U P S

Line-Interactive

Tower type: 500VA-3000VA

Rack type: 500VA-1500VA

■USER MANUAL■

Table of content

1. IMPORTANT SAFETY INSTRUCTION

WARNING: SAVE THESE INSTRUCTIONS!!

- **WARNING: Manual contains important instructions of UPS and batteries during Installation and maintenance. Follow this instruction at all time**
- **WARNING:** It is recommended to install UPS in an ANSI/NFPA75 room in which temperature and humidity are controlled and free from electrically conductive particles. **DO NOT** expose UPS to direct sunlight or high heat source; **DO NOT** block off ventilation opening around the housing.
- **CAUTION:** Before conducting maintenance, repair, or shipment, please turn off everything completely and disconnect them.
- **CAUTION:** The UPS is **NOT** applicable for any inductive loads such as motors or domestic appliances like hairdryers, speakers, and fluorescent lamps.
- **CAUTION:** All interconnection and power cable should be connected **ONLY AFTER** the UPS shut down and disconnected from main.
- **CAUTION:** Only use No.26 AWG or larger certified cables to connect UPS and device
- **CAUTION: DO NOT** unplug UPS from main power during operation or protective ground will fail. **DO NOT** disconnect battery under load or shut down may occur.
- **CAUTION:** Ensure the total leakage current of UPS and the connected equipment under 3.5mA.
- **CAUTION:** Ensure UPS connects to grounded main power with a fuse or circuit breaker protection.
- **CAUTION:** Dangerous amount of voltage might still exist even the UPS disconnects from the main power since residual voltage exists due to battery supply.
- **CAUTION:** Beware of all the details on the cautionary sticker located on UPS.
- **CAUTION (No user-serviceable parts):** Do not attempt to remove the unit's cover, no user-serviceable parts inside. Please refer all service to qualified service technicians.
- **CAUTION: DO NOT** dispose UPS and its batteries to fire, the battery may explode
- **CAUTION: DO NOT** attempt to open or mutilate the battery.
- **User's operations**: Users only permits to:
  - Turning the UPS unit on and off.
  - Operating the user interface.
  - Connecting data interface cables.
  - Changing the battery
- **CAUTION:** Battery can cause shock and short circuit current. When servicing batteries:
  - **A.** Remove watches, rings, or other metal objects.
  - **B.** Use tools with insulated handles.
  - **C.** Wear rubber gloves and boots.
  - **D.** Please **DO NOT** place any tools or metal parts on top of batteries.
  - **E.** Disconnect charging source before connecting/disconnecting battery terminals
  - **F.** Servicing of batteries should be performed or supervised by personnel with necessary precautions and knowledge. Keep unauthorized personnel away from batteries.
- **DANGER:** Hazardous electric component inside this unit (example: Heat-sinks) remain energized from the battery supply even when the main power is disconnected.
- **DANGER:** Battery circuit is not isolated from the AC input. Hazardous voltage may exist at battery terminals and ground—test for safety before any direct contact.
- **CAUTION:** Remove the battery's pole during service inside the battery cabinet or UPS.
- **CAUTION: ONLY** replace batteries with the same type and quantity

WARNING (Fuses): Ensure fuse replacement with the same type and rating **ONLY.**

2. Introduction

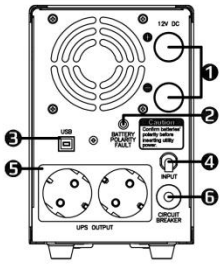
The information provided in this manual covers Line-Interactive 500VA-1500VA, 500VA-3000VA uninterruptible power system (UPS). This manual contains basic functions, operating procedures, and emergencies, also including information on how to ship, store, handle, and install the equipment. Only detailed requirements of the UPS units described herein. The Installation must carry out according to this manual. The electrical Installation must further comply with local legislation and regulations.

3. Installation

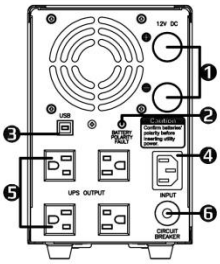
3.1 Rear panel view

Tower:

500-800VA

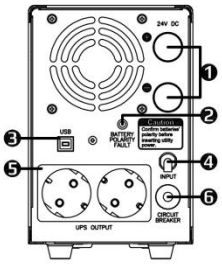


Schuko Type



NEMA Type

1.1K-1.5KVA



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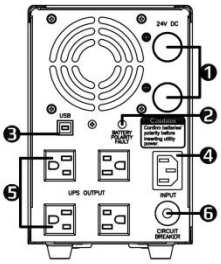
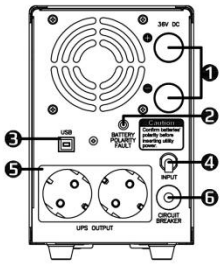
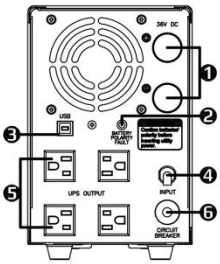


NEMA Type

3KVA



Schuko Type

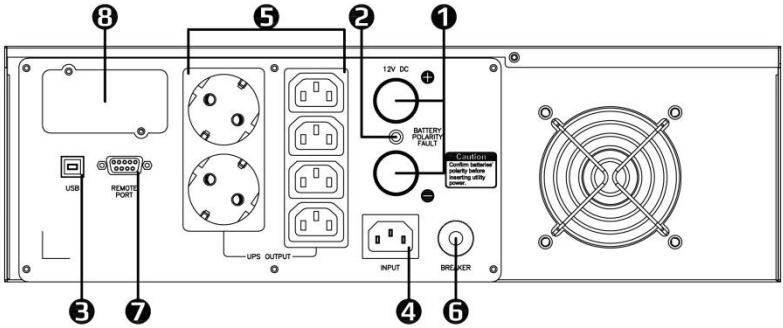


NEMA Type

❶ External battery port (12VDC/24VDC/36VDC)
❷ "Battery Polarity Fault" light
❸ USB (optional)
❹ Input
❺ Outlet
❻ Input breaker

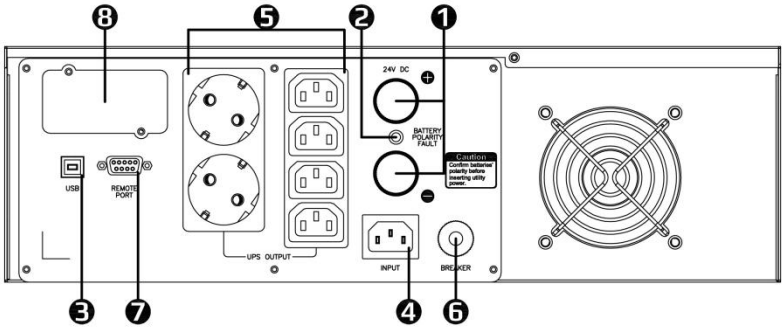
Rack:

500-800VA



Schuko + IEC Type

1.1K-1.5KVA



Schuko + IEC Type

❶ External battery port (12VDC/24VDC)
❷ "Battery Polarity Fault" light
❸ USB
❹ Input
❺ Outlet
❻ Input breaker
❼ RS232 port
❽ Interface port

***Figures only display available function; functions are not on unit if not marked.**

3.2 Connection to External Battery Pack

- Please read safety instructions first before proceeding.
- Connect battery (purchased separately) to UPS by cables from package contents.
- Use **only** factory supplied or authorized battery cable provided.
- Please refer to 6.4.3 External Battery Pack for recommended battery capacity.
- Connect the second battery to the first one with proper battery cable if installing more than one battery
- The maximum quantity of a battery pack is regulated to 2 by UL approval.
- In factory default**:**

Red cable to the positive terminal (+)
Black cable to the negative terminal (-)
Caution: For safety concerns, we highly recommend that users use gloves or tapes to isolate battery terminals before operating the unit.
Caution: Please ensure batteries are the same type and capacity.

Single Battery Connection (Tower)

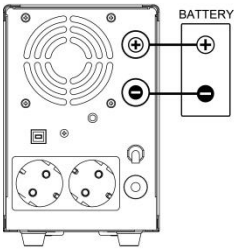


Fig.1 12VDC

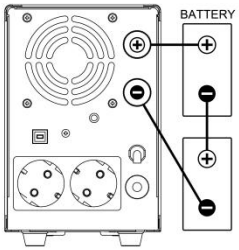


Fig.2 24VDC

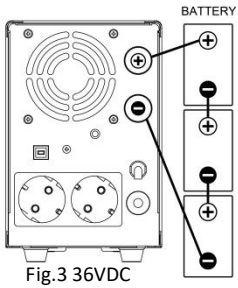


Fig.3 36VDC

As Fig.1, 2 and 3, connecting the battery cable to its proper position. Ensure voltage matches the UPS nominal DC voltage.

Multiple Battery Connections (Tower)

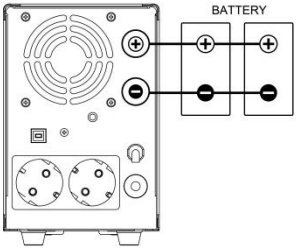


Fig.4 12VDC

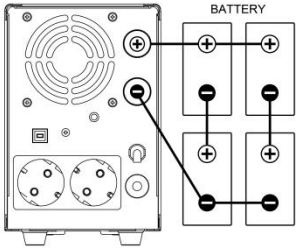


Fig.5 24VDC

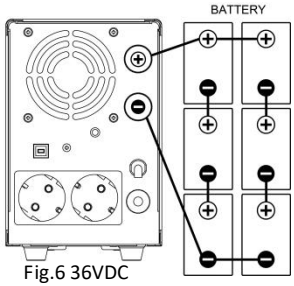


Fig.6 36VDC

As Fig.4, 5 and 6, when connecting two or more batteries, please ensure their type and capacity are the same, and the battery wire is AWG#8 or above.

When using two battery sets simultaneously, connect them in parallel. Additional cables (to be purchased separately) are required to connect extra batteries. When two or more batteries are connected, connect the plus (+) terminal of one battery to the plus (+) terminal of the other battery; Connect the Minus (-) terminals of batteries to the minus (-) terminals of the other battery.

Single Battery Connection (Rack)

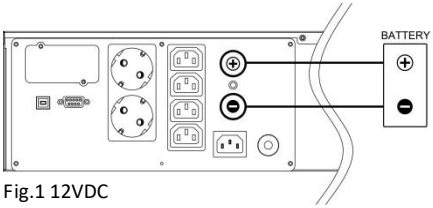


Fig.1 12VDC

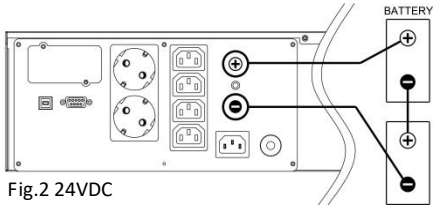


Fig.2 24VDC

As Fig.1 and Fig.2, connecting the battery cable to its proper position. Ensure voltage matches the UPS nominal DC voltage.

Multiple Battery Connections (Rack)

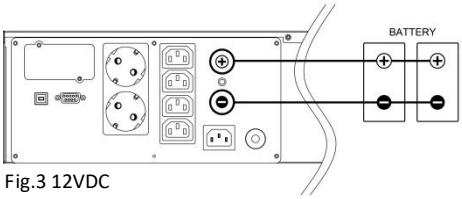


Fig.3 12VDC

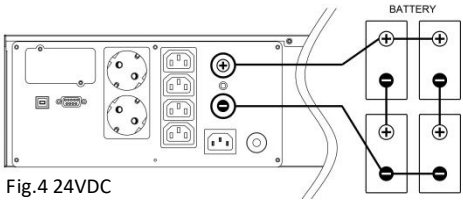


Fig.4 24VDC

As Fig.3 and Fig.4, when connecting two or more batteries, please ensure their type and capacity are the same, and the battery wire is AWG#8 or above.

When using two battery sets simultaneously, connect them in parallel. Additional cables (to be purchased separately) are required to connect extra batteries. When two or more batteries are connected, connect the plus (+) terminal of one battery to the plus (+) terminal of the other battery; Connect the Minus (-) terminals of batteries to the minus (-) terminals of the other battery.

3.3 Connection to Main and Load

- Follow all installation and safety instructions very carefully; failure to do so may cause hazardous situations to personnel and equipment.
- Ensure the main power voltage matches with UPS. (110V/220V)
- For electrical Installation, closely observe the nominal current rating of the source.
- Check the equipment's power requirement to prevent overloading situations.
- Do not connect devices that draw either massive power shortly or half-wave rectified current - such as hairdryer, vacuum cleaner, laser printer, and plotter.
  Note: Although you may use the UPS immediately, maximum back up time will not be available yet. It is recommended to charge the batteries for a minimum of 8 hours before use.
- Connect the input cable to the UPS and the other end to the mains. The battery will automatically charge when connecting to the main power.
- Connect the loads to the UPS; Ensure receptacles are connected firmly.
- (Optional) To protect your telecom/internet system, use RJ45/RJ11 cable to install the input/output cable with matching in/out jack.

4. Operation

Necessary information for the operation of the unit is covered in this chapter. Normally UPS runs automatically, but on a few occasions such as just after Installation, all procedures are described herein.

4.1 General Description

As Line-Interactive UPS, it is capable of providing clean and stable power to your critical system. While the UPS regulates and filters power fluctuation, it also keeps the battery charged for any emergency.

- Automatic transformer regulates over and under-voltage power.
- During a power failure, the UPS immediately provides backup power from the battery to support your essential equipment.
- Power transference is typically achieved uninterrupted within 4 milliseconds.

Line-Mode/Battery-Mode

UPS will operate in Line-Mode that supports power and charge battery while connected to power. During a power failure, the UPS will switch to Battery-Mode, in which power is maintained from the battery. In case of failure time exceed Battery-Mode duration, UPS will shut down until voltage return to prevent battery discharge.

Diagnostic Test

While the advanced battery management system monitors the conditions of the batteries, it sends early warnings if a battery replacement is needed. Diagnostic tests can be performed from the control panel.

4.2 System Configuration

The UPS device and battery make up the system. Depending on site and load requirements, certain additional options are available as tailored solutions. Please consider the following when planning your UPS system:

- The total demand for the protected system shall dictate the output power rating (VA). When measuring demand, please allow a margin for future expansion and calculation error.
- Battery-mode duration needs dictate the battery size. If the load is less than the UPS nominal power rating, then the actual backup time is longer.

External battery packs

4.3 UPS Control Control panel functions

Display	Function Description	Display	Function Description
LED Display			
LED Light	Status indicator Line-Mode: steady light / Battery mode: flash every 2 second / Fault: rapid flash		
LCD Display			
	Line mode UPS is operating with Main power		AVR MODE Correcting over-voltage or under- voltage condition. Out put power remain normal
	Battery mode UPS is operating with battery power		Overload Load exceeds UPS capacity
	Battery Fault Battery fault occurred	Output	Output Display of current output voltage
Load	Load level Display of current load on UPS (25/50/75/100)%	Battery	Battery level Display of battery power remaining (25/50/75/100)%
Button Display			
	ON/OFF/Test/Silence The master button for UPS control, refer to Button Operation		

Button operation

Cold Start function

When the main power is disconnected from UPS, it is capable of starting with battery power for users' needs. Simply start the UPS as the instruction below.

"On/Off/Test/Silence" button

Turn on the UPS

- Switch on the Load
- Press the "ON" button until a single "beep" alarm disappeared or the LED display turns on.

Shut Down the UPS

- Switch off the Load
- Press the "OFF" button for 3 seconds during Line/Battery-mode.
- (If applicable) To avoid electrical hazards, please turn off the internal/external input breaker. Then, turn off any external battery breaker and wait till all fans completely shut down.

Test : Press once to start self-test function during Line-Mode

Silence : Press once to enable/disable alarm buzzer during Battery-Mode

4.4 UPS Configuration

UPS Manual test

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

Simple test: It's recommended to conduct a simple simulation test when

1. The first use of UPS.
2. Adding new loads.
3. 6 months' regular check-up

Switch on the UPS and wait for the power indicator to light up, then unplug UPS to simulate the main power failure.

5. UPS Monitoring Connection

UPSMON Pro software (Or other power monitoring software) can further utilize the UPS with warning reminders, monitoring, control shut down, and setting adjustments. UPS must connect to a computer or the internet to use the monitoring feature.

Connect UPS to Computer with USB

- Locate the USB port on UPS.
- Connect with factory-provided
- Ensure your computer can install and support power management software.

6. Maintenance

Please read the following instruction to ensure your safety and maintain a longer product lifetime. This section contains detailed information about moving, maintaining, and placing the UPS. With a minimal amount of maintenance, you can expect the UPS to function smoothly.

6.1 Transportation

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

6.2 Storage

Please read 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.
- Protect the equipment from wet or damp areas and moist air.
- To maintain the vitality of the batteries, please recharges the UPS at least 8 hours every six months.

6.3 Operation

CAUTION: Ensure that all environmental concerns and requirements are met according to safety instruction; otherwise, the safety of installation personnel cannot be guaranteed since the unit may malfunction.

- Please ensure no flammable substances such as gases or fumes.
- Avoid extreme temperature and humidity. Protect the equipment from moisture.
- Ensure there is enough space (300mm or above recommended) at the rear and side of UPS for proper ventilation.
- Ensure that the front of the UPS remains clear for user operation.
- **Only** authorized agents or technicians may service the unit.
- **Do not** open the UPS cabinet. Components may contain hazardous or fatal voltage.
- Output receptacles may carry live voltage without connecting to the main power.
- Pay special attention to UPS air inlet; **do not** let it covered by dust.

6.4 Battery

6.4.1 Maintenance

The reliability of the battery is heavily related to the environmental issue.
At the temperature of 25 degrees Celsius, A regular 6-12 months' checkup is advised.

6.4.2 Replacement

1. Ensure the UPS is turned off and disconnected from the main power
2. Disconnect the battery from the UPS
3. Replace the battery with the same type and quantity of battery
4. Refer to Installation for battery connection

6.4.3 External Battery Pack

The following chart is the recommended specification of the external battery pack/cabinet.
For other options, please ensure that the option meets safety instruction and local legislation.
The following chart is the recommended specification of the external battery pack/cabinet. For other options, please ensure that the option meets safety instruction and local legislation.

Model (Tower)	500VA	800VA	1100VA	1500VA	3000VA
Capacity	300W	480W	770W	1050W	1800W
Battery Voltage	12V DC		24V DC		36V DC
Recommended Battery Capacity	65AH-200AH		100AH-200AH		65AH-200AH
Maximum Charge Current	10A max		15A max		10A max

Model (Rack)	500VA	800VA	1100VA	1500VA
Capacity	300W	480W	770W	1050W
Battery Voltage	12V DC		24V DC	
Recommended Battery Capacity	65AH-200AH		100AH-200AH	
Maximum Charge Current	10 A max		15 A max	

For detail of battery set wiring, please refer to Installation.

APP-A. Troubleshooting

Troubleshooting procedures give simple instructions in determining UPS malfunctions. Start the troubleshooting procedure if you witness any alarm indication.

Alarm

The UPS has an audible alarm. When different situations occurred, UPS will alert users with display and buzzer.

Battery-mode (Slow alarm)

During battery mode, the alarm will beep every 2 seconds for the first 15 seconds, then dropped to twice per minute. The alarm will stop when UPS resumes Line-mode.

Battery-Low (Rapid alarm)

During Battery-low (less than 30%), the UPS will beep every 0.5 seconds. The alarm will stop when UPS shutdown or returns to Line-mode.

Overload/Fault (Constant alarm)

When UPS operating with load exceeded its maximum capacity, UPS will emit a continuous alarm to warn an overload condition. UPS will automatically turn off to protect your essential load. Please consider remove or shutdown less-essential loads.

Also, when the unit encounters other problems (battery failure, charger failure), the unit emits the alarm. Please refer to the function description and troubleshooting chart to identify the precise cause.

Silencing Alarm

Here is the instruction to mute the active alarm or future alarm notification:

Note: During battery-mode, if the battery is low on power, the alarm will sound regardless of silent-mode enable/disable.

Silent alarm Enable/Disable: Press the "on" button during the Battery-Mode alarm.

If troubleshooting does not include or resolve your situation, feel free to contact for technical assistance.

PROBLEM	POSSIBLE CAUSE	Solutions
UPS can't operate switching on. No lights on, no warning sound	Power source mistake or low battery power	Check the main power connection If operating with battery power, ensure enough charging time for UPS.
	Time of pressing the Button is too short	Press and hold the "ON" button for a longer duration.
	Output short circuit or overload on UPS	Turn off UPS and take off all load. Check for any potential internal short circuit Then attempt to turn on UPS again.
	Hardware failure	Contact for technical assistance.
	Battery out of order	Replace battery or contact for technical assistance.
UPS always remain on battery-mode regardless of main power connection	No power source input	Check the main power source and cable.
	Fuse melted or Circuit breaker tripped	Reset the breaker or replace the fuse (spare fuse is in UPS inlet.) then restart the UPS.
	The main voltage is out of the UPS input range.	UPS function normally, check your main power voltage.
Overload/Fault indicator lit or constant buzzer beeping	UPS load exceed the Capacity UPS overloading	Remove or shut down the less essential load.
Battery mode duration below expectation	Batteries aren't fully Charged Batteries are worn out or faulted	Ensure enough recharge time for UPS. Run a self-test to check battery status. Replace UPS battery if the problem remains.
	The charger is out of order	Contact for technical assistance.
The battery fault indicator occurred	Battery not connected	Check the UPS batteries; make sure they are well connected.
	Battery out of order or damaged	Replace battery.

APP-B Technical Specifications

Model	500AP	800AP	1100AP	1500AP	3000AP
Configuration					
Capacity (VA)	500 VA	800 VA	1100 VA	1500 VA	3000 VA
Capacity (Watts)	300 W	480 W	770 W	1050 W	1800 W
Form	Tower Type				
Input					
Voltage	100 / 110 / 120 VAC or 220 / 230 / 240 VAC				220 / 230 / 240 VAC
Input Voltage Range	70 - 150 or 140 - 300 VAC				140 - 300 VAC
Input Frequency Range	50 Hz / 60 Hz (Auto Sensing)				
Output					
Waveform	Pure Sine Wave				
Voltage	100 / 110 / 120 VAC or 220 / 230 / 240 VAC				220 / 230 / 240 VAC
Frequency	50 Hz / 60 Hz ± 1 Hz				
Transfer Time	2 - 4 ms (Typical)				
Protection					
Full Protection	Overload, Fuse, Surge, Short Circuit				
Management & Communication					
Indicator	LED Panel, LCD Panel				
Communication Port	USB B type : AP Model				
Physical					
Dimensions (WxDxH) (mm)	130 x 412 x 200				
Weight (kgs)	5.8	7.2	10.8	12.2	13.4
Shipping Dimensions (mm)	253 x 488 x 321				
Shipping Weight (kgs)	7.3	8.7	12.3	13.7	14.9
Alarm					
Overload / Fault	Continuous Beeping				
Battery Mode	Beep every 2 seconds				
Low Battery	Beep every 0.5 second				
Environment					
Operating Humidity	0-90 % RH at 0-40°C (Non-condensing)				
Audible Noise	Less than 50 dB				
Battery (Recommand Form)					
Voltage	12 VDC		24 VDC		36 VDC
Battery Capacity	65 Ah - 200 Ah		100 Ah - 200 Ah		65 Ah - 200 Ah
Maximum Charge Current	10 A max		15 A max		10 A max
Discharge Protection	Auto Diagnostics, Over- Discharge, Shot Circuit, Fuse				

Model	500AP RM	800AP RM	1100AP RM	1500AP RM
Configuration				
Capacity (VA)	500 VA	800 VA	1100 VA	1500 VA
Capacity (Watts)	300 W	480 W	770 W	1050 W
Form	Rack Type			
Input				
Voltage	100 / 110 / 120 VAC or 220 / 230 / 240 VAC			
Input Voltage Range	70 - 150 or 140 - 300 VAC			
Input Frequency Range	50 Hz / 60 Hz (Auto Sensing)			
Output				
Waveform	Pure Sine Wave			
Voltage	100 / 110 / 120 VAC or 220 / 230/ 240 VAC			
Frequency	50 Hz / 60 Hz ± 1 Hz			
Transfer Time	2 - 4 ms (Typical)			
Protection				
Full Protection	Overload, Surge, Short Circuit			
Management & Communication				
Indicator	LCD Panel			
Communication Port	USB B type, RS232, SNMP SLOT			
Physical				
Dimensions (WxDxH) (mm)	428 x 219 x 130			
Weight (kgs)	6.7	8.3	11.8	13.2
Shipping Dimensions (mm)	546 x 328 x 278			
Shipping Weight (kgs)	8.9	10.5	14	15.4
Alarm				
Overload / Fault	Continuous Beeping			
Battery Mode	Beep every 2 seconds			
Low Battery	Beep every 0.5 second			
Environment				
Operating Humidity	0-90 % RH at 0-40°C (Non-condensing)			
Audible Noise	Less than 50 dB			
Battery (Recommand Form)				
Voltage	12 VDC		24 VDC	
Battery Capacity	65 Ah - 200 Ah		100 Ah - 200 Ah	
Maximum Charge Current	10 A max		15 A max	
Discharge Protection	Auto Diagnostics, Over- Discharge, Shot Circuit, Fuse			

* Specifications are subject to change without further notice.
* Specifications are for reference; actual information should be based on the real product.

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