

U P S

On Line

1000VA – 3000VA

■ **USER'S MANUAL** ■

EMC Statements

The products have been tested and thereby comply with the condition of Class C2 , which has been established for offering sufficient protection against dangerous interference for installation in a residential area. Installation and use of the equipment should comply with the instructions provided in order to avoid such interference due to the amount of radio frequency energy that is radiated and generated by the equipment. In spite of this, we cannot assure that a certain amount of interference may not occur in some installations. If, by turning on and off, it can be deduced that your radio or television reception is found to be influenced by harmful interference from the equipment, it is recommended to use one of the following preventive measures:

- . Place the receiving antenna in a separate location or orientation.
- . Ensure a greater distance is achieved between the receiver and the equipment.
- . Ensure that your equipment is connected to an outlet on a separate circuit than the receiver.
- . Contact a technician experienced with radio and TV or a dealer for further assistance.

Declaration of Conformity Request

Units labeled with a CE mark comply with the following standards and directives:

- . Harmonic Standards: EN 62040-1, EN62040-2
- . EU Directives: 2006/95/EC Council Directive on equipment designed for use within certain voltage limits: EU Directives: 2004/108/EC Council Directive relating to electromagnetic compatibility.

The EC Declaration of Conformity is available upon request for products with a CE mark.

CONTENTS

1. Introduction..... 6

2. System Description 6

 2.1 General description 8

 2.2 System configuration..... 9

3. Safety Information..... 9

4. Storage 10

5. Installation 10

 5.1 Environment 10

 5.2 Rear panel view..... 12

 5.3 Connection to mains and loads (1KVA to 3KVA) 14

 5.4 Default settings at the factory..... 14

6 Computer and Alarm Connections..... 15

7 User’s Guide to Operations 17

 7.1 Start up and shut down the UPS 17

 7.2 Button operation..... 17

 7.3 Control panel functions..... 19

 7.4 Interpreting UPS messages 22

 7.5 Trouble shooting..... 22

8 Maintenance 22

9 Technical Specifications 24

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

- **WARNING (SAVE THESE INSTRUCTIONS):** This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries. The equipment can be operated by any individuals with no previous experience.
- **WARNING:** Product is intended for installation in a controlled environment; maximum ambient temperature is 40°C.
- **CAUTION:** Risk of electric shock – Refer to cautionary markings at top, or rear, or bottom of UPS.
- **CAUTION:** Risk of electric shock – Heat-sinks are live. Disconnect unit before servicing.
- **CAUTION (UPS has internal batteries):** Risk of electric shock – Hazardous live parts inside this unit is energized from the battery supply even when the input AC power is disconnected.
- **CAUTION (No user serviceable parts):** Risk of electric shock – do not remove cover, no user serviceable parts inside. Refer service to qualified service personnel.
- **CAUTION (Non-isolated battery supply):** Risk of electric shock – battery circuit is not isolated from AC input. Hazardous voltage may exist between battery terminals and ground. Test before touching.
- **WARNING (Fuses):** To reduce risk of fire, replace only with the same type and rating of fuse.
- **CAUTION:** Do not disconnect battery connector under load.
- **ATTENTION:** Hazardous through electrical shock. Also with disconnection of this unit from the mains, hazardous voltage still may be accessible through supply from the batteries. The battery supply should therefore be disconnected in the positive and the negative pole when maintenance or service work inside the battery cabinet or UPS is considered.
- **CAUTION (For any pluggable only):** With the installation of this equipment it should be

prevented, that the sum of the leakage current of the UPS and connected consumer does not exceed 3.5 mA.

- **CAUTION (For permanent connection only):** HIGH LEAKAGE CURRENT, Earth connection essential before connection supply.
- **CAUTION:** Do not dispose of batteries to fire, the battery may explode.
- **CAUTION:** Do not open or mutilate the battery, released electrolyte is harmful to human skin, eyes, etc.
- **CAUTION:** A battery can bring risk of electric shock and high short circuit current.

The following precaution should be observed when working on batteries:

A. Remove watches, rings or other metal objects.

B. Use only tools with insulated handles.

C. Wear rubber gloves and boots.

D. Do not lay tools or metal parts on top of batteries.

E. Disconnect charging source prior to connecting or disconnecting battery terminals.

To reduce risk of electric shock, disconnect the UPS from the mains supply before installing a computer interface signal cable. Reconnect the power cord only after signaling interconnections have been made.

Servicing of batteries should be performed or supervised by personnel with knowledge of batteries and the required precautions. Keep unauthorized personnel away from batteries.

- **CAUTION:** When replacing batteries, replace with the same type and number of batteries:
One Sealed lead acid battery, rated 12 V, 9 AH max.
- **CAUTION:** To reduce risk of fire, use only No. 26 AWG or larger telecommunication line cable.
- **CAUTION:** This UPS is not applicable for motors, hair dryers, speakers, fluorescent lamps and medical purpose.

The instructions contained within this safety manual are deemed important and should be closely followed at all times during installation and follow-up maintenance of the UPS and batteries.



CAUTION





The unit has a dangerous amount of voltage. If the UPS indicator is on, the unit's outlets may have a dangerous amount of voltage even when not plugged into the wall outlet because the battery may continue to supply power.

Cares should be taken to undertake installation indoors free from electrically-conductive particles which is under temperature and humidity control in order to reduce the risk of electric shock. It is best to disconnect the device using the power supply cord. Ensure that the equipment is placed in a position near the outlet where easily accessible. Except replacing the batteries, all service on this equipment must be carried out by qualified service personnel. Before conducting any maintenance, repair or shipment, first ensure that everything is turned off completely and disconnected.



For additional safety instructions, please use the Safety Manual as reference.

Special Symbols

The following symbols used on the UPS warn you of precautions:

-  **RISK OF ELECTRIC SHOCK** – Please observe the warning that a risk of electric shock is present.
-  **CAUTION: REFER TO OPERATOR'S MANUAL** – Refer to the operator's manual for additional information, such as important operating and maintenance instructions.
-  **SAFE GROUNDING TERMINAL** - Indicates primary safe ground.
-  **LOAD ON/OFF** - Pressing this button turns on/off the output receptacles and the

Indicator light.

-  RJ-45 RECEPTACLE – The receptacle provides network interface connections and telephone or telecommunications equipment should not be plugged into it.
-  Please do not discard the UPS or UPS batteries as the UPS may have valve regulated, lead–acid batteries. Please recycle batteries.

1. Introduction

The information provided in this manual covers single phase 1000 – 3000 VA, uninterruptible power systems, their basic functions, operating procedures, and emergency situations, also including information on how to ship, store, handle and install the equipment. Only detailed requirements of the UPS units are described herein, and installation must be carried out in accordance with this manual. Electrical installations must also carefully follow local legislation and regulations. Only qualified personnel should conduct these installations as failure to acknowledge electrical hazards could prove to be fatal.

2. System Description

Several different kinds of sensitive electrical equipment stay protected by a UPS (Uninterruptible Power System) including computers, workstations, process control systems, telecommunications systems, sales terminals, other critical instrumentation, etc. The purpose of the UPS is to protect these systems from poor quality utility power, complete loss of power, or other associated problems.

Electrical interference abounds in many forms causing problems in AC power, from lightning, power company accidents and radio transmissions to motors, air conditioners, and vending machines, among others. So protection of sensitive electrical equipment is vital to protect against power outages, low or high voltage, slow voltage fluctuations, frequency variations, differential and common-mode noises, transients, etc.

In order to prevent power line problems reaching critical systems causing damage to software, hardware and causing equipment to malfunction, the UPS helps by maintaining constant voltage, isolating critical load output if needed, and cleaning the utility AC power.

2.1 General description

As a double conversion on-line UPS, it is able to supply uninterrupted, clean single-phase power to your critical systems while keeping batteries charged continuously, regardless of whether utility power fails or not.

In event that a power failure lasts longer than a UPS backup time, it will shut down avoiding battery discharge, and as soon as power comes back, the UPS will automatically charge up and start recharging the batteries. As shown in Fig.1 block diagram:

- An input filter reduces transients on the mains
- For maintaining full battery charge, AC-power is rectified and regulated in the rectifier feeding power to the inverter and battery converter.
- DC power is converted to AC in the inverter passing it on to the load.
- Power is maintained from the battery during a power failure.
- The converter increases voltage appropriately for the inverter.

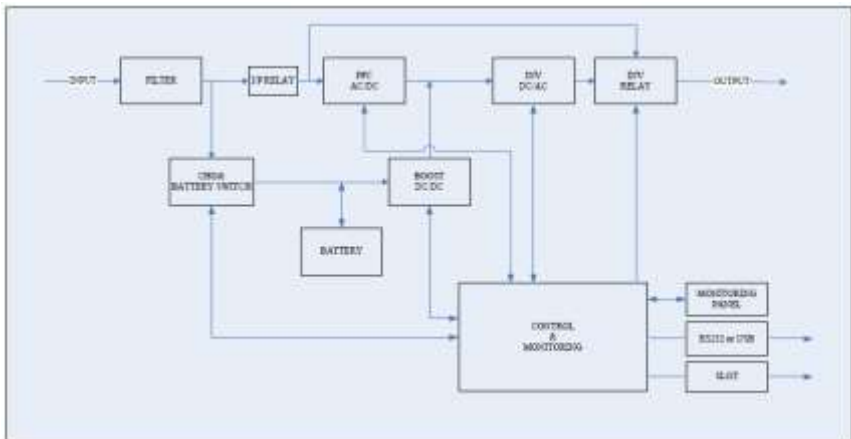


Fig.1. Block diagram

Efficiency Optimizer Function

The Efficiency Optimizer Function is a new feature for the UPS adding cost effectiveness, minimizing power loss and reducing power consumption. Alternating between bypass and on-line modes is achieved automatically and in accordance with the conditions of the utility power. On-line mode may be used during times of intermittent power supply, and bypass mode when power flows smoothly in order to obtain greatest efficiency. Irregularities can be detected in less than a second, and on-line mode reactivated immediately. Switching back to online mode occurs when input voltage is outside $\pm 10\%$ or nominal ($\pm 15\%$ selectable), when input frequency is outside of $\pm 3\text{Hz}$ or when no input line is available.

Although high efficiency is standard, the default operation is in on-line mode. Bypass can be activated in the LCD panel though on-line can be run permanently if preferred.

Free Run Mode

The UPS operates in free run mode when input frequency is outside of the selected input frequency range. Free run mode is when output frequency does not match input frequency. When starting the UPS, the frequency regulation detected is 50 or 60 Hz $\pm 0.25\text{Hz}$. Please refer to chapter 7.2 if you want bypass available while running in free run mode.

Diagnostic tests

When you start the UPS, a diagnostic test is automatically executed that checks electronics, battery, and reports any problems on the LCD display.

An advanced battery management system always monitors the conditions of the batteries sends any forewarnings if replacement is needed. Otherwise every 30 days of normal mode operation, a battery discharge test is performed and any problems reported on the LCD display.

Except during the first 24 hours after startup while the UPS is in charging mode (please see chapter 7.2), diagnostic tests can be performed manually from the front panel at any time.

2.2 System Configuration

The UPS device and the internal backup battery make up the system. Depending on the site and load requirements of the installation, certain additional options are available as a tailored solution. The following items should be taken into consideration when planning a UPS system:

- The total demand of the protected system shall dictate the output power rating (VA). Allow a

margin for future expansion or calculation inaccuracies from measuring power requirements.

- Backup time needed defines the battery size needed. If load is less than the UPS nominal power rating then actual backup time is longer.
- The following options are available:
 - ♦ Transformer cabinets
 - ♦ Maintenance bypass switches
 - ♦ Connectivity options (relay card, SNMP/WEB card)

The following UPS models are available

Model	Backup time for 100% load with internal batteries	Recharge time to 90% capacity
UPS 1000VA	3~4 min	4 hours
UPS 2000VA	3~4 min	4 hours
UPS 3000VA	3~4 min	4 hours

3. Safety Information

Information presented here is vital to all personnel; please read the UPS safety manual.

Storage and Transportation

Please handle the unit with extreme caution since a high amount of energy is contained with the batteries. Always keep the unit in position as marked on the packaging and never drop the unit.

Installation

If flammable substances such as gases or fumes are present or if the room is airtight, a safety hazard situation exists, in which no electrical equipment should be operated.

The instructions in this manual explain how to install the UPS safely. Not acknowledging such electrical hazards may be fatal, so keep this manual for all future reference.



WARNING!

It is strongly advisable not to open the UPS cabinet as the components have very high voltage and touching them may be fatal. Only a technician from the manufacturer or an authorized agent may service the unit. This UPS unit's output receptacles carry live voltage even when not connected to a power supply as it has its own energy source.

User's operations:

The only operations that users are permitted to do are:

- Turning the UPS unit on and off.
- Operating the users interface.
- Connecting data interface cables.
- Changing the batteries.

All such operations are to be performed exactly as instructed in this manual. The greatest care possible must be taken for any of these operations and any change thereof may prove very hazardous to the operator.

4. Storage

Please adhere to the following instructions if the UPS is not installed immediately:

- Store the equipment as is in its original packing and shipping carton.
- Do not store in temperatures outside the range of +15°C to +25°C.
- Ensure that the equipment is fully protected from wet or damp areas and from moist air.

In order to maintain the vitality of the batteries, ensure that the UPS is recharged every 6 months for at least 8 hours.

5. Installation

5.1 Environment

Ensure that all environmental concerns and requirements are met according to these technical specifications, otherwise the safety of installation personnel cannot be guaranteed and the unit may malfunction.

Please follow below instructions when locating the UPS system and battery options:

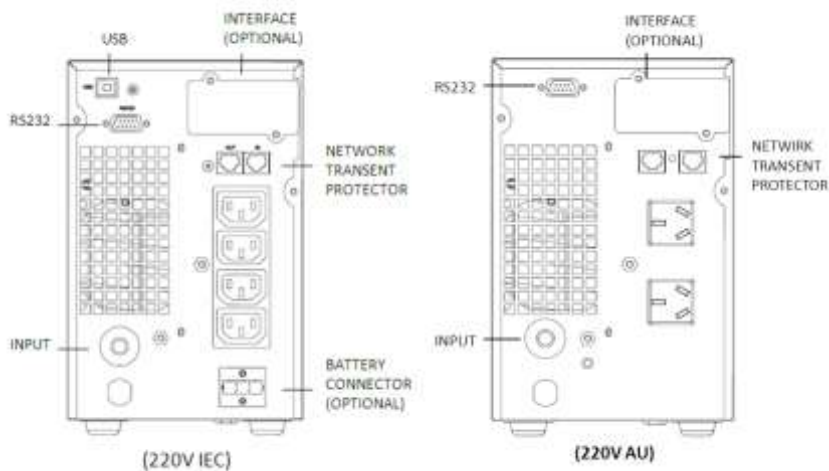
- Avoid extreme temperature and humidity. Maximal battery life can be attained with a recommended temperature range of 15 °C to 25 °C.
- Protect the equipment from moisture.
- Space and ventilation requirements must be met. Ensure there are 100mm behind and 50mm on

the sides of the UPS for ventilation.

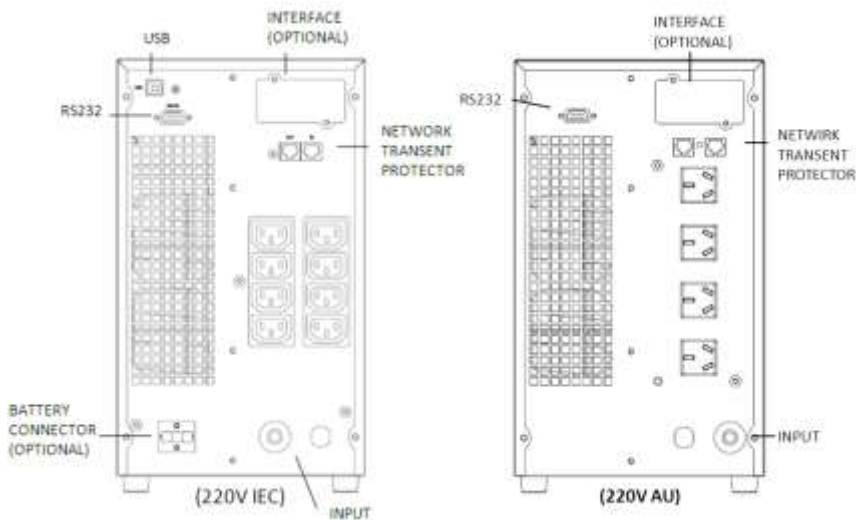
- Ensure that the front of the UPS remains clear for user operation.
- The External Battery Packs has to be installed next to the UPS or under the UPS.

5.2 Rear panel view

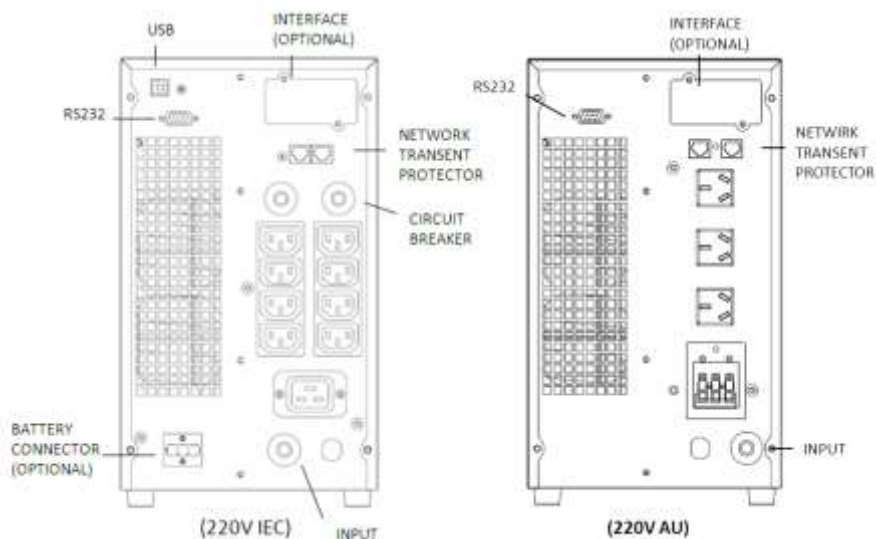
- 1KVA rear panel



- 2KVA rear panel



- 3KVA rear panel



5.3 Connection to mains and loads (1KVA to 3KVA)

- Connect the input cable to the UPS and connect the other end to a grounded outlet. The batteries will automatically charge when connected to the mains. Please realize that although you may start using the UPS immediately, maximum back-up time will still not be available, so it is recommended to charge the batteries for a minimum of 8 hours before use.
- After charging, connect the loads to the UPS (see the example in fig 3).
- Do not connect any devices that have the possibility of overloading the UPS or drawing half-wave rectified current, such as hair dryers or vacuum cleaners.
- Should computer or alarm connections be used, use connections according to chapter 6 of the manual provided with that option. The connections can be referred to on the rear panel.
- The installation is now complete.

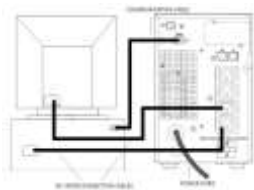


Fig. 3 Example of Installation of Plug & Play products

5.4 Default settings at the factory

On the LCD display you will find several of the UPS parameters to select.

Default settings are as follows:

Settings	Selection	Factory default
	208/220/230/240V	230V
Input/Frequency	±2% ±5% ±7%	±5%
HE Mode Setting	On/Off	Off
Free Run Mode	On/Off	On
Bypass Enable/Disable at free run mode	Disable/Enable	Disable
Alarm silence	On/Off	Off

You may change default settings, but we recommend that this is done after installation and before starting up loads. Please read UPS configurations in chapter 7.2 for more information.

6 Computer and Alarm Connections

At the back of the UPS is an interface allowing direct communication with your computer system, the location of which can be found in figure 2. There is a RS232 serial data interface, one USB data interface. However, the RS232 port cannot be used when the USB interface is in use.

In addition, there is an optional interface slot that allows you to install different communications cards. It can be used parallel with either the RS232 or USB ports.

Currently there are two cards available for the optional interface slot. An SNMP/WEB card allows management and monitoring over a network or internet, and the AS400 card allows voltage free relay contacts. Your local dealer will have more information about these option cards.

Connecting the UPS to a Computer

The communication device for the UPS and PC comes as a complete package with power management software. Only the communication cable provided with UPS may be used to connect to your computer, which is accomplished through the UPS RS232 port. Also ensure that the operating system on your computer is supported. Instructions provided in the power management software will help with this installation. Other advanced power protection solutions such as SNMP can be provided by your dealer.

RS-232 Standard Interface port

The RS-232 interface uses a 9-pin female D-sub connector. This information consists of data about utility, load and the UPS. The interface port pins and their functions are identified in the following table.



Pin #	Signal name	Direction (re UPS)	Functions
2	TxD	Output	TxD Output
3	RxD	Input	RxD / Inverter Off Input
5	Common		Common
6		Output	Ac Fail Output
8		Output	Low Battery Output
9		Output	12 VDC Power

Caution! Max rated values 12Vdc

USB port (option)


Connecting the UPS to your computer is accomplished through the USB port on the back of your computer. USB compliant hardware and operating system will be necessary including installation of a UPS driver. The serial port cannot be used when using the USB port. The USB cable is standard and can be bought separately.

7 User's Guide to Operations


Necessary information for operation of the unit is covered in this chapter. Normally the UPS runs automatically, but on those few occasions such as just after installation, all the starting and shutting down procedures are described herein.

7.1 Start up and shut down the UPS

Start up the UPS


- Ensure that installation was correct and successful and that the input power cable is connected to a well-grounded outlet.
- The UPS can be started by pressing the  button on the front panel.
- The UPS should now start its inspection of: internal functions, main synchronization and inverter startup. Then power should start to be supplied via the outlets.
- During this inspection, the LCD will display "Ready on". The LED shall light up when output power has commenced and the LCD will display "Line mode".
- Switch on the loads.


Shut down the UPS


- Shut down and turn off all the loads.
- Press the  button on the front panel for five seconds. The alarm will sound and the UPS will shut down.
- The LCD will display UPS OFF for a few seconds.


7.2 Button operation


Please note the three operating buttons on the front panel:

1.  is an ON/ OFF button:


(A). Press the  button (at least 3 seconds) to turn on the UPS.


(B). When UPS is working, press the  button (at least 3 seconds) to turn off the UPS.

2.  is a Enter button. Use this button to check content of UPS and the method is listed below:


(A). Press the  button (at least 2 seconds) to check content of UPS. Each content can be displayed by pressing at once, and it has fifteen kinds of function to be checked.


(B). If no pressing within 10 seconds, it will return to original status.


3.  is a Function button . Each function can be enabled by pressing this button.

(A). Press the  button (at least 2 seconds) to choose which function that you want. Each content can be displayed by pressing at once, and it has fourteen kinds of function to be checked.

(B). After choosing the function, press the  button to enter the function that you want.

(C). Press the  button to choose other function again.

(D). Press the  button to enable your function.

(E). Press the  button to confirm and enable your function.

(F). If no pressing within 10 seconds, it will return to original status.

7.3 Control panel functions

Operation of the UPS is indicated on the monitor panel with five LED indicators and an LCD screen.

ON/ <div><div>ON</div><div></div></div>	This green LED is lighted when UPS has been turned on.
ON-LINE/ <div><div>ON-LINE</div><div></div></div>	When the UPS is in normal or static bypass modes, there is voltage at the output terminals and this LED will light up in green.
ON-BAT/ <div><div>ON-BAT</div><div></div></div>	While operating in battery mode.
BYPASS/ <div><div>BY-PASS</div><div></div></div>	While operating in bypass mode, this LED will light up in yellow.
FAULT/ <div><div>FAULT</div><div></div></div>	If any internal error occurs in the UPS, this LED will light up in red and give off an audible alarm. Press any of the buttons on the front panel to turn off the alarm.

Status of the UPS, measurements and alarms are all indicated on the LCD screen.

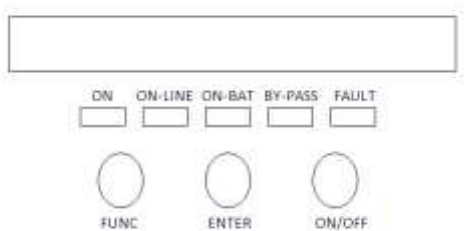


Fig 6. Control panel

Normal display


The UPS status is shown in normal display mode. From here you have a choice to go to UPS meters display and the Setting display by pressing the button.



UPS meters display



Various measurements are available through the UPS meters display; pressing the button will scroll through the following meters:

LCD message	Description
O/P VOLT= xxx, xV	Shows Output AC voltage
O/P FREQ= xx, x Hz	Shows Output Frequency
I/P VOL T= xxx, xV	Shows Input AC voltage
I/P FREQ= xx, x Hz	Shows Input Frequency
BAT VOLT= xx,xV	Shows Battery Voltage
O/P LOAD%= xx%	Shows Load % of max load
O/P W= xW	Shows Output Watts
O/P VA= xVA	Shows Output VA
O/P CURR= xA	Shows Output Current
RATING = xxxxVA	Shows UPS Rating
CPU VERSION xx.x	Shows CPU Version



UPS configurations


 Various settings that have been chosen are shown in the UPS setting display.


 To enter configuration mode, press the  button for one second. The first configuration parameter will be shown on the LCD display.


 Press the  button to scroll through the parameters.

 Press the  button to select the parameter.

 Press the  button to scroll through the options for the selected parameter;

Press the  button to select the option.

You may be prompted to save the selection, if so press the  button to either confirm or save your selection. Other options are saved and started automatically. See the table below for further details.

 If no buttons are pressed (or user inactivity) for ten seconds, the UPS shall exit the

configuration mode and return to normal mode displaying Line mode.

Caution!

The factory default settings do not necessarily have to be changed, although you are free to tailor the UPS to your specific needs.

Settings	LCD display	Explanation	Selection	Factory default
Output Volt. Setting	O/P V Setting	Select Nominal Voltage	208/220/230/240 V	230V
			100/110/115/120 V	120V
Input/Frequency	I/P F Setting	Select input frequency range when UPS goes into free run mode	±2% ±5% ±7%	±5%
Free Run Mode	Free Run Set	Select if UPS can run in Free run mode (unsynchronized)	ON/OFF	ON
Bypass Enable/Disable at Free run mode	Bypass disable	If Enable is chosen, the UPS can go to bypass when unsynchronized.	Disable/Enable	Disable
He mode Setting	HE Mode Set	Select if UPS runs in high efficiency mode	ON/OFF	OFF
Force Manual Bypass	Manual bypass	Permanently force UPS to bypass. For service only.**	ON/OFF	OFF
Do Battery Test	Battery Test	Detect battery is normal or not.		
Silence Function	Silence Set	Enable or disable silence function	ON/OFF	OFF
Select Language	Language	Select load language	English, German, French, Spanish, Italian.	English
Set Generator Mode	Generator	Set unit in generator mode. ***	ON/OFF	OFF

Manual test of the UPS

Manual UPS or Manual Battery tests can be conducted from the UPS configuration as well and are functional even when the UPS is not charging the battery.

Manual Battery test: Scroll the parameters until Manual Bat test displays on the LCD.



Press the  button twice.

**) Note: In order for the UPS and power management software to operate normally, Manual Bypass should always be set to OFF as the load will not be protected by the unit when Manual

Bypass is ON. This is aimed for operating an external maintenance bypass switch.

***) Note: You should turn UPS off and keep the AC power before you use “Generator” function. (Even you want to select “\Generator\OFF” to back to normal mode).

7.4 Interpreting UPS messages

Troubleshooting procedures described here give simple instructions in determining UPS malfunctions.

Start the troubleshooting procedure if you witness any alarm indication on the control panel.

Alarm indicators

The UPS gives the following audible alarms:

- If UPS is on battery and the ON BATTERY LED is on, UPS will beep every 5 seconds.
- If the battery capacity is low and the ON BATTERY LED is flashing, the UPS will beep twice every 5 seconds.
- If UPS is on bypass and the BYPASS LED is on, UPS will not beep.
- If UPS has an internal fault and the ALARM LED is on, the UPS will give a constant audible alarm displaying the cause on the LCD display.

Silencing an alarm

By pressing any of the three buttons on the front panel, the alarm can be turned off, except when the battery is low, which will cause the alarm to resound.

On the LCD display, you can also choose silent alarm mode which will not warn you of any malfunction audibly.

7.5 Trouble shooting

Displayed on LCD	Audible Alarm	Alarm Description	What You Should Do
Output Overload	Two Beeps per second	The UPS is overloaded (in Line Mode). Your equipment needs more power than the UPS can provide. The UPS operates in bypass.	Shut off the least important equipment connected to the UPS. If this solves the overload problem, the UPS will switch from bypass back to normal operation.
Battery Test	No Beep	The UPS is doing a battery test.	No action needed. The UPS will return to normal operation when it successfully completes the battery test.
Over-Charge	Constant beep	Batteries are overcharged.	Turn off protected loads. Turn off UPS and call your local

			dealer
Low Battery	2 beeps every 5seconds	The unit is operating on Battery Power and will shut down soon due to very low battery voltage	The unit will restart Automatically when acceptable power returns.
On-Battery	Once every 5 seconds	The unit is operating on Battery Power.	Save your data and perform a controlled shutdown.
Charger Failure	Constant beep	Charger has failed.	Phone the local dealer
Over-Temperature	Constant beep	High ambient Temperature.	Make sure the unit's fans and vent holes are not blocked, and make sure the ambient surrounding temperature is not above 40 degree C. If these conditions did not solve the problem, call your service representative.
Output Short	Constant beep	Output short circuit	Call the Local dealer
High output Voltage	Constant beep	High output voltage	Call the Local dealer
Low Output Voltage	Constant beep	Low output voltage	Call the Local dealer
Bus Fault	2 Beeps per second	High internal DC bus Voltage.	Turn off protected loads. Turn off UPS and call your local dealer
Line abnormal	1 Beep per second	Wrong AC Line backed up during auto restart	

8 Maintenance

With a minimal amount of maintenance, you can expect the UPS to function, otherwise consider changing the batteries to have a long life free of trouble. The most critical issues for the reliability of the UPS are environmental issues. Ensure that the temperature and humidity are always according to specifications and keep the area around the unit clean and dust free.

At a temperature of 25°C, the typical battery lifetime is 4 years.

Also check at regular intervals of 6 to 12 months whether the back-up time of the battery is adequate for its



WARNING!

Batteries may cause electrical shock or burn from high short circuit currents. Please observe the following precautions: 1. Remove jewelry and metal objects such as watches

and rings. 2. Use tools that have insulated handles. 3. Keep tools and other metal objects from contacting and away from the batteries.

ELECTRIC ENERGY HAZARD: Do not attempt to rewire, alter, or change any battery wiring or connectors. Attempting to make such alterations can cause injury.

Replace the batteries with the same number and type as originally installed batteries.

DO NOT DISCONNECT the batteries while UPS is in Battery mode.

9 Technical Specifications

9.1 Power range 1KVA to 3KVA at PF=0.9 (Tower)

GENERAL

Rated power	1000VA, 2000VA, 3000VA at PF=0.9
Technology	On-line, double conversion topology with automatic bypass

INPUT

Phase	Single phase with ground
Bypass voltage	Output +10%/-15% (depend on output voltage)
Input voltage range	60~150V (for UL model) 60~69V at 25% load, 70~79V at 50% load 80~94V at 75% load, 95~150V at 100% load 120~300V (for CE model) 120~139V at 25% load, 140~159V at 50% load 160~189V at 75% load, 190~300V at 100% load
Frequency	50/60 Hz. Auto selection
Frequency window from mains	45-65 Hz
Synchronization window	$\pm 2\%$, $\pm 5\%$, $\pm 7\%$ selectable
Input current	1000VA 8.6A, 2000VA 17.2A, 3000VA 25.8A (for UL model) 1000VA 4.7A, 2000VA 9.4A, 3000VA 14.1A (for CE model)
Input Power factor	≥ 0.97

OUTPUT

Output Voltage	100/110/115/120 VAC (for UL approval), selectable from LCD panel 208/220/230/240 VAC (for CE approval), selectable from LCD panel
Voltage regulation	$\pm 2\%$
Voltage distortion	$< 4\%$ THD at non-linear load, $< 2.5\%$ THD at linear load
Frequency regulation	± 0.25 Hz (battery or free running mode)

Dynamic response	$\pm 9\%$ max from 100% to 20 % or from 20% to 100 % linear load
Overload capacity	105-120% 30 sec, 121-150% 10 sec (On Grid) 101-110% 10 sec, 111-120% 3 sec (On Bat)
Efficiency	about 89%

WARNING:

"When power is supplied by external batteries, output toward loads must be limited to less than 90% of overall power generation."

ENVIRONMENTAL

Ambient temperature	+0 °C to +40 °C
Recommended temperature	+15 °C to +25 °C
Storage temperature	-15 °C to +50 °C
Cooling	Forced air-cooling
Humidity	0-95%, non-condensing
Audible noise	< 45 db normal and battery mode (1000VA) < 50 db normal and battery mode (2000VA, 3000 VA)

STANDARDS

Safety	EN62040-1
Emissions	EN62040-2
Immunity	EN62040-2 Category C2

Tower Model at P.F 0.9

OUTPUT POWER	1000VA/900W
Connection input	IEC 320 (10A)
Connection output	4 x IEC C13
Battery type	Lead-acid 7AH/12V
Number of batteries	3
Backup time/full load	3~4 min
Recharge time	<4 hours to 90%
Dimensions W x D x H	144mm x 357mm x 229mm (5.7" x 14.1" x 9.0")
Net weight	12.4 kg (27.3 lb)

OUTPUT POWER	2000VA/1800W	3000VA/2700W
Connection input	IEC 320 (10A)	IEC 320 (16A)
Connection output	8 x IEC C13	8 x IEC C13
		1 x IEC C19
Battery type	Lead-acid 7AH/12V	
Number of batteries	6	8
Backup time/full load	3~4 min	3~4 min
Recharge time	<4 hours to 90%	
Dimensions W x D x H	190mm x 386mm x 332mm (7.5" x 15.2" x 13.1")	190mm x 435mm x 332mm (7.5" x 17.1" x 13.1")
Net weight	23.2 kg (51.1 lb)	27.6 kg (60.8 lb)

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