MINUTEMAN®
UNINTERRUPTIBLE POWER SUPPLIES

OWNER'S MANUAL

UNINTERRUPTIBLE POWER SUPPLIES

MODELS DESCRIBED IN THIS MANUAL:

MM250XL/ 1	**(120VAC, 60HZ, 250 WATTS)**
MM250XL/2	**(230VAC, 50HZ, 250 WATTS**
MM500/ 1	**(120VAC, 60HZ, 500 WATTS)**
MM500/2	**(230VAC, 50HZ, 500 WATTS)**

MINUTEMAN Uninterruptible Power Supplies are manufactured by Para Systems, Inc. Each unit is fully automatic, simple to use and designed to be maintenance-free operation for years to come. Each unit provides superior power protection for all sensitive electronic equipment.

IMPORTANT SAFETY INSTRUCTIONS THAT SHOULD BE FOLLOWED DURING INSTALLATION AND MAINTENANCE OF THE UPS AND BATTERIES ARE CONTAINED IN THIS MANUAL. SAVE THESE INSTRUCTIONS.



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INTRODUCTION

Congratulations on your purchase of a MINUTEMAN Uninterruptible Power Supply (UPS). Each unit is designed to provide superior, total power protection for personal computers, telephone systems and any other sensitive or critical electronic equipment against:

- Blackouts or Power Interruptions
- Brownouts or Sags
- Over-voltage
- Surges
- Spikes
- EMI / RFI Noise

Additionally, this unit provides light and alarm indications, so that the user will know the status of both commercial power and the MINUTEMAN Power Supply at all times. Finally, each unit is designed to be maintenance-free, and to provide years of excellent service.

RECEIVING INSPECTION

Remove and inspect the unit for shipping damage. If damage is found, immediately notify the carrier and your dealer. If no damage is found, save both the shipping container and the packing foam in case the unit may later need to be returned to the factory or shipped to another location.

WARRANTY REGISTRATION

Locate your warranty registration card, fill in the blanks, apply postage and put the card in the mail within 10 days of receipt to register your warranty. **FAILURE TO REGISTER YOUR WARRANTY RENDERS IT NON-VALID.** Protect your investment by registering your warranty. Para Systems, Inc. standard warranty period is one year (see warranty statement). You may extend your warranty period for the second year for a nominal charge.

SAFETY

- MINUTEMAN models MM250XL /1 and MM500 /1 have been tested by Underwriters Laboratories for safety per UL 1012, Standard for Power Supplies. These Models have been listed (84T3) by U.L.

MODEL #	OUTPUT	UL LISTING
MM250XL / 1	250 WATT, 120VAC, 60 HZ	84T3
MM250XL /2	250 WATT, 230VAC, 50HZ	Not Listed
MM 500 / 1	500 WATT, 120VAC, 50 HZ	84T3
MM 500 / 2	500 WATT, 230VAC, 50 HZ	Not Listed

- UPS units contain batteries for generation of AC voltages, so the output receptacles may be electrically hot even when the unit is not connected to commercial power. Trained service personnel should perform all repairs, since an electrical hazard exists.

- The 3 wire plug (NEMA Type 5-15P) supplied with the unit provides earth ground for the unit chassis to prevent electrical shock. Removal of the ground PIN from the plug or use of a 3 wire-to-2 wire adapter will defeat this safety feature and may result in a shock hazard. Additionally, if the plug is removed to simulate a power failure (not recommended), do not touch the plug conductors or the chassis while the plug is removed.

- Do not allow water or any foreign object to enter the UPS. In case this occurs, immediately turn both the unit power switch and breaker off and unplug the MINUTMAN for the commercial receptacle.

- The power switch or the breaker switch should not be turned "on" and "off" rapidly and repeatedly while the unit is running in the inverter mode (battery operation). Damage to the MINUTEMAN inverter and your system can occur.

- Do not cover unit air holes or restrict airflow in any way. The unit must have good air circulation at all times.

SELECTION OF UPS LOCATION

- Select a location that will provide good air circulation for the UPS.

- Avoid locations near heating devices.

- Avoid locations near water or excessive humidity

- Avoid locations where the unit is exposed to direct sunlight.

DETERMINING LOAD REQUIREMENTS FOR SELECTION OF THE PROPER MINUTEMAN UNIT

If you are unsure of the power requirements of your system, there are two ways to make that determination.

1. Locate the identification plate on each piece of equipment that will be powered by the MINUTEMAN. The identification plate should state the power rating or current requirement of the equipment in either watts or amps. If stated in amps, multiply by 120 volts (230 volts for 230 VAC requirements) to obtain the power required in watts. Then sum all the power requirements to obtain total power required. MINUTEMAN units are available as follows:

MODEL	OUTPUT POWER AVAILABLE
MM250	250 WATTS
MM300SS	300 WATTS
MM500	500 WATTS
MM600SS	600 WATTS
MM900SS	900 WATTS
MM1200SS	1200 WATTS
MM1600SS	1600 WATTS

Larger, on-line units are also available for output loads of 1KVA, 3KVA and 5KVA.

2. To determine whether the MINUTEMAN unit purchased is large enough to handle your existing equipment, in case the equipment does not have power requirements labeled, go through the **INSTALLATION AND TEST PROCEDURE.** While running in the inverter mode (battery operation), be sure that maximum power is being utilized by your system. For example, if your load is a computer with a floppy disc drive, monitor and printer, run the monitor, printer and floppy disc drive while the unit is in the inverter mode. Repeat this procedure several times (5-10). If no operation problems are found, then the MINUTEMAN is sufficient to handle this load.

INSTALLATION AND TEST PROCEDURE

1. If your MINUTEMAN Uninterruptible Power Supply uses an external battery pack, refer to the External Battery Pack Owner's Manual. Complete the **INSTALLATION AND TEST PROCEDURE** contained in that manual before proceeding.

2. Most MINUTEMAN models have a D.C. breaker switch located on the back, left, bottom of the unit with a red / green polarity light above the rear access panel cover. MM250XL does not have the polarity light, since it is not normally used with external battery packs. Earlier models of the products have an external D.C. fuse or the D.C. breaker switch inside the control unit and have no polarity light. If you have no external battery pack connected to your MINUTEMAN, turn on the D.C. breaker (up position) and the polarity light (if your model has one) will turn green. If the light doesn't turn green, the internal batteries have become disconnected in shipment, and you should contact Para Systems, Inc. for assistance. For units with external battery packs, the polarity light must come on green when the external battery pack is turned on. Turn on the control unit D.C. breaker only if this is the case. To turn on an internal D.C. breaker switch, you must either remove the access panel cover in the rear or remove the unit cover and push the breaker switch to the forward position.

3. Plug the unit's power plug into a standard 120VAC receptacle (230VAC receptacle for 230-volt units) and turn the power switch "on". If commercial power is acceptable, the "AC Normal" (green) light will come on after a short delay (1.2 seconds). If commercial voltage is not available or is out of range, the unit will go

to the inverter mode (battery operation) after the delay and the "Battery-In-Use" (amber) light and audible alarm will come "on". If the unit will not function in the "AC Normal" mode, see the section titled "Trouble Shooting" before proceeding.

4. Leave the unit in the "AC Normal" mode at least 4 hours to permit the internal battery system to charge.

5. After the charge period has expired, plug your system load(s) into the MINUTEMAN output receptacles and turn on load power.

6. Turn off commercial power to the MINUTEMAN plug by either turning off the breaker supplying power to the commercial receptacle or using a switchable power strip for the MINUTEMAN plug. If you prefer, you can unplug the MINUTEMAN power plug for test (not recommended), but do not touch the chassis or plug connectors while the plug is removed from the commercial receptacle. When commercial power is turned "off", the MINUTEMAN alarm will sound and the "amber" light will glow. Operation of both light and alarm is intermittent (approximately 2.5 times each second). The "green" indicator light is "off" at this time. The audible alarm can be silenced by depressing the "Alarm Silencer Switch". Verify that your system(s) functions normally in every respect in this mode. If any problems occur, see the section titled "Troubleshooting".

7. Restore commercial power to the MINUTEMAN again and observe that after a short delay (0.6 seconds) the unit returns to the 'AC Normal" mode- "green" light comes back "on", alarm and "amber" light goes "off"

   Your MINUTEMAN unit is now properly installed and ready to protect your system.

OPERATION

When a brownout, power interruption, power outrage or overvoltage condition occurs, the alarm will sound and the "amber" light indicator will glow, indicating that commercial power is lost or unacceptable and MINUTEMAN is now supplying power to your system. With a slower intermittent audible alarm (approximately 2.5 per second) and an amber indicator light, the unit is in the normal inverter mode (battery operation). When the alarm sounds at more rapid intervals (approximately 5 per second) and the "red" indicator light turns "on" along with the "amber", only 2 minutes of battery power remain. If you have not already downloaded your system and turned it off, you must do so at this time. Then the MINUTEMAN power switch should be turned "off" to prevent further battery discharge.

When commercial power returns, switch the MINUTEMAN power switch to the "on" position if it was turned off previously. The "green" indicator light will come "on" after a short delay. Return your system to operation, and the MINUTEMAN system will automatically recharge the internal batteries during systems operation.

Since most commercial power outages are of short duration, commercial power will probably be restored before the 2-minute warning. **IF COMMERCIAL POWER RETURNS BEFORE THE WARNING SIGNAL, THERE IS NO NEED TO SHUT DOWN THE SYSTEM AT ALL.** The MINUTEMAN will switch back to normal AC operation automatically.

During normal AC operation, the MINUTEMAN unit will quietly protect your system from power surges, voltage spikes and noise interference. No alarms will sound and the "green" indicator light will remain "on" during this operation.

SPECIAL FEATURES - OPERATION

1. **Audible Alarm Silencer:** During system (battery) operation, depressing the "Alarm Silencer" button can silence the audible alarm. When AC operation is restored, the audible alarm is automatically reset, providing an audible indication of the next power outage. The audible alarm is also restored at the 2-minute warning during systems operation. Depressing the "Alarm Silencer" button again will silence the audible alarm for the last 2 minutes of system operation. Operation of this feature can be checked by depressing the "Alarm Silencer" button after Step 6 and before Step 7 of the **INSTALLATION AND TEST PROCEDURE.**

2. **Automatic Low Battery Voltage Cutoff:** MINUTEMAN units provide an automatic lower battery voltage cutoff feature to protect the internal system batteries from experiencing an excessive discharge. During prolonged systems (battery) operation, a 2-minute warning is provided a minimum of 2 minutes prior to low battery voltage cutoff. When battery cutoff occurs, the systems will be switched back to AC operation. If no commercial power is available, the unit will turn "off" (no power out) and the "amber" light will stay "on" (steady), indicating that the shutdown has occurred. When commercial power is restored, the MINUTEMAN will automatically return to proper AC operation.

3. **Automatic Inverter Overload Shut Down:** In case the MINUTEMAN unit output becomes overloaded in the inverter mode (battery operation), circuitry is provided to protect the unit inverter and transformer as well as your system. When an overload occurs, the MINUTEMAN inverter will immediately shut down (no power out) and all light indicators except a steady “amber” light will turn off, indicating the overload. If this occurs, turn the MINUTEMAN power switch “off”, and check for a shorted output or overload. When the problem is cleared, restore commercial power to the MINUTEMAN, turn the unit power switch “on” and the "green" indicator light will come back "on" after a short delay. You can verify that the overload condition has been corrected by again turning “off” commercial power to the MINUTEMAN plug and checking for proper inverter mode function.

4. **Overload condition:** Unlike most units available today, the MINUTEMAN will correct a commercial overvoltage condition. When commercial voltage increases above 132VAC (260VAC for 230 volt units), the unit will switch to the inverter mode (battery operation) and remain in that mode until commercial voltage decreases to 125VAC (250VAC for 230 volt units). All unit indications are exactly the same as with a brownout or power interruption.

SYSTEM BATTERIES

The batteries used internally in MINUTEMAN units are sealed, maintenance-free, lead-acid batteries with electrolyte totally absorbed in the plates and separator material. These batteries can be used in any position. For maximum battery life, batteries should be maintained at as cool a temperature as is practical indoors at proper trickle charge voltage. The most effective charging temperature range is 41˚F to 95°F. However, batteries can be charged within the range of 32° F to 104° F (0° - 40° C) without any detrimental effects. Expected float life of the batteries is 3 to 6

years at 85°F. We recommend replacement after 3 years of use. Replacement batteries can be purchased from Para Systems, Inc. or from your local distributor or dealer.

1. MINUTEMAN batteries must not be left in a discharged state with the unit power switch “on” for longer than 72 hours. Further, the batteries must not be left in a discharged state with the power switch “off” for longer than 30 days. Either situation can cause permanent damage to the batteries and will void the battery warranty.

2. If the unit must be stored, the internal batteries must be fully charged prior to storage. Store the unit in a cool, dry location, For extended storage, the unit must be removed from storage periodically for battery charge. With a storage temperature of 40°C (104°F), charge the unit 24 hours every 4 months. Cooler storage temperatures increase the length of time between recharge cycles.

BATTERY/SYSTEM CHECKOUT

To verify proper system function and battery condition, the user is encouraged to repeat Steps 6 and 7 of the **INSTALLATION AND TEST PROCEDURE** periodically. Normal indications as specified should be observed. If the system goes immediately to the 2-minute warning mode, the batteries should be replaced.

UPS MONITORING CONFIGURATIONS

MM500 units in this manual provide a UPS monitoring capability option which will allow direct interface with many different computer hardware/software configurations. This capability permits an unattended, orderly shutdown of the computer system when commercial power is lost for a long period. Some configurations also provide for a timed delay shutdown of the UPS after the computer has been shut down, thereby conserving UPS battery capability.

Following is a partial list of systems with which the monitoring capability exists, along with the Para Systems interface part number required for each. Contact Para Systems sales department for a more complete, up-to-date list. In addition to those configurations listed below, Para Systems also offers its own software package, “Network Manager”, which functions with Novell O/S 2.11 and above and SCO Xenix O/S 2.2.3 and above. This system offers many advantages over most existing UPS monitoring packages. Most all of these monitoring interface systems can be used to control multiple file servers.

Finally, for systems that do not have UPS interface capability, user software can be written to read UPS status and provide for system shutdown. Software specialists should contact Para Systems, Inc. for more information.

USP INTERFACE CONFIGURATIONS

CJ01*	Novell At type with 3.5 mm stereo jack
CJ02	Novell PS/2 type with mouse port connector
CJ03	Altos Unix/Pick/ Xenix with ¼ stereo jack
CJ04	Same except for 2-minute warning response
CJ05	DTS Servers running Banyon Vines
CJ06	Servers running Banyon Vines/286,Vines/386
CJ07	Prime 2350/2450
CN01	3 Com 3S/400
CN02	SCO Xenix with Netsavers** Software
SJ01	Convergent /Unisys
SJ02	Altos with GNJ Upshut*** Software
SJ03	Microsoft LAN Manager
SJ04	Convergent Might Frame/Miniframe
UJ01	IBM AS/400 System 9406
UJ02	IBM AS/400 System 9404

*This interface configuration functions with existing Novell UPS monitoring board, SS Keycard or Disk Coprocessor Board. Para Systems Monitoring Board (MBI) is available for new installations which do not already have an add-on monitoring board.

**Software sold separately by Sutton Designs, Ithaca, NY

*** Software sold separately by GNJ Corp. Silver Springs, MD.

MINUTEMAN PROBLEMS

If problems occur with you MINUTEMAN, first check the items listed below under **TROUBLESHOOTING.** If, after reviewing the **TROUBLESHOOTING** section and taking appropriate action the problem persists, contact your supplier or Para Systems, Inc. customer service department. Prior to calling for service, please write down and be prepared to discuss all unit light indications in each mode (AC and battery), alarm indications and whether or not the unit supplies output power in each mode.

TROUBLESHOOTING

1. PROBLEM: **Unit will not operate in AC Mode**

Probable causes:

a. No power available at commercial receptacle.
b. Commercial voltage is out of range. If voltage is out of range, report the problem to your local utility company.

Acceptable ranges are:

120VAC units . . . . . 110VAC to 125VAC
208/220VAC units . . . . . 204VAC to 240VAC
230VAC units . . . . . 213VAC to 250VAC
240VAC units . . . . . 225VAC to 260VAC

c. AC fuse blown. **CAUTION:** Turn off MINUTEMAN power switch and disconnect the power cord before removing the AC fuse from the holder. Inspect fuse carefully, since it is sometimes difficult to identify a bad slow blow fuse visually. Fuse replacement is the user's responsibility, Use a fuse with proper ratings.

PRODUCT	FUSE RATING	BUSS EQUIVALENT PART NUMBER
MM250XL/1	3 Amp, 250VAC, Slow Blow	MSL3
MM250XL/2	1.5 Amp, 250VAC,Slow Blow	MSL1.5
MM500/1	6 Amp, 250VAC, Slow Blow	MSL6
MM500/2	3 Amp, 250VAC, Slow Blow	MSL3

2. PROBLEM: **Unit drops load in inverter mode (battery operation)**

Probable causes:

a. Unit is overloaded. Read the section titled **SPECIAL FEATURES- OPERATION,** pertaining to overload and see if unit function is as described.

b. D.C. breaker is off. Check D.C. breaker

c. Internal batteries disconnected. Obtain assistance from your supplier.

NOTE:
If either b or c is the problem, the MINUTEMAN unit will go off completely when it switches to inverter mode (battery operation).

3. PROBLEM: **Unit goes immediately to 2-minute warning during inverter mode (battery) operation.**

Probable cause: Batteries are bad or require charge.

POLICY AND INSTRUCTIONS FOR RETURN OF PRODUCT TO PARA SYSTEMS, INC.

If product is returned to Para Systems, Inc. for any reason:

1. Call Para Systems at (972) 446-7363 and ask for Customer Service

2. Describe the problem or reason for return and you will be given a Return

   Material Authorization Number (RMA #). This number **must** be place on the shipping carton, preferably on the return shipping label. The RMA # on the carton will ensure prompt handling when received at Para Systems, Inc.

3. Pack the unit for shipment in the original carton and foam as received. Other packaging methods can result in damage to the unit. Prior to packing the unit, remove battery pack cabling, if installed, and reinstall the access cover plate. Also turn the breaker switch “off” and tape the power switch in the “off” position. If these actions are not taken, these units can come “on” during shipment.

4. Enclose the name and telephone number of the person who can authorize repair charges inside the carton or packing list folder. Also include your current address for product return.

5. Return the unit freight prepaid to Para Systems headquarters at the address shown on the front of this brochure. C.O.D. shipment will not be accepted.

6. If repair of the product is Para Systems, Inc.’s responsibility per the warranty statement, there will be no charge for the repairs and the product will be returned to you, freight prepaid, provided the unit(s) was returned in the original shipping carton and foam. If other packing methods used result in unit damage during shipment, this repair will be at your expense. Additionally, if your packing is not deemed useable for return of the product to you, you will incur a $10 charge for new box and foam.

7. If repair of the product is not Para Systems, Inc.’s responsibility, Para Systems will advise estimated repair charges by telephone for your authorization. Should you choose not to have the unit repaired, you will incur a repair estimate charge of $15 only. All product will be returned to you C.O.D. for the amount of the repair or repair estimate, plus applicable shipping and handling charges.

PARA SYSTEMS, INC.
1455 LeMay, Carrollton, TX 75006

Tel: (972) 446-7363
Fax: (972) 446-9011

LIMITED PRODUCT WARRANTY

PARA SYSTEMS, INC. (PARA SYSTEMS) warrants that this product will be free from defective material and workmanship for a period of two years from the date of the original retail purchase by the end user provided that the warranty registrations card is completed and returned PARA SYSTEMS within ten (10) days of purchase. PARA SYSTEMS or its designated representative will repair, or at PARA SYSTEMS' option, replace any product that has been returned by the purchaser and is confirmed by PARA SYSTEMS to be defective.

Fuses and damage from lightning and over-voltage in excess of specification are not warranted and are the customer's responsibility. This warranty shall be null and void if this product has been altered, opened without authorization, misused or damaged by accident, misapplication, abuse, fire, flood or other disaster.

PARA SYSTEMS SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHER TYPES OR DAMAGES RESULTING FROM THE USE OF THIS PRODUCT OTHER THAN THE LIABILITY STATED ABOVE. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MECHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

PLEASE KEEP THIS DOCUMENT FOR YOUR RECORDS

Model # _____ Date Purchased _____

Warranty Registration

Model # _____ Serial # _____

Dealer Name _____

City/State _____ Zip _____

Protected Equipment _____Date Purchased _____

Your Name _____

Your Company's Name (if applicable) _____

Address _____

City/State _____ Zip _____

Your Telephone # (_____) _____

This registration must be returned within ten (10) days after purchase to PARA SYSTEMS, INC. or the warranty is not valid.