

UPS



On Line

1000VA - 3000VA

■ USER'S MANUAL ■

EMC Statements

The products have been tested and thereby comply with the condition of a Class C1 (1000VA) and Class C2 (2000VA and 3000VA), 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: 93/68/EEC, Amending Directive 2006/95/EC; 2004/108/EC, Council Directive relating to electromagnetic compatibility; 92/31/EEC, Amending Directive 2004/108/EC relating to EMC.

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

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IMPORTANT SAFETY

INSTRUCTIONS

SAVE THESE INSTRUCTIONS

See installation instructions before connecting to the supply

- **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 batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- **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:** Do not apply for uses in a computer room as defined in the Standard for the Protection of Electronic Computer \ Data Processing Equipment, ANSI/NFPA75.
- **CAUTION: This UPS is not applicable for motors, hair dryers, speakers, and fluorescent lamps.**

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.

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.

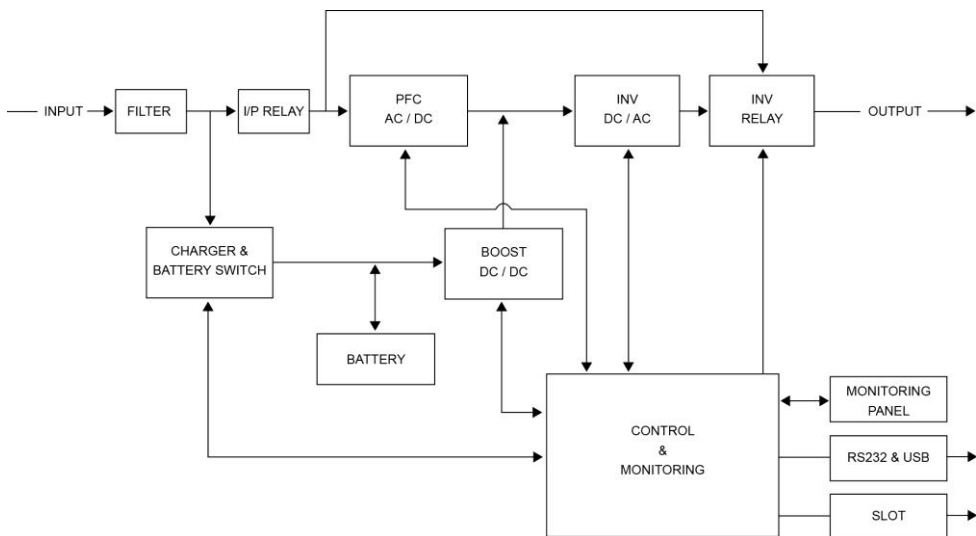


Fig.1. Block diagram

High Efficiency Mode

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 fore warnings 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 start up 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	3~5 min	4 hours
UPS 2000VA	2~4 min	4 hours
UPS 3000VA	2~4 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.

The service personnel should wear insulation gloves when doing the maintain process.

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

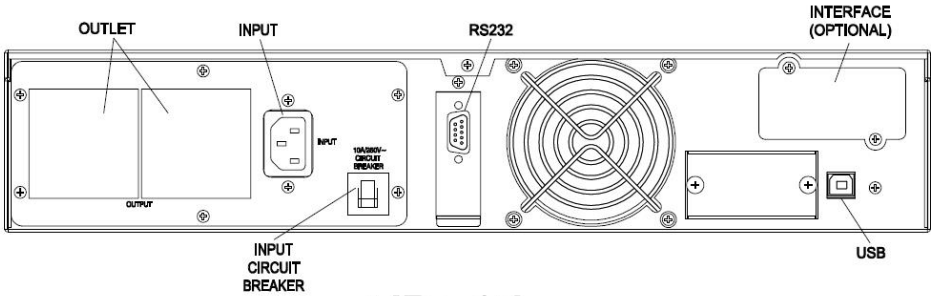
5.1 Environment

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.

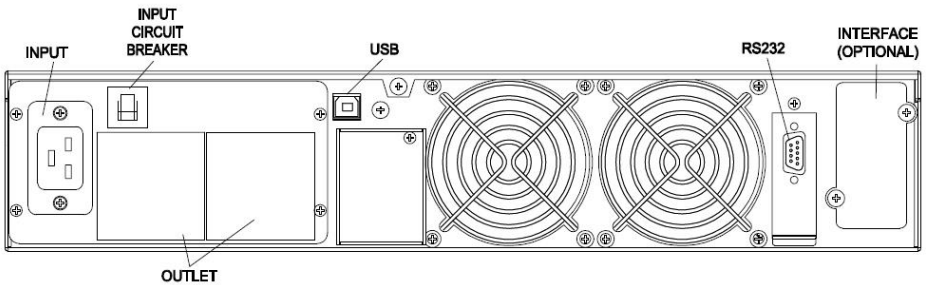
Please follow below instructions when locating the UPS system and battery options:

- 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.

5.2 Rear panel view



MRT-1K



MRT-2K/3K

Fig.2 Rear panel of UPS 1KVA to 3KVA

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

The following input and output cables come supplied with all models

1000 VA	IEC 320 10 A (Input cable)
2000 VA	IEC 320 16 A (Input cable)
3000 VA	IEC 320 16 A (Input cable)

- 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.

- If unit instantly shows a “Site Wiring Fault”, rotate the connector (Schuko)
- 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.

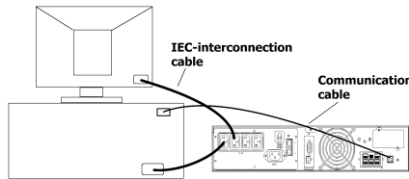


Fig. 3 Example of Installation of Plug & Play products

5.4 Battery replacement

The following is a step by step tutorial for replacing the battery:

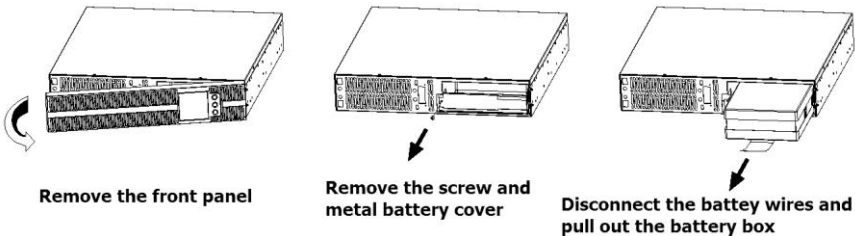


Fig.5 Replacing battery

1 Remove the front panel

The front panel of UPS can be removed by pushing where the arrow indicates in the picture beside the UPS.

2 Unscrew the screw and remove the metal battery cover.

- 3 Disconnect the battery wires and pull out the battery box.
- 4 Replace the battery and push the battery box into the UPS.
- 5 Reinstall the metal battery cover and the front panel.

5.5 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	LCD display	Explanation	Selection	Factory default
Output Volt. Setting	O/P V Setting	Select Nominal Voltage	220/230/240 V	230V
			100/110/115/120/127 V	120V
Do Battery Test	Battery Test	Detect battery is normal or not.	ON/OFF	OFF
Force Manual Bypass	Manual bypass	Permanently force UPS to bypass. For service only.	ON/OFF	OFF
Free Run Mode	Free Run Set	Select if UPS can run in Free run mode (unsynchronized)	ON/OFF	ON
He mode Setting	HE Mode Set	Select if UPS runs in high efficiency mode	ON/OFF	OFF
Silence Function	Silence Set	Enable or disable silence function	ON/OFF	OFF
Set Generator Mode	Generator	Set unit in generator mode.	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 and an emergency power off switch supplied. 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

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.

6.1 EPO port (Emergency Power Off) (Optional)



A customer-supplied switch located remotely can be used to open the EPO connection and allows UPS output receptacles to be switched off. Since the EPO shuts down the equipment immediately, orderly shutdown procedures are not followed and not by any power management software. The UPS will have to be manually restarted in order to regain power to the outlets.

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 pushing 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.
- The LCD shall light up when output power has commenced and the LCD will display “On Line” symbol 
- Switch on the loads.











Shut down the UPS

- Shut down and turn off all the loads.
- Push the  button on the front panel for five seconds. The alarm will sound and the UPS will shut down.
- In emergency situations, the EPO located on the back of the unit should be used.

7.2 Button operation

Please note the three operating buttons on the front panel:

1. “” is a ON/ OFF button :

- (a). Push the “  ” button (at least 3 seconds) to turn on the UPS.
- (b). When UPS is working, push 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). Push the “  ” button to check content of UPS. Each content can be displayed by pressing at once, and it has 10 contents to be checked.
- (b). If no pressing within 20 seconds, it will return to original status.
3. “  ” is a function button . Each function can be enabled by pressing this button.
- (a). Push 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 7 kinds of function to be checked.
- (b). After choosing the function, push the “  ” button to enter the function that you want.
- (c). Push the “  ” button to choose other function again.
- (d). Push the “  ” button to enable your function.
- (e). Push the “  ” button to confirm and enable your function.
- (f). If no pressing within 10 seconds, it will return to original status.

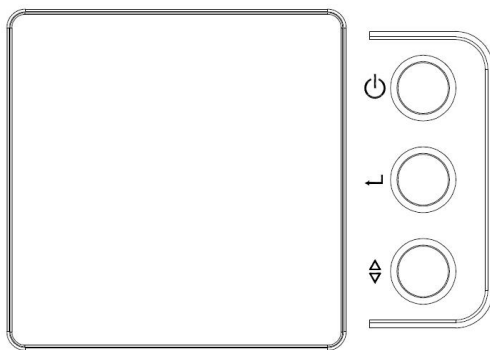


Fig 6. Control panel

7.3 LCD panel

Operation of the UPS is indicated on the monitor panel with a LCD screen. This display is also capable of alerting the user with audible alarms. Status of the UPS, measurements and alarms are all indicated on the LCD screen.

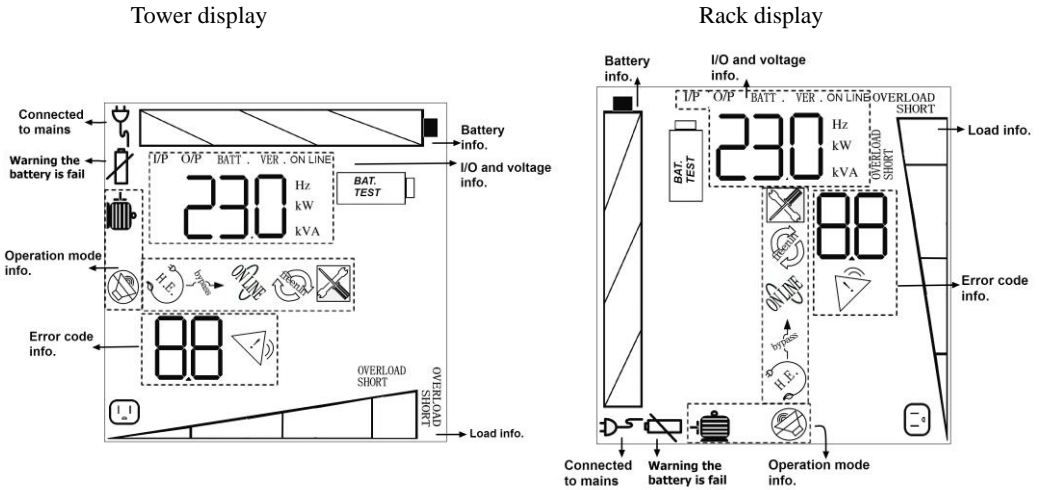
















Fig.7 LCD display

Display	Function description
	Indicates the UPS is working in the line mode.
	Indicates the UPS connects to the mains.
	Warning the battery is fail.
	Indicates the UPS is under silence mode.
	Indicates the UPS is working under generator mode.
	Indicates the UPS is working under high efficiency mode.
	Indicates the UPS is working under free run mode.
	Indicates there is any error occurs in the UPS.
	Indicates the bypass circuit is working.
	Indicates the UPS is working under manual bypass mode.
	Indicates the UPS overload or the output is short circuit.
	Indicates the battery remaining by 0~24%, 25~49%, 50~74%, 75~100%.
	Indicates the load level by 0~24%, 25~49%, 50~74%, 75~100%.
	Indicates the outputs are working normally.

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 pushing the button.

UPS LCD display






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

LCD message	Description
O/P VOLT= xxxV	Shows Output AC voltage
O/P FREQ= xx.x Hz	Shows Output Frequency
I/P VOL T= xxxV	Shows Input AC voltage
I/P FREQ= xx.x Hz	Shows Input Frequency
BAT VOLT= xx.xV	Shows Battery Voltage
O/P W= xx.xW	Shows Output Watts
O/P VA= xx.xVA	Shows Output VA
RATING = xx.xKVA	Shows UPS Rating
UPS VERSION xx.x	Shows UPS Version


When you select the O/P voltage, LCD will display the output AC voltage as following diagram.



UPS configurations

-  Various settings that have been chosen are shown in the UPS setting display.
-  To enter configuration mode, press the "▲" button for 1 second. The first configuration parameter will be shown on the LCD display.
-  Press the "▼" button to switch through the parameters.
-  Press the "↵" button to select the parameter.
-  Press the "▲" button to switch 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.

-  If no buttons are pressed (or user inactivity) for 10 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.

*) 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 Function set and status flow tree diagram

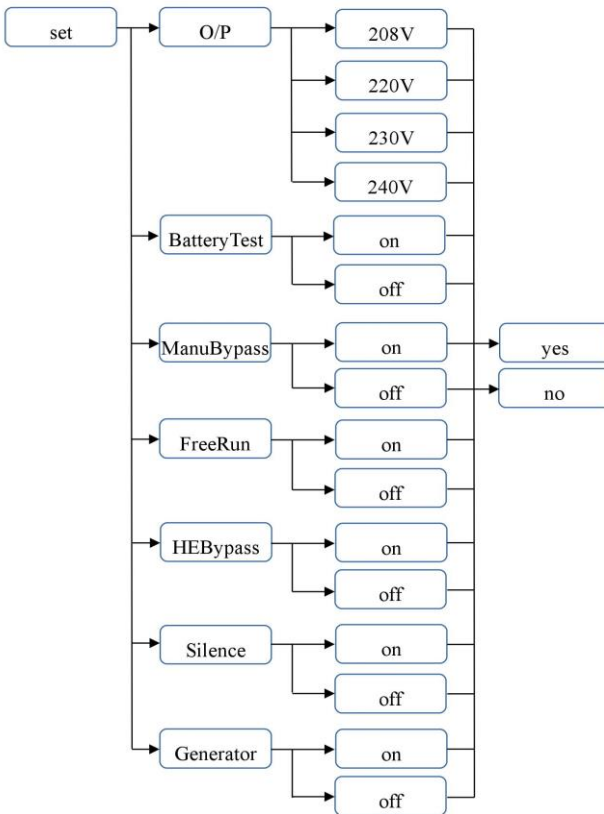
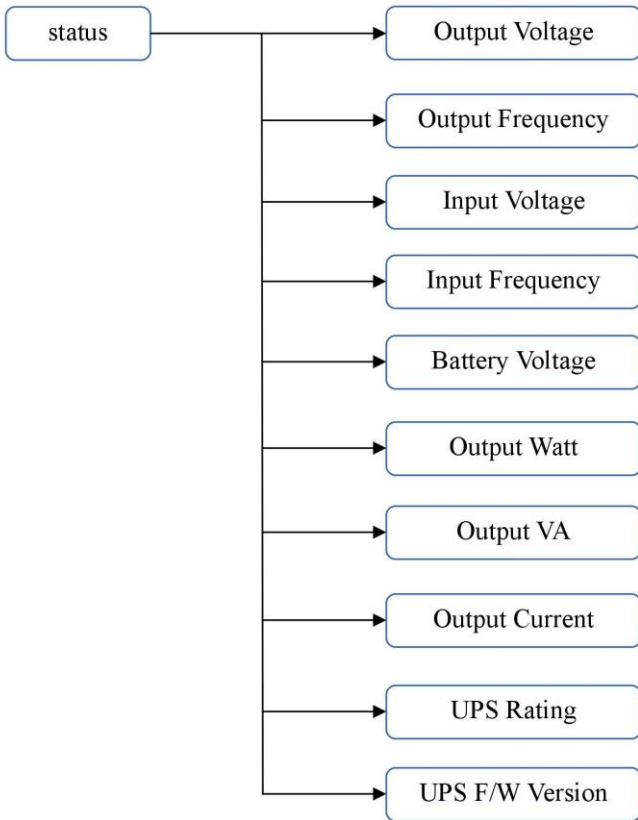


Fig.8 Function set tree diagram




7.5 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 mode the symbol”  ”will disappear , UPS will beep every 5 seconds.
- If the battery capacity is low and the low battery diagram will turn on, the UPS will beep twice every 5 seconds.
- If UPS is on bypass and the BYPASS diagram is on, UPS will not beep.
- If UPS has an internal fault and the error diagram 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.

7.6 Trouble shooting (Error code)

Displayed on LCD	Audible Alarm	Alarm Description	What You Should Do
01 (High output voltage)	Constant beep	High output voltage	Call the Local dealer
02 (Low Output voltage)	Constant beep	Low output voltage	Call the Local dealer
03 (Output Short0)	Constant beep	Output short circuit	Call the Local dealer
04 (Bus Fault)	2 Beeps per second	High internal DC bus Voltage.	Turn off protected loads. Turn off UPS and call your local dealer
05 (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.
06 (Site wiring Fault)	1 Beep per second	Voltage detected Between Neutral and Ground	UPS mains connector polarity Wrong. Rotate the connector (Schuko). UPS installed to mains supply without ground.
07 (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.
08 (Over-Charge)	Constant beep	Batteries are overcharged.	Turn off protected loads. Turn off UPS and call your local dealer
09 (Charger Failure)	Constant beep	Charger has failed.	Phone the local dealer
10 (Battery Failure)	Constant beep	Battery has failed.	
11 (Line abnormal)	1 Beep per second	Wrong AC Line backed up during auto restart	
(Battery Test)	No Beeps	The UPS is doing a battery test.	No action needed. The UPS will return to normal operation when it successfully completes the battery test.
(On-Battery)	Once every 5 seconds	The unit is operating on Battery Power.	Save your data and perform a controlled shutdown.
(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.

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!

Do 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.

The service personnel should wear insulation gloves and then remove the battery connector to disconnecting the power of batteries when doing the maintain process.



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.

- Short-circuit backup protection : Firmware control and output relay.
- Number and location of protective devices :
6 devices : Input circuit breaker, input fuse, battery fuse, input relay, output relay, MOV.
- Protection by several devices :
Short circuit : Firmware control and output relay.
Over current : Input circuit breaker and output relay.
Battery short : Battery fuse
IGBT fail : Input fuse and input relay.
- Over current protection :
Firmware control, output relay and input circuit breaker(bypass mode).
- Location of protective device :
Input circuit breaker : real panel
Input fuse : main PCB
Battery fuse : main PCB
Input relay : main PCB
Output relay main PCB
MOV : main PCB and EMC PCB
- Rating of protective device :
Input circuit breaker : MRT 1000 10A; MRT-2000 10A; MRT3000 16A
Input fuse : MRT 1000 15A; MRT-2000 20A; MRT3000 25A
Battery fuse : MRT 1000 30A*2 ; MRT-2000 20A*2; MRT3000 30A*2

9 Technical Specifications

Model		MRT-1000	MRT-2000	MRT-3000
Capacity		1000VA / 1000W	2000VA / 2000W	3000VA / 2850W
P.F.		1	1	0.95
INPUT	Nominal voltage	220-240V		
	Voltage range	198~276V under 100% load		
	Frequency	50Hz to 60Hz auto sensing		
OUTPUT	Voltage	220V / 230V / 240V $\pm 2\%$ (selectable output voltage)		
	Current	4.5A/4.3A/4.2A	9.1A/8.7A/8.3A	13A/12.4A/11.9A
	Frequency	50Hz / 60Hz ± 0.25 Hz		
	Wave form	Pure sine wave		
	Transfer time	0 ms		
	Overload recovery	Auto transfer to UPS		
	Harmonic distortion	$\leq 2.5\%$ THD at linear load		
	Normal efficiency mode (AC to AC)	90%		
	High efficiency mode (AC to AC)	> 95%		
	Cress factor	3 : 1		
	Connections	Standard IEC C13 (Customized outlets can be discussed)		
PROTECTI ON	Surge protection	230V (IEEE C61000-4-5 level 3)		
	Overload protection (on main)	105%~120% for 30 seconds and 121%~150% for 10 seconds		
	overload protection(on battery)	101%~109% for 10 seconds and 110%~120% for 3 seconds		
	Short circuit protection	UPS output cut off immediately or input fuse / circuit breaker protection		
SYSTEM DISPLAY / WARNING	Visual display	Input / output voltage, input / output frequency, on-line mode, back up mode, battery capacity, load level		
	Audible alarm (battery back-up)	Beep every 5 seconds		
	UPS fault	Continuous beeping sound and LCD display		

BATTERY	Type	Sealed, maintenance-free lead acid battery		
	Typical recharge time	4 hours to 90%		
	Battery quantity	12V, max7.2Ah x3	12V, max7.2Ah x6	12V, max 8.5Ah x6
	Management	Self-test, adjustable battery transfer pointes and alarm settings		
	Battery protection	Cut off without draining any current when battery is low		
	Cold start (DC start)	Yes		
	Back up time (full load / half load)	2 to 4 mins / 7 to 10 mins		
GENERAL	Input inlet	IEC 320 (230V)		
	Receptacles	IEC 320 (230V)		
	Dimension (W x D x H)mm (inch)	428x425x84mm (16.9 x 16.7 x 3.3)	428x635x84mm (16.9 x 25.0 x 3.3)	
	Net weight kg (lb)	15.8kg (34.8)	28.8kg (63.4)	31.9kg (69.5)
	Shipping weight kg (lb)	18.9kg (41.6)	32.9kg (72.4)	35.5kg (78.1)
	Communication interface	Standard - RS-232- USB B-type *Optional SNMP		
	Audible noise	< 45dBA (1m from surface)		< 50dBA (1m from surface)
	Operation temperature	0 ~ 40°C / 32 ~ 104°F		
	Storage temperature	15 ~ 25°C / 59 ~ 77°F		
	Altitude	2000 meters max		
	Relative humidity	0-95%, non-condensing		
	Safety	EN 62040-1		
	EMC	EN 62040-2 ; CISPR 22	EN 62040-2 ; CISPR 22	EN 62040-2 ; CISPR

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Declaration:

We hereby to declare that the following two factories are manufacture the same products.

Manufacture name :

- 1.Powercom Co., Ltd.
- 2.Zhongshan Guanhong Electronic Co., Ltd.

Manufacture Address :

- 1.9F., No.246, Lien Chen Rd., Chung Ho Dist., New Taipei City 235, Taiwan.
- 2.Zhongshan Torch Development Zone, 9 Hongye Rd Zhongshan, Guangdong 528400 China.