

1KVA - 2KVA - 3KVA ONLINE UPS PS-POU1K#2B9A



PS-POU1K#2B9A PS-POU2K#4B9A PS-POU3K#6B9A

USER MANUAL



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SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

This manual contains important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

DANGER



The UPS contains **LETHAL VOLTAGES.** All repairs and service should be performed by **AUTHORIZED SERVICE PERSONNEL ONLY.** There are **NO USER SERVICEABLE PARTS** inside the UPS.

WARNING



- The UPS contains its own energy source (batteries). The UPS output may carry live voltage even when the UPS is not connected to an AC supply
- To reduce the risk of fire or electric shock, install the UPS in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 40°C (104°F). Do not operate near water or excessive humidity (90% maximum).
- To reduce the risk of fire, connect only to a circuit provided with branch circuit overcurrent protection in accordance with the National Electrical Code (NEC), ANSI/NFPA 70.
- Output overcurrent protection and disconnect switch must be provided by others.
- To comply with international standards and wiring regulations, the sum of the leakage current of the UPS and the total equipment connected to the output of the UPS must not have an earth leakage current greater than 3.5 mA.
- If the UPS requires any type of transportation, verify that the UPS is unplugged and turned off and then disconnect the UPS internal battery connector.

CAUTION



- Batteries can present a risk of electrical shock or burn from high short-circuits current. Observe proper precautions. Servicing should be performed by qualified service personnel knowledgeable of batteries and required precautions. Keep unauthorized personnel away from batteries.
- Proper disposal of batteries is required. Refer to your local codes for disposal requirements.
- Never dispose of batteries in a fire. Batteries may explode when exposed to flame.

• Symbol Conventions

• The symbols that may be found in this document are defined as follows.

Symbol	Description	
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.	
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.	
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.	
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.	
	NOTICE is used to address practices not related to personal injury.	
	Calls attention to important information, best practices and tips.	
	NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.	
Pb	This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed of properly. For more information, contact your local recycling/reuse or hazardous waste center.	
X	This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.	

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1. 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

1-1. Transportation

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

1-2. 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.

1-3. Installation

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) 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 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 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.

1-4. 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.

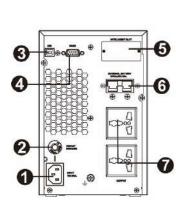
1-5. Maintenance, service and faults

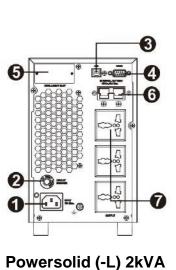
- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- **Caution** risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery 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!
- 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 wristwatches, rings and other metal objects
 - Use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- 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.

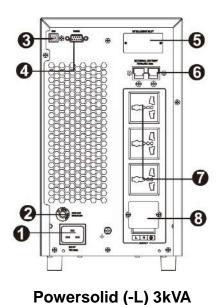
2. Installation and setup

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.

2-1. Rear panel view







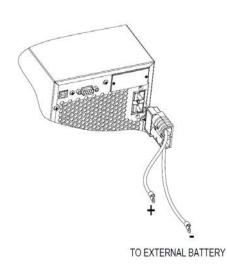
Powersolid (-L) 1kVA

- 1. AC input
- 2. Input circuit breaker
- 3. USB communication port
- 4. RS-232 communication port
- 5. SNMP intelligent slot (option)
- 6. External battery connection (For long back up models)
- 7. Output receptacles
- 8. Output terminal

2-2. Setup the UPS

Step 1: External battery wires

Please connect external batteries as below chart. (For long back up models)



Step 2: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords. The power cord is supplied in the UPS package.

Step 3: UPS output connection

- For socket-type outputs, simply connect devices to the outlets.
- For terminal-type input or outputs, please follow below steps for the wiring configuration:
 - a) Remove the small cover of the terminal block
 - b) Suggest using AWG14 or 2.1mm² power cords for 3KVA (200/208/220/230/240VAC models). Suggest using AWG12-10 or 3.3mm²-5.3mm² power cords for 3KVA (100/110/115/120/127VAC models). Please also install a circuit breaker (40A) between the mains and AC input of UPS in 3KVA (100/110/115/120127VAC models) for safety operation. Upon completion of the wiring configuration, please check whether the wires are securely affixed.
 - c) Upon completion of the wiring configuration, please check whether the wires are securely affixed.
 - d) Put the small cover back to the rear panel.

Step 4: Communication connection

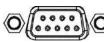
Communication port:

USB port

RS-232 port

Intelligent slot

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status monitoring,

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.

PS. USB port and RS-232 port can't work at the same time

Step 7: 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 8: Install software

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown.

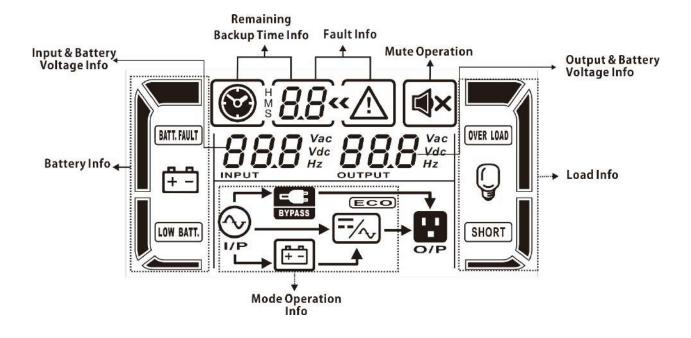
- Insert the included installation CD into CD-ROM drive and then follow the on-screen instructions to proceed software installation. If there no screen shows 1 minute after inserting the CD, please execute setup.exe file for initiating software installation.
- 2. If you don't have CD, The program can be set up by downloading the <u>www.powersolid.vn</u> or <u>http://www.power-software-download.com</u> web site. You run the setup.exe file after downloading the program
- 3. Follow the on-screen instructions to install the software.
- 4. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

3. Operations

3-1. Button operation

Button	Function	
	Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS.	
ON/Mute Button	Mute the alarm: After the UPS is turned on in battery mode, press and hold this button for at least 5 seconds to disable or enable the alarm system. But it's not applied to the situations 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 ON/Mute buttons for 5 seconds to enter UPS self-testing while in AC mode, ECO mode, or converter mode.	
OFF/Enter Button	Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. UPS will be in standby mode under power normal or transfer to Bypass mode if the Bypass enable setting by pressing this button.	
	 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, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, load current and load percent. It will return back to default display when pausing for 10 seconds.	
	Setting mode: Press and hold this button for 5 seconds to enter UPS setting mode when Standby or Bypass mode.	
	Down key: Press this button to display next selection in UPS setting mode.	
ON/Mute + Select Button	Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 5 seconds. Then UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range.	

3-2. LCD Panel



Display	Function	
Remaining backup tim	e information	
	Indicates the remaining backup time in pie chart.	
M 88	Indicates the remaining backup time in numbers. H: hours, M: minute, S: second	
Fault information		
~~ <u>\</u>	Indicates that the warning and fault occurs.	
8.8	Indicates the warning and fault codes, and the codes are listed in details in 3-5 section.	
Mute operation		
×	Indicates that the UPS alarm is disabled.	
Output & Battery voltage information		
888 Vac Vdc Hz	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency	

Display	Function		
Load information			
	Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%.		
OVER LOAD	Indicates overload.		
SHORT	Indicates the load or the UPS output is short circuit.		
Mode operation inform	nation		
	Indicates the UPS connects to the mains.		
+ -	Indicates the battery is working.		
BYPASS	Indicates the bypass circuit is working.		
ECO	Indicates the ECO mode is enabled.		
/~,	Indicates the Inverter circuit is working.		
1 0/P	Indicates the output is working.		
Battery information			
	Indicates the Battery level by 0-25%, 26-50%, 51-75%, and 76-100%.		
BATT. FAULT	Indicates the battery is fault.		
LOW BATT.	Indicates low battery level and low battery voltage.		
Input & Battery voltag	e information		
888 Vac Vdc Hz	Indicates the input voltage or frequency or battery voltage. Vac: Input voltage, Vdc: battery voltage, Hz: input frequency		

3-3. Audible Alarm

Battery Mode	Sounding every 4 seconds	
Low Battery	Sounding every seconds	
Overload	Sounding every second	
Fault	Continuously sounding	
Bypass Mode	Sounding every 10 seconds	

3-4. LCD display wordings index

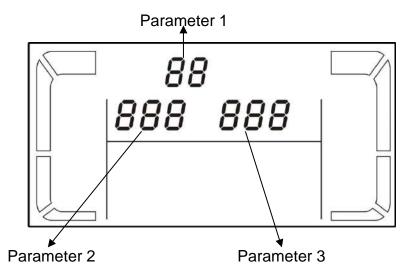
Abbreviation	Display content	Meaning
ENA	EN8	Enable
DIS	di S	Disable
ESC	850	Escape
HLS	НLS	High loss
LLS	LLS	Low loss
BAT	685	Battery
CF	CF	Converter
TP	Ł٩	Temperature
СН	CH	Charger
FU	FU	Bypass frequency unstable
EE	66	EEPROM error

3-5. UPS Setting

There are three parameters to set up the UPS.

Parameter 1: It's for program alternatives. Refer to below table.

Parameter 2 and parameter 3 are the setting options or values for each program.

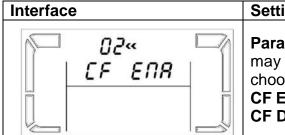


• 01: Output voltage setting

Interface		00
	0 /« 230 ^v	F

Setting		
Parameter 3: Output voltage		
You may choose the following output voltage:		
200: presents output voltage is 200Vac		
208: presents output voltage is 208Vac		
220: presents output voltage is 220Vac		
230: presents output voltage is 230Vac (Default)		
240: presents output voltage is 240Vac		

• 02: Frequency Converter enable/disable



Setting
Parameter 2 & 3: Enable or disable converter mode. You may
choose the following two options: CF ENA: converter mode enable CF DIS: converter mode disable (Default)

• 03: Output frequency setting

Interface	Setting
	 Parameter 2 & 3: Output frequency setting. You may set the initial frequency on battery mode: BAT 50: presents output frequency is 50Hz BAT 60: presents output frequency is 60Hz If converter mode is enabled, you may choose the following output frequency: CF 50: presents output frequency is 50Hz CF 60: presents output frequency is 60Hz

• 04: ECO enable/disable

Interface	Setting
04«	Parameter 3: Enable or disable ECO function. You may choose the following two options:
<i>ENR</i>	ENA: ECO mode enable
<i>ENR</i>	DIS: ECO mode disable (Default)

• 05: ECO voltage range setting

Interface	Setting
	 Parameter 2 & 3: Set the acceptable high voltage point and low voltage point for ECO mode by pressing Down key or Up key. HLS: High loss voltage in ECO mode in parameter 2. The setting range in parameter 3 is from +7V to +24V of the nominal voltage. (Default: +12V) LLS: Low loss voltage in ECO mode in parameter 2. The setting range in parameter 3 is from -7V to -24V of the nominal voltage. (Default: -12V)

• 06: Bypass enable/disable when UPS is off

Interface	Setting
05« <i>ENR</i>	Parameter 3: Enable or disable Bypass function. You may choose the following two options: ENA: Bypass enable DIS: Bypass disable (Default)

• 07: Bypass voltage range setting

Interface	Setting
07« HLS 280 ^{vac}	 Parameter 2 & 3: Set the acceptable high voltage point and acceptable low voltage point for Bypass mode by pressing the Down key or Up key. HLS: Bypass high voltage point 230-264: setting the high voltage point in parameter 3 from 230Vac to 264Vac. (Default: 264Vac) LLS: Bypass low voltage point 170-220: setting the low voltage point in parameter 3 from 170Vac to 220Vac (Default: 170Vac)

• 08: Autonomy limitation setting

Interface	Setting
© ∗08« <u>999</u> 	 Parameter 3: Set up backup time on battery mode for general outlets. 0-999: setting the backup time in minutes from 0-999 for general outlets on battery mode. 0: When setting as "0", the backup time will be only 10 seconds. 999: When setting as "999", the backup time setting will be disabled. (Default)

• 00: Exit setting

3-6. Operating Mode Description

Operating mode	Description	LCD display
Online mode	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at online mode.	
ECO mode	Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving.	
Frequency Converter mode	When input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.	
Battery mode	When the input voltage is beyond the acceptable range or power failure and alarm is sounding every 4 second, UPS will backup power from battery.	
Bypass mode	When input voltage is within acceptable range but UPS is overload, UPS will enter bypass mode or bypass mode can be set by front panel. Alarm is sounding every 10 second.	
Standby mode	UPS is powered off and no output supply power, but still can charge batteries.	

3-7. Faults Reference Code

Fault event	Fault event Fault code Icon Fault event		Fault code	lcon	
Bus start fail	01	x	Inverter output short	14	SHORT
Bus over	02	х	Battery voltage too high	27	BATT. FAULT
Bus under	03	х	Battery voltage too low	28	BATT. FAULT
Bus unbalance	04	х	Over temperature	41	х
Inverter soft start failure	11	х	Overload	43	OVER LOAD
Inverter voltage high	12	х	Charger failure	45	х
Inverter voltage Low	13	х			

3-8. Warning indicator

Warning	Icon (flashing)	Alarm
Low Battery	LOW BATT.	Sounding every second
Overload	OVER LOAD	Sounding twice every second
Battery is not connected	⚠ 🖽	Sounding every second
Over Charge		Sounding every second
Over temperature	<u> </u>	Sounding every second
Charger failure	[н 🛆	Sounding every second
Battery fault	BATT. FAULT	Sounding every second
Out of bypass voltage range	BYPASS	Sounding every second
Bypass frequency unstable	FU 🛆	Sounding every second
EEPROM error	EE 🛆	Sounding every second

4. Troubleshooting

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

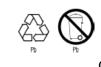
Symptom	Possible cause	Remedy	
No indication and alarm even	The AC input power is not connected well.	Check if input power cord firmly connected to the mains.	
though the mains is normal.	The AC input is connected to the UPS output.	Plug AC input power cord to AC input correctly.	
The icon And I flashing on LCD display and alarm is sounding every second.	The external or internal battery is incorrectly connected.	Check if all batteries are connected well.	
Fault code is shown as 27 and the icon BATT.FAULT is lighting on LCD display and alarm is continuously sounding.	Battery voltage is too high or the charger is fault.	Contact your dealer.	
Fault code is shown as 28 and the icon BATT.FAULT is lighting on LCD display and alarm is continuously sounding.	Battery voltage is too low or the charger is fault.	Contact your dealer.	
	UPS is overload	Remove excess loads from UPS output.	
The icon A and OVER LOAD is flashing on LCD display and alarm is sounding twice every second.	UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the Bypass.	Remove excess loads from UPS output.	
	After repetitive overloads, the UPS is locked in the Bypass mode. Connected devices are fed directly 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 OVER LOAD is lighting on LCD display and alarm is continuously sounding.	The UPS shut down automatically because of overload at the UPS output.	Remove excess loads from UPS output and restart it.	

Symptom	Possible cause	Remedy	
Fault code is shown as 14 and the icon SHORT is lighting on LCD display and alarm is continuously sounding.	The UPS shut down automatically because short circuit occurs on the UPS output.	Check output wiring and if connected devices are in short circuit status.	
Fault code is shown as 01, 02, 03, 04, 11, 12, 13, 41 and 45 on LCD display and alarm is continuously sounding.	 A UPS internal fault has occurred. There are two possible results: 1. The load is still supplied, but directly from AC power via bypass. 2. The load is no longer supplied by power. 	Contact your dealer.	
Battery backup time is shorter	Batteries are not fully charged	Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer.	
than nominal value	Batteries defect	Contact your dealer to replace the battery.	

5. 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	

6. Specifications

Model Tower UPS		ONLINE 1kVA ONLINE -L 1kVA	ONLINE 2kVA ONLINE -L 2kVA	ONLINE 3kVA ONLINE -L 3kVA
CAPACIT	[Y *	1000VA/800W	2000VA/1600W	3000VA/2400W
INPUT				<u> </u>
	Low Line Transfer	160VAC/140VAC/120VAC/110VAC±5% (Ambient Temp.<350C) (based on load percentage 100% - 80 % / 80 % - 70 % / 70 - 60 % / 60 % - 0)		
Voltage Range	Low Line Comeback	175VAC/155VAC/135VAC/125VAC ± 5 % (Ambient Temp.<350C) (based on load percentage 100% - 80 % / 80 % - 70 % / 70 - 60 % / 60 % - 0)		
	High Line Transfer		300 VAC ± 5 %	
	High Line Comeback		290 VAC ± 5 %	
Frequenc	Frequency Range 40Hz ~ 70 Hz			
Phase				und
Power Fa	ower Factor ≥ 0.99 @ nominal voltage (input voltage)			out voltage)
OUTPUT				
Output vo	ut voltage 200/208/220/230/240VAC		/AC	
AC Voltag	ge Regulation		± 1% (Batt. Mode)	
Frequenc	y Range	47 ~ 53 Hz or 57 ~ 63 Hz (Synchronized Range)		
Frequenc	y Range (Batt. Mode)	50 Hz ± 0.25 Hz or 60Hz ± 0.3 Hz		
Overload		Ambient Temp.<350C 105%~110%: UPS shuts down after 10 minutes at battery mode or transfer to bypass when the utility is normal 110%~130%: UPS shuts down after 1minute at battery mode or transfer to bypass when the utility is normal >130%:UPS shuts down after 3 seconds at battery mode or transfer to bypass when the utility is normal		
Current Crest Ratio		3:1		
Harmonic	Distortion	\leq 3 % THD (linear load); \leq 6 % THD (non-linear load)		
Transfer	AC Mode to Batt. Mode	Zero		
Time Inverter to Bypass		4 ms (Typical)		
Waveform (Batt. Mode) Pure Sinewave				

EFFICIENCY				
AC Mode		88%	89%	90%
Battery Mode		83%	87%	88%
BATTERY				
Standard Model	Battery Type	12V/9AH	12V/9AH	12V/9AH
	Numbers	2	4	6
	Recharge Time	4 hours recover to 90% capacity (Typical)		
	Charging Current	1.0 A(max.)		
	Charging Voltage	27.4 VDC ± 1%	54.7 VDC ±1%	82.1 VDC ± 1%
Long-run Model	Battery Type	Depends of the external battery		
	Number	2	4	6
	Charging Current	1.0 A/2.0 A/4.0A/6.0 A (max.)		
	Charging Voltage	27.4 VDC ± 1%	54.7 VDC ±1%	82.1 VDC ± 1%
Charging method		3 stage charging (CC -> CV -> FV)		
PHYSICAL				
Standard Model	Dimension, D X W X H	282 x 145 x 220 (mm)	397x145 x 220 (mm)	421 x 190 x 318 (mm)
	Net Weight (kgs)	9.8	17	27.6
Long-run Model*	Dimension, D X W X H (mm)	282 x 145 x 220 (mm)	397 x 145 x 220 (mm)	421 x 190 x 318 (mm)
	Net Weight (kgs)	4.1	6.8	7.4
ENVIRONME	NT			
Operation Temperature		0°C to 40°C		
Operation Humidity		20-95 % RH @ 0- 40°C (non-condensing)		
Noise Level		Less than 50dBA @ 1 Meter (With fan speed control)		
MANAGEMEN	NT			
Smart RS-232 or USB		Supports Windows® 2000/2003/XP/Vista/2008/7, Linux, Unix and MAC		
Optional SNM	P	Power management from SNMP manager and web browser		

* Derate capacity to 80% of capacity in Frequency converter mode and to 80% when the output voltage is adjusted to 100VAC, 200VAC or 208VAC.

** Product specifications are subject to change without further notice.

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