



User Manual

Power-Lite

Single Phase Wall Mountable Emergency Lighting Inverter

Document No. 6005-100P
Revision B

Installation and
Operation

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Congratulations on selecting one of the fine products from Perfect Power Systems, the leader in power protection technology. Our wide product offering includes UPS (Uninterruptible Power Systems), power conditioners, automatic voltage regulators and specialty transformers (e.g., computer-grade, medical-grade). Since our founding in 1972, Perfect Power Systems has shipped many of these fine products to discerning customers around the world for use on sensitive equipment and in critical applications.

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SERVICE

If you require assistance, please call our 24-hour toll free hot line 800-PWR-SRVC (800-797-7782) or email to info@800pwrsrv.com. Please have the following information from your unit's nameplate available to speed assistance:

Serial Number:	
KVA/Power Rating:	
Input Voltage:	
Output Voltage:	
Manufacturer Date:	

IMPORTANT SAFETY
SAVE THESE INSTRUCTION

Following safety precautions is important when operating or servicing electrical equipment. The symbols shown are used extensively throughout this manual. Always heed these precautions since they are essential to the safe operation and servicing of this product.



Boxes labeled with **“DANGER”** indicate that there is a high risk of personal injury or death if instructions are not followed.



Boxes labeled with **“CAUTION”** or **“WARNING”** indicate that there is a high probability of equipment malfunction, damage, or destruction if instructions are not followed.



DANGER!

ALL POWER TO THE UNIT MUST BE LOCKED AND TAGGED “OFF” BEFORE PERFORMING ANY SERVICE OR WORK ON THE UNIT. FAILURE TO DO SO COULD RESULT IN ELECTROCUTION.



DANGER!

ONLY FACTORY TRAINED OR AUTHORIZED PERSONNEL SHOULD ATTEMPT TO INSTALL OR REPAIR THE UNIT OR ITS BATTERY SYSTEM. IMPROPER INSTALLATION HAS PROVEN TO BE THE SINGLE MOST SIGNIFICANT CAUSE OF START-UP PROBLEMS. HIGH AC AND DC ELECTRICAL VOLTAGES ARE PRESENT THROUGHOUT THE UNIT(S) AND INCORRECT INSTALLATION OR SERVICING COULD RESULT IN ELECTROCUTION, FIRE, EXPLOSION, OR EQUIPMENT FAILURE.



DANGER!

ALL POWER CONNECTIONS MUST BE COMPLETED BY A LICENSED ELECTRICIAN WHO IS EXPERIENCED IN WIRING THIS TYPE OF EQUIPMENT. WIRING MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE NATIONAL AND LOCAL ELECTRICAL CODES. IMPROPER WIRING MAY CAUSE DAMAGE TO THE EQUIPMENTS, INJURY OR DEATH OF PERSONNEL. VERIFY THAT ALL HIGH AND LOW VOLTAGE INPUT POWER CIRCUITS ARE DE-ENERGIZED AND LOCKED OUT BEFORE INSTALLING CABLES OR MAKING ANY ELECTRICAL CONNECTIONS.



DANGER!

IN CASE OF FIRE INVOLVING ELECTRICAL EQUIPMENT. ONLY CARBON DIOXIDE FIRE EXTINGUISHERS, OR THOSE APPROVED FOR USE ON ELECTRICAL EQUIPMENT, SHOULD BE USED. USE OF WATER ON FIRES INVOLVING LIVE HIGH VOLTAGE ELECTRICAL CIRCUITS COULD PRESENT AN ELECTROCUTION HAZARD.



DANGER!

EXTREME CAUTION IS REQUIRED WHEN PERFORMING MAINTENANCE. LETHAL VOLTAGES EXIST WITHIN THE EQUIPMENT DURING OPERATION. OBSERVE ALL WARNINGS AND CAUTIONS IN THIS MANUAL. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY OR DEATH. OBTAIN QUALIFIED SERVICE FOR THIS EQUIPMENT AS INSTRUCTED.



DANGER!

INTERNAL BATTERY STRAPPING MUST BE VERIFIED BY THE CUSTOMER PRIOR TO MOVING THIS UNIT. THIS UNIT CONTAINS NONE –SPILLABLE BATTERIES. KEEP THE UNIT UPRIGHT. DON NOT STACK. DO NOT TIP. ALWAYS FLOW THE BATTERY MANUFACTURERE’S SAFTERY INFORMATIONS TO PREVENT AN ACCIDENT THAT COULD RESULT IN INJURY OR DEATH



DANGER!

OBSERVE ALL BATTERY SAFETY PRECAUTIONS DURING INSTALLATION OR SERVICE OF THE UNIT OR BATTERIES. EVEN WITH THE BATTERY CIRCUIT BREAKER IN THE OFF POSITION, THE DANGER OF ELECTROCUTION MAY STILL BE PRESENT. THE BATTERY POWER TO THE UNIT MUST BE LOCKED AND TAGGED “OFF” BEFORE PERFORMING ANY SERVICE OR WORK ON THE UNIT. THE BATTERY MANUFACTURER’S SAFETY INFORMATION AND MATERIAL SAFETY DATA SHEET IS LOCATED IN A POCKET ATTACHED TO THE INSIDE OF LEFT DOOR OF EACH UNIT. FAILURE TO FOLLOW THOSE INSTRUCTIONS AND THE INSTRUCTION LISTED ABOVE AND ELSEWHERE IN THIS MANUAL COULD RESULT IN AN EXPLOSION, FIRE, EQUIPMENT FAILURE, OR ELECTROCUTION.



DANGER!

SOME COMPONENTS WITHIN THE CABINETS ARE NOT CONNECTED TO CHASSIS GROUND. ANY CONTACT BETWEEN FLOATING CIRCUITS AND THE CHASSIS IS A LETHAL SHOCK HAZARD.



DANGER!

TEST LIFT AND BALANCE THE CABINETS BEFORE MOVING. MAINTAIN MINIMUM TILT FROM VERTICAL AT ALL TIMES. THE BOTTOM STRUCTURE WILL SUPPORT THE UNIT ONLY IF THE FORKLIFT FORKS ARE COMPLETELY UNDERNEATH THE UNIT.



DANGER!

BE CONSTANTLY AWARE THAT THE UNIT SYSTEM CONTAINS HIGH DC AS WELL AS AC VOLTAGES. WITH INPUT POWER OFF AND THE BATTERY, DISCONNECTED, HIGH VOLTAGE AT THE FILTER CAPACITORS AND POWER CIRCUITS SHOULD DISCHARGE WITHIN 30 SECONDS. HOWEVER, POWER CIRCUIT FAILURES CAN OCCUR, SO YOU SHOULD ALWAYS ASSUME THAT HIGH VOLTAGE MIGHT STILL EXIST AFTER SHUTDOWN. VERIFY THAT POWER IS OFF USING AC AND DC VOLTMETERS BEFORE MAKING CONTACT.



DANGER!

LEAD-ACID BATTERIES CONTAIN HAZARDOUS MATERIALS. BATTERIES MUST BE HANDLED, TRANSPORTED, AND RECYCLED OR DISCARDED IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. BECAUSE LEAD IS A TOXIC SUBSTANCE, LEAD-ACID BATTERIES SHOULD BE RECYCLED RATHER THAN DISCARDED.

DO NOT DISPOSE OF BATTERIES IN A FIRE, THE BATTERIES MAY EXPLODE.

DO NOT OPEN OR MUTILATE THE BATTERIES. RELEASED ELECTROLYTE IS HARMFUL TO THE SKIN AND EYES AND MAY BE TOXIC.

A BATTERY CAN HAVE A HIGH SHORT CIRCUIT CURRENT AND PRESENT A RISK OF ELECTRICAL SHOCK. THE FOLLOWING PRECAUTIONS SHOULD BE OBSERVED WHEN WORKING ON BATTERIES:

1. REMOVE WATCHES, RINGS OR OTHER METAL OBJECTS.
2. USE TOOLS WITH INSULATED HANDLES.
3. WEAR RUBBER GLOVES AND BOOTS.
4. DO NOT LAY TOOLS OR METAL PARTS ON TOP OF BATTERIES.
5. DISCONNECT CHARGING SOURCE PRIOR TO CONNECTING OR DISCONNECTING BATTERY TERMINALS.
6. DETERMINE IF BATTERY IS INADVERTENTLY GROUNDED. IF SO, REMOVE THE SOURCE OF THE GROUND. CONTACT WITH ANY PART OF A GROUNDED BATTERY CAN RESULT IN ELECTRICAL SHOCK. THE LIKELIHOOD OF SUCH SHOCK WILL BE REDUCED IF SUCH GROUNDS ARE REMOVED DURING INSTALLATION AND MAINTENANCE.
7. LEAD-ACID BATTERIES CAN PRESENT A RISK OF FIRE BECAUSE THEY GENERATE HYDROGEN GAS. THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED:
 1. DO NOT SMOKE WHEN NEAR BATTERIES.
 2. DO NOT CAUSE FLAME OR SPARK IN BATTERY AREA.
8. DISCHARGE STATIC ELECTRICITY FROM YOUR BODY BEFORE TOUCHING BATTERIES BY FIRST TOUCHING A GROUNDED SURFACE.

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INSTRUCTIONS

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 200-490watt, 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.

Important Notice:

To be sure that the UPS will be open correctly, the following items should be noticed:

- a. Read instructions carefully before operating the UPS.
- b. UPS power connect instruction should be followed.
- c. Please don't open the case to prevent danger.
- d. If the UPS will be stored for long period, the battery must be charged once every 90 days.
- e. Retain the load within the rating of UPS to prevent faults.
- f. Handle unusual events according to the trouble-shooting guide.
- g. Keep the UPS clean and dry.

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 voltage 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.

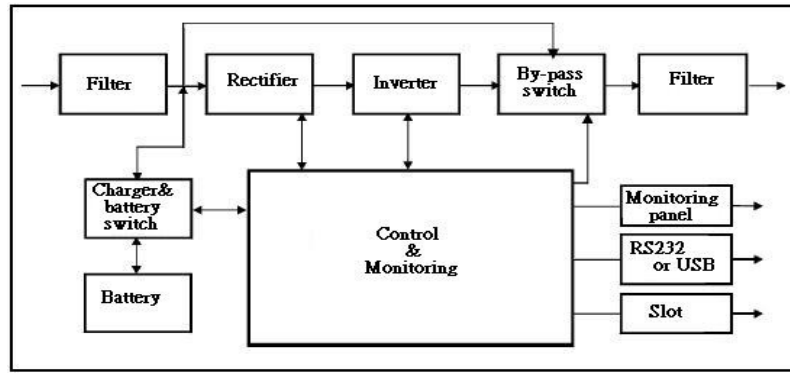


Fig.1. Block diagram

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.

Planning a UPS system, the following should be taken into consideration:

- The total demand of the protected system shall dictate the output power rating (Watts). Allow a margin for future expansion or calculation inaccuracies from measuring power requirements.
- Backup time at the indicated power rating is 90 minutes.

The following UPS models are available

Power-Lite Wall Mount Lighting Inverter 90 minute battery back up (Batt. 24 VDC)				
Total/ WATT	Model Numbers	Input/Output Voltages	BTU/ Hr	Cabinet Dimension (W"xH"xD")
200W	WM.20A01PP	120V/120V	216	24 X 17 X 9.5
	WM.20R01PP	277V/120V	233	
	WM.20R25PP	277V/277V	233	
	WM.20A25PP	120V/277V	233	
300W	WM.30A01PP	120V/120V	305	“
	WM.30R01PP	277V/120V	353	
	WM.30R25PP	277V/277V	353	
	WM.30A25PP	120V/277V	353	
490W	WM.49A01PP	120V/120V	499	“
	WM.49R01PP	277V/120V	543	
	WM.49R25PP	277V/277V	543	
	WM.49A25PP	120V/277V	543	
(NOTE) ** BTU/HR ARE APROX. NUMBER WITH TOLERANCE ± 15% FOR ALL MODELS				

3. Safety Information

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

Storage and Transportation

Please handle 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

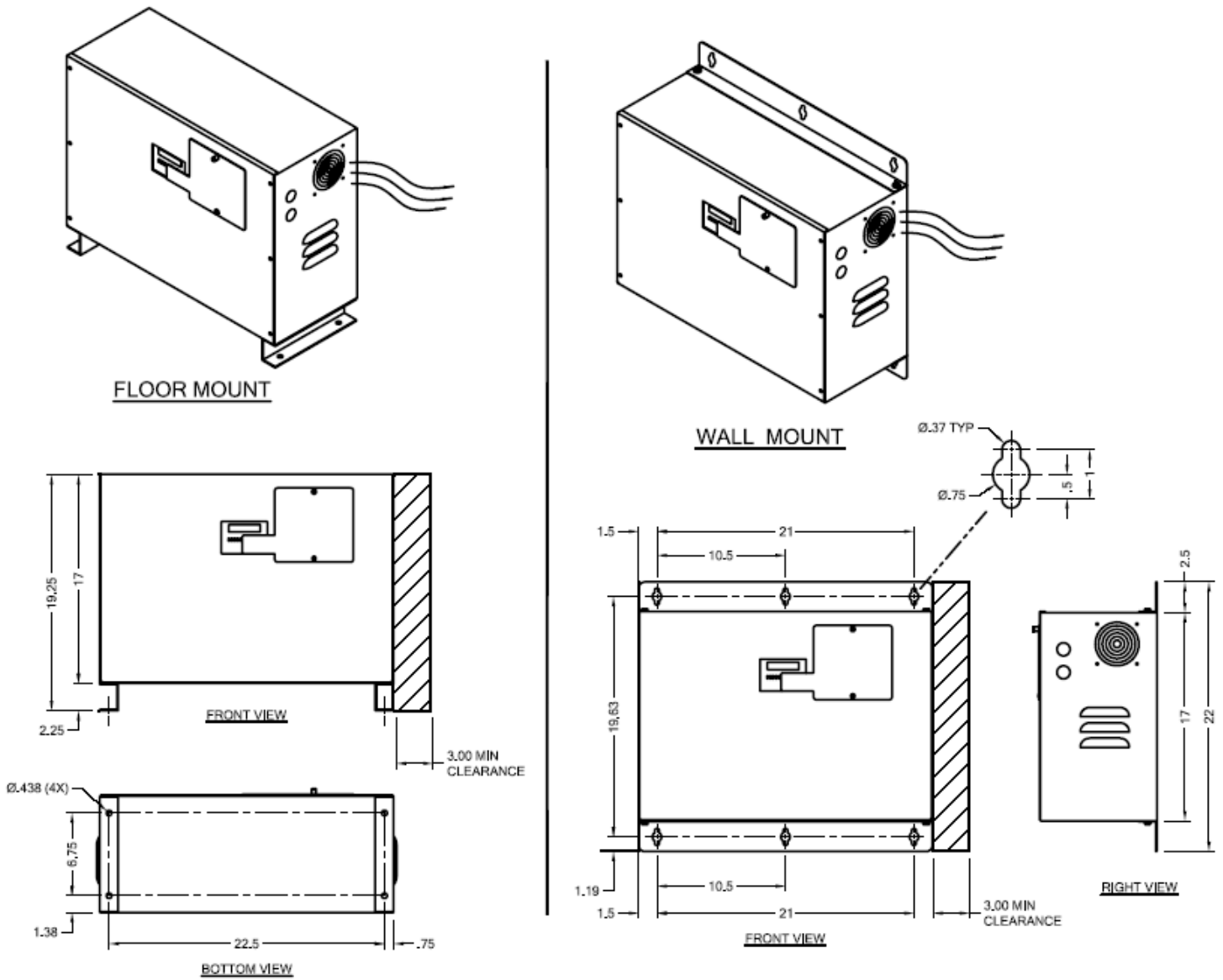
5.1 Environment

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.

Ensure that you remember the following when locating the UPS system and battery options:

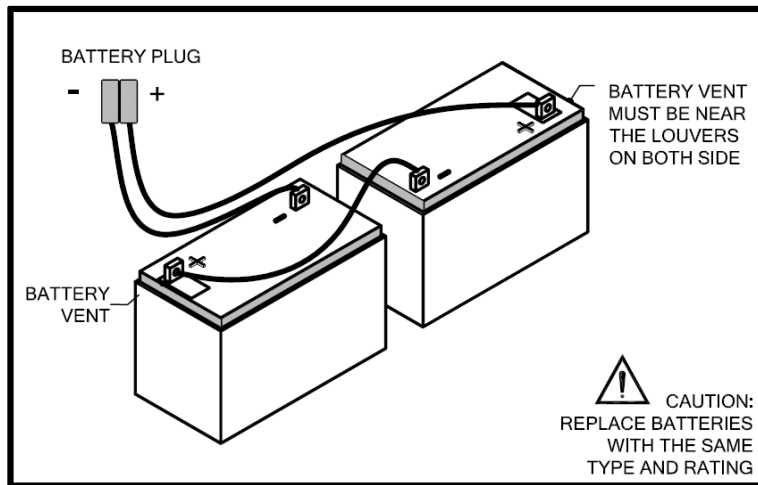
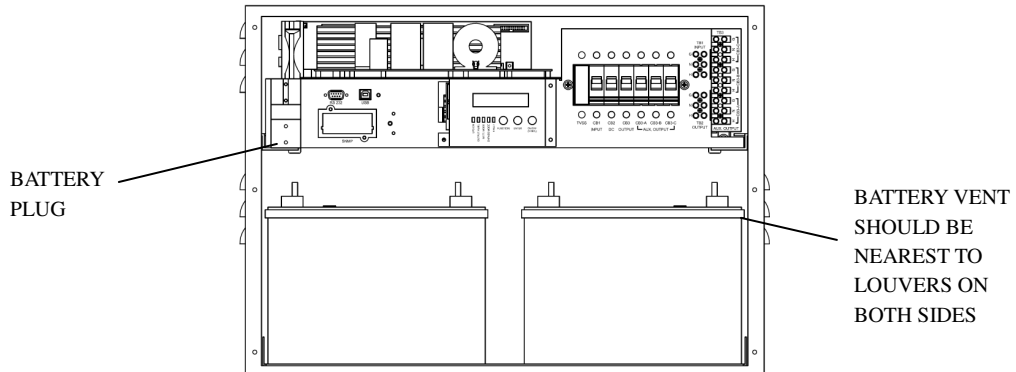
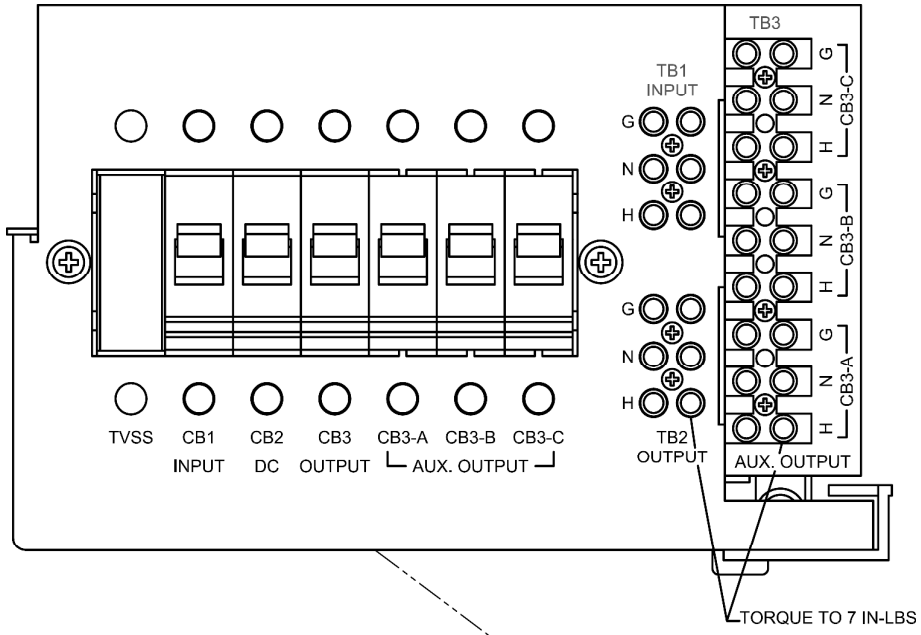
- Avoid extremes of temperature and humidity. Maximal battery life can be attained with a recommended temperature range of 15 °C to 25 °C.
- Provide protection for the equipment from moisture.
- Ensure that the front of the UPS remains clear for user operation.
- Space and ventilation requirements must be met (see below).

5.2 Installation Layout:

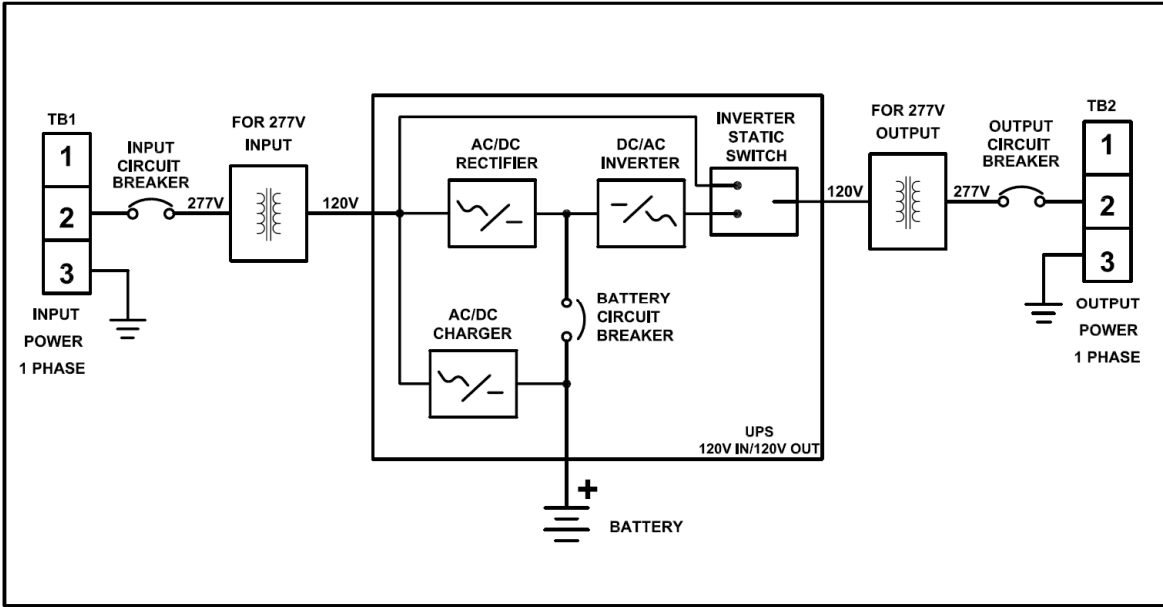


Customer to supply hardware and to ensure the wall structure and material is proper for the load handling of the unit

5.3 Connection to mains and loads



Battery connection




The installation is now complete.

6. Operation


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.

6.1 Starting and shutting down the UPS

Starting 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.
- 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.

Shutting down the UPS

- Shut down and turn off the loads.
- Push 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.
- In emergency situations, the EPO located on the back of the unit should be used.

6.2 Button Operation

Please note the three operating buttons on the front panel:

1. “” is an 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 an Enter button. Use this button to check content of UPS and the method is listed Below:
 - (a). Push 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). 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 fourteen 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.

6.3 Control Panel functions

Operation of the UPS is indicated on the monitor panel with five LED indicators and an LCD screen. This display is also capable of alerting the user with audible alarms.

- ON** This green LED is lit when UPS has been turned on.
- OUTPUT AVAIL** 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.
- BATT MODE** While operating in battery mode.
- BYPASS MODE** While operating in bypass mode, this LED will light up in yellow.
- FAULT** 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.

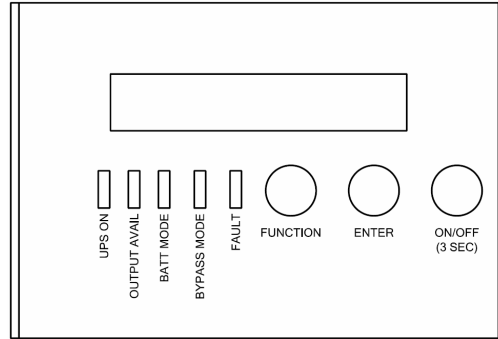


Figure 6. Control panel

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 pushing 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
BACKUP TIME= xx min	Shows Estimated Backup time in minutes
BAT CHARG= xx%	Shows approximate percentage of Battery capacity
TEMPERATURE= xxC	Shows approximate ambient temperature
BAT PACK NUM= x	Shows External Battery Pack Number
RATING = xxxVA	Shows UPS Rating
CPU VERSION xx.x	Shows CPU Version

UPS configurations

1. Various settings that have been chosen are shown in the UPS setting display.
2. To enter configuration mode, press the  button for one second. The first configuration parameter will be shown on the LCD display.
3. Press the  button to scroll through the parameters.
4. Press the  button to select the parameter.
5. 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.
6. 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
			100/110/115/120/127 V	120V
Input/Frequency	I/P F Setting	Select input frequency range when UPS goes into free run mode	±2% ±5% ±7%	±5%
Input/Bypass Voltage	I/P Bypass Set	Select Input Voltage range when bypass is available	±10% +10/-15% +15/-20%	+10/-15%
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
Management of Load groups	Outlet Setting	You can put the two load groups on and off form front panel	1 ON & 2 ON 1 OFF & 2 ON 1OFF & 2 OFF 1 ON & 2 OFF	Both load segments ON
Do Battery Test	Battery Test	Detect battery is normal or not.		
Silence Function	Silence Set	Enable or disable silence function	ON/OFF	OFF
Number of External battery Packs	Bat Cabinet Set	This setting is needed For UPS to predict Backup time	0 (only internal batteries) 1 (one external cabinet) 2 (two external cabinets)	0
Site wiring alarm	Sit Fault Set	You can enable or disable the site wiring alarm	Enable /Disable	Disable
Select Language	Language	Select load language	English, German, French, Spanish, Italian.	English
Set Generator Mode	Generator	Set unit in generator mode. ***	ON/OFF	OFF
Set RS232 communication	RS232 Control	Set RS232 communication enable or disable	Enable/Disable	Enable

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).

6.4 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 BYPASSED LED is on, UPS will no 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. 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 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.
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
Site wiring Fault	1 Beep per second	Voltage detected Between Neutral and Ground	UPS mains polarity is Wrong. UPS installed to mains supply without ground.
Line abnormal	1 Beep per second	Wrong AC Line backed up during auto restart	

8. Maintenance

With minimal maintenance, your UPS will provide years of trouble free service. However, a sub-standard operating environment can negatively impact that reliability. Ensure that the unit is installed in a location where the temperature and humidity will not exceed the published specifications and that the UPS is located in a clean, dust free area where air circulation is unobstructed. Also remember to clean the filters and interior if dust starts to accumulate.

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

8.1 Replacing batteries

The batteries may be replaced without turning off the UPS or disconnecting the load due to the hot-swappable battery feature.



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. Communication

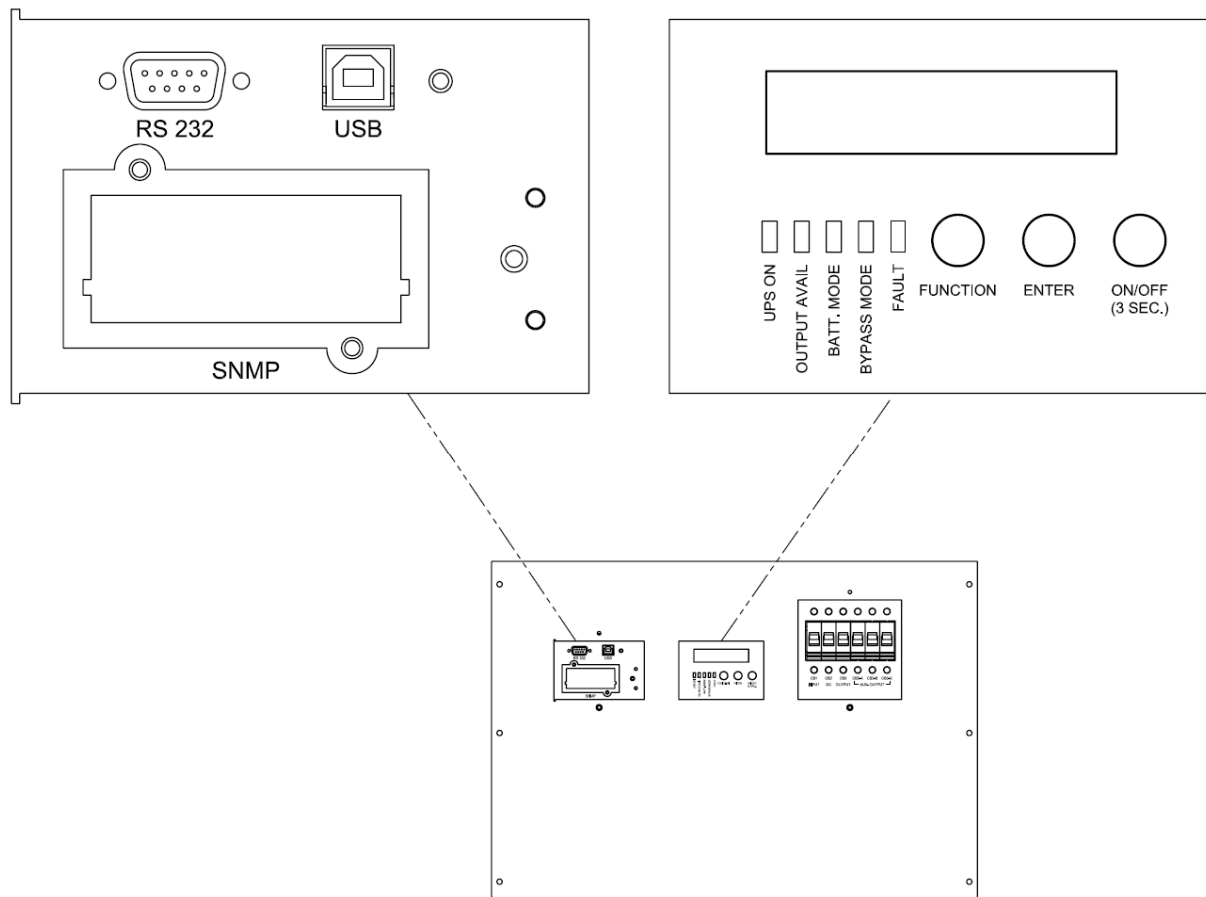
Communication ports are located on the front for easy access as shown below

One RS232 serial data interface, one USB data interface

In addition there is an optional interface slot (SNMP) Option 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 AS/400 card allows voltage free relay contacts. Your local dealer will have more information about these option cards.

Note the RS232 port cannot be used when the USB interface is in use.




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 are 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	Caution! Max rated values 12Vdc	itions
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

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.

10. Options

10.1 Auxiliary TVSS

10.2 Auxiliary Output Circuit Breaker 10 amp (max. 3)

10.3 SNMP

10.4 Communication interface, RS232

10.5 Floor mount brackets

10.6 Remote Status

11. Technical Specification

Specifications for 120V/277V				
Capacity (W)		200W	300W	490W
Input	Voltage	Single Phase 120Vac or 277V		
	Voltage Range	120Vac \pm 10% or 277V		
	Frequency	50Hz or 60Hz +/- 4Hz		
	Power Factor	> 95%		
Output	Voltage (on battery)	Single Phase 120Vac or 277V		
	Voltage Range	120Vac \pm 2% or 277V		
	Frequency (on battery)	50 / 60 Hz +/-0.5%		
	Transfer Time	0 ms		
	Overload Recovery	Auto transfer to UPS		
	High Efficiency mode (AC to AC)	> 95 %		
	UPS Design Technology	On-Line / Fully digitized microprocessor controlled		
Protection and Filtering	Surge Protection	120V (IEEE C62.41) / 230V (IEEEC61000-4-5 level 3)		
	Overload Protection	125% for 1 minutes and 150% for 10 seconds		
	Short Circuit Protection	Circuit breaker		
System/Display/ Warning	Visual Display (LED model)	UPS on(green), line-mode(green), battery mode(yellow), bypass(yellow), fault(red)		
	Visual Display (LCD model)	Input / output voltage, input / output frequency, on-line mode, back up mode, battery capacity, load level		
	Audible Alarm	Beep every 5 sec		
	UPS Fault	Continuous beeping sound and LCD display		
	Communication	RS-232 Serial Port and USB		
Battery	90 min.	2X35 A/H	2X50 A/H	2X50 A/H
Dimensions	Inches (width x Height x depth)	24 x 17 x 9.5		

Note: Due to continuous improvement specifications are subject to change without prior notice