APC Back-UPS *User's Guide*

230VAC

Easy Setup

1 The battery in the UPS will lose some charge in shipping and storage. It will recharge completely after approximately six hours of normal operation. Do not expect full battery run time during this initial recharge period.

2 Place the UPS in an area with adequate airflow, and away from direct sunlight and excessive dust. See the *Specifications Table* for proper operating conditions.

3 Power the UPS from a mains socket that is not on the same circuit as a heavy motor load (e.g., an air conditioner or refrigerator). Remove the power cord from the computer to be protected, and plug it into the mains power inlet on the UPS. If the power cord for your computer is not removable, see your dealer for a mains inlet cord.

**4** If the mains power source frequency is 60 Hz, set option switch #4 (at the rear of the UPS) to the up position. If the local line frequency is unknown, leave switch #4 in the factory default, 50 Hz, down position.

5 Use the output power cords (provided) to connect a computer, monitor and/or other data-critical devices to the three "Surge and Battery Backup" power outlets. The "Full-Time Surge Protection" outlet can be used for a laser printer, a fax machine, a scanner or another device that does not require battery backup protection.
Important: Connect a laser printer or scanner to the "Full-Time Surge Protection" outlet only.

6 Switch on the UPS. Switch on the load equipment. The indicator on the On/Off control will illuminate, and the load equipment will operate normally. The UPS can be used as a master On/Off control for the three "Surge and Battery Backup" power outlets. The "Full-Time Surge Protection" outlet is always powered.

7 To test the system, disconnect the mains inlet cord from the mains power source while the load equipment is switched on. The audible alarm will beep once every five seconds, and the UPS should power all of the load equipment. Restore normal operation by reconnecting the mains inlet cord to the mains power source.

Important
File this guide where it can be found when it's time to replace the battery (3-6 years).
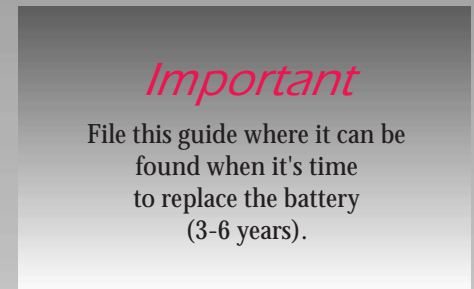
Description and Operation

On/Off Control Switch
("|" means "on," O means "off")
When the On/Off switch is in the "on" position, the UPS receives power from the mains source, and delivers conditioned power to all four outlets. When in the "off" position, the UPS and the three "Surge and Battery Backup" outlets are not powered. The "Full-Time Surge Protection" outlet is independent of the On/Off switch. If mains voltage is present, it is powered.

Check Battery/Alarm Disable Switch
(500MI & 650MI Only)
Check Battery: Press and hold the *top* of the toggle switch to check the battery. The UPS will power the loads from the battery. If the UPS emits the battery exhaustion alarm (see below), the battery is weak and requires extended recharge or replacement. See "Battery Replacement."
Alarm Disable: When delivering battery power during a mains failure, the UPS emits an audible alarm once every five seconds. Press the *bottom* of this toggle switch to silence the alarm.

Audible Alarms
The UPS emits the following audible alarms:
On Battery - single beep every five seconds
This is the most important alarm signal to understand.
It warns that the mains voltage has failed, and the load equipment is operating from the battery. Because battery run time is limited in duration, this alarm calls for action. When this alarm sounds, save the files you are working on, and then follow the steps you normally take to shut down the computer. Then switch the UPS off.
Battery Exhaustion - loud tone
When operating on battery, the UPS monitors the amount of battery capacity remaining. A loud tone will sound to warn there is only two minutes of battery run time remaining. Close files and switch off system *immediately*.
Severe Overload - loud tone
If the UPS detects a severe overload when it is switched on, it will shut down, and emit a loud tone. Switch the On/Off control to the off position. See "Circuit Breaker" for instructions to remove the overload.

Option Switches
Four option switches on the rear panel of the UPS control the power failure audible alarm, the voltage level at which the UPS will transfer voltage to the load equipment, and the local line frequency.
Audible Alarm Disable Switch - when switch #1 is set to the down position, the UPS will sound an audible alarm once every five seconds in the event of a mains failure. Set it to the up position to disable this alarm.
Note: The UPS will still emit the Battery Exhaustion alarm.
Setting the Minimum Voltage - the UPS is factory configured to transfer the load equipment to battery power when the mains voltage drops below 196V. In locations where the mains voltage power fluctuates frequently (causing the

UPS to transfer to battery too often), the transfer threshold can be set lower with switches #2 & #3. See figure 2.
Important: *Before selecting a lower threshold, make sure the load equipment can safely operate at the voltage level.*
Line Frequency - if the local line frequency is 60 Hz, set switch #4 to the up position. If you are unsure what the local line frequency is, leave switch #4 in the factory default, 50 Hz, down position.

Circuit Breaker
If the UPS is severely overloaded, the circuit breaker on the rear panel will disconnect the UPS from the mains power source. The circuit breaker button will pop out. If this occurs, remove at least one piece of load equipment from the UPS, and reset the circuit breaker by pressing the button back into place.

Computer Interface Port
(650MI only)
"*PowerChute Plus*" UPS monitoring software is available from APC. This software enables a computer to monitor the UPS, and to initiate an orderly shutdown of load equipment in the event of an unattended mains power failure. The appropriate 9 pin, RS-232 serial cable is provided with the software. See the APC website for order information (**www.apcc.com**), or call APC technical support.

Mains Power Inlet
Due to the variety of outlet configurations in Asia, Africa, Europe, and Latin America, a mains inlet cord is not provided. Use the power cord *from the computer that is to be protected,* to connect to this inlet. Use one of the provided output power cords to connect the computer to an output power outlet on the UPS.

Surge and Battery Backup Outlets
Three "Surge and Battery Backup" outlets are provided. These will be powered by the battery in the event of a mains failure. Connect a computer, monitor, and one other "data-critical" devices to these.

Full-Time Surge Protection Outlet
A single "Full-Time Surge Protection" outlet is provided. This outlet is "always on," and is independent of the UPS On/Off switch. It is rated for 500VA (300W), which is sufficient for most laser printers or scanners. Use this outlet for equipment that requires protection from surges, but is not required during a mains failure.
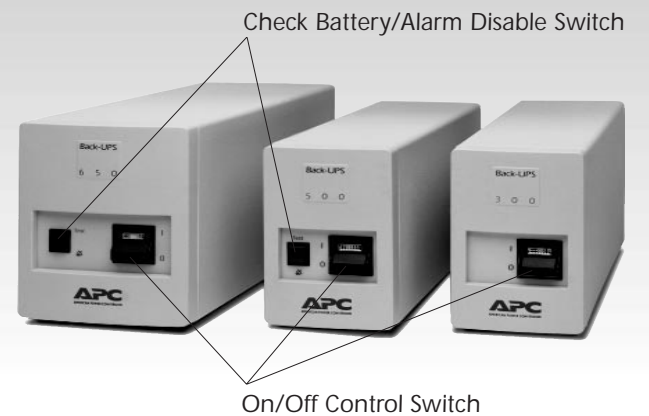
Check Battery/Alarm Disable Switch
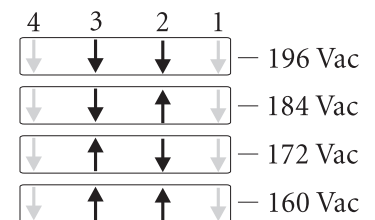
On/Off Control Switch

Fig 1 Family of BKMI UPS Units

4	3	2	1	
				— 196 Vac
				— 184 Vac
				— 172 Vac
				— 160 Vac

Fig 2 Option Switch Settings

Option Switches
Circuit Breaker
Mains Power Inlet
Full-Time Surge Protection Outlet
Surge and Battery Backup Outlets
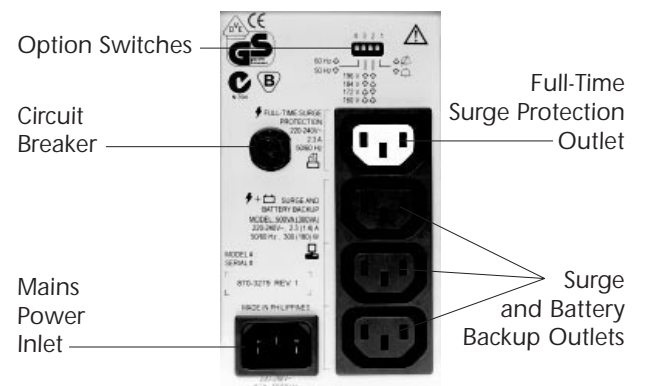
Fig 3 Rear View - 300MI and 500MI

Computer Interface Port
Full-Time Surge Protection Outlet
Surge and Battery Backup Outlets
Option Switches
Circuit Breaker
Mains Power Inlet

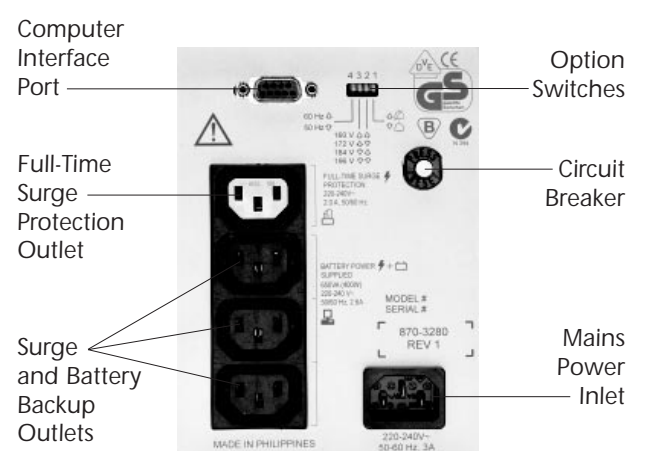***Fig 4*** Rear View - 650MI

⚠ **CAUTION:** Read and follow the enclosed safety precautions before replacing battery. Servicing of the battery should be performed or supervised by personnel knowledgeable of batteries and their precautions. Keep unauthorized persons away.

⚠ **CAUTION:** Use the same number and type of valve-regulated, sealed, lead acid battery. See the dealer or call APC for information on replacement batteries. Always recycle batteries.

⚠ **CAUTION:** The battery can present a risk of electrical shock and high short circuit current. When replacing battery, wrist watches and jewelry such as rings should be removed. Use tools with insulated handles. Do not lay tools or metal parts on the battery. Do not dispose of the battery in a fire, it may explode. Do not open or mutilate the battery. Released electrolyte is harmful to the skin and eyes, and may be toxic.

NOTE: The battery can be replaced while the UPS is supplying power to the load equipment. The UPS does not provide battery back up protection while the battery is being replaced.

BATTERY REPLACEMENT PROCEDURE:

1 Lay the UPS on the left side, and remove the two battery door screws. Remove only the screws indicated on the battery door.

2 Grasp the white tab on the battery, and pull it from the UPS. (Figure 1)

3 Remove the two wires connecting the battery to the UPS. To loosen the wire connectors, wiggle the connectors side-to-side while pulling straight back from the mating battery connector. Be careful to not pull wire from the connector. (Figure 2)

4 Connect the battery wires to the new battery. The red wire is positive (+), the black wire is negative (-).

5 Slide the replacement battery into the UPS. Arrange the wires so that they will not interfere with the battery installation.

6 Close the battery door and fasten the two battery door screws. The new battery must charge for a *minimum of six hours* before full run time can be expected.
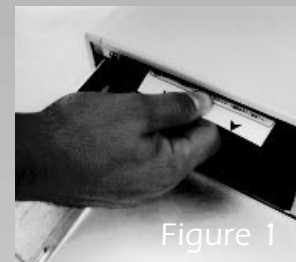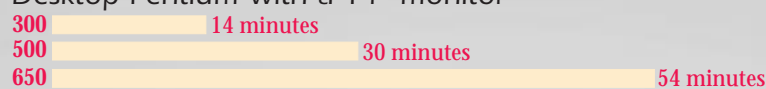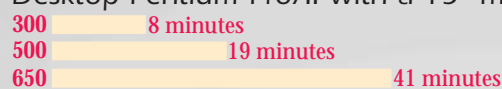
Figure 1

Figure 2

Specifications

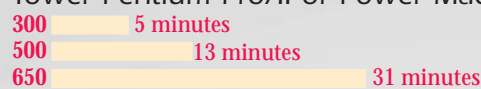| Characteristic	Specifications
Nominal Input Voltage	Single Phase 230 Vac
Nominal Input Frequency	50 or 60 Hz, selected by option switch #4
Frequency limits for on-line operation	± 5% of the nominal 50 or 60 Hz
Transfer Voltage Threshold	196 Vac., may be set lower - see "Option Switches" Instructions
Maximum Load	**300MI:** 300VA/180W; **500MI:** 500VA/300W; **650MI:** 650VA/400W
Nominal Output Voltage	230Vac, ±5%. When verifying "on-battery output voltage," use a true rms responding voltmeter.
Frequency Regulation	50 or 60 Hz, ±3% unless synchronized to the utility.
Waveshape	Stepped approx. to sine wave; peak and rms values equivalent to the utility.
Battery Replacement	**300MI & 500MI:** RBC 2 **650MI:** RBC 4
Typical service life	3-6 years, dependent on number of discharges, temperature.
Low battery signalling	< 2 minute audible tone, interface port signal.
Recharge time	6 to 10 hours, dependent on load and length of utility outage.
Noise filter	Full time EMI/RFI suppression, 100 kHz to 10 MHz.
Operating environment	0°C - 40°C (32°F - 104°F), 0 to 95% RH, non condensing.
Size: 300MI and 500MI	15cm x 9cm x 33cm (6.0" H x 3.4" W x 13.1" D)
Size: 650MI	17cm x 12cm x 36cm (6.6" H x 4.7" W x 14.2" D)
Weight - Add 1.5 kg (3 lb) for shipping.	**300MI:** 6.3 kg (14 lb); **500MI:** 7.0 kg (15.3 lb); **650MI:** 11.0 kg (24.3 lb)

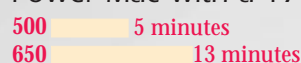## Run Times

Desktop Pentium with a 14" monitor
300 14 minutes
500 30 minutes
650 54 minutes

Desktop Pentium Pro/II with a 15" monitor
300 8 minutes
500 19 minutes
650 41 minutes

Tower Pentium Pro/II or Power Mac with a 15" monitor
300 5 minutes
500 13 minutes
650 31 minutes

Tower Multimedia Pentium Pro/II with a 14" monitor
Power Mac with a 17″ monitor
500 5 minutes
650 13 minutes

Tower Multimedia Pentium Pro/II with a 21" monitor
Power Mac with a 21" monitor
Engineering workstation with a 17" monitor
650 5 minutes
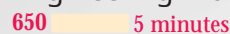
* Actual run times will vary.

Troubleshooting

Problem	Possible Cause	Action To Take
Load equipment is not powered.	Line cord plug is loose.	Check fit of line cord plug.
	Extended tab at rear of UPS indicates circuit breaker is tripped.	Unplug excessive load, and reset breaker (press tab.)
	Dead wall socket.	Check wall socket with a table lamp.
UPS emits beep frequently, (more than once or twice an hour). Load equipment operates normally.	Mains voltage is distorted or branch circuits are heavily loaded.	Have mains voltage checked by an electrician. Operate the UPS from a socket that is wired to a different branch fuse or circuit.
UPS does not provide expected run time. Low battery warning is sounded prematurely.	Battery is weak due to wear or successive mains outages.	Allow UPS to recharge battery for a minimum of 6 hours. If UPS sounds low battery warning prematurely, when retested, battery should be replaced.
UPS emits loud tone. Power switch is on, but load equipment is not powered.	UPS has shutdown due to overload.	Turn off UPS and unplug excessive loads.

APC
www.apcc.com

How to Contact APC

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     +34 3 3180133
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APC Brazil
Toll free number: 0-800-12-72-21

APC Columbia
Toll free number: 980-15-39-47

APC Mexico
Toll free: 95-800-804-42-82

APC Uruguay
Toll free: 000-413-598-21-39

APC Venezuela
Toll free number: 800-128-56

APC Middle East
APC Middle East
82 A Barrow Road
Streatham, London
SW16 5PG, United Kingdom
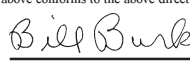Tel: +44 181 769 1963
Fax: +44 181 769 1963

APC E-Mail & Internet
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E-Mail: apcinfo@apcc.com
Information, TechSupport and
Lit Request: apcinlam@apcc.com
Compuserve: GO APCSUPPORT

Declaration of Conformity

Application of Council Directives:	89/336/EEC,73/23/EEC,92/31/EEC, 93/68/EEC,91/157/EEC
Standards to Which Conformity Declared:	EN55022, EN50082-1, EN50091, EN60950
Manufacturer's Name and Address:	American Power Conversion
	132 Fairgrounds Road
	West Kingston, Rhode Island, 02892, USA
	-or-
	American Power Conversion (A. P. C.) b. v.
	Ballybritt Business Park
	Galway, Ireland
	-or-
	American Power Conversion Phillipines
	Second Street
	Caivte EPZA
	Roserio, Cavite Phillipines
Importer's Name and Address:	American Power Conversion (A. P. C.) b. v.
	Ballybritt Business Park
	Galway, Ireland
Type of Equipment:	Uninterruptible Power Source
Model Numbers:	Back-UPS 300MI, 500MI, 650MI
Serial Numbers:	X9701 000 0000 — X9799 999 9999*
	X9801 000 0000 — X9899 999 9999*
Years of Manufacture:	1997, 1998
Note:	Where X = B, O, W, or D

We, the undersigned, hereby declare that the equipment specified above conforms to the above directives.

Billerica, MA   1/1/97   *Bill Burks*

Place   Date   Bill Burks
            Regulatory Compliance Engineer

Phillipines   1/1/97

Place   Date   Gerard Rutten
            Managing Director, Europe