PowerWalker VI 1100 CW IEC VI CW Series Automatic Voltage Regulator User Manual

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PowerWalker

PowerWalker VI 1100 CW IEC VI CW Series Automatic Voltage Regulator

Important Safety Warning

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully

Transportation

- Please transport the UPS system only in the original package to protect against shock and impact.

Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heater.
- Do not block ventilation holes in the UPS housing.

Installation

- Do not connect appliances or devices which would overload the UPS system to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked (or UL-marked for 110/115/120/127 VAC models) mains cable (e.g.

the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).

- Please use only VDE-tested, CE-marked (or UL-marked for 110/115/120/127 VAC models) power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.
- Temperature Rating – Units are considered acceptable for use in a maximum ambient of 40°C (104°F).
- For Pluggable Equipment – The socket-outlet shall be installed near the equipment and shall be easily accessible.

Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent no fluids or other foreign objects from inside of the UPS system.

Maintenance, service and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- Caution – risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.
- Caution – risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- Caution – Do not dispose of batteries in a fire. The batteries may explode.
- Caution – Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
    - Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries: Remove watches, rings, or other metal objects.
    - Use tools with insulated handles.
    - Wear rubber gloves and boots.
    - Do not lay tools or metal parts on top of batteries.
    - Disconnect charging source and load prior to installing or maintaining the battery.
    - Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

Manufacture	Type	Rated
Toplite (Guangzhou) Technology Battery Co Ltd (MH29104)	NPW45-12	12 V dc, 9.0 Ah
	UXW460-12	12 V dc, 9.0 Ah
	NPW36-12	12 V dc, 7.2 Ah
	UXW360-12	12 V dc, 7.2 Ah
	NPW45-12 FR	12 V dc, 7.0 Ah
	UXW460-12/FR	12 V dc, 7.0 Ah
	NPW36-12 FR	12 V dc, 7.0 Ah
CSB Battery Co Ltd (MH14533)	UXW360-12/FR	12 V dc, 7.0 Ah
	GP1272	12 V dc, 7.2 Ah
	UPS 12460 F2	12 V dc, 9.0 Ah
	UPS 12360 6	12 V dc, 6.5 Ah
	UPS 12360 7	12 V dc, 6.5 Ah
	HR 1234W	12 V dc, 8.5 Ah
	HR 1234W FR	12 V dc, 8.5 Ah
Yuasa Battery (Guangdong) Co Ltd (MH29616)	NPW45-12	12 V dc, 8.0 Ah
	NPW45-12FR	12 dc, 8.0 Ah

- When changing batteries, install the same number and same type of batteries.
- For UPS with internally mounted battery
  - Instructions shall carry sufficient information to enable the replacement of the battery with a suitable manufacturer and catalogue number.
  - Safety instructions to allow access by Service Personnel shall be stated in the installation/service handbook.
  - If batteries are to be installed by Service Personnel, instructions for interconnections, including terminal torque, shall be provided.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.
- **WARNING:** This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user many be required to take additional measures. (only for 220/230/240 VAC system)

Only for 110/115/120/127 VAC system:

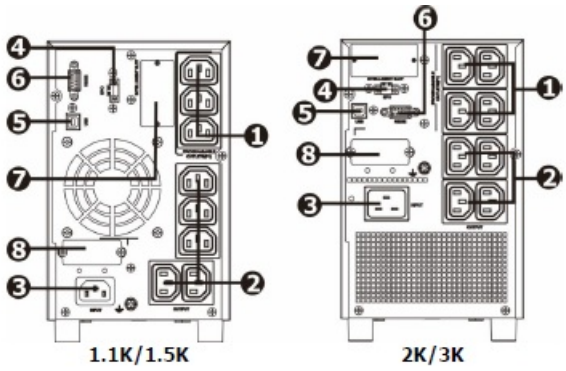
- **NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- **WARNING:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Installation And Setup

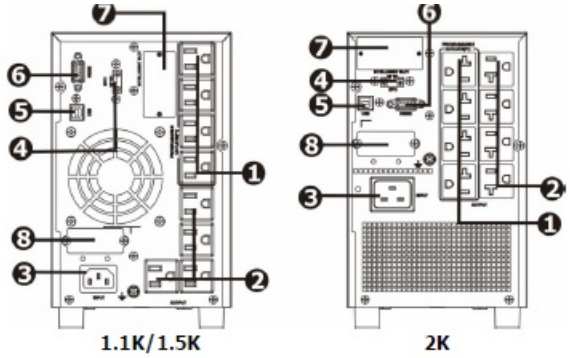
NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

Rear panel view

IEC Type



NEMA Type

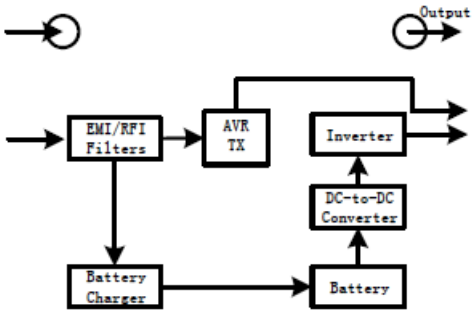


1. Programmable outlets: connect to non-critical loads.
2. Output receptacles: connect to mission-critical loads.
3. AC input
4. Emergency power off function connector (EPO)
5. USB communication port

6. RS-232 communication port
7. SNMP intelligent slot
8. External battery connector Output terminal

Operating principle

The operating principle of the UPS is shown as below.

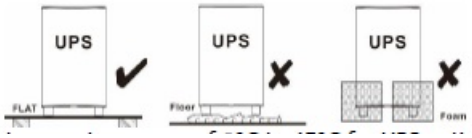


The UPS is composed of mains input, EMI/RFI filters, inverter, battery charger, DC-to-DC converter, battery, AVR TX and UPS output

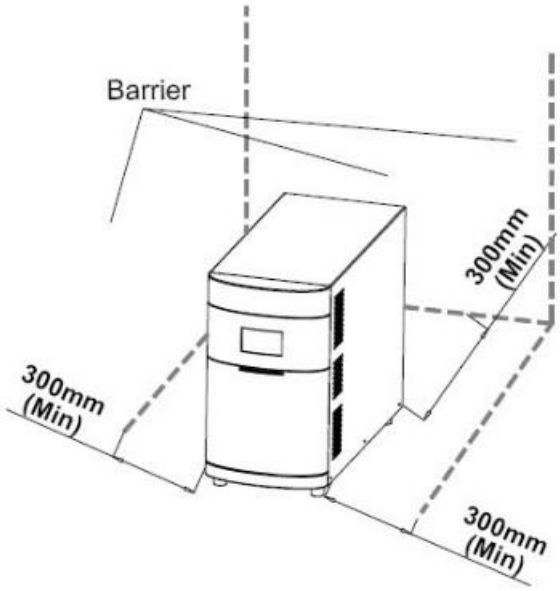
Setup the UPS

Before installing the UPS, please read below to select proper location to install UPS.

1. UPS should be placed on the flat and clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive and conductive contaminants. Install the UPS indoors in a clean environment, where it is away from window and door. Maintain minimum clearance of 100mm in the bottom of the UPS to avoid dust and high temperature.

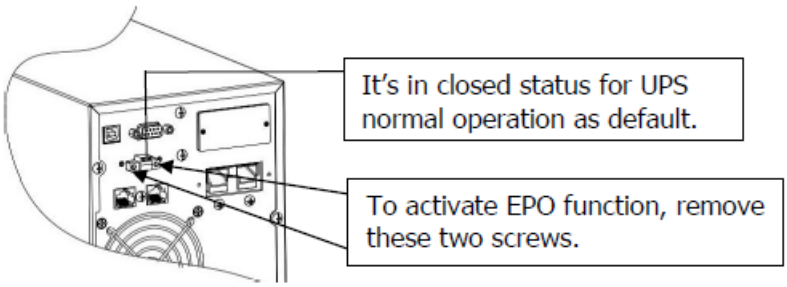


2. Maintain an ambient temperature range of 0ºC to 45ºC for UPS optimal operation. For every 5ºC above 45ºC, the UPS will derate 12% of nominal capacity at full load. The highest working temperature requirement for UPS operation is 50ºC.
3. It's required to maintain maximum altitude of 1000m to keep UPS normal operation at full load UPS. If it's used in high altitude area, please reduce connected load. Altitude derating power with connected loads for UPS normal operation is listed as below:



4. Place UPS:
   It's equipped with fan for cooling. Therefore, place the UPS in a well-ventilated area. It's required to maintain minimum clearance of 100mm in the front of the UPS and 300mm in the back and two sides of the UPS for heat dissipation and easy-maintenance.

- Step 1: UPS input connection
  Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.
- Step 2: UPS output connection
  There two kinds of outputs: programmable outlets and general outlets. Please connect non-critical devices to the programmable outlets and critical devices to the general outlets. During power failure, you may extend the backup time to critical devices by setting shorter backup time for non-critical devices.
- Step 3: Communication connection
  Communication port:
  USB port RS-232 port Intelligent slot
  To allow for unattended UPS shutdown/start-up and status monitoring, connect the communication cable one end to the USB/RS-232 port and the other to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/start-up and monitor UPS status through PC. The UPS is equipped with intelligent slot perfect for either SNMP or AS400 card. When installing either SNMP or AS400 card in the UPS, it will provide advanced communication and monitoring options.
- Step 4: Disable and enable EPO function
  This UPS is equipped with EPO function. By default, the UPS is delivered from factory with Pin 1 and pin 2 closed (a metal plate is connected to Pin 1 and Pin2) for UPS normal operation. To activate EPO function, remove two screws on EPO port and green connector will be removed. Note: The EPO function logic can be set up via LCD setting. Please refer to program 8 in UPS setting for the details.



- Step 5: Turn on the UPS

Press the ON/Mute button on the front panel for two seconds to power on the UPS.

Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

- Step 6: Install software

  For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. Use supplied RS-232 or USB communication cable to connect RS-232/USB port of UPS and RS-232/USB port of PC. Then, follow below steps to install monitoring software.

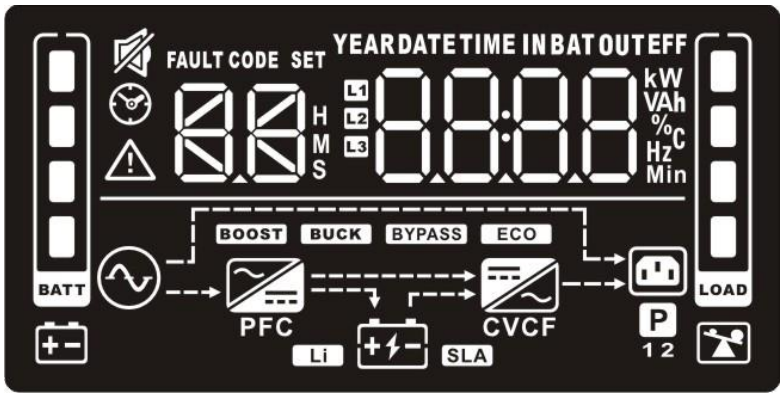
  - Insert the included installation CD into CD-ROM drive and then follow the on-screen instructions to proceed software installation. If there no screen shows 1 minute after inserting the CD, please execute setup.exe file for initiating software installation.
  - Follow the on-screen instructions to install the software.
  - When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

Operations

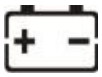
Button operation

Button	Function
ON/MUTE Button	Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS. Mute the alarm: After the UPS is turned on in battery mode, press and hold this button f or at least 3 seconds to disable or enable the alarm system. But it's not applied to the si tuations when warnings or errors occur. Up key: Press this button to display previous selection in UPS setting mode. Switch to UPS self-test mode: Press and hold ON/Mute button for 3 seconds to enter U PS self-testing while in AC mode
OFF/ENTER Button	Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS Confirm selection key: Press this button to confirm selection in UPS setting mode.
SELECT Button	Switch LCD message: Press this button to change the LCD message for input voltage, i nput frequency, battery voltage, battery capacity, ambient temperature, output voltage, output frequency, load current and load percentage. Setting mode: Press and hold this button for 3 seconds to enter UPS setting mode whe n UPS is off. Down key: Press this button to display next selection in UPS setting mode.
ON/Mute + Select Bu tton	Exit setting mode or return to the upper menu: When working in setting mode, press O N/Mute and Select buttons simultaneously for 0.2 seconds to return to the upper menu. If it's already in top menu, press these two but tons at the same time to exit the setting mode.

LCD Panel



Configuration and fault information	
	Indicates the configuration items, and the configuration items are listed in details in section 3-5.
	Indicates the warning and fault codes, and the codes are listed in details in section 3-7 and 3-8.
Mute operation	
	Indicates that the UPS alarm is disabled.
Input, Battery, Temperature, Output & Load information	
	Indicate the input voltage, input frequency, battery voltage, battery capacity, ambient temperature, output voltage, output frequency, load current and load percentage. k: kilo, W: watt, V: voltage, A: ampere, %: percent, ℃: centigrade degree, Hz: frequency
Load information	
	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.
	Indicates overload.
Programmable outlets information	
P	Indicates that programmable management outlets are working.
Mode operation information	
~	Indicates the UPS connects to the mains.
ECO	Indicates the battery is working.

BOOST	Indicates charging status
BUCK	Indicates the ECO mode is enabled.
	Indicates the UPS is working in boost mode
	Indicates the UPS is working in buck mode
	Indicates the AC to DC circuit is working.
~	Indicates the inverter circuit is working.
	Indicates the output is working.
Battery information	
	Indicates the battery level by 0-24%, 25-49%, 50-74%, and 75-100%.
+-	Indicates low battery.

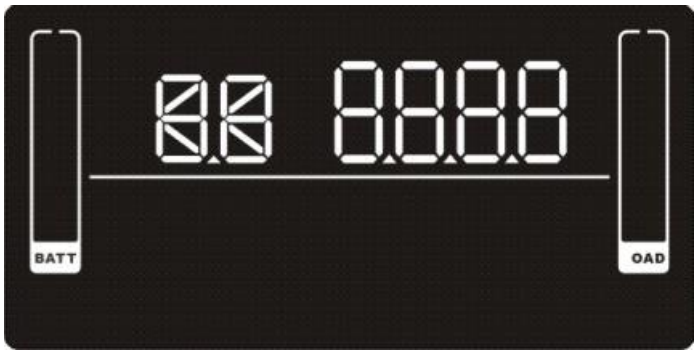
Audible Alarm

Battery Mode	Sounding every 10 seconds
Low Battery	Sounding every 2 seconds
Overload	Sounding every second
Fault	Continuously sounding

LCD display wordings index

Abbreviation	Display content	Meaning
ENA	**END**	Enable
DIS	**ELS**	Disable
ESC	**ESC**	Escape
AO	**AO**	Active Open
AC	**AC**	Active Close
OK	**OK**	OK
ON	**ON**	ON
BL	**PL**	Battery Low
OL	**OL**	Over Load
NC	**ON**	No Connect
OC	**SF**	Over Charge
SF	**EP**	Site wiring fault
EP	**EF**	EPO
TP	**CH**	Temperature
CH	**HF**	Charger
BF	**HR**	Battery Fault
BR	**PF**	Battery Replace
EE	**FF**	EEPROM error

UPS Setting

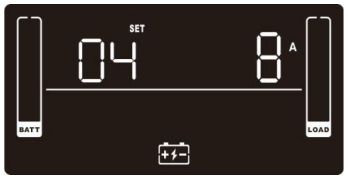


There are two parameters to set up the UPS.
Parameter 1: It's for program alternatives. Refer to below table.
Parameter 2 is the setting options or values for each program.

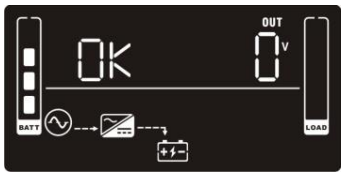
- 01: Output voltage setting
- 02: Programmable outlets enable/disable
- 03: Programmable outlets setting
- 04: Maximum charger current setting

- 06: Autonomy limitation setting
- 07: Battery total AH setting
- 08: EPO logic setting
- 00: Exit setting

Steps for setting programmable outlet

Step 1: Before entering setting mode, the UPS should be in Stand-by mode (off-charging) and make sure the battery is connected. The LCD display is shown as r ight.	
Step 2: Press and hold the “Selection” button for 3 seconds to enter Setting mod e.	
Step 3: Press the “Up“ button (ON/MUTE) to switch to “02” of program list. Then press “Enter“ button to enter value setting of parameter 2. Press the “Up” button to change the value to “ENA” to enable the programmable outlet function. Then press “Enter” button again to confirm the set ting.	
Step 4: Press the “Up“ button (ON/MUTE) again to switch to “03” of program list. Then press “Enter“ button for setting programmable outlet time. Push “Up” button to change the value of backup time according your demand. Then press “Enter” t o confirm the setting.	
Step 5: Press “Up“ button (ON/MUTE) to switch to “00” of program list. Then pre ss “Enter” button to exit setting menu.	
Step 6: Disconnect AC input and wait until the LCD display is off. The new setting will be activated when turning on the UPS again.	

Operating Mode Description

Operating mode	Description	LCD display
ECO mode	When the input voltage is within voltage regulated range, UPS will power the output directly from the mains. ECO is an abbreviation of Efficiency Corrective Optimizer. In this mode, when battery is fully charged, the fan will sto p working for energy saving.	
Buck mode when A C is normal.	When the input voltage is higher than the voltage regulatio n range but lower than high loss point, the buck AVR will b e activated.	
Boost mode when A C is normal.	When the input voltage is lower than the voltage regulatio n range but higher than low loss point, the boost AVR will be activated.	
Battery mode	When the input voltage is beyond the acceptable range or power failure, UPS will backup power from battery and ala rm is sounding every 10 seconds.	
Standby mode	UPS is powered off and no output supply power, but still c an charge batteries.	
Fault mode	When a fault occurs, the ERROR icon and the fault code will be displayed.	

Faults Reference Code

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start fail	01	x	Inverter output short	14	x
Bus over	02	x	Battery voltage too high	27	x
Bus under	03	x	Battery voltage too low	28	x
Inverter soft start fail	11	x	Over temperature	41	x
Inverter voltage high	12	x	Over load	43	
Inverter voltage Low	13	x	Charger failure	45	x

Warning indicator

Warning	Code	Alarm
Low Battery	**hl**	Sounding every 2 seconds
Overload	**OL**	Sounding every second
Battery is not connected	**NC**	Sounding every 2 seconds
Over Charge	**OC**	Sounding every 2 seconds
Site wiring fault	**SF**	Sounding every 2 seconds
EPO enable	**EP**	Sounding every 2 seconds
Over temperature	**EP**	Sounding every 2 seconds
Charger failure	**CH**	Sounding every 2 seconds
Battery fault	**HF**	Sounding every 2 seconds (At this time, UPS is off to remind users something wrong with battery)
Battery replacement	**PR**	Sounding every 2 seconds
EEPROM error	**EE**	Sounding every 2 seconds

NOTE: “Site Wiring Fault” function can be enabled/disabled via software. Please check software manual for the details.

Troubleshooting

If the UPS system does not operate correctly, please solve the problem by using the table below.

Symptom		**Possible cause**	**Remedy**
No indication and alarm even though the mains is normal.		The AC input power is not conne cted well.	Check if input power cord firmly c onnected to the mains.
		The AC input is connected to the UPS output.	Plug AC input power cord to AC i nput correctly.
The icon	and the warning	EPO function is activated.	Set the circuit in closed
code flashing on LCD display and alarm is sounding every 2			position to disable EPO function.

seconds.		
The icon , and the warning code f lashing on LCD display and alarm is sou nding every 2 seconds.	Line and neutral conductors of U PS input are reversed.	Rotate mains power socket by 180° and then connect to UPS sy stem.
The icon , and the warning code fla shing on LCD display and alarm is sound ing every 2 seconds.	The external or internal battery i s incorrectly connected.	Check if all batteries are connect ed well.
Fault code is shown as 27 on LCD displa y and alarm is continuously sounding.	Battery voltage is too high or the charger is fault.	Contact your dealer.
Fault code is shown as 28 on LCD displa y and alarm is continuously sounding.	Battery voltage is too low or the charger is fault.	Contact your dealer.
The icon , and the warning code flas hing on LCD display and alarm is soundi ng every second.	UPS is overload	Remove excess loads from UPS output.
	UPS is overloaded. Devices con nected to the UPS are fed directl y by the electrical network via th e Bypass.	Remove excess loads from UPS output.
	After repetitive overloads, the U PS is locked in the Bypass mode . Connected devices are fed dire ctly by the mains.	Remove excess loads from UPS output first. Then shut down the UPS and restart it.
Fault code is shown as 43 and the icon i s lighting on LCD display. Alarm is contin uously sounding.	The UPS shut down automaticall y because of overload at the UP S output.	Remove excess loads from UPS output and restart it.

Storage and Maintenance

Operation

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer. Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

Storage

Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During

storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C – 40°C	Every 3 months	1-2 hours
40°C – 45°C	Every 2 months	1-2 hours

Specifications

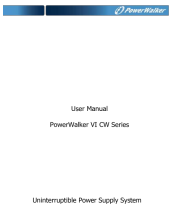
MODEL	**1.1K**	**1.5K**	**2K**	**3K***
CAPACITY	1100 VA / 770 W	1500 VA / 1050 W	2000 VA / 1400 W	3000 VA / 2100 W
INPUT				
Acceptable Voltage Range	81-134 VAC/86-139 VAC/89-145AVC/102-152 VAC or 162-268 VAC/162-268 VAC/170-280AVC/177-290 VAC			
Frequency Range	60/50 Hz ± 5 Hz (auto sensing)			
OUTPUT				
Voltage Regulation (AC Mode)	110 (-15%/+10%) /115(-14%/+10%)/120(-14%/+10%)/127(-12%/+10%) VAC or 208 (-10%/+16%) /220(-15%/+10%)/230(-15%/+10%)/240(-15%/+10%) VAC			
Voltage Regulation (Batt. Mode)	110/115/120/127 VAC or 208/220/230/240 VAC ±1.5%(before battery alarm)			
Frequency Range (Batt. Mode)	50 Hz or 60 Hz ± 0.1 Hz			
Current Crest Ratio	3:1			
Harmonic Distortion	2% max @ 100% linear load, 5% max @ 100% non-linear load (before low battery alarm)			
Transfer Time	Typical 2-6 ms, 10ms max.			
Waveform (Batt. Mode)	Pure Sine Wave			
Overload capacity	AC mode	103%~120% (-5%/+10%) 5 minutes 120%~150% (-5%/+10%) 10 sec >150%(-5%/+10%) 1 sec		

	Battery mode	103%~110% (-5%/+10%) 1 minutes 110%~150% (-5%/+10%) 10 sec >150%(-5%/+10%) 0.5 sec			
EFFICIENCY					
AC Mode		96%			
Buck & Boost Mode		95%			
Battery Mode		≧ 88%, up to 90% @ nominal battery voltage			
BATTERY					
Battery Type & Number		12 V/7 Ahx2	12 V/9 Ahx2	12 V/7 Ahx4	12 V/9 Ahx4
Charging Voltage		27.4 VDC ± 1%		54.8 VDC ± 1%	
Recharge Time		4 hours recover to 90% capacity			
PROTECTION					
Full Protection		Overload, short, discharge, and overcharge protection			
ALARM					
Battery Mode		Sounding every 10 seconds			
Low Battery		Sounding every 2 seconds			
Overload		Sounding every second			
Battery Replacement Alarm		Sounding every 2 seconds			
Fault		Continuously sounding			
PHYSICAL					
Dimension, DXWXH (mm)		397 x 145x 220		455 x 145x 220	
Net Weight (kg)		11.65	12.35	18.1	20.3
ENVIRONMENT					
Operating Humidity		0-90 % RH @ 0- 40°C (non-condensing)			
Noise Level		Less than 45dB			
MANAGEMENT					

Smart RS-232/USB	Supports Windows® 2000/2003/XP/Vista/2008, 7/8/10, Linux, Unix, and MAC
Optional SNMP	Power management from SNMP manager and web browser

* Only available for 208/220/230/240VAC system.
Product specifications are subject to change without further notice.

Documents / Resources

	PowerWalker VI 1100 CW IEC VI CW Series Automatic Voltage Regulator [pdf] User Manual VI 1100 CW, IEC VI CW Series, Automatic Voltage Regulator, VI 1100 CW IEC VI CW Series Automatic Voltage Regulator, IEC VI CW Series Automatic Voltage Regulator, Voltage Regulator, Regulator