

OWNER'S MANUAL

UNINTERRUPTIBLE POWER SUPPLIES

MODELS DESCRIBED IN THIS MANUAL:

MM300SS/1	(120VAC, 60HZ, 300 WATTS)
MM600SS/1	(120VAC, 60HZ, 600 WATTS)
MM600SS/2	(230VAC, 50HZ, 600 WATTS)
MM900SS/1	(120VAC, 60HZ, 900 WATTS)
MM1200SS/1	(120VAC, 60HZ, 1200 WATTS)
MM1200SS/2	(230VAC, 50HZ, 1200 WATTS)
MM1600SS/1	(120VAC, 60HZ, 1600 WATTS)
MM1600SS/2	(230VAC, 50HZ, 1600 WATTS)

MINUTEMAN Uninterruptible Power Supplies are manufactured by Para Systems, inc. Each unit is full 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 Synchronized Sine wave Uninterruptible Power Supply. 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, each 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. You may extend your warranty period for the second year for a nominal charge.

SAFETY

- MINUTEMAN models MM300SS/1 and MM600SS/1 have been tested by Underwriters Laboratories for safety per UL1012, Standard for Power Supplies. These models have been listed (84T3) by U.L. MINUTEMAN models MM600SS/1, MM900SS/1 and MM1200SS/1 are presently undergoing testing, but are not presently U.L. 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. All repairs should be performed by trained service personnel, since an electrical shock 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 to 3 wire-to-2 wire adapter will defeat this safety feature and may result in 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 MINUTEMAN from the commercial receptacle.
- The power switch or the breaker 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 vent holes or restrict air flow 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 off your system, there are two ways to make that determination.

1. Locate and identification plate on each piece of equipment which will be powered be the MINUTEMAN. Then 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 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
MM300SS	300 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, 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

2. 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. MM300SS does not have the polarity light, since it is not normally used with external battery packs. Earlier models of the other products have the breaker switch inside the control unit and have no polarity light. If you have no external battery pack connected to you MINUTEMAN turn on the D.C. breaker (up position) and the polarity light (if your model has one) will turn green. If the light turn doesn't 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. 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 and turn the power switch "on." The "Battery-In-Use" light indicator may blink for a short time indicating that the batteries are low. If commercial power is acceptable, the "AC Normal" light will come on after a short delay (7 seconds). If commercial voltage is not available or is out of range, the unit will go to the inverter mode after the delay and the "Battery-In-Use" (red) 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.

3. Leave the unit in the "AC Normal" mode at least 4 hours to permit the internal battery system to charge, The blinking red light should be extinguished prior to the end of the charge cycle.

5. After the charge period has expired, plug your system load into the MINUTEMAN output receptacles and turn on load power. "Output Load" light indicator segments will turn on to indicate the total load. If too much load is added to the MINUTEMAN, all load lights and the "AC Normal" light will extinguish, indicating an overload. Lightening the load will bring the lights back on. Operation of the "Output Load" light indicator segments is explained in **SPECIAL FEATURES – OPERATION**.

6. Ensure that MINUTEMAN is not overloaded; "AC Normal" light on and "Output Load" red segment is off, and then turn off commercial power to the MINUTEMAN plug by either turning off the breaker supplying power to the commercial receptacle. When commercial power is turned "off", the MINUTEMAN alarm will sound and the "Battery –In-Use" light and the "Battery Status" lights will turn on. Operation of the alarm is intermittent. The "AC Normal"(green) indicator light and the "Output Load" lights are "off" at this time. The audible alarm can be silenced by depressing the "Alarm Silencer" function and "Battery Status" light may blink for a short period of time after AC operation is restored, indicating that batteries require a charge.

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

OPERATION

When a Brownout, power interruption, power outage or over voltage condition occurs, the alarm will sound and the "Battery-In-Use" 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 and 1 or more green "Battery Status" indicator lights on, the unit is in the normal inverter come. When the alarm sounds at more rapid intervals and all green "Battery Status" lights extinguish, only 2 minutes of battery power remain. If you have not already down loaded 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 system operation

Since most commercial power outages are of short duration, commercial power will probably be restored 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 operation, the audible alarm can be silenced by depressing the “Alarm Silencer” button. 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 system operation. Depressing the “Alarm Silencer” button will again 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 low battery voltage cutoff feature to protect the system batteries from experiencing an excessive discharge. During prolonged system operation, a 2-minute warning is provided a minimum of 2 minutes prior to low battery voltage cutoff. When battery cutoff occurs, the system will be switched back to AC operation. If no commercial power is available, the unit will turn “off” and the “Battery-In-Use” light will blink, indicating that the shutdown has occurred. When commercial power is restored, the unit will return to normal AC operation.

3. Lighted indicator segments:

(A) “OUTPUT LOAD” consists of a string of 10 light indicator segments, 9 green and 1 red, which provide a measure of power being utilized by the load. The 9 green segments, when illuminated, indicate an output load between 0 watts and maximum load or approximately watts per segment. The red segment, when illuminated, indicates an overload condition. A severe overload condition causes the “AC Normal” and all of the “Output Load” segments to extinguish. The “Output Load” indicator segments are illuminated during the AC operation mode only.

(B) “BATTERY STATUS” consists of a string of 10 light indicator segments, 8 green and 2 red, which provide a measure of the percentage of internal battery charge remaining. These segments are illuminated during system operation only. During prolonged system operation, segments will extinguish from left (100%) to right until all green segments are extinguished. The 2-minute warning will sound near the point at which all green segments turn off. A minimum of 2 minutes later, the unit will go to automatic low battery voltage cutoff at which time all of the indicator segments will be “off”. With any appreciable output load the first green segment (100%) will probably not light.

4. **Automatic inverter overload shut down:** In case the MINUTEMAN unit output becomes overloaded in the inverter mode, circuitry is provided to protect the unit inverter and transformer as well as your system. When an overload occurs, the MINUTEMAN inverter will shut down and all light indicators except a blinking “Battery-In-Use (red) 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 back “on” and the “green” indicator light will come back “on” after a 7-second delay. You can verify that the overload condition

5. has been corrected by again turning off commercial power to the MINUTEMAN plug and checking for proper inverter mode function.
6. **Over voltage condition:** Unlike most units available today, the MINUTEMAN will correct a commercial over voltage 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 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 32F to 104F (9-40 C) without any detrimental effects. Expected float life of the batteries is 3 to 6 years at 85F. 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 is packed for shipment, the MINUTEMAN D.C. breaker must be "turned off" and the power switch must be taped in the "off" position on units with internal batteries to prevent accidental turn-on in shipment.
3. If the MM300SS or MM600SS units must be stored, the internal batteries must be fully charged prior to storage. Store the units in a cool, dry location. For extended storage, the unit must be removed from storage periodically for battery charge. With a storage temperature of 40C (104F), 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

All of the 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 SCO Xenix O/S 2.2.3 and above. This system offers many advantages over most existing UPS monitoring packages. 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.

UPS 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 1/4 " 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 Vetsvers** Software
SJ01	Convergent / Upshut*** Software
SJ03	Microsoft LAN Manager
SJ04	Convergent Mighty 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 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 your MINUTEMAN first check the items listed below under "Trouble Shooting." If, after reviewing the "Trouble Shooting" 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.

TROUBLE SHOOTING

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:

- 120V AC units.....110VAC to 125VAC
- 208/220VAC UNITS.....204VAC to 250VAC
- 230VACunits.....213VAC to 250VAC
- 240VAC units.....225VAC to 260VAC

- c. AC fuse blown (MM600SS or smaller units).
CAUTION: Turn off the 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 EQUIVALENT PART NUMBER	FUSE RATING	BUSS
MM300SS/ 1	3 AMP, 250VAC, SLOW BLOW	MSL3
MM600SS/ 1	6 AMP, 250VAC, SLOW BLOW	MSL6
MM600SS/ 2	3 AMP, 250VAC, SLOW BLOW	MSL3

- d. AC breaker tripped (MM90SS and larger units). Push the breaker switch back in.

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

Probable causes:

- a. Unit is overloaded. Read the section titled **SPECIAL FEATURES OPERATION**, paragraph 4.
- b. MINUTEMAN D.C. breaker is off or tripped. Check Bp breaker.
- c. Battery pack D. C. breaker is off or tripped. Check BP breaker.
- d. Internal batteries or battery pack batteries disconnected. Obtain assistance from your supplier.
- e. Batteries are very low and unit is going to low battery cutoff. Obtain assistance.

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

Probable cause: Batteries are bad or require charge.

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

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

1. Call Para Systems at (972)446-7363, ext. 206 & 224, and ask for Customer Service.
2. Describe the problem or reason for return and you will be given a Return Authorization Number (RMA #). This number must be placed 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. For MM300SS and MM600SS units, 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. shipments will not be accepted.
6. Please call for an estimate on any RMA return. All out-of-warranty product is subject to a fixed-rate of repairs.
7. 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 units was returned in the original shipping carton and foam. If other packing methods are used it could result in unit damage during shipment, this repair will be at your expense. Additionally, if your packaging is not deemed useable for return of the product to you, you will incur a charge for new box and foam.
8. 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 repaired, you will incur a repair estimate of the repair or repair estimate plus shipping and handling.