contact your service representative to replace batteries.

The internal battery modules are hot-swappable and can be easily replaced without shutting down the UPS or disconnecting the load(s). If powering down the UPS to replace battery modules, press the OFF button on the front panel for two seconds to power off the UPS and unplug the UPS from utility power.

NOTE 1: DO NOT DISCONNECT the internal battery modules while the UPS is in Battery mode.

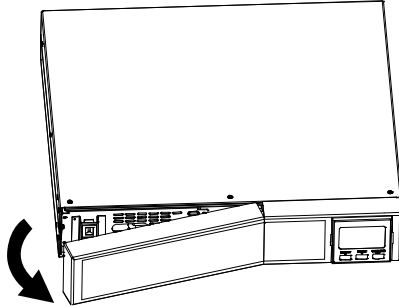
NOTE 2: A small amount of arcing may occur when connecting the internal battery modules. This is normal and will not cause any harm. Connect the cables quickly and firmly.

NOTE 3: This UPS is equipped with internal battery modules and should only be replaced by authorized service personnel.

NOTE 4 : During the replacement process, when the battery module is disconnected, the attached loads will not be protected from power outages.

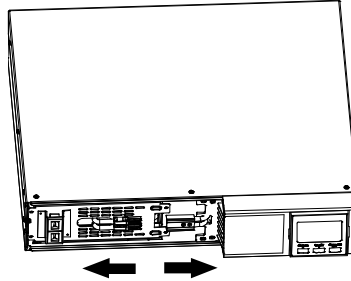
CAUTION!! Consider all warnings, cautions, and notes before replacing battery modules.

Step 1



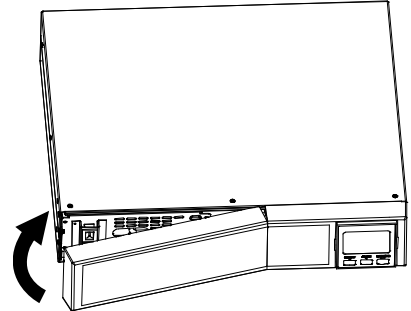
Remove front panel.

Step 2



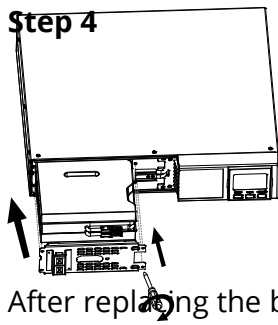
Disconnect battery wires.

Step 3



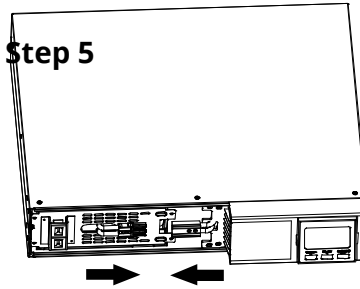
Pull out the battery box by removing two screws on the front panel.

Step 4



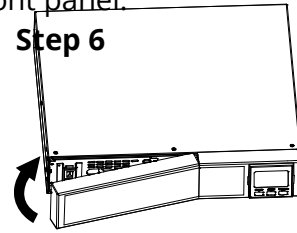
After replacing the batteries, put the battery box back to original location and screw it tightly.

Step 5



Re-connect the battery wires.

Step 6



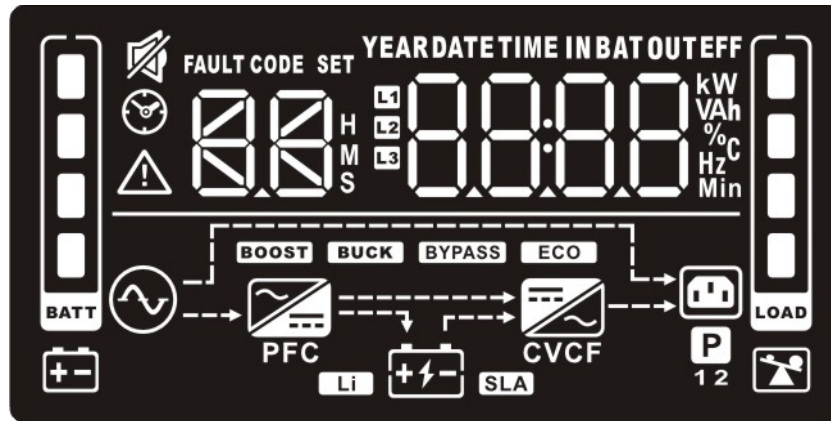
Put the front panel back to the unit.

3. Operations









3-1 Button operation

Button	Function
ON/MUTE Button	<ul style="list-style-type: none"> ➤ <u>Turn on the UPS:</u> Press and hold ON/MUTE button for at least 2 seconds to turn on the UPS. ➤ <u>Mute the alarm:</u> While the UPS is operating in battery mode, press and hold the ON/MUTE button for at least 3 seconds to disable or enable the alarm system. The Mute function will not silence during general warnings or errors. ➤ <u>Up "▲" key:</u> Press this button to display the previous menu option in the UPS setting mode. ➤ <u>Switch to Self-test mode:</u> While the UPS is in AC, ECO or Converter modes, press ON/MUTE buttons for 3 seconds to place the UPS into Self-test mode.
OFF/ENTER Button	<ul style="list-style-type: none"> ➤ <u>Turn off the UPS:</u> Press and hold the OFF/ENTER button for at least 2 seconds to turn off the UPS. When pressed, the UPS will transfer to Standby mode (under normal utility power) or transfer to Bypass mode if the Bypass mode is enabled. ➤ <u>Confirm selection:</u> Press the OFF/ENTER button to confirm the shutdown selection in UPS setting mode.
SELECT Button	<ul style="list-style-type: none"> ➤ <u>Switch LCD Display:</u> Press the SELECT button to change the information displayed on the LCD panel. Options are: input voltage, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, load current and load percent. ➤ <u>Setting mode:</u> Press and hold the SELECT button for 3 seconds to place the UPS into Setting mode when in Standby or Bypass modes. ➤ <u>Down "▼" key:</u> Press this button to display the next menu selection in the UPS setting mode.
ON/MUTE + SELECT Button	<ul style="list-style-type: none"> ➤ <u>Switch to Bypass mode:</u> When the mains input power is normal, press the ON/MUTE and SELECT buttons simultaneously for 3 seconds. The UPS will then enter into Bypass mode. This selection will not be available when the input voltage is out of an nominal range. ➤ <u>Exit Setting mode or return to the previous menu:</u> When in the Setting mode, press the ON/MUTE and SELECT buttons simultaneously for 0.2 seconds to return to the previous menu. If in the home menu, press the two buttons at the same time to exit the Setting mode.

3-2 LCD Panel



Display	Function
Backup time information	
	Indicates the estimated backup time. H: hours, M: minute, S: second.
Configuration and fault information	
	Indicates the options available for configuration. (A full list of these options are listed in Section 3-5)
	Indicates the active warning and fault codes. (See section 3-7 and 3-8 for a full list of codes)
Mute operation	
	Indicates that the UPS alarm is disabled.
Input, Battery, Temperature, Output & Load information	
	<u>Normal Mode</u> : Indicates the real-time UPS status. (Options include: input voltage, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, load current and load percent) kW: kilowatt, V: voltage, Ah: Amp/hour, %: percent, °C: centigrade degree, Hz: hertz <u>Battery Mode</u> : Estimated runtime
Load information	
	Indicates the connected load level in segments measured as: 0-24%, 25-49%, 50-74% and 75-100%.
	Indicates overload.
Programmable outlets information	
	Indicates that programmable management receptacles are active.

Mode operation information	
	Indicates the UPS is connected to nominal mains input power.
	Indicates the battery is actively providing output power.
	Indicates charging status
BYPASS	Indicates the bypass circuit is active.
ECO	Indicates the ECO mode is enabled.
	Indicates the AC to DC circuit is active.
PFC	Indicates the PFC circuit is active.
	Indicates the inverter circuit is active.
CVCF	Indicates the UPS is working in Converter mode.
	Indicates the output is active.
Battery information	
	Indicates the capacity level of the internal battery in segments measured by 0-24%, 25-49%, 50-74%, and 75-100%.
	Indicates low battery status.

3-3 Audible Alarm

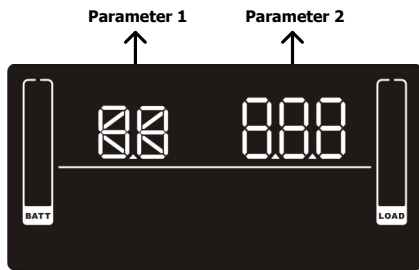
Battery Mode	Sounds every 5 seconds
Low Battery	Sounds every 2 seconds
Overload	Sounds every second
Fault	Continuous
Bypass Mode	Sounds every 10 seconds

3-4 LCD display wordings index

Abbreviation	Display content	Meaning
ENA	ENR	Enable
DIS	diS	Disable
ESC	ESC	Escape
HLS	HLS	High loss
LLS	LLS	Low loss
AO	AO	Active open
AC	AC	Active close
EAT	EAT	Estimated autonomy time
RAT	RAT	Running autonomy time
SD	Sd	Shutdown

OK	OK	OK
ON	ON	ON
BL	bL	Battery Low
OL	OL	Over Load
OI	OI	Over input current
NC	nC	Battery No Connect
OC	OC	Over Charge
SF	SF	Site wiring fault
EP	EP	EPO
TP	tP	Temperature
CH	CH	Charger
BF	bF	Battery Fault
BV	bV	Bypass Out Range
FU	FU	Bypass frequency unstable
BR	bR	Battery Replace
EE	EE	EEPROM error

3-5 UPS Setting



There are three parameter options for setting up the UPS.

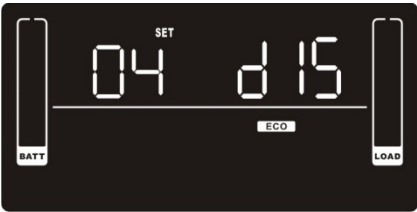
Parameter 1: Selects the parameter option to program. Refer to below table.

Parameter 2: Sets the values to be used for the parameter option.


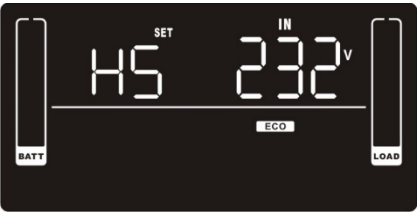
- **A: Output voltage setting**

Interface	Setting
	<p>Parameter 2: Output voltage</p> <p>100: presents output voltage is 100VAC 110: presents output voltage is 110VAC 115: presents output voltage is 115VAC 120: presents output voltage is 120VAC (Default) 125: presents output voltage is 125VAC 127: presents output voltage is 127VAC (127 is not applicable to U.S. voltage)</p>

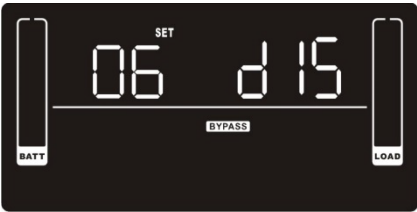
• **B: ECO enable/disable**

Interface	Setting
	<p>Parameter 2: Enable or Disable the ECO function. ENA: ECO mode Enable DIS: ECO mode Disable (Default)</p>

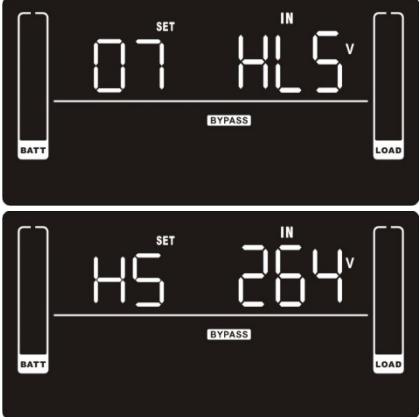
• **C: ECO voltage range setting**

Interface	Setting
 	<p>Parameter 2: Adjusts the acceptable high voltage and low voltage points for ECO mode by pressing Down “▼” key or Up “▲” key.</p> <p>HLS: Sets the High loss voltage in ECO mode within a range of +3V to +12V of the nominal voltage. (Default: +6V) LLS: Sets the Low loss voltage in ECO mode within a range of -3V to -12V of the nominal voltage. (Default: -6V)</p>


• **D: Bypass Enable/Disable when UPS is off**

Interface	Setting
	<p>Parameter 2: Enable or disable Bypass function. ENA: Bypass enable DIS: Bypass disable (Default)</p>


• **E: Bypass voltage range setting**

Interface	Setting
	<p>Parameter 2: Sets the acceptable high and low voltage points for Bypass mode by pressing Down “▼” key or Up “▲” key.</p> <p>HLS: Allows for the adjustment of the Bypass high voltage point with a range of 120-140VAC. (Default: 132VAC)</p> <p>LLS: Allows for the adjustment of the Bypass low voltage point within a range of 85-115VAC. (Default: 85VAC)</p>


• **F: Programmable outlets enable/disable**

Interface	Setting
	<p>Parameter 2: Enable or disable the programmable receptacles.</p> <p>ENA: Programmable outlets enabled</p> <p>DIS: Programmable outlets disabled (Default)</p>


• **G: Programmable outlets setting**

Interface	Setting
	<p>Parameter 2: Sets the backup runtime limits for the programmable receptacles when the UPS is in Battery mode.</p> <p>0-999: The runtime limits are listed in minutes and range from 0-999. (Default: 999)</p>


• **H: Autonomy limitation setting**

Interface	Setting
	<p>Parameter 2: Sets the backup runtime limits for general receptacles, if not programmed as defined in Table J, when the UPS is in Battery mode.</p> <p>0-999: sets the backup time in minutes from 0-999 for general receptacles in battery mode.</p> <p>DIS: Disables the runtime limitation, allowing the UPS to provide battery output until the UPS reaches Low Battery Cut-off. (Default)</p> <p>Note: Backup time will be 10 seconds when set to “0”</p>


• **I: Charger current setting**

Interface	Setting										
	<p>Parameter 2: The current for the battery charger is set by the factory to 4Amps and is not configurable. The recharge time vs. charging current is listed in the table below (in hours):</p> <table border="1" data-bbox="727 428 1377 512"> <thead> <tr> <th></th> <th>1000VA</th> <th>1500VA</th> <th>2000VA</th> <th>3000VA</th> </tr> </thead> <tbody> <tr> <td>4A</td> <td>2.1</td> <td>1.4</td> <td>2.9</td> <td>2.1</td> </tr> </tbody> </table>		1000VA	1500VA	2000VA	3000VA	4A	2.1	1.4	2.9	2.1
	1000VA	1500VA	2000VA	3000VA							
4A	2.1	1.4	2.9	2.1							


• **J: EPO logic setting**

Interface	Setting
	<p>Parameter 2: Sets the EPO function control logic.</p> <p>AO: Active Open (Default). When AO is selected, the EPO function will activate with Pin 1 and Pin 2 in an open status.</p> <p>AC: Active Close. When AC is selected, the EPO function will activate with Pin 1 and Pin 2 in a closed status.</p>


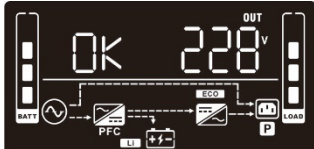





• **K: Display setting for autonomy time**

Interface	Setting
	<p>Parameter 2: Sets the timer setting for displaying battery runtime.</p> <p>EAT: If EAT is selected, it will display the remaining battery runtime. (Default)</p> <p>RAT: If RAT is selected, it will show amount of time running in Battery mode.</p>


• **L: Exit setting**

Interface	Setting
	<p>Exits the Setting mode.</p>





















3-6 Operating Mode Description

Operating mode	Description	LCD display
Online mode	Is active when input voltage is within an acceptable range. The UPS will provide pure and stable AC output power and will also actively charge the internal batteries.	
ECO mode	ECO mode is an energy saving mode: When the input voltage is within strict voltage regulation parameters, the UPS will bypass the inverter output, providing direct utility power for energy savings. The UPS will still actively charge the batteries in ECO mode.	
Frequency Converter mode	When input frequency is within a range of 40Hz to 70Hz, the UPS can be set to a constant output frequency of 50 Hz or 60 Hz. The UPS will actively charge the batteries under this mode.	
Battery mode	Is active when the input voltage is beyond the acceptable range or during a power failure. The UPS will backup power from its battery and sound an alarm every 5 seconds.	
Bypass mode	Is active when input voltage is within an acceptable range and the UPS goes to overload. Bypass mode can also be set manually from the front panel. The alarm will sound every 10 seconds.	
Standby mode	UPS is powered off from the front panel and no output power is supplied to connected loads. The UPS will still actively charge the batteries in Standby mode.	
Fault mode	When a fault occurs, the ERROR icon and the fault code will be displayed.	

3-7 Faults Reference Code

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start fail	01	x	Battery voltage too high	27	x
Bus over	02	x	Battery voltage too low	28	x
Bus under	03	x	Charger output short	2A	x
Inverter soft start fail	11	x	Over temperature	41	x
Inverter voltage high	12	x	Overload	43	
Inverter voltage Low	13	x	Charger failure	45	x
Inverter output short	14	x	Over input current	49	x









3-8 Warning indicator

Warning	Icon (flashing)	Code	Alarm
Low Battery	 	bL	Sounds every 2 seconds
Overload	 	OL	Sounds every second
Over input current		OI	Sounds 2 beep every 10 seconds
Battery is not connected	 	NC	Sounds every 2 seconds
Over Charge	 	OC	Sounds every 2 seconds
Site wiring fault	 	SF	Sounds every 2 seconds
EPO enable		EP	Sounds every 2 seconds
Over temperature		EP	Sounds every 2 seconds
Charger failure		CH	Sounds every 2 seconds
Battery fault		bF	Sounds every 2 seconds
Out of bypass voltage range	 	b ^v	Sounds every 2 seconds
Bypass frequency unstable		FU	Sounds every 2 seconds
Battery replacement		b ^t	Sounds every 2 seconds
EEPROM error		EE	Sounds every 2 seconds

NOTE: The "Site Wiring Fault" function can be enabled/disabled from the front display panel or via software. Please check software manual for the details.

4. Troubleshooting

If the UPS does not operate correctly, please table below to reference the problem and solution.

Symptom	Possible cause	Remedy
No LCD display or audible alarm even nominal input power.	The AC input power plug is not connected well to the utility receptacle.	Check if input power cord is firmly connected to the utility receptacle.
The  icon and the EP code is flashing on the LCD display and the alarm is sounding every 2 seconds.	The EPO function is activated.	Set the circuit in the closed position to disable EPO function.
The  and  icons and the SF code are flashing on the LCD display. The alarm is sounding every 2 seconds.	The line and neutral conductors of input mains are reversed.	Consult an electrician to verify proper mains wiring.
The  and  icons and the  code are flashing on the LCD display. The alarm is sounding every 2 seconds.	The internal battery module is not connected or improperly connected.	Verify the internal battery is connected properly.
Fault code 27 is showing on the LCD display and the alarm is continuously sounding.	Battery voltage is too high or the charger is faulty.	Contact your dealer or Minuteman customer support.
Fault code 28 is showing on the LCD display and the alarm is continuously sounding.	Battery voltage is too low or the charger is faulty.	Contact your dealer or Minuteman customer support.
The  and  icons and the OL code are flashing on LCD display. The alarm is sounding every second.	The UPS is in overload	Remove excess loads from the UPS output receptacles until the alarm is removed.
	The UPS is overloaded. Devices connected to the UPS are fed directly by the input mains via the Bypass.	Remove excess loads from the UPS output receptacles until the alarm is removed.
	After repetitive overloads, the UPS is locked in the Bypass mode. The connected devices are fed directly by the mains.	First, remove excess loads from UPS output receptacles. Then shut down the UPS and restart it.
Fault code 49 is shown on the LCD display and the alarm is continuously sounding.	UPS is over the maximum input current.	Remove excess loads from the UPS output receptacles until the alarm is removed.
Fault code 43 is shown and the  icon is lit on the LCD display. The alarm is continuously sounding.	The UPS shut down automatically because the UPS output is overloaded.	First, remove excess loads from UPS output receptacles. Then shut down the UPS and restart it.

Symptom	Possible cause	Remedy
Fault code 14 is shown on the LCD display and the alarm is continuously sounding.	The UPS shut down automatically because a short circuit has occurred on the UPS output.	Check the output wiring to verify if any connected devices are in short circuit status.
Fault code 01, 02, 03, 11, 12, 13 or 41 is shown on the LCD display and the alarm is continuously sounding.	A UPS internal fault has occurred. There are two possible results: 1. Power to the connected load(s) is still supplied, but directly from AC power via the bypass. 2. The connected load(s) is no longer supplied by power.	Contact your dealer or Minuteman customer support.
The battery backup time is shorter than nominal value.	The batteries are not fully charged.	Charge the batteries for at least 8 hours and then check the battery capacity. If the problem still persists, consult your dealer or Minuteman customer support.
	The batteries are defective.	Contact your dealer or Minuteman customer support to replace the battery.
Fault code 2A is shown on the LCD display and the alarm is continuously sounding.	A short circuit has occurred on the charger output.	Contact your dealer or Minuteman customer support.
Fault code 45 is shown on the LCD display and the alarm is continuously sounding.	The charger does not have any output and battery voltage is less than 10V/PC.	Contact your dealer or Minuteman customer support.

5. Storage and Maintenance

Operation

The UPS system contains no user-serviceable parts. If the battery service life, (5~7 years at 25°C ambient temperature), has been exceeded, the batteries must be replaced. If necessary, please contact your dealer or Minuteman customer support.



Be sure to deliver any spent LiFePO₄ (LiFe) batteries to a proper recycling facility or return it to your dealer, (or Minuteman), in the replacement battery packing material.

Storage

Before storing, the UPS charge the internal batteries for a minimum of 8 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
35°C ~ 45°C	Every months	1 hours @5~35°C
25°C ~ 35°C	Every 1-3 months	1 hours@5~25°C
-10°C ~ 25°C	Every 3-12 months	1 hours@5~25°C

6. Specifications

MODEL	END1000RT2U-L	END1500RT2U-L	END2000RT2U-L	END3000RT2U-L
CAPACITY*	1000VA/900W	1500VA/1350W	2000VA/1800W	3000VA / 2700W
INPUT				
Voltage Range	Low Line Transfer	160VAC/140VAC/120VAC/110VAC ± 5 % or 80VAC/70VAC/60VAC/55VAC ± 5 % (based on load percentage 100% - 80 % / 80 % - 70 % / 70 - 60 % / 60 % - 0)		
	Low Line Comeback	175VAC/155VAC/135VAC/125VAC ± 5 % or 87VAC/77VAC/67VAC/62VAC ± 5 %		
	High Line Transfer	300 VAC ± 5 % or 150 VAC ± 5 %		
	High Line Comeback	290 VAC ± 5 % or 145 VAC ± 5 %		
Frequency Range	40Hz ~ 70 Hz			
Phase	Single phase with ground			
Power Factor	≥ 0.99 @ full load			
THDi	≤ 5% @ 160-265VAC or 80~140VAC THDU < 1.6% @ input and full linear load condition			
OUTPUT				
Output voltage	100/110/115/120/125/127 VAC**			
AC Voltage Regulation	± 1% (Batt. Mode)			
Frequency Range (Synchronized Range)	47 ~ 53 Hz or 57 ~ 63 Hz			
Frequency Range	50 Hz ± 0.1 Hz or 60Hz ± 0.1 Hz (Batt. Mode)			
Current Crest Ratio	3:1			
Harmonic Distortion	≤ 2 % THD (Linear Load) ; 4 % THD (Non-linear Load)			
Transfer Time	AC Mode to Batt. Mode	Zero		
	Inverter to Bypass	< 4 ms		
Waveform (Batt. Mode)	Pure Sinewave			
EFFICIENCY				
AC Mode @ full charged battery	≥90%	≥90%	≥91%	≥90%

ECO Mode@ full charged battery	≥96%			
Battery Mode	≥87%	≥89%	≥89%	≥90%
BATTERY				
Battery Type	LIFE-247500	LIFE-485000		LIFE-722500
Numbers	1	1	2	3
Recharge Time	2 hours recover to 100% capacity @ 4A charging current			
Charging Current	4A (Default)			
Charging Voltage	28 VDC ± 1%	52.5 VDC ± 1%		84 VDC ±1%
PHYSICAL (RT models)				
Dimension, D" x W" x H" (mm)	16.1" x 17.2" x 3.5" (410 x 438 x 88)		20.1" x 17.2" x 3.5" (510 x 438 x 88)	24.8" x 17.2" x 3.5" (630 x 438 x 88)
Net Weight LBS. (kgs)	23.8 (10.8)	25.6 (11.6)	33.5 (15.2)	45.2 (20.5)
ENVIRONMENT				
Operation Humidity	20-95 % RH @ 0- 40°C (non-condensing)			
Noise Level	Less than 50dBA @ 1 Meter (With fan speed control)			
IP degree	IP20			
MANAGEMENT				
Smart RS-232 or USB	Supports Windows® 2000/2003/XP/Vista/2008/7/8/10, Linux, Unix and MAC			
Optional SNMP	Power management from SNMP manager and web browser			

* Derate capacity to 90% of capacity when the output voltage is adjusted to 100VAC.

**The output power ratings are different based on different input voltage. Please check output power rating table for the details. (127 is not applicable to U.S. voltage)

*** Product specifications are subject to change without further notice.

Output Power Rating Table (For 100/110/115/120/125VAC settings)

Model name	Input rating	Output rating
END1000RT2U-L	100-125VAC, 50/60Hz, 12A, 1Ø	100/110/115/120/125VAC, 50/60Hz, 1000VA/900W, 1Ø, 10/9.1/8.7/8.3/8A
END1500RT2U-L	100-125VAC, 50/60Hz, 12A, 1Ø	100/110/115/120/125VAC, 50/60Hz, 1Ø 1500VA/1350W, 12A (@125VAC input) ; 1500VA/1300W, 12.5A (@120VAC input) ; 1500VA/1270W, 13A (@115VAC input) ; 1500VA/1200W, 13.6A (@110VAC input) ; 1350VA/1040W, 13.5A (@100VAC input)
END2000RT2U-L	100-125VAC, 50/60Hz, 16A, 1Ø	100/110/115/120/125VAC, 50/60Hz, 1Ø 2000VA/1800W, 16A (@125VAC input) ; 2000VA/1800W, 16.7A (@120VAC input) ; 2000VA/1740W, 17.4A (@115VAC input) ; 2000VA/1640W, 18.2A (@110VAC input) ; 1800VA/1500W, 18A (@100VAC input)
END3000RT2U-L	100-125VAC, 50/60Hz, 24A, 1Ø	100/110/115/120/125VAC, 50/60Hz, 1Ø 3000VA/2700W, 24A (@125VAC input) ; 3000VA/2700W, 25A (@120VAC input) ; 3000VA/2650W, 26.1A (@115VAC input) ; 3000VA/2500W, 27.3A (@110VAC input) ; 2700VA/2300W, 27A (@100VAC input)

7. Warranty

Para Systems, Inc. (Para Systems) warrants this equipment, when properly applied and operated within specified conditions, against faulty materials or workmanship for a period of three years from the date of purchase. For equipment sites within the United States and Canada, this warranty covers depot repair or replacement of defective equipment at the discretion of Para Systems. Depot repair will be from the nearest authorized service center. The customer pays for shipping the product to Para Systems. Para Systems pays ground freight to ship the product back to the customer. Replacement parts and warranty labor will be borne by Para Systems. For equipment located outside of the United States and Canada, Para Systems only covers faulty parts. Para Systems products that are depot repaired or replaced pursuant to this warranty shall only be warranted for the unexpired portion of the warranty applying to the original product. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.

The warranty shall be void if (a) the equipment is damaged by the customer, is improperly used, is subjected to an adverse operating environment, or is operated outside the limits of its electrical specifications; (b) the equipment is repaired or modified by anyone other than Para Systems or Para Systems approved personnel; or (c) has been used in a manner contrary to the product's User's Manual or other written instructions.

Any technical advice furnished before or after delivery in regard to use or application of Para Systems' equipment is furnished without charge and on the basis that it represents Para Systems' best judgment under the circumstances, but it is used at the recipient's sole risk.

EXCEPT AS PROVIDED HEREIN, PARA SYSTEMS MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation of implied warranties; therefore, the aforesaid limitation(s) may not apply to the purchaser.

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL PARA SYSTEMS BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, Para Systems is not liable for any costs, such as; labor for on-site installation, on-site maintenance or on-site service, lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, cost of substitutes, claims by third parties, or otherwise. The sole and exclusive remedy for breach of any warranty, expressed or implied, concerning Para Systems' products and the only obligation of Para Systems hereunder, shall be depot repair or replacement of defective equipment, components, or parts; or, at Para Systems' option, refund of the purchase price or substitution with an equivalent replacement product. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

No employee, salesman, or agent of Para Systems is authorized to add to or vary the terms of this warranty.

Please go to our website at www.minutemanups.com/warranty/ to fill out the Warranty Registration.

Additional Notices:

NOTICE: This product complies with the rules for Class B device, pursuant to Part 15 of the FCC rules for radio noise emissions from a digital apparatus.

These limits are designed to provide reasonable protection against such interference in a residential installation.

This equipment generates and uses radio frequency and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. If this device does cause 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 the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.
- Shielded communications interface cables must be used with this product.

Life Support Policy

Para Systems does not support the use of any of its products in life support applications where the failure or malfunction of the product can be reasonably expected to cause failure to life support devices or to significantly affect their safety or effectiveness. Furthermore, Para Systems does not recommend the use of any of its products in direct patient care.



RoHS2
FCC Class A
cULus (UL1778 5th Edition)
CE Compliant

Para Systems, Inc.
1455 LeMay Drive
Carrollton, TX 75007
800.238.7272

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A1. Declaration of Conformity

Application of Council Directive(s): 2014/30/EU

Standard(s) to which Conformity is declared: EN62040-2, IEC61000-2-2, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8, IEEE C62.41 Category A1, IEC62040-1-1, IEC/EN62040-2, UL1778 (5th Edition), CSA 22.2 no. 107.3-05, FCC Class A

Manufacturer's Name: Para Systems, Inc. (MINUTEMAN UPS)

Manufacturer's Address: 1455 LeMay Drive, Carrollton, Texas 75007 (USA)

Type of Equipment: Uninterruptible Power Supplies (UPS)

Model Nos: END1000RT2U-L (Y), END1500RT2U-L (Y), END2000RT2U-L (Y), END3000RT2U-L (Y)

Year of Manufacture: Beginning November 2024

I hereby declare that the equipment specified above conforms to the above Directive(s).

Kevin Canole
Director of New Business Development

Place: Carrollton, Texas, USA
Date: September 6, 2024

NOTES:

