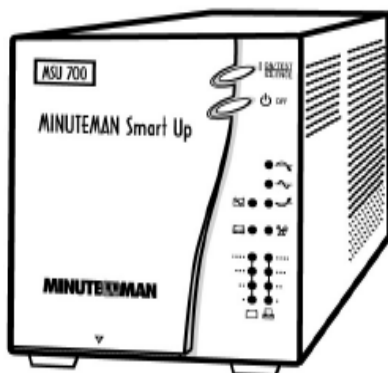




Smart Up Series

Uninterruptible Power Supply



User's Manual





Smart Up Series User's Manual

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 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 !

Please read the manual before installing your Smart Up Series UPS as it provides the information that should be followed during installation and maintenance of the UPS and batteries allowing you to correctly set up your system for the maximum safety and performance.

Included is information on customer support and factory service if it is required. If you experience a problem with the UPS, please refer to the Troubleshooting guide in this manual to correct the problem or collect enough information so that the Minuteman technical support department can rapidly assist you.



NOTICE: 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 interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté



CAUTION: WHEN DISCONNECTING THE INTERNAL BATTERIES, THE UPS CANNOT BE RUNNING IN THE BATTERY MODE. THE UPS MUST BE OFF OR SUPPLYING POWER TO THE LOAD FROM THE UTILITY MAINS.



WARNING: CHANGES OR MODIFICATIONS TO THIS UNIT NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.



Receiving Inspection

After removing your Minuteman UPS from its carton, it should be inspected for damage that may have occurred in shipping. Immediately notify the carrier and place of purchase if any damage is found. Warranty claims for damage caused by the carrier will not be honored. The packing materials that your UPS was shipped in are carefully designed to minimize any shipping damage. In the unlikely case that the UPS needs to be returned to Minuteman, please use the original packing material. Since Minuteman is not responsible for shipping damage incurred when the system is returned, the original packing material is inexpensive insurance.

PLEASE SAVE THE PACKING MATERIALS!



WARNING: RISK OF ELECTRICAL SHOCK. HAZARDOUS LIVE PARTS INSIDE THIS POWER SUPPLY ARE ENERGIZED FROM THE BATTERY EVEN WHEN THE AC INPUT POWER IS DISCONNECTED.

TO DE-ENERGIZE THE OUTPUTS OF THE UPS:

1. IF THE UPS IS ON PRESS THE ON/OFF BUTTON FOR 1 SECOND.
2. DISCONNECT THE UPS FROM THE AC POWER OUTLET.
3. TO DE-ENERGIZE THE UPS COMPLETELY, DISCONNECT THE BATTERY.

(SEE SECTION 6 FOR INSTRUCTIONS)



CAUTION! TO REDUCE THE RISK OF ELECTRICAL SHOCK IN CONDITIONS WHERE LOAD EQUIPMENT GROUNDING CANNOT BE VERIFIED, DISCONNECT THE UPS FROM THE AC POWER OUTLET BEFORE INSTALLING A COMPUTER INTERFACE CABLE. RECONNECT THE POWER CORD ONLY AFTER ALL SIGNALING CONNECTIONS ARE MADE.



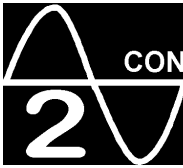
CAUTION! CONNECT THE UPS TO A TWO POLE, THREE WIRE GROUNDING AC POWER OUTLET. THE RECEPTACLE MUST BE CONNECTED TO APPROPRIATE BRANCH PROTECTION (CIRCUIT BREAKER OR FUSE). CONNECTION TO ANY OTHER TYPE OF RECEPTACLE MAY RESULT IN A SHOCK HAZARD AND VIOLATE LOCAL ELECTRICAL CODES.

Para Systems Life Support Policy

As a general policy, Para Systems, Inc. (Para Systems) does not recommend the use of any of its products in life support applications where failure or malfunction of the Para Systems product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Para Systems does not recommend its products for use in direct patient care. Para Systems will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to Para Systems that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of Para Systems, Inc. is adequately protected under the circumstances.

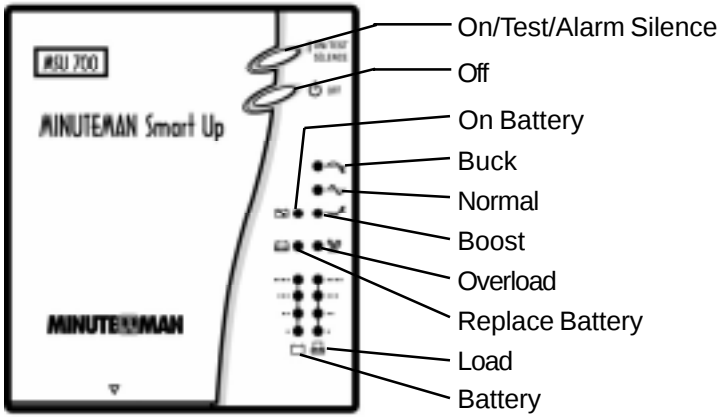
Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief or other purposes), auto transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, and infusion pumps as well as any other devices designated as "critical" by the United States FDA.

Hospital grade wiring devices and leakage current may be ordered as options on many PARA SYSTEMS UPS systems. PARA SYSTEMS does not claim that units with this modification are certified or listed as Hospital Grade by PARA SYSTEMS or any other organization. Therefore, these units do not meet the requirements for use in direct patient care.



CONTROLS AND INDICATORS

FRONT PANEL



I Press and release the On/Test/Alarm Silence button to turn on, test or silence the alarm.



Press and release the OFF button to turn the UPS OFF.



The Buck LED illuminates when the UPS is correcting for a high utility line voltage.



The On Battery LED illuminates when the UPS is supplying power from the battery.



The AC Normal LED illuminates when the utility voltage is normal.



The Boost LED illuminates when the UPS is correcting for a low utility line voltage.



The Overload LED illuminates when the loads connected to the UPS exceeds the UPS power rating (see Section 4).



The Replace battery LED illuminates when the UPS has detected that battery replacement is required (see Section 6).

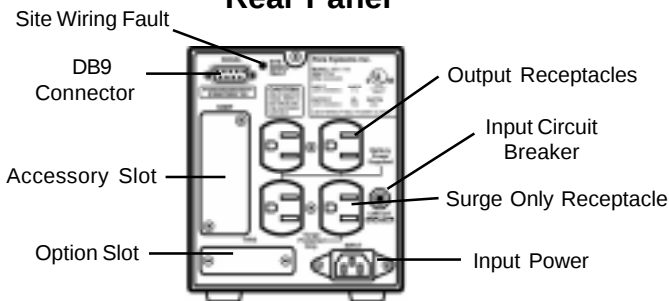


The Load Level LEDs illuminate to show the percentage of load connected to the UPS: 20%, 40%, 60% or 80%.

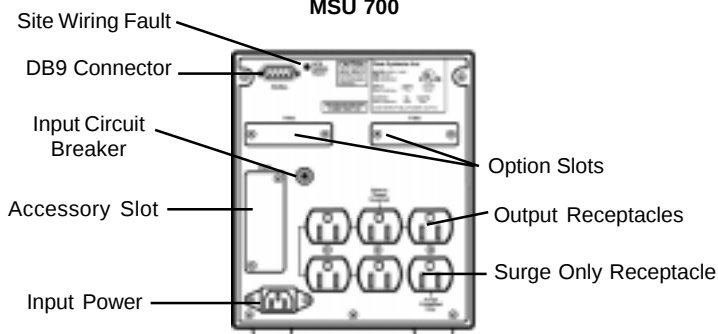


The Battery Level LEDs illuminate to show the percentage of battery capacity remaining: 25%, 50%, 75% or 100%.

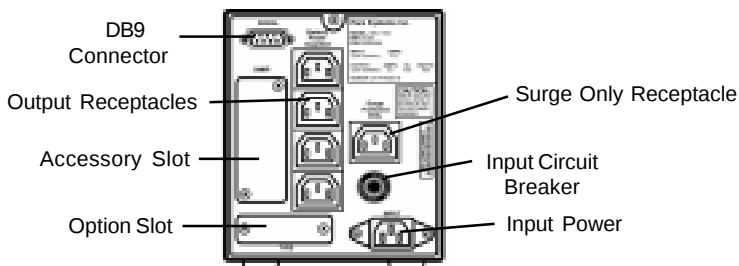
Minuteman Smart Up Rear Panel



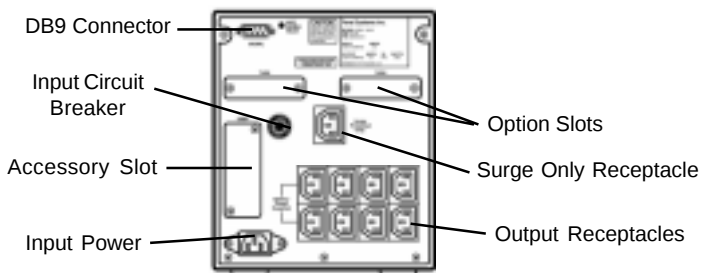
MSU 700



MSU 1000 & 1400



MSU 700i



MSU 1000i & 1400i

REAR PANEL

The **Accessory Slot** is used for SNMP UPS monitoring. Available from Minuteman.

The **DB9 connector** is used for UPS monitoring and control through a computer's serial port (see Section 3).

The **Option Slots** are for adding RJ-45/RJ-11 surge protection cards. Available from Minuteman.

The **Site Wiring Fault** LED illuminates when the UPS detects an improperly wired AC power outlet (see Section 3).

The **Output Power** receptacles are NEMA 5-15R type for 120V units and IEC 320 for 230V units.

The **Input Power** receptacle is a IEC 320.

The **Input Circuit Breaker** will trip in the event the load exceeds the UPS's power rating.



INSTALLATION PLACEMENT

Please observe the following items:

- Install the UPS in a temperature-controlled, indoor environment that is free of conductive contaminants. Select a location which will provide good air circulation for the UPS at all times. Avoid locations near heating devices, water or excessive humidity, or where the UPS is exposed to direct sunlight.
- Plug the UPS into a two pole, three wire, grounded receptacle only. Do not use extension cords or adapter plugs.

DB9 CONNECTOR

Minuteman Power Management software and interface cable kits are used with this port (software and cables are optional and available from Minuteman). Use only Minuteman or Minuteman approved interface cables with these UPS's. Connect the interface cable to the DB9 connector on the rear of the UPS. Secure the connector to the UPS via the screws on the connector housing. Connect the other end of the cable to the device that will be monitoring/controlling the UPS.

NOTE: CONNECTING TO THE DB9 IS OPTIONAL. THE UPS WORKS PROPERLY WITHOUT A CONNECTION.



SITE WIRING FAULT

After plugging in the UPS, check the site wiring fault (SWF) LED on the rear of the unit. If the LED is illuminated, the UPS is plugged into an improperly wired AC outlet.



CAUTION!: IF THE UPS INDICATES A SITE WIRING FAULT, HAVE A QUALIFIED ELECTRICIAN CORRECT THE PROBLEM.

CHARGING THE BATTERIES

The Smart Up Series UPS's will charge the batteries whenever the unit is connected to an AC source. It is recommended that the UPS batteries be charged for a minimum of 4 hours before use. The UPS may be used immediately. However, the "on battery" run time may be less than normally expected.

CONNECTING YOUR EQUIPMENT

Plug the equipment into the receptacles on the rear of the unit. Insure that you do not exceed the maximum output rating of the UPS (refer to the back panel of the UPS or the electrical specifications in this manual). For non-critical loads, such as printers, it is recommended that the equipment be connected to the Surge Only outlet.



CAUTION! DO NOT CONNECT A LASER PRINTER TO THE BATTERY SUPPLIED RECEPTACLES ON THE UPS. LASER PRINTERS MAY BE CONNECTED TO THE SURGE ONLY OUTLET.



CAUTION! BE SURE ALL CRITICAL LOADS ARE CONNECTED TO THE BATTERY SUPPLIED OUTLETS. THE SURGE ONLY OUTLET IS NOT A BATTERY SUPPLIED OUTLET.



ON/TEST/SILENCE SWITCH

Press and release this switch to turn the UPS on. After the UPS is ON, pressing this switch will implement a self test. When the UPS is in battery mode, pressing this switch will silence the alarm. If utility line is not present, press and hold this switch for 2 seconds and the UPS will turn on.

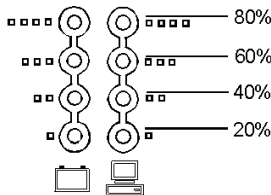
OFF SWITCH

Press and release this switch to turn the UPS OFF. The UPS will continue to charge the batteries whenever it is plugged in and the utility line is present.

LED STATUS & ALARMS

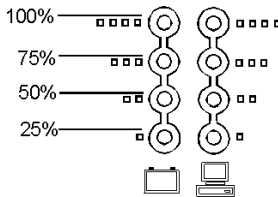
LOAD LEVEL DISPLAY

The 4-LED load percentage display shows the power level (20%, 40%, 60%, 80%) drawn by the loads which are connected to THE BATTERY-SUPPLIED OUTLETS on the UPS. If UPS is overloaded, the OVERLOAD LED will light.



BATTERY LEVEL DISPLAY

This display shows the battery capacity left in the battery. The level is represented by percentage of 25, 50, 75 and 100, and these LED's will extinguish gradually when using battery power. When battery capacity reaches the minimal level of 25%, the lowest LED(25%) blinks.



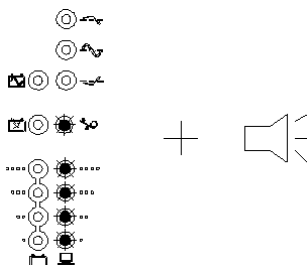
ON BATTERY MODE

When UPS is in battery mode, the ON BATTERY LED will light, preceded by a "beep" sound for every 2 seconds, and then the UPS will start supplying power to load through battery.



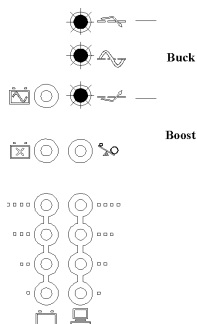
OVERLOAD

If an overload occurs, the OVERLOAD LED will light and an uninterrupted alarm will be heard. Under this condition, check the load connected to the UPS.



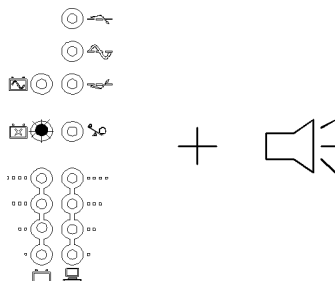
BUCK/BOOST

If the UPS detects a high utility voltage, the function of the buck is to automatically reduce the output voltage to its nominal level. If the UPS should detect a low utility voltage, the boost function will raise the output voltage to its nominal level. These two functions are represented by their respective LED on the front panel.



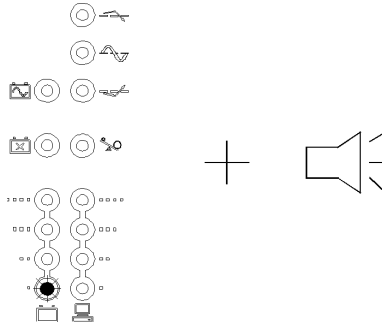
BATTERY REPLACE

This function is to alert users of the need to replace the batteries. When the microprocessor in the UPS detects a battery fault, the UPS alarm will give out three beeps. Each beep lasts for 0.5 seconds and interrupted by an interval of 0.5 seconds. After the initial 3 beeps, the alarm will continue to sound every hour.



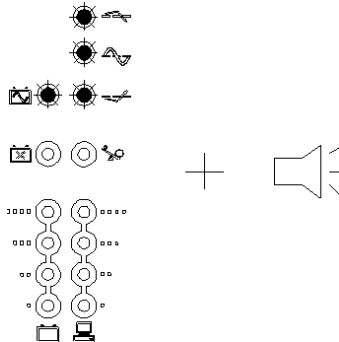
BATTERY LOW

This function is to inform user of the remaining power capacity of the batteries. When the batteries reach a low capacity condition, the UPS alarm will beep once every second, and the LED on the 25% level will flash.



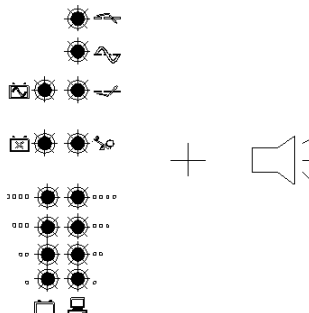
OVER TEMPERATURE

When temperature inside the UPS is too high, the LED of Buck, Boost, Normal and On Battery will light, the alarm will sound continuously, and after a minute the UPS will stop supplying power to load.



UPS Fault

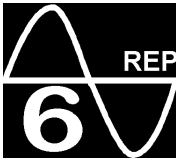
When there is a breakdown on the UPS, all LEDs will light and the alarm will sound continuously. If this happens, turn off the UPS and unplug the power cord from the wall outlet. (see Section 7 for obtaining service)



TROUBLESHOOTING

TROUBLESHOOTING CHART

Problem	Possible Cause	Solution
No alarm, No LED indication (UPS is not turned on).	ON/TEST button is not pushed.	Press the ON/TEST button to turn on the UPS. (Refer to Section 4 to turn on the UPS).
	The rear panel circuit breaker is tripped (Button is out).	Reduce some loads connected to the UPS. Reset the circuit breaker (Push button in).
	UPS fault.	Call for qualified service personnel if above actions do not solve the problem
UPS does not provide expected back-up time	Batteries inside the UPS are not fully charged.	Recharge the batteries for at least 4 hours.
	UPS is overloaded.	Remove some unnecessary loads.
	Batteries are weak.	Batteries wear faster when used often or operating at higher temperatures. If the battery is near the end of its life, replace the battery even if the REPLACE BATTERY LED does not light (Refer to Section 6 for replacing batteries).
	Charger fault or other reason.	Call for service.
All LEDs are on.	Internal UPS fault.	Turn off UPS. Call for service.
'REPLACE BATTERY' LED lights	Weak batteries.	Recharge the batteries for at least 4 hours. If problem remains, replace the batteries.
UPS operates on battery even though good line voltage may be present.	The rear panel circuit breaker is tripped (Button is out).	Reduce some loads connected to the UPS. Reset the circuit breaker (Push button in).
	Very high, low, or distorted utility voltage.	Have qualified electrician check the input voltage.
Site wiring fault LED on rear panel lights.	Wiring error such as reversed hot/neutral or no earth ground.	Get wiring checked by electrician.
UPS over temperature (BUCK, BOOST, NORMAL, ON BATTERY LEDs are on)	The exhaust fan and ventilation grill may be obstructed.	Choose a well-ventilated area to position your UPS to allow adequate dissipation of heat.
	The environment temperature is too high.	Position your UPS in cooler area.



REPLACING THE BATTERY

REPLACING THE BATTERY

The Smart Up Series UPS has easy-to-replace hot-swappable batteries. Please read the following warning statements before attempting to service the batteries.



WARNING! THIS UNINTERRUPTIBLE POWER SOURCE CONTAINS POTENTIALLY HAZARDOUS VOLTAGES. DO NOT ATTEMPT TO DISASSEMBLE THE UNIT BEYOND BATTERY REPLACEMENT PROCEDURES BELOW. EXCEPT FOR THE BATTERY, THIS UPS CONTAINS NO USER SERVICABLE PARTS. REPAIRS CAN BE PERFORMED BY MINUTEMAN SERVICE PERSONNEL ONLY.



CAUTION: DO NOT OPEN OR MUTILATE BATTERIES. RELEASED ELECTROLYTE IS HARMFUL TO THE SKIN AND EYES AND MAY BE TOXIC.
CAUTION: DO NOT DISPOSE OF BATTERIES IN A FIRE. THE BATTERIES MAY EXPLODE.



THE BATTERIES IN THIS UPS ARE RECYCLABLE. DISPOSE OF THE BATTERIES PROPERLY. THE BATTERIES CONTAIN LEAD AND POSE A HAZARD TO THE ENVIRONMENT AND HUMAN HEALTH IF NOT DISPOSED OF PROPERLY. REFER TO LOCAL CODES FOR PROPER DISPOSAL REQUIREMENTS, OR RETURN THE BATTERY TO MINUTEMAN.



CAUTION: ALTHOUGH BATTERY SYSTEM VOLTAGES ARE ONLY 24 VDC, THE BATTERY SYSTEM CAN STILL PRESENT A RISK. THE CURRENT CAPABILITY OF A BATTERY IS SUFFICIENT TO BURN WIRE OR TOOLS VERY RAPIDLY, PRODUCING MOLTEN METAL. OBSERVE THESE PRECAUTIONS WHEN REPLACING THE BATTERIES:

1. REMOVE WATCHES, RINGS OR OTHER METAL OBJECTS.
2. USE HAND TOOLS WITH INSULATED HANDLES.
3. DO NOT LAY TOOLS OR OTHER METAL PARTS ON TOP OF BATTERIES



CAUTION: WHEN DISCONNECTING THE INTERNAL BATTERIES OR THE EXTERNAL BATTERY PACK, THE UPS CANNOT BE RUNNING IN THE BATTERY MODE. THE UPS MUST BE OFF OR SUPPLYING POWER TO THE LOAD FROM THE UTILITY MAINS.



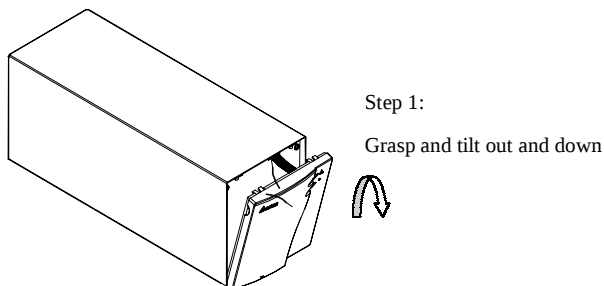
CAUTION: REPLACE BATTERIES WITH THE SAME NUMBER AND TYPE AS ORIGINALLY INSTALLED IN THE UPS. THESE BATTERIES HAVE PRESSURE OPERATED VENTS.

BATTERY REPLACEMENT PROCEDURE

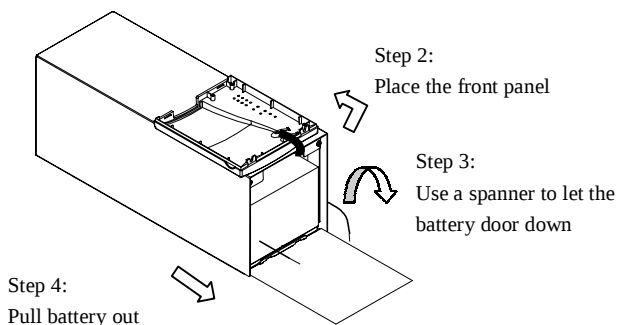
PLEASE READ THE PREVIOUS “CAUTIONS” SECTION BEFORE ATTEMPTING TO REPLACE THE BATTERIES

Battery replacement is a safe procedure when cautions and instructions are carefully followed. You may leave the UPS and the loads on for the following procedure.

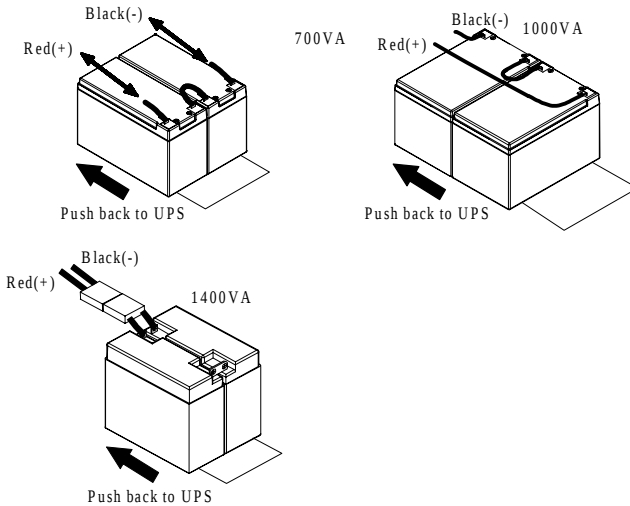
1. Hold the top of the front panel, tilt it out and pull it carefully away from the chassis.



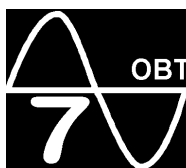
2. Loosen the bottom of the front panel from the chassis and place it on the top of the UPS. Be cautious so as not to pull the ribbon cable and touch the LED printed circuit board.
3. Use a spanner to unlock, remove and open the battery door.
4. Carefully and smoothly pull the battery out of the UPS.



5. Disconnect the battery:
For 700VA and 1000VA models, disconnect the batteries and UPS by loosening the connectors.
For 1400VA model, disconnect the batteries and UPS by pulling apart the two couplers that are connected together.
6. Connect the new battery:
For 700VA and 1000VA models, connect positive (+) connectors (RED-RED) and negative (-) connectors (BLACK-BLACK) together.
For 1400VA model, connect the two connected couplers on battery and UPS together.



7. Re-assemble the UPS as shown above.

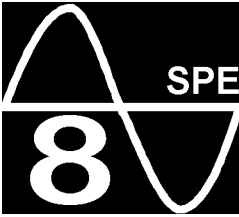


OBTAINING SERVICE

IF THE UPS REQUIRES SERVICE

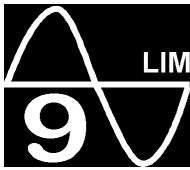
1. Use the **TROUBLESHOOTING** Section 5 to eliminate obvious causes.
2. Verify that no circuit breakers are tripped. A tripped circuit breaker is the most common problem.
3. Call your dealer for assistance. If you cannot reach your dealer or if he cannot resolve the problem, call or FAX Minuteman Technical Support at the following numbers: Voice phone (972) 446-7363, FAX line (972) 446-9011, e-mail: support@minuteman-ups.com. Please have the following information available **BEFORE** calling technical support.
 - A. Your name and address.
 - B. Where and when the unit was purchased.
 - C. All of the model information on the rear of your UPS.
 - D. Any information on the failure, including LEDs that may be illuminated.
 - E. A description of the protected equipment, including model numbers if possible.
 - F. A technician will ask you for the above information and, if possible, help solve your problem over the phone. In the event that the unit requires factory service, the technician will issue you a Return Material Authorization Number (RMA #).
 - G. If the UPS is under warranty, the repairs will be done at no charge. If not, there will be a charge for repair.
4. Pack the UPS in its original packaging. If the original packaging is no longer available, ask the technical support technician about obtaining a new set. It is important to pack the UPS properly in order to avoid damage in transit. Never use Styrofoam beads for a packing material. Include a letter with your name, address, day-time phone number, RMA number, a copy of your original sales receipt and a brief description of the trouble.
5. Mark the RMA # on the outside of all packages. The factory cannot accept any package without the RMA # marked on the outside.
6. Return the UPS by insured, prepaid carrier to:

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



SPECIFICATIONS

NOTE: 230VAC Specs Shown In ()	MSU 700	MSU 1000	MSU 1400
Acceptable input Voltage	0-145 (0-288) VAC		
Input Voltage (on-line operation)	91-145 (174-288) VAC		
Output Voltage (on-line operation)	103-131 (200-253) VAC		
Nominal input frequency	50 or 60 Hz auto-sensing		
Input protection	Manual reset circuit breaker		
Frequency limits (on-battery operation)	50 or 60 Hz $\pm$ 0.1%		
Transfer Time	2-4 ms. Typical		
Maximum Load	700VA 450W	1000VA 670W	1400VA 950W
Battery Power Supplied	3 (4)	5 (8)	5 (8)
Output Receptacles			
Surge Protected Only Output Receptacles	1 (1)	1 (1)	1 (1)
On-battery Output Voltage	115 VAC (230 VAC)		
On-battery frequency	50 or 60 Hz $\pm$ 1 Hz unless synchronized to utility during brownout		
On-battery wave shape	True Sinewave		
Protection	Over-current and short circuit protected, latching shutdown on overload		
Surge energy rating	480J		
(one time 10/1000 ms waveform)			
Surge current capability (one time, 8/20 ms waveform)	6500A max		
Surge response time	0 ns (instantaneous) normal mode, <5 ns common mode		
Surge voltage let through (percentage of applied ANSI C62.41 cat A $\pm$ 6 v test wave form)	< 0.3 % of peak typical		
Noise filter	Normal and common mode EMI / RFI suppression, 100Khz to 10Mhz		
Battery type: Spill proof, maintenance free, user replaceable, sealed lead acid	2 x 12V7AH	2 x 12V11AH	2 x 12V17AH
Typical battery life	3 to 5 years depending on number of discharges and ambient temperature		
Typical recharge time	2 to 4 hours from 50% discharge		
Operating temperature	0 to 40 degrees C (+32 to 104 degrees F)		
Storage temperature	-15 to +45 degrees C (+5 to +113 degrees F)		
Operating and storage relative humidity	0 to 95% non-condensing		
Operating elevation	0 to +3,000 m (0 to +10,000 ft.)		
Storage elevation	0 to 15,000 m (0 to +50,000 ft.)		
Electromagnetic immunity	IEC 801-2 LEVEL IV, 801-4 LEVEL IV, 801-5 LEVEL III		
Audible noise at 1 m (3 ft.)	<45 dBA		
Size (H x W x D)	15.6 x 13.8 x 40 cm 6.14 x 5.43 x 15.7 in.	17 x 22 x 42 cm 6.69 x 8.66 x 16.5 in.	17 x 22 x 42 cm 6.69 x 8.66 x 16.5 in.
Weight-net (shipping)	14 Kg 31 lb.	21 Kg 46 lb.	26 Kg 57 lb.
Safety and approval	UL, CUL, TUV/GS, CE		
EMC Verification	FCC Class A, TUV/EMC		



LIMITED PRODUCT WARRANTY

LIMITED PRODUCT 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 original purchase by the end user. For equipment sites within the United States and Canada, this warranty covers repair or replacement of defective equipment at the discretion of Para Systems. Repair will be from the nearest authorized service center. 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 repaired or replaced pursuant to this warranty shall 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 operating 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.

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