Table of Contents

1 IMPORTANT SAFETY INFORMATION	
2 PRODUCT OVERVIEW	
2.1 Product Description	4
2.2 Operation Modes	б
2.3 Specifications	9
2.4 UPS Display Interface	
2.5 Fault Protection and Alarms	
2.6 Product Structure	13
2.7 Options	
3 INSTALLATION	
3.1 Selecting Location	
3.2 Initial Inspection and Unpacking of UPS	
3.3 Positioning and Installation	
3.4 Optional Accessories	
3.5 External Protective Devices	
3.6 Power Cables	
3.7 Wiring Terminal	
3.8 Wiring	
3.9 Control Cable and Communication	
3.10 Maintenance Sockets	
4 OPERATION	
4.1 Turn On the UPS (Switch to Mains Power Mode)	
4.2 ECO Mode	
4.3 Manual Bypass	
4.4 Maintenance Bypass	
4.5 Battery Cold Start (Optional)	
4.6 Battery Manual Maintenance Mode	
4.7 Turn Off the UPS (Completely Turn Off the UPS & Load)	
4.8 Emergency Power Off (EPO)	
4.9 Turn On/Off the Parallel UPS System	51
4.10 Reset Operation after Fault Alarm	
4.11 Auto Start	
4.12 Language Selection	
4.13 Change Current Date and Time	
4.14 Control Password	
5 UPS DISPLAY PANEL	
5.1 Brief Introduction	
5.2 Display Events	
6 MAINTENANCE	
6.1 UPS Room Management	
6.2 Maintenance Guidance	

6.3 Safety Precautions	
6.4 Preventative Maintenance	
6.5 Usage and Maintenance of Batteries	71
7 ANNEX	
7.1 Product Specifications	73
7.2 SNMP Card	73
7.3 iStars Hardware Connection	74
7.4 Email and SMS Platform of SNMP	76

1 Important Safety Information

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. Only qualified electricians who has skills and knowledge related to the construction, installation, and operation of electrical equipment are allowed to perform the tasks described in this document.

- 1. External battery switch can be closed only when the inverter is in normal operation, otherwise, internal devices of UPS and battery will be severely damaged, unless battery cold start option is connected between battery and UPS.
- 2. The output end of UPS may still present a shock hazard even when the mains power fails. According to EN 50091-1, installer should examine and distinguish cable or plug powered by UPS and should inform the user.
- 3. The full series of UPS batteries is external. We recommend that the battery should be installed after UPS can charge it. It should be noted that if the battery is failed to charge within 2-3 months, irreparable damage will be caused to the battery.
- 4. UPS is provided forced cooling by the internal centrifugal fan. Cold-blast air enters UPS through the front air grid at the top of UPS cabinet; hot-blast air is discharged from the rear air grid at the top of UPS cabinet. Therefore, do not block the air vent (air grid).
- 5. When executing operations for exiting the maintenance mode, it shall set manual bypass to "on" before switching on the output switch to avoid damage of UPS caused by short circuit of two circuits.
- 6. People cannot touch the internal parts which are identified with yellow labels, otherwise they will get an electric shock.
- 7. The maintenance outlet may still be charged when the electricity for the UPS is turned off, so please carefully examine whether the external power switch of UPS has been turned off to avoid the electric shock.
- 9. Please disconnect the external switch for the battery in time when UPS is not used (especially when UPS is not used for a long time) to avoid the irreparable damage to battery caused by deep discharge of battery.
- 10. When fluctuation of bypass power supply is large, please carefully use the ECO mode of UPS to supply power to the load which is possible to power down (maximum power down time: 10 ms).
- 11. The UPS must be grounded before power on or any operation to this equipment to avoid any personal injury caused by leakage current.
- 12. Make sure that all power supplies are disconnected before installation and maintenance, and operation in the UPS can be performed only after electrolytic capacitor is fully discharged.
- 13. Please pay special attention to emphasized words and with "⁽¹⁾", which are safety instructions and cautions.
- 14. When the bypass frequency change rate exceeds 1 Hz / S, the inverter output frequency cannot track the bypass frequency. At this time, the output cannot be switched from the bypass output status to the inverter output status.

2 Product Overview

2.1 Product Description

This series of UPS is full digital with high performance by using DSP control technology, rectifier has function of power factor calibration, and its all performance indexes can reach the leading level in industry. This series of UPS is connected between the main power and the important load, and supply high quality power for the load. It uses high-frequency double-conversion pulse-width modulation (PWM) and full digital control (DSP) technologies, and its output voltage cannot be affected by input voltage, frequency variation and interference.

As shown in Figure 2-1, power supply of AC main power is inputted by RCB and then is ensured to charge for the battery at any time through BCB after transferred into DC power. At the same time, it can supply power for inverter which can transfer this DC power into pure AC power which cannot be interfered by main power. When main power is disconnected, the battery will supply back-up power to the load through inverter. When inverter is in fault or overloaded for exceeding time, it also can supply power for the load by bypass switch (SBCB) and bypass static switch (SB). In addition, if it needs to maintain or repair the UPS, the UPS can supply power for the load by maintenance bypass switch (MBCB). When UPS is running normally, all switches shall be closed except maintenance bypass switch.

Note: BCB switch and battery are external equipments. Maintenance switch of 80 ~ 300 kVA are inner, 400 ~ 500 kVA are external.



Figure 2-1: Schematic diagram of single UPS system

2.1.1 Separated Bypass Input

Figure 2-1 shows schematic diagram of UPS single UPS system with "separated bypass power" (i.e. bypass uses independent input of main power). When allocating the separated bypass, static bypass and maintenance bypass share an independent bypass power which is connected with specialized bypass power by an independent power switch. If there is no independent bypass power, it shall connect the bypass with terminal of rectifier input power.

2.1.2 Rectifier

Rectifier of this series of UPS uses IGBT three-phase rectifier bridge with full digital control, and it can transfer the voltage of three-phase of main power to continuous DC voltage. Design power is inverter with full load and supplies maximum charging current for battery.

Rectifier has the function of power factor calibration, which can reduce the harmonic distortion of main power to 5% and less. It can ensure that, no matter how is the load, the rectifier cannot cause voltage distortion of main power and can avoid overheat of cable caused by over-current of harmonic wave.

2.1.3 Inverter

Inverter of this series of UPS uses matured three-phase half-bridge IGBT inverter technology which can transfer the continuous voltage from rectifier or battery into stable alternating voltage with stable amplitude and frequency.

Inverter uses full digital control circuit and 16 bits microprocessor. Because of its superior processing capability, output sine wave produced by it is low, which only cause minimum distortion even under condition of extremely high peak current for load.

2.1.4 Static Transfer Switch

"Static switch" shown in Figure 2-1 takes controllable silicon as converter to convert the load between power supply of inverter and power supply of main power. Under normal operation, inverter output and static bypass power must be synchronous fully, and then it can realize the uninterrupted conversion between inverter and static bypass power. Synchronization between inverter output and static bypass power supply is realized by controlling circuit through inverter. When static bypass power frequency is within allowed synchronization range, inverter control circuit always let the inverter output frequency trace static bypass power frequency

In addition, UPS also provides manual control of maintenance bypass. If it needs to power off the UPS to take daily maintenance and repairing, UPS can supply power for major load by maintenance bypass.

2.1.5 Redundancy Control Power board

UPS is equipped with two same control power board with mutual stand-by. Both these two control board can get input power from AC or DC power supply. If there is some fault for one power or one control power board, UPS system still can operate normally. This function supplies higher reliability for the system.

2.1.6 Battery

Battery pack is installed in external battery cabinet. Charging and discharging control of battery is fully integrated in main control panel. According to DIN41773 standard, after partial discharge or full

discharge every time, the battery needs to be charged, and it shall float charge it after charging fully to compensate self discharge loss of the battery.

2.2 Operation Modes

Full series of UPS are online double-conversion UPS system, and its operation modes are:

- Main power supply mode
- Battery mode
- Bypass mode
- Maintenance mode
- Economic (ECO) mode
- Parallel redundancy mode

2.2.1 Mains Power Mode

Main power supplies AC power supply to rectifier of UPS, then supply DC power for inverter by rectifier, and then supply uninterrupted AC power for the load by inverter. At the same time, the rectifier supplies equalizing charge current and floating charge voltage for battery.



Figure 2-2: Main power supply mode

2.2.2 Battery Mode

The working mode that battery supplies back-by power supply for the load through inverter is called battery mode. When main power fault occurs, the system will convert to battery mode automatically and the battery supplies power continuously which shall be lasted to set back-by time. Power of load is supplied by inverter output through static switch and the power of load is uninterrupted. When main power recoveries, the system will switch to main power supply mode automatically without any manual operation and power supply for load is not interrupted. If the back-by time of battery is overdue but the main power still is not recovered, the system will switch to bypass mode automatically and uninterruptedly.



Figure 2-3: Battery mode

2.2.3 Bypass Mode

Under inverter supply mode, if there is some fault for inverter or overload time of inverter is overdue or switch manually to bypass, the static switch will convert the load from inverter supply to static bypass power supply and the power supply of load is not interrupted. If the inverter and bypass is not synchronous at that time, UPS will switch off the inverter static switch firstly, and then switch on the bypass static switch, and the power supply of load is not interrupted.

Note: When UPS is under bypass mode, load cannot be protected by UPS if voltage or frequency changes or power is down.



Figure 2-4: Bypass mode

2.2.4 Maintenance Mode

If it needs to take daily maintenance or repairing for UPS, it can switch to maintenance mode by maintenance switch (MBCB) and the power supply of load is not interrupted. Maintenance switches of 80 ~ 300 kVA UPS locate inside of the cabinet; the maintenance switches of 400 ~ 500 kVA UPS are options, and locate external of the stand-alone, it can be flexibly configured with external distribution.





2.2.5 Parallel Redundancy Mode (System Expansion)

To improve capacity and reliability of the system, it can set direct parallel of several stand-alone UPSs to control logic by paralleled UPS of every UPS to ensure automatic equal-division load of all units.

In parallel system, if there is any fault of one UPS, there will be no output of faulted UPS, and other UPSs without faults continue to share load. If all UPSs of parallel system are faulted, the system will switch to bypass mode. Parallel UPS can be paralleled by 6 stand-alone UPSs at most.

2.2.6 Economic (ECO) Mode (Only for Single UPS System)

If the economic mode is selected, under normal bypass power condition, the power supply of load is preferentially supplied by bypass and double conversion UPS is in standby status to achieve the purpose of energy-saving. When bypass power is within the working scope of ECO, power supply of the load is supplied by bypass; and if it is out of the working scope of ECO, the system will switch to inverter output. However, it may occur disconnection of power supply of the load, and maximum disconnection time is 10 ms.



Figure 2-6: ECO mode

2.3 Specifications

Table 2-1: Performance parameters

Rated Capacity (kVA)		80 ~ 120	160	400 ~ 500			
	Rated input voltage		Line voltage 380 / 400 / 415 V				
	Input mode		Three-phase three-wire				
	Power factor			> 0.99			
Main	Range of voltage	Ra	ange for	working: -25% ~ +15%	, 0		
input	Range of frequency		(!	50 / 60) ± 5 Hz			
	Rectifier delay start		10 s	(1 ~ 300 settable)			
	Input current-limiting		1.1 (0.1 ~ 1.1 settable)			
	Rated input voltage	Р	hase vo	ltage 220 / 230 / 240 V	'		
Bypas s input	Range of voltage	Bypass upper limit 10%, 15%, 20%, 25% (settable), 20% by default Bypass lower limit 10%, 20%, 30%, 40%, 50%, 60% (settable), 20% by default					
-	Input mode		Thre	e-phase four-wire			
	Range of frequency		(;	50 / 60) ± 5 Hz			
	Rated input voltage	e Phase voltage 220 / 230 / 240 V					
ECO input	Range of voltage	± 10% (5%, 10%, 15% settable)					
mpat	Range of frequency		(50 / 60) ± 2 Hz				
	Rated output voltage		220 / 230 / 240 V				
	Output trim	[-5 V, 5 V]					
	Power factor	0.9					
	Frequency tracking range	(5	(50 / 60) ± 3 Hz (± 5 Hz settable)				
	Normal switching time	Main power ←→battery: 0 ms Bypass ←→inversion: 0 ms					
Output	Overload capacity of inverter	Load ≤ 105% for lo 105% < load ≤1109 110% < load ≤ 125 125% < load ≤ 150 150% < load ≤ 200 200% < load, inver output	Load $\leq 105\%$ for long term; 105% < load $\leq 110\%$, switch to bypass output after 60 min; 110% < load $\leq 125\%$, switch to bypass output after 10 min; 125% < load $\leq 150\%$, switch to bypass after 60 s; 150% < load $\leq 200\%$, switch to bypass output after 200 ms; 200% < load, inverter shutdown after 100 ms and switch to bypa				
	Display			LCD+LED			
	EMI			IEC62040-2			

	EMS	IEC61000-4-2(ESD) IEC61000-4-3(RS) IEC6100-4-4(EFT) IEC6100-4-5(Surge)								
	Insulation resistance	> 2 MΩ (500 VDC)								
	Insulating strength	2820 Vdc, leak current is less than 1 mA, without electric arcing for 1min				rcing for				
	Surge protection	Meet the requirement of installation position of IV-class specified by IEC60664-1, which means that the ability to withstand hybrid wave of 1.2/50us+8/20us is not less than 6KV/3KA								
	Number of batteries		50 pcs of 12 V (48 to 52 pcs adjustable)							
	Mode of connection	Lower wiring and side wiring (upper wiring for power distribution cabinet)								
	Dimensions	800 x 800 x 1800 860 x 1210 x 860 x 1950 2380 × 860				× 860				
	$(W \times D \times H) (mm)$				1700				× 19	950
	Gross weight (kg)	630	680	730	840	1200	1340	1420	2200	2410
	Net weight (kg)	580	630	680	790	1135	1275	1355	2090	2300
	Color	Black (selectable)								
	Level of protection (IEC60529)		IP20							

2.4 UPS Display Interface

Monitoring content of this series of UPS is very comprehensive, and it can take operational control for UPS, inquire all parameters of UPS, UPS and battery status, and event and alarm information by operation display panel.

(1) Liquid crystal display



Figure 2-7: Liquid crystal panel

- UPS basic information
- UPS name
- UPS model
- Current time and date
- UPS number of parallel system
- UPS warning information
- Real-time data

All listed parameters below shall be listed on liquid crystal screen. All displayed electrical capacity shall be updated every 500 ms, and error between display value and actual value is lower than 2%.

- Main input
 Three-phase main input line voltage
 Three-phase main input current
 Three-phase main input frequency
- Bypass input
 Phase voltage of three-phase bypass input
 Bypass input frequency
- Menu language
 Support 3 languages: Chinese, English and user-defined.
- UPS output
 Three-phase output phase voltage
 Three-phase output current
 Three-phase power factor
 Three-phase output frequency
- Settable information
 Date format
 Date and time
 Baud rate
- Load information
 Three-phase load percentage
 Active power of three-phase output
 Apparent power of three-phase output

- Battery
 Battery voltage
 Battery current
 Battery information
- Logs of historical event It shall update logs of historical event if there is any fault It can record 10,000 historical events at most
- (2) LED display

Power flow of the system is displayed by 5 bi-color LEDs.

- Rectifier
- Battery
- Bypass
- Inverter
- Load

It means corresponding circuit is under normal operation when LED is green and it means corresponding circuit is under abnormal operation when LED is red. It means corresponding circuit is shutdown when LED is distinguished, and it means corresponding circuit is under startup or ready status when LED is flashing. Red LED is used for fault warning.

(3) Button

Panel o	neration	nrovides I CD	touch screen	and 9 keys	including	4 menu kev	s (switch	≝I⊂⊐"	"
	peration		100011 3010011	and b Keys,	, moluumy	т попа ксу	3 (3001011		- ,

up "①", down "①", and enter "②"), power-on "ON", power-off "OFF", emergency power off "EPO", fault muffle "SILENCE ON/OFF", and fault clear "FAULT CLEAR".

• 4 menu keys and LCD touch screen can be used to select the menu displayed by liquid crystal display screen.

- ON/OFF is used to turn on/off the UPS system.
- Emergency Power Off key (EPO) is used to quickly shut down in case of emergency. After pressing EPO button, the UPS needs power off completely so that the system can exit emergency power off condition.
- FAULT CLEAR is used to clear fault lock condition.
- SILENCE ON/OFF is used to turn off the warning of buzzer.

2.5 Fault Protection and Alarms

1. Alarm information

UPS will give alarm information to remind the user in case of following cases listed in the Table besides giving alarm information in case of fault.

Output overload	Effective of maintenance bypass	Pressing of EPO button	Open circuit of bypass
Effective of manual bypass	Disconnection of battery	Disconnection of fan	

Table 2-2: Alarm information

2. Fault protection

UPS will give sound and light alarm if any fault, and it can inquire the type and time of faults in menu of historical record.

	•		
Fault Protection Item	UPS Motion Method		
Fault of low output voltage in phase A			
Fault of high output voltage in phase A			
Fault of low output voltage in phase B			
Fault of high output voltage in phase B			
Fault of low output voltage in phase C			
Fault of high output voltage in phase C			
Fault of overvoltage of bus	Close rectifier, inverter, and inverter static		
Fault of low voltage of bus	switch, convert the output to bypass; after		
Fault of over-temperature of radiator	troubleshooting, press button "FAULT		
Fault of input soft -start	CLEAR" on panel to exit the UPS from		
Fault of rectifier	fault mode, recover the normal workin status, and the load will not power dow		
Fault of short circuit of bus			
Fault of fuse	again.		
Fault of over-temperature of inverter			
Fault of inverter IGBT over-current			
Fault of rectification IGBT over-current			
Fault of inverter soft-start			
Fault of inverter SCR			
Fault of charger			
Fault of bypass SCR	Power off (ECO mode, output to inverter)		
Fault of bypass overload delay	Power off		
Fault of output short circuit	Switch to bypass		
Fault of main power	Forbid to start the rectifier		
Fault of bypass	Forbid to switch		

Table	2-3	Fault	protection

2.6 Product Structure

It considers operability of site maintenance for structure design, it uses advanced front maintenance design concept, realize modular design by functions for internal of UPS, and it is convenient for installation and maintenance.

(1) The model of 80 ~120 kVA UPS



Figure 2- 8: The model of 80 ~ 120 kVA UPS



Figure 2- 9: Rectifier, inverter and STS module, bus capacitance of 80 ~ 120 kVA UPS



Figure 2-10: Output filter capacitor and switch of 80 \sim 120 kVA UPS (2) The model of 160 kVA UPS



Figure 2- 11: The model of 160 kVA UPS



Figure 2-12: Rectifier, inverter and STS module of 160 kVA UPS



Figure 2-13: Bus capacitance of 160 kVA UPS



Figure 2-14: Communication interface module of 160 kVA UPS (3) The model of 200 ~ 300 kVA UPS

Figure 2-15: Output filter capacitor and isolation switch of 160 kVA UPS



Figure 2-16: Physical model of interior door of 200 ~ 300 kVA UPS



Figure 2-17: Communication port of 200 ~ 300 kVA UPS



Figure 2-18: Internal module of 200 ~ 300 kVA UPS (4) The model of 400 ~ 500 kVA UPS



Figure 2-19: Static switch module of 400 ~ 500 kVA UPS



Figure 2-20: Model of 400 ~ 500 kVA UPS



Figure 2- 21: Rectifier module of 400 ~ 500 kVA UPS

Figure 2- 22: Inverter module of 400 ~ 500 kVA UPS



Figure 2-23: The auxiliary switch and communication port of 400 ~ 500 kVA UPS

2.7 Options

(1) Battery cold start option

The UPS can start by using battery directly without input of AC.

(2) SNMP card

Remote management of UPS through network can be realized.

(3) Undervoltage release of battery (adapted to ABBT4-T6 molded case circuit breaker)

Cut the circuit of battery off when the UPS goes wrong or does not work to avoid the irreparable damage to battery caused by deep discharge of battery. Battery switch is only allowed to close after inverter is working normally if it contains undervoltage release, otherwise, battery switch or UPS will be damaged if it is forced to close.

(4) LBS synchronous controller

It can ensure that two independent UPS systems output synchronously, which is most suitable for power distribution system with double bus.

(5) Lightning protection device

It is used to control overvoltage caused by lightning surge in power distribution to protect UPS or rear-end load.

(6) Power distribution cabinet (optional range: 80 ~ 300 kVA)

Provide upper wiring.

(7) Bypass maintenance switch cabinet (optional range: 400 ~ 500 kVA)

It contains maintenance switch and battery switch and has upper wiring function.

(8) Parallel kit (optional range: 80 ~ 500 kVA)

It needs to be equipped with the parallel kit, when the stand-alone is extended to parallel unit.

(9) Battery temperature sensor (optional range: 80 ~ 500 kVA)

It is mainly used to collect the working temperature of external battery pack and realize the temperature compensation function of battery charging voltage.

(10) Main power-bypass short connected copper bar (optional range: 400 ~ 500 kVA)

It is suitable for the common input connection, that is, short connected mains input and bypass input when single circuit mains inputs

3 Installation

This chapter introduces the UPS requirements which are necessary for UPS site selection and wiring.

Since every site has its particularity, this chapter will not introduce detailed installation steps, only provides directive general installation steps and methods for qualified installation personals, and it should be carried out by installation personals according to detail condition of the site.

- For electric connection, earth wire of UPS should be well connected; and ensure that all switches should be disconnected before finishing UPS installation.
- Installation of UPS should be taken by qualified engineer according to description in this chapter and local standards. For other equipments not mentioned in this manual, their detailed mechanical and electric installation materials should be attached when delivery.
- Installation of battery should be very careful. Voltage in battery terminal will be more than 500Vdc when the battery is connected, which has fatal danger. Please wear eye shield to avoid eye injury caused by accidental electric arc. Take off ring, watch and other metal objects. Use tool with insulated handle. Wear rubber gloves. If the electrolyte leaks or battery is damaged, this battery is must be replaced. Put it into container which can resist corrosion of sulfuric acid, and take disablement process according to local stipulations. Rinse the skin immediately if it touches the electrolyte.

3.1 Selecting Location

3.1.1 UPS Room

Pay attention to the following requirements when you select room:

- UPS must be installed in a clean and dry room with flat floor (relative humidity: 5% ~ 95%). It would be best if there is no dust and UPS is away from contaminants and combustibles.
- Suitable room temperature: UPS can operate under 0~40 °C indoor environment, but the

temperature should be more than 0°C when starting, and optimal operating temperature is 25°C.

User should ensure enough ventilation in the room so that the equipment can take heat dissipation fully; if necessary, indoor exhaust fan should be installed to avoid too high room temperature. Or it can select the accurate air-condition for UPS room. This equipment cannot be used outdoors.

- Altitude: lower than 1,000 m. Please use it by derating if it is higher.
- Suitable space and weight capacity are as follows.

Rated Capacity (kVA)	80 ~ 120	160	200 ~ 300	400 ~ 500				
W – mm	800	800	1210	2380				
D – mm	800	860	860	860				
H – mm	1800	1700	1950	1950				

Table 3-1: External dimensions of the whole UPS 160 ~ 500 kVA

80 ~ 300 kVA UPS is integrated in one cabinet. 400 ~ 500 kVA UPS is composed of rectifier cabinet and inverter cabinet. Rectifier cabinet and inverter cabinet have the same size and dimension, as shown in Figure 3-1. Each cabinet must be carried separately and then be spliced together again.



Figure 3-1: External view of 400 ~ 500 kVA UPS



Figure 3-2: External view of 80 ~ 300 kVA cabinet

Note: The series of 80 ~ 160 kVA UPS is equipped with single-door, the series of $200 \sim 300$ kVA UPS is equipped with double-door, the Figure above is schematic diagram.

3.1.2 External Battery Room

Ambient temperature of the battery should be constant, and it is the major factor affecting the

capacity and service life of battery. Standard working temperature of battery is 20°C ~ 25°C, it will

shorten the service life of battery if it is used in condition that ambient temperature is higher than it, and it will reduce the battery capacity if it is used in condition that ambient temperature is lower than

it. In general condition, ambient temperature range of battery is 15°C ~ 25°C. The battery should be

far away from heat resource and take reasonable ventilation (EN50091-1 annex N) to avoid forming of mixed gas of hydrogen and oxygen which is explosive. Battery switch should be installed near the battery, and wiring distance from battery to UPS should be as short as possible.

3.1.3 Storage

If it is not installed at once, please put the UPS vertically according to instruction shown in package. It should be stored in dry and shade room together with its packing-case to avoid dust and high temperature.

Cover UPS with packing-case to prevent dust or other impurities from entering UPS, which will influence reliability of UPS, when the room or place where it is stored need to decorate or UPS is not used for a long time.

3.2 Initial Inspection and Unpacking of UPS

The equipment cabinet will be fixed on the wooden pallet with screw and be protected by packing materials during the transportation.



Figure 3-3: Outer packing and wooden pallet of UPS

Before installing UPS, the following should be carried out:

- Carefully check the outer packing to confirm that no damage has been caused during the moving. After unpacking the packing-case, take a look at UPS and battery to check if damage has been caused during the transportation. Please immediately inform the carrier and contact customer service staff as soon as possible if you find they are damaged.
- Open the packing-case and remove the protective foam.
- Check up the technical data list to verify that it is the right equipment. Technical data list of UPS locates at label inside the front door, indicating the model, capacity and main parameters of UPS.
- Remove the fixed screw before unloading the cabinet from the wooden pallet. Remove the front and the back shield at the bottom of UPS cabinet, and then you will see the screw that fix the cabinet and the wooden pallet, as shown in Figure 3-4 and 3-5.
- Unload UPS cabinet from the wooden pallet and then move it with forklift to the installation position.

Note: Because UPS cabinet is heavy, please keep it vertical to the ground during removing or transportation, otherwise casualties and property losses will be caused if the UPS cabinet topples.



Figure 3-4: Position schematic diagram of shield

Figure 3-5: Position of fixed bolt hole of 80 ~ 500 kVA UPS cabinet and pallet

3.3 Positioning and Installation

Component arrangement of UPS brings convenience for maintenance, diagnosis and repairing of UPS from front, so it reduces room requirement for side and back. After opening the front door of UPS, you can see the power terminal, auxiliary terminal block, and power operating switch. Selection of location for UPS should ensure:

- Convenient wiring
- Enough operating space
- Good ventilation to meet heat dissipation requirement
- No corrosive gas around
- Away from combustibles
- No over-wet and high-temperature resource
- Not environment with much dust
- Meet fire fighting requirements

• Optimal ambient temperature for working: +20 $^\circ\!C$ ~ +25 $^\circ\!C$, temperature range for maximum efficiency of battery.

3.3.1 Clearance

There is no air grid in side and back of this series of UPS. For $80 \sim 300$ kVA UPS, it has no special space requirement to the side and the back. However, for $400 \sim 500$ kVA UPS, at least 500 mm

should be kept behind the cabinet for the convenience of connection of the UPSs. Besides meeting local stipulations, it should keep enough space in front of UPS so that human can walk freely after full open of front door of UPS. For convenience of daily maintenance, at least 500 mm should be kept behind 80 ~ 500 kVA UPS, at least 700 mm should be kept between top of UPS and ceiling to ensure unblocking of ventilation in above space of it.



Figure 3-6: Installation space diagram of 80 ~ 300 kVA UPS (unit: mm)



Figure 3-7: Installation space diagram of 400 ~ 500 kVA UPS (unit: mm)

3.3.2 Handling of Cabinet

Lifting equipment used to carry UPS cabinet must have sufficient lifting capacity (See Table 2-1 for the total weight of UPS). The rectifier cabinet and inverter cabinet of 400 ~ 500 kVA UPS should be carried separately. Before the UPS is put in the final location, pallet truck or forklift can be used to lift or carry UPS; only when the front lower baffle is removed, the forklift can be used.



Figure 3-8: Carrying of 80 ~ 500 kVA stand-alone cabinet

3.3.3 Cabinet Parallel Installation

The two cabinets of 400 ~ 500 kVA UPS can be installed in parallel as follows:

 Side-by-side placement: place the rectifier cabinet and inverter cabinet side by side as shown in Figure 3-9. Don't leave any gap between the two cabinets which should be placed in the same level.



Figure 3-9: Side-by-side placement of 400 ~ 500 kVA UPS rectifier cabinet and inverter cabinet
2. Fixed installation: disassembly the back board of cabinets placed side by side. Fix the two cabinets together with screw rod at the "fixing holes for parallel connection of the two cabinets" (as shown in Figure 3-10), and then fit on the back board.



Figure 3-10: Diagram of fixing holes for parallel connection of 400 ~ 500 kVA UPS rectifier cabinet and inverter cabinet

3. Bus connection: connect the bus of rectifier cabinet with soft copper bar (as shown in Figure 3-11) and then correspondingly connect it to the copper bars for the bus of inverter cabinet (as shown in Figure 3-12).

Note: +BUS, N and -BUS must be connected correspondingly.



Figure 3-11: Soft copper bars for the bus of rectifier cabinet

Figure 3-12: Copper bars for bus of inverter cabinet

4. Inverter connection: connect the "inverter output switch terminal" of rectifier cabinet with the "inverter output terminal" of inverter cabinet with the given soft copper bars. In connection, the phase sequence should maintain corresponding connection (for example: "phase A of inverter output switch terminal" should be connected with "phase A of inverter output terminal" correspondingly)

The N-line copper between rectifier cabinet and inverter cabinet also need to be connected. Th e inverter connection is as shown in Figure 3-13.



Figure 3-13: Diagram for inversion connection of 400 ~ 500 kVA UPS

5. Connection of signal cable: connect a bunch of unconnected signal cables on the top right of rectifier cabinet to the switch board on the top left of inverter cabinet correspondingly (as shown in Figure 3-14) and the connection between signal cable mark and corresponding terminal is as shown in Table 3-3.

Switch board 1	Switch board 2
cable J2 is connected to switch	cable J4A is connected to switch board J4A
board J2	
cable J4 is connected to switch	cable J3B is connected to switch board J3B
board J4	
cable J5 is connected to switch	cable J2B is connected to switch board J2B
board J5	
cable J8 is connected to switch	cable J1B is connected to switch board J1B
board J8	

Tabla	22.	Corros	nonding	connection	of	torminale
Table	ა-ა.	Cones	ponuing	connection	OI.	terminais



Figure 3-14 Signal cable connection of 400 ~ 500 kVA UPS

6. Connection of dry contacts: the wiring terminal of dry contacts is located below the interior door of rectifier cabinet. Dry contacts are as shown in Figure 3-15. Dry contacts "1" and "2" are the wiring terminal for cold start of battery (Note: The terminal carries strong current during the operation of UPS. "1" refers to fire wire and "2" refers to neutral wire); dry contacts "4" and "5" are wiring terminals of auxiliary contacts in maintenance bypass (option); dry contact "6" and "7" for the battery switch undervoltage release wiring terminals.



Figure 3-15: Dry contacts of 400 ~ 500 kVA UPS

3.3.4 Wiring Routing

Full series UPS and battery cabinet can use lower wiring and side wiring. When lower wiring is used, the wiring channel can be seen when the front door of UPS is opened and the baffle below the wiring terminal is removed. When side wiring is used, the side wiring channel can be seen when the baffle on the left or right of cabinet is removed.

When upper wiring is required, please select power distribution cabinet (for 80 ~ 300 kVA UPS) or maintenance bypass switch cabinet (for 400 ~ 500 kVA UPS)



Figure 3-16: Diagram for installation of UPS and power distribution cabinet

3.4 Optional Accessories

3.4.1 Power Distribution Cabinet and Maintenance Bypass Switch Cabinet

Power distribution cabinet is selected for 80 \sim 300 kVA UPS and maintenance bypass switch cabinet is selected for 400 \sim 500 kVA UPS.

Power distribution cabinet and maintenance bypass switch cabinet can realize the upper and lower wiring as shown in Figure 3-17 and 3-18.





Figure 3-17: Power distribution cabinet of 80 ~ 300 kVA UPS **3.4.2 Cold Start of Battery**

Figure 3-18: Maintenance bypass switch cabinet of 400 ~ 500 kVA UPS

Cold start of battery can start the UPS directly, as shown in Figure 3-20.



Figure 3-19: Cold start box 32

 \triangle Note: Dry contacts for cold battery start of 200 ~ 300 kVA UPS is located on the right of UPS power wiring bar, which can be seen when the front door of UPS is opened; the dry contact for the cold battery start of 80 ~ 160 kVA UPS and 400 ~ 500 kVA UPS is located on the bottom right corner of the right interior door of circuit board, which can be seen when the right interior door of UPS is opened.



3.4.3 LBS (Load Bus Synchronization)

Figure 3-20: LBS controller

Dual bus system is composed of two independent UPS systems and each UPS system can be composed of one or more parallel stand-alone UPS. Dual bus system with high reliability is applicable to load with multiple input terminals. For single input load, one optional static transfer switch (STS) can be added for load power supply.

Dual bus system uses LBS cable option to realize the synchronous output of two independent (or parallel) UPS system. One of the systems is master system and the other one is slave system. The operation mode of dual bus system includes the operation of master / slave system in inversion or bypass mode. The wiring diagram between synchronous controller and stand-alone or parallel system is as shown in Figure 3-21 and 3-22;

3 Installation





Figure 3-21: Typical stand-alone dual bus system (STS and LBS cables are used)

Figure 3-22: Typical parallel dual bus system (STS and LBS cables are used) $^{\ 34}$

3.5 External Protective Devices

Breaker or other protective devices must be installed at the external power input location of UPS system. This chapter only provides general direction for installation engineer who should know related stipulations on local wiring of equipment to be installed.

Before connecting the rectifier and bypass input with main power, proper over-current protective device must be installed between main power and UPS. According to EN50091-1 and in consideration of leakage current of UPS, leakage protective device with adjustable threshold can be used. While external battery should be equipped with DC compatible breaker to provide over-current protection for UPS and its battery.

Note: If leakage protective device is used to supply power for UPS, it may be started wrongly due to the greatly high leakage current caused by FRI filtering.

3.6 Power Cables

In the design of external wiring cable, the requirements on current capacity of power cable and the overload capacity of the system, as well as ambient temperature and physical support media, should be considered. Installation engineer should make selection according to related local standards and actual situation of users. Length of connecting cable should be 2 ~ 50 m generally. If the cable is too long, low voltage will be caused and corresponding cable section area should be increased.

Table 3-4: Wiring terminal and wiring method of UPS							
Terminal	Rectifier input	Bypass input	Output	Battery (50 pcs)			
Wiring method	3Φ+PE	3Φ+N+PE	3Φ+N+PE	Anode + cathode + PE			

		3		
Terminal	Rectifier input	Bypass input	Output	Battery (50 pcs)
Wiring method	3Φ+PE	3Φ+N+PE	3Φ+N+PE	Anode + cathode + PE

	Rated Current (A)						
Rated Capacity (kVA)	Input cu	rrent in fu	III Ioad an	d Outpu	t current o	Discharging	
	full charg	jing		(PF =	0.9)	current for the	
	R	S	т	U	V	W	lowest battery voltage (495 V)
80	128	128	128	121	121	121	155
100	160	160	160	152	152	152	194
120	191	191	191	182	182	182	232
160	255	255	255	243	243	243	310

Table 3-5: Rated current of UPS

200	319	319	319	304	304	304	387
250	399	399	399	380	380	380	484
300	478	478	478	456	456	456	580
400	638	638	638	608	608	608	774
500	797	797	797	760	760	760	967

⚠ _{Note}

- Please refer to national or local electrical specification on the connection of external wiring cable.
- In rated battery current, the wiring between battery and UPS shouldn't have a voltage drop greater than 1% of the nominal DC voltage.

3.7 Wiring Terminal

Open the front door of UPS, remove the protective baffle, then you can see the copper bars connecting the power cable.



Figure 3-23: Wiring terminals of 80 ~ 120 kVA UPS


Figure 3-24: Wiring terminals of 160 kVA UPS



Figure 3-25: Wiring terminals of 200 ~ 300 kVA UPS



Figure 3-26: Wiring terminals of 400 ~ 500 kVA UPS

3.8 Wiring

3.8.1 Wiring of Single UPS System

After the equipment is positioned completely, connect power lines according to the following steps:

- 1. Confirm that all power distribution switches and internal power switches of UPS are cut off. Paste warning identification at the location of switches to prevent faulty operation of others.
- The terminal connecting power cable can be seen when the front door of UPS is opened, but for 200 ~ 300 kVA UPS, the rectifier input terminal can only be seen when the protective cover in front of isolated switch is removed.

Note: When 200 ~ 300 kVA UPS is connected with rectifier input cable, the minimum distance between the fixed screw rod and protective cover should be 3 cm to prevent accidents caused by sparking or short circuit of cabinet due to the insufficient distance of safety regulation.

Connect the protective earth and other necessary earth cables with earth studs at the power equipment base of UPS. All UPS cabinets should be connected with the grounding system of users.

According to the installation type, select one of following two steps (separated bypass or public input) according to installation mode to mark and connect input cables:

Separated bypass connection

4. Bypass input and mains input have been separated when the 80 ~ 500 kVA UPS is finished. When connecting cables, only bypass input cable and mains input cable need to be connected separately. Make sure that the phase sequence is correct when wiring.

Public input connection

5. When the bypass input and mains input share the same mains input, 80 ~ 500 kVA UPS needs to be connected to short wires (or copper bar) of bypass input and mains input. 80 ~ 120 kVA and 200 ~ 300 kVA UPS are connected with short wires equipped randomly. 160 kVA UPS uses copper bar connection which is equipped randomly. Switch baffle shall be disassembled during installation. 400 ~ 500 kVA UPS is not equipped with wire and copper bar. (Note: Copper bar of 400 ~ 500 kVA UPS is optional). Make sure that the phase sequence is correct when wiring.

System output connection

6. Connect the output cable between UPS output terminal (OUTPUT: R/S/T/N) and major load. When debugging engineer comes to the site, please deal with safety insulation at the end of

output cable of the system properly if the load is not ready to receive power supply.

External battery connection

Refer to Chapter 4.5 in EN50091-1 for battery connection. Battery cabinet must be connected with protective earth alone.

- Connect the battery cable between the (+B\-B) battery terminal and battery switch of UPS. The connection of cable between battery terminal and battery switch should start from switch end. Pay attention to the polarity of battery cable.
- 8. Inspect wiring and fasten bolt again for wire locking. Recover all protective covers after confirmation.

3.8.2 Wiring of Parallel UPS System

Wiring of parallel signal cable

Each UPS has 4 parallel wiring ports (two are DB25 and another two are DB9). Closed loop should be formed in the wiring of DB25 in parallel system, so should DB9. Two parallel wires in the same circuit should be closed and parallel as near as possible and kept away from power cable to the greatest extent so as to reduce outside interference to parallel wires. Schematic diagram of wiring is as shown in Figure 3-27.



Figure 3-27: Schematic diagram for connection of parallel signal line

Connection of parallel power cable

If there is only one circuit with power supply, first connect each UPS into the "public input connection", and connect the input terminals of each UPS together, so do output. Schematic diagram of wiring is as shown in Figure 3-28.

If separated bypass connection is used, it is necessary to remove the copper bars with short connected the internal main input and bypass input, and then connect the rectifier input terminals of each UPS together, so do bypass input; the connection of phase sequence should be correct.

A Battery cable is connected in the same way as stand-alone UPS and the battery pack of UPS can't be shared.

Note: In the configuration design of parallel system, for better current sharing to be obtained by parallel UPS, the input and output cables of each UPS must be same in specifications, the length of power cable from the input terminal to the AC power distribution connection point of each UPS is same as that from output terminal to load connection point, and the input and output impedance of each UPS should be consistent.



Figure 3-28: Schematic diagram for connection of parallel power cable

3.9 Control Cable and Communication

3.9.1 Communication Port

According to detail requirements on site, auxiliary connection may be needed for UPS to realize management of battery system (battery temperature sensor), communication with personal computers, provision of alarming signals to external devices or remote emergency power off, etc. These functions are realized by monitoring panel locating at the back of the front door of UPS and communication port module. The monitoring panel can provide the following ports:

The following three Figures are diagrams for communication port module of 80 ~ 500 kVA UPS.

SNMP Battery temp RS232 RS485-1 Input dry contact	FUSE Manual SNMP Battery temp RS485 Cutput dry RS232 Input dry contact
Output dry o o o	Figure 3-30: Communication port of 200 ~ 300 kVA UPS
FUSE [®] Manual	FUSE Manual Battery temp RS485-1 Output dry maintenance RS232 Input dry contact R\$485-2 auxiliary switch SNMP R\$485-2
R\$485-2 Parallel	Figure 3-31: Communication port of 400 ~ 500 kVA UPS

Figure 3-29: Communication port of 80 ~ 160 kVA UPS

Communication Interfaces:

1. Temperature detection interface of battery (BATTMP)

- 2. User communication interface RS232 and RS485 (user background monitoring)
- 3. SNMP port (realizing remote management of UPS by network)
- 4. Parallel interface (communication interface of parallel system)
- 5. Debugging personnel port RS485-2 (realizing UPS debugging)
- 6. Input and output dry contacts (port definitions are shown in Table 3-7)

It shall note following points for wiring of auxiliary cable:

- If conduit is adopted for wiring, communication line and power line shall use conduits separately.
- Wiring of remote EPO switch must comply with local regulations.
- Auxiliary cable must be double-layer insulated twisted cable, whose cross section area shall be 0.5
 ~ 1.5 mm² when the wiring distance is 25 ~ 50 m.

3.9.2 Emergency Power Off Input Interface (EPO)

As shown in Figure 3-37, input dry contacts IN5 interface is remote EPO input interface. UPS provides emergency power off (EPO) function (EPO can be set to cut off output and switch to bypass, switch to bypass by default), which is realized through EPO button on the UPS control panel or a user-supplied remote contact. EPO button is protected by a hinged plastic cover.

Note: The EPO is set to "cutting off output". During the emergency power off (EPO) operation, the UPS system will cut off the load power supply (output termination). This function can only be used when it is confirmed to disconnect the UPS output.

Note: The UPS emergency power off action will turn off the rectifier, inverter and static bypass, but does not disconnect the UPS input mains from the inside. If UPS needs to be completely cut off, when the EPO is triggered, disconnect the upper input switch.

3.9.3 External Battery Temperature Detection Interface

The first interface in left shown in Figure 3-32 (BATTMP) is the temperature sensor interface of battery and temperature sensor of battery shall connect external battery cabinet.

Arrangements of battery temperature sensor pins are shown in Figure 3-32.

Pin 1: + 5 V (power supply of temperature sensor)

Pin 2: BAT-T (battery temperature single)

Pin $3 \sim 8$ is empty, they are unused.



Figure 3-32: Pin Arrangement of Temperature Sensor Interface of Battery

3.9.4 Serial port communication

RS232 provides serial data and is used as port of background monitoring software directly. If client requires, it only can use data cable supplemented with the UPS to connect the communication interface module directly.

RS485-1 provides serial data and is used as port of background monitoring software. If client requires, it only needs a serial data cable to connect the communication interface module directly. Pin arrangements of RS485-1 interface are shown in Figure 3-33.

Pin 1: 485+

Pin 2: 485-

Pin 3: power supply ground



Pin Figure 3-33: arrangements of RS485-1 interface

RS485-2 provides serial data for the debugging and maintenance interface of authorized debugging and maintenance personnel, which has been connected to the communication interface module.

3.9.5 SNMP Interface

This series of UPS provides SNMP card communication interface used for field installation of communication option part SNMP card to realize remote management of UPS by network. The interface has been connected to the communication interface module.

3.9.6 Dry Contact Interface

Dry contact ports of communication interface board are defined as shown in Table 3-6. Table 3-6: Definitions of dry contact ports communication interface board

		-	
Port Name	Signal Definition	Close Condition	
IN-1 (customizable)	Default function: power off		
IN-2 (customizable)	Default function: power on		
IN-3	Power off		
IN-4	Manual bypass ——		
IN-5	EPO —		
OUT-1 (customizable)	Default function: fan fault	Fan fault	
OUT-2	Fault alarm	Fault alarm	
OUT-3 (customizable)	Default function: power on	Power on	

OUT-4 (customizable)	Default function: battery low voltage	Battery low voltage
OUT-5	Output overload	Output overload
OUT-6	Mains mode	Mains mode
OUT-7	Battery mode	Battery mode
OUT-8	Bypass mode	Bypass mode

Use of dry contact ports

The output dry contacts include the operation mode of the UPS and fault alarm (The specific ports are defined in Table 3-7). Each output dry contact port provides a normally open contact and a normally closed contact. The user chooses to use according to the specific situation. Pin arrangements of ports are shown in Figure 3-34 and Figure 3-35.

Pin arrangements of dry contact OUT interface are shown in Figure 3-34.

- Pin 1: normally closed contact
- Pin 2: common terminal
- Pin 3: normally open contact



Figure 3-34 Pin arrangements of dry contacts OUT 1 - 12 interfaces

Pin arrangements of dry contact IN interface are shown in Figure 3-35.

Interface is shown in Figure 3-35. Pin 1: power supply + 12 V Pin 2: power supply ground



Figure 3-35: Pin arrangements of dry contacts IN 1 - 5 interfaces



Figure 3-36: Diagram of communication interface board

 Input dry contact ports include power on, power off, bypass output, and emergency power off (EPO). Customizable functions of IN-1 and IN-2: close dry contact function, power on, generator access (auxiliary contact), battery switch closure (auxiliary contact), external maintenance bypass closure (auxiliary contact), external output switch closure (auxiliary contact) and start test program (used in engineering debug mode). When the above functions are used, the shielded cable shall be used for connection to prevent the interference from causing the wrong action, resulting in the power down of the load or other effects. If this function is not needed, please keep the input dry contact terminal disconnected. Pin arrangements of ports are shown in Figure 3-35.

2. The output dry contacts include the operation mode of the UPS and fault alarms (The specific ports are defined in Table 3-7). Customizable functions of OUT-1, OUT-3 and OUT-4: close dry contact function, fan fault, power on, battery low voltage, start up the generator, time-sharing power off, battery undervoltage release, bypass contactor closure (internal control signal). Each output dry contact port provides a normally open contact and a normally closed contact. The user chooses to use according to the specific situation. Pin arrangements of ports are shown in Figure 3-34.

3.10 Maintenance Sockets

Maintenance sockets can supply power to the tools which need power, when engineer doing maintenance (220 V / 50 Hz).

For example: Electric iron, digital oscilloscope, the maximum current which can be passed through the maintenance socket is 5 A.

Note:



- The action mode of EPO by default is "switching to bypass". When operating EPO function, UPS system switches to bypass output. If needs the action mode of EPO to be "cutting off output", please set the action mode of EPO correct before turning on the UPS. "Cutting off output" can only be set to use this function when you confirm to cut off the output of the UPS.
- When performing "maintenance bypass output", UPS system will set the manual bypass as "open" to switch to bypass mode, and it shall operate by monitoring panel if it needs to switch off manual bypass.
- When UPS is in bypass mode, the load cannot be protected by UPS if voltage and frequency are fluctuated or power fails.

4 Operation

Before starting UPS, please ensure that UPS is installed by authorized maintenance engineer, and he/she should test whether all the electrical connections are correct to ensure the system can run normally. After UPS is started, it can operate in the working modes described in Chapter 2. This chapter describes all operating steps of operator under all working modes, including steps for UPS power on / power off, steps for switching the load to bypass, steps for entering and exiting maintenance bypass and steps for UPS parallel.

Note: All user operational keys and LED display mentioned in operating steps can refer to Chapter 5.

Note: Before taking any operating step described in this chapter, please read the guidance carefully to avoid personal injury or equipment damage caused by faulty operation.

4.1 Turn On the UPS (Switch to Mains Power Mode)

This step is used to turn on the UPS in case of its complete power down, that is, it hasn't provided power supply to the load by the UPS or by the maintenance bypass switch before that. It is assumed that the UPS has been installed well and debugged by an electrician, and external power switch has been closed.

Warning:

- This operating step will cause UPS output terminal to have main power voltage.
- If it needs to cut off subordinate load connection, please paste warning identification in location of load connection.
- Any part whose protective cover only can be opened by tools is inoperable part for users.
- Only qualified maintenance personal can open this kind of protective cover.
 - 1. Ensure all switches are disconnected.

2. Close bypass switch of UPS. After normal display of LCD, click on/off icon " \bigcup " in main interface, select "ON", and then press "YES"; or using button operation, it can start up the UPS by pressing "ON" on panel for more than 1 s. At this time, the UPS is started and fan of the UPS starts to run. Display status of LED can be seen in Table 4-1:

Table 1-1

LED No.	REC	INV	OUTPUT	BAT	BYP	STATUS
Display status	Off	Off	Red	Red	Green	Red

3. Close the rectifier input switch (RCB). After about 10 s, the rectifier starts to normally run, and indicating light of rectifier turns to green and on. Next, inverter starts soft start, indicating light of inverter (INV) in panel is green and flashing. After about 3 s, inverter starts to run normally, UPS is

converted to inverter power supply from static bypass power supply. Display status of LED can be seen in Table 4-2:

Table 1-2

LED No.	REC	INV	OUTPUT	BAT	BYP	STATUS
Display status	Green	Green	Red	Red	Off	Red

4. Close external battery switch. This switch locates inside the battery cabinet or near battery rack. After the UPS system detects the battery, the red indicating light of battery (BAT) in panel will be off. Find the battery data in liquid crystal display field to check whether the battery voltage (500 V ~ 680 V) is correct or not.

5. Inspect and confirm that there is no warning information in left bottom of LCD display screen. UPS is running under main power mode. Close the output switch and confirm display status of LED as shown in Table 4-3:



Figure 4-1: Power flow diagram after normal boot

4.2 ECO Mode

If need UPS to operate in ECO mode, please set it to ECO mode before turning on the UPS and it will be effective after power down.

4.2.1 Start ECO Mode

Click set icon "**W**" in main interface and menu of "advanced setting" (enter right password), and click to enter "mode setting", select "ECO mode" and then press "YES". Here, the "ECO mode" is

not effective, please make the UPS power down, and then power up, then the configured "ECO mode" become effective. Operate according to normal startup steps, the UPS will work in ECO mode. The display status of LED can be seen in Table 4-4:

	Table 4-4					
LED No.	REC	INV	OUTPUT	BAT	BYP	STATUS
Display status	Green	Green light flashes	Green	Off	Green	Green

4.2.2 Shut Down ECO Mode

Click set icon " in main interface and menu of "advanced setting" (enter right password), and click to enter "mode setting", select "UPS mode" and then press "YES". Here, the "UPS mode" is not effective, please make the UPS power down, and then power up, then the configured "ECO mode" become effective. Operate according to normal startup steps, the UPS will work in UPS mode.

4.3 Manual Bypass

If you need to manually switch the inverter power supply to the bypass power supply, you can use the manual bypass enable function. Manual bypass can be set at any time, and it has memory function (that is, manual bypass mode only needs to be set once, after taking effect, UPS will keep working in manual bypass mode, even if the UPS is self-starting).

Operation steps are as follows: click set icon "⁽ⁱ⁾" in main interface and menu of "advanced setting" (enter right password), then click to enter "mode setting", and then press "YES" to enter the current mode. Click to enter "basic parameter" setting, and press "Manual Byp", select "ON", and then press "YES". Here, the output is switched to bypass power supply, it will display "Manual Byp On" in left bottom corner of LCD display screen. It can be set as "OFF" if needs to switch off the manual bypass.

Note: When UPS is in bypass mode, the load cannot be protected by UPS if voltage and frequency are fluctuated or power is failure.

4.4 Maintenance Bypass

Note: Please read the warning information in Chapter 1 and operate the maintenance bypass carefully, otherwise it may damage the UPS or cause power down of the load and even endanger personal safety.

4.4.1 Enter Maintenance Mode (Single UPS unit)

The following operating step can switch the load from status of UPS power supply protection to status that maintenance bypass switch is connected with AC input bypass power directly.

- 1. Click set icon " in main interface and menu of "advanced setting" (enter right password), then click to enter "mode setting", and then press "YES" to enter the current mode. Click to enter "basic parameter" setting, and press "Manual Byp", select "ON", and then press "YES". At this time, UPS can provide power supply to the load through static bypass.
- 2. Manually close the maintenance switch. At this time, power supply of load is provided by power supply of both maintenance bypass and UPS static bypass.
- 3. Click On/Off icon "🕐" in main interface, select option of "OFF" and press "YES" to turn off the UPS. Or keyboard operation can be used: press "OFF" on the panel for more than 1 s, press switch button "🐨" to switch to keyboard operation mode, press up "🏠" and down "🖓" to

select option of "OFF", and then press "

- 4. Manually disconnect the rectifier switch, bypass switch, battery switch, and output switch.
- 5. At this time, the operation of switching UPS output to maintenance bypass has been finished, power supply of load is provided by maintenance bypass, fan stops, and UPS is turned off completely. When the BUS voltage is lower than 36 V, daily maintenance or repair can be done by maintenance personnel, but the load device has no protection if AC power is abnormal.

4.4.2 Exit Maintenance Mode (Single UPS unit)

After maintenance is completed, the load can be converted from status of no AC power fault protection to status of UPS power supply protection by the following operating steps.

- 1. Carefully check whether there is any object left in UPS cabinet, and whether internal connecting wire of UPS has recovered to status before maintenance.
- 2. Close the rectifier input switch. After liquid crystal display become normal, click On/Off icon "

in main interface, select "ON", and then press "YES". Or use button operation: start up the UPS by pressing "ON" on panel for more than 1 s. Observe whether the UPS rectifier and inverter is working properly. If it is normal, continue the following steps; if not, please turn off the UPS and disconnect the rectifier input switch, and then continue the maintenance.

- 3. Close the bypass input switch after normal operation of rectifier and inverter of UPS.
- 4. Check whether the manual bypass enable (Manual Bypass) is ON or not in set menu " ", if not, set it to be "ON".
- 5. Switch on output switch. At this time, power supply of load is provided by power supply of both maintenance bypass and UPS static bypass.

- 6. Disconnect maintenance switch.
- 7. Close battery switch, and set "Manual Byp" on panel as "OFF". At this time, operation of exiting maintenance status is finished; the load is switched from status of no AC power fault protection to status of UPS power supply protection.

4.5 Battery Cold Start (Optional)

If you need to start the UPS through battery when there is no main power or bypass, battery cold start option is should be equipped. It is assumed that electrical connection of battery cold start option with UPS and battery cabinet is normal. The operating steps for power on are as follows: 1. Close external battery switch.

2. After LCD display become normal, click On/Off icon "" in main interface, select "ON", and then press "YES"; or use button operation: power on the UPS by pressing "ON" on panel for more than

1 s.

Note: Only the product with battery cold start can be turned on by the battery.

4.6 Battery Manual Maintenance Mode

To prolong service life of battery, it is suggested to take manual maintenance for battery once 2 or 3 months. Steps to access battery manual maintenance are as follows:

1. Click test command icon "

According to needs, select options of "battery test (time)" or "battery test (voltage)", or "battery test (EOD)". At this time, the rectifier is turned off, battery discharges, "BAT" indicator flashes in green.

2. If the UPS output is switched to static bypass without interruption and "Bat test success" is displayed in left bottom corner of LCD screen, it means battery manual maintenance has been finished. After finishing battery manual maintenance, rectifier and inverter of UPS start normally, output is switched to inverter output without interruption, and battery is charged. If necessary, maintenance personal can stop manual maintenance and recover normal working mode of UPS only by selecting "CLR TEST" in menu of "TEST CMD".

Note: With the battery manual maintenance mode, the battery will automatically discharge and the backup time will be shortened. Please use the battery manual maintenance mode function when the mains and bypass input are stable. In case of any abnormal situation, you can operate the "terminate test".

4.7 Turn Off the UPS (Completely Turn Off the UPS & Load)

It shall follow following steps to completely power off UPS and disconnect power supply of load. All power supply switches and breakers are disconnected, and UPS does not provide power supply to the load.

- 1. Shut down or cut off all loads of the UPS.
- 2. It can power off the UPS by clicking On/Off icon "D" in main interface, selecting "OFF", and then pressing "YES". Or use button operation: power off UPS by pressing "OFF" on panel for

more than 1 s, pressing switch button "^[1]" to switch it to button operation mode, pressing up

" and down " b select "OFF", and then pressing " ". This operation can power

off the rectifier and inverter, disconnect static switch, and disconnect power supply of the load.

- 3. Disconnect the rectifier switch, bypass switch, output switch and battery switch.
- 4. Ensure maintenance switch is disconnected.
- 5. Along with all internal power supplies power off, all LED indicator lights on panel are off, and LCD display is off.
- 6. To ensure complete power off of the UPS, must disconnect its distribution switches of external mains power and external output switches, and paste them with warning labels.

Note: if you want to completely power off UPS, please disconnect all power switches, circuit breakers, and external distribution switch for main power and external output switch and then paste them with warning labels.

4.8 Emergency Power Off (EPO)

For this model of UPS, when execute EPO function, it will turn to two modes, the default is bypass mode, press the red EPO button on the panel, the UPS will execute EPO function. EPO function is used to turn off the UPS in case of emergency (e.g. fire, flood, etc.). The system will switch off the rectifier and inverter, and rapidly switch the output to bypass status, and batteries stop charging or discharging. If need the action mode of EPO to be "cutting off the output", please set the action mode of EPO to be "cutting off the output" before turning on the UPS. At this time, if press EPO button, the UPS will switch off the rectifier and inverter and disconnect the output, and the load will power off.

If the UPS still has main power input, the control circuit of UPS still has electricity, but the UPS output has been cut off. If it needs to cut off main power supply of UPS completely, it shall disconnect the UPS external mains power input switch.

The UPS must be powered down completely, that is, the UPS doesn't exit emergency power off status until disconnecting all input switches (including battery switch) manually.

Note: When executing emergency power off (EPO) operation (EPO is set to be "cutting off the output" mode), the UPS system will disconnect load power supply (disconnect output), and this function only can be used when ensure to disconnect the UPS output.

4.9 Turn On/Off the Parallel UPS System

4.9.1 Notice for operating of Parallel UPS System

- During normal operation of parallel system, it cannot take plug operation for parallel line.
- Before loading, all output switch of parallel system must be switched on and all output terminals must be connected together. After loading, all output switches of parallel system cannot be disconnected except that the UPS is powered off.
- Before using maintenance bypass, manual bypass "Manual Byp" of all UPSs in parallel system shall be set as "ON", and then switch on maintenance switch.
- When parallel system is working, bypass switches of all UPSs in parallel system must be in the same status.

4.9.2 Turn On the Parallel UPS System

- 1. Please ensure all wirings of the UPS and parallel systems are correct;
- 2. Switch on all bypass switches of all UPSs in parallel system;
- 3. Switch on output switch of UPS1 firstly, switch on rectifier switch of UPS1, after LCD display

normally, click On/Off icon " D" in main interface, select option "ON", and then press "YES". Or use button operation: power on the UPS by pressing "ON" on panel for more than 1 s. Then REC indicator light starts flash, UPS1 starts bypass output. About 15 s later, green BYP indicator light is off, green INV indicator light is on, and the UPS starts inverter output. Switch on battery switch of UPS1, REC, INV, OUT, and STATUS indicator lights on panel are green, and BYP and BAT indicator lights are off.

- 4. Please start the UPS2, UPS3...UPS N by above sequences in step 3;
- 5. After starting all UPSs, their indicator lights are the same with those of UPS1. By now, start of parallel system is finished;
- 6. Before loading, please ensure output switches of all UPSs in parallel system are switched on and output terminals are connected together;
- 7. Please take operations in step 2 and step 3 to add a stand-alone UPS to the parallel system.

4.9.3 Turn Off the Parallel UPS System

- 1. Switch off all loads;
- 2. Click On/Off icon "O" in main interface, select "OFF", and then press "YES" to power off the UPS. This operation can power off the rectifier and inverter, disconnect static switch, and disconnect power supply of the load, please operate carefully. After powering off the UPS, disconnect output switch, battery switch, rectifier switch, and bypass switch of UPS1, and REC, INV, OUT, BYP, and BAT indicator lights on panel are off;
- 3. Switch off UPS2, UPS3.....UPS N by above sequences in step 2;
- 4. Please take operations in step 2 to exit a stand-alone UPS from the parallel system.

4.9.4 Operating of Maintenance Mode of Parallel UPS system

- 1. Set manual bypass "BYP" of UPS1, UPS2, UPS3......UPS N as "ON" by sequence;
- 2. Switch on maintenance switch of the UPS needing maintenance, click On/Off icon "¹¹¹" in main interface, select "OFF"; and then press "YES". Disconnect output switch, battery switch, rectifier switch, and bypass switch of the UPS;
- 3. It can start maintenance after the UPS is under full power down condition and electrolytic capacitor is discharged completely (The bus voltage is less than 36V);
- 4. After finishing maintenance, carefully check whether there is any object left in the UPS cabinet, and recover internal wiring of UPS to status before maintenance. Switch on rectifier switch and bypass switch, press "ON", the fan start run. At that time, the UPS is operating under bypass mode. About 15 s later, green INV indicator light is flashing continually, which means that operations of powering on the UPS has been finished;
- 5. Ensure all UPSs in parallel system are under bypass mode, switch on output switch of the maintained UPS, and then disconnect its maintenance switch;
- 6. Switch on battery switch of the UPS, and set "manual bypass" of UPS1, UPS2 and UPS3.....UPS N as "off" by sequence. At that time, REC, INV, OUT, STATUS indicator lights of all UPSs are green, BYP and BAT indicator lights are off, and all UPSs in parallel system are switched to main power supply mode.
- 7. View the load and load equal-division of each UPS.

Note: If parallel line is disconnected when parallel system is under maintenance mode, other UPSs in parallel system may under power down condition, and it is suggested to switch other UPSs in parallel system to maintenance bypass mode if it needs to disconnect the parallel line for maintenance.

4.10 Reset Operation after Fault Alarm

If UPS is powered off due to rectifier or inverter caused by over-temperature or over-load or over-voltage of bus, it shall adopt proper measures to clear it on basis of warning information displayed in display screen, and then reset to normal working status of UPS by following steps. It shall execute following steps after user confirm that the fault has been cleared and there is no

remote EPO signal:

- 1. Press "FAULT CLEAR" on panel to exit the UPS system from fault mode.
- 2. UPS starts automatically; rectifier, inverter, and inverter static switch start, and UPS accesses normal operating mode.

4.11 Auto Start

When main power is failure, UPS can provide power supply to load through battery system until final voltage 495 V of battery discharge is reached by battery discharge, UPS stops inverter output, and the output is switched to static bypass. When main power is recovered, UPS can start automatically, recover inverter output power supply, and charge the battery. Automatic start function is also applicable for bypass mode.

4.12 Language Selection

LCD menu and data provides English, Chinese and user-defined for selection. It can select language by clicking set icon "

4.13 Change Current Date and Time

It can set current time of UPS by clicking set icon "

4.14 Control Password

System is equipped with password protection to restrict operation of some control, and the initial password is "12345678". After starting control password, it can execute UPS and battery test operations after passing the password verification.

In setting menu ⁽¹⁾, the options in "advanced setting" has to be entered the maintenance password then it can be operated; the operation must be operated by authorized maintenance engineer.

5 UPS Display Panel

5.1 Brief Introduction

Operation display panel of UPS locates at upper of front door. By operation display panel, it can take operation control to UPS and inquire all parameters of UPS, UPS and battery status, event and alarming information. Operation display panel can be divided into four parts: simulation status diagram, LCD display and menu button, and control operation button.

Simulation status diagram LCD display and menu button Control operation button



Figure 5-1: UPS operation control and display panel

Table 5-1: Descriptions of silk-screen for operation display panel of UPS and icon of LCD display screen

Monitoring panel	Icon/Silk-screen Meaning			
	REC	Rectifier indicator light		
	INV	Inverter indicator light		
LED indicator light	OUTPUT	Load indicator light		
	BAT	Battery iindicator light		
	BYP	Bypass input indicator light		
	STATUS	UPS status and warning indicator light		
Icons of LCD touch screen	\$	Set		
		Battery		
	9	On/off		
	2	Input parameter		

	K.	2	Output parameter	
	~		Bypass parameter	
	ÅË	())	Battery self-inspection and maintenance	
]	Historical record	
	+]	Return to main interface	
	Û)	Return to last menu	
	t		Down	
			Up	
	+		Left	
	+]	Right	
	_ † ↓]	Switch of up and down line	
	4]	Enter	
	×		Delete	
	EP	0	Emergency power off	
	NO	J	On	
	OF	F	Off	
Operation key	FAULT CLEAR		Fault reset	
	SILENCE	ON/OFF	Warning mutt off	
		D	Switch	
		仑	Up	
		L 2	Down	
		Į	Enter	

5.1.1 Simulated Status Diagram

Simulation status diagram provides LED indicator lights which can display all working paths of UPS and current working status of it.

Table 5-2 [.] Descri	ntion for status	of indicator I	ight of rec	tifier (REC)
	plion for status	or indicator i	Igni or iec	

Green and on	Rectifier is in normal working condition
Green and flashing	Rectifier is in soft start condition
Red and on	Rectifier is in fault
Off	Rectifier cannot work

Table 5-3: Description for status of indicator light of battery (BATT)

Green and on	Battery discharges normally
Green and flashing	Battery low voltage discharge or battery is taking manual
	maintenance test
Red and on	Battery is in fault (fault of battery or no battery)
Off	Battery is being charged.

Table 5-4: Description for status of indicator light of bypass (BYP)

Green and on	Power of load is supplied by bypass
Red and on	Power of bypass is in fault or exceeds normal range, bypass static
	switch is in fault or load impact to bypass
Off	Bypass is normal

Table 5-5: Description for status of indicator light of inverter (INV)

Green and on Power of load is supplied by inverter	
Green and flashing	Inverter starts or is in stand-by status (ECO mode)
Red and on	Inverter is in fault
Off	Inverter cannot work

Table 5-6: Description for status of indicator light of load (OUTPUT)

Green and on	UPS has output		
Red and on	Output switch of UPS is disconnected or has output but		
	overloaded		
Off	UPS has no output		

Table 5-7: Description for operation status (STATUS)

Green and on	Operation is normal
Yellow and on	UPS gives alarm
Red and on	UPS is in fault

5.1.2 Sound Alarm (Buzzer)

There are three kinds of different sound alarms during running of UPS:

Table 5-8: Description of sound alarm of buzzer

Short single alarm	Give this alarm when pressing any functional operation key	
Continual alarm	Give this alarm when UPS is under fault	
	Give this alarm once 2 seconds when battery is discharging	
Distant alarm	Give this alarm once 1 second when battery is discharging and	
	voltage is lower than low-voltage alarm point	

5.1.3 Functional Operation Keys

EPO	Used to cut off the load power supply and turn off rectifier, inverter
EPU	and static switch
	Used to start the rectifier, inverter and static switch and supply power
ON	to the load
OFF	Used to cut off the load power supply and turn off rectifier, inverter
	and static switch
FAULT CLEAR	Clear the fault
SILENCE	Cancel alarming sound by pressing this key when sound alarm is
ON/OFF	given, and restart the buzzer by pressing it again

Table 5-9

5.1.4 LCD Touch Screen and Menu Button

LCD displays friendly interface and provides 320 x 240 raster graphic display. LCD can display the alarm information real-time, provide 10,000 historical alarm records for inquiry of user, and provide reliable basis for fault diagnosis.

User can execute various operational commands through LCD touch screen interface, check input, output, load, and battery parameter conveniently, and obtain current UPS status and warning information timely. Besides, LCD can display version information of control software and monitoring board software.

There are four menu buttons, and descriptions of their functions:

Table 5-10: Description of meanings of menu icons

Button icon	Ĵ	仑	Ŷ	٩,
Function	Switch	Up	Down	Enter

LCD display screen supports two control modes: button control and touch control.

1. Button control

Press button of ", under any interface to switch to button control mode, the selected icon is
displayed in reverse, move the cursor by pressing button of "The "or "The ", press ", to
select the icon where cursor locates at, and press " T " to return to touch screen control mode.
2. Touch control
Take operations by clicking corresponding icons in LCD screen.

5.1.5 Calibration of LCD Touch Screen

Click set icon " in main interface and menu of "user set", select "calibration of touch screen", click cross cursor "+" in touch screen in according to corresponding tips, and every location shall be clicked for 7 times. After tip shows that calibration of touch screen is finished, it means calibration of touch screen is finished.

5.1.6 Description of Menu Details



Figure 5-2: Main interface

UPS system information window: to display basic information of UPS, including current time, date, UPS series name, configuration, and status. Information in this window cannot be operated by user, and detailed explanations are listed in Table 5-11:

Display Content	Meaning
89XX	UPS series name
Stand-alone online	Single UPS online: double-conversion single UPS
Parallel system (M/N)	system
Hot standby host/slave	Parallel system (M/N): parallel redundant system
	Hot standby host/slave: hot standby system
2019-01-05	Current date (format: year-month-date)
15:26	Current time (format: 24 hours, hour: minute: second)

Table 5-11: Item description of UPS system information window

Select menu icon by LCD touch screen to check data window.

Menu Icon	Menu Name	Menu Item	Explanation		
	lanut	Input voltage (V)	Input voltage		
$ \sim $	Input	Input current (A)	Input current		
	parameter	Input frequency (Hz)	Input frequency		
	Bypass	Bypass voltage (V)	Bypass voltage		
\sim	parameter	Bypass frequency (Hz)	Bypass frequency		
		Output voltage (V)	Output voltage		
	Output	Output current (A)	Output current		
2	parameter	Output frequency (Hz)	Output frequency		
		Power factor	Power factor		
		Active power (kW)	Pout: active power		
	Load parameter	Apparent power (kVA)	Sout: apparent power		
		Load rate (%)	Load (UPS rated load percentage)		
	Battery parameter	Battery voltage (V)	Battery voltage		
		Battery current (A)	Charging and discharging current of battery		
		Battery temperature	Display battery temperature after access to		
		(°C)	battery temperature detection		
		Environment			
F		temperature (°C)	Environment temperature		
		Battery status	Equalizing charge, floating charge, battery discharging, battery self-testing		
		Battery info	100 Ah * 50 pcs * 1 group		
		Next time of battery self-test	Display next time of battery self-test after related parameters are configured		
	Fault record	Fault record	Fault logging		
	Warning record	Warning record	Warning logging		

Table 5-12: UPS	menu icon and	UPS data window
10010 0 12. 01 0	mona icon ana	

	Status record	Status record	Status logging		
	Operation record	Operation record		Operation log	gging
	Master control record	History record information	Read all	Read all master control history rec	
			Language setting	Set display language: Chinese English, user-defined	
			Protocol setting	Set communication protocols	
		User settings	Time setting	Set display time	
			Password	Modify password to enter the	
			Touch	Make correction to the touch	
			correction	screen	
				Upen password	
			Initial	LUC	
			settings	Dry cor	ntacts settings
				Restore	factory settings
				-	Basic parameters
tot I	Setting				Main parameters
	interface				Bypass
				UPS mode	parameters
					battery
					Output
					parameters
		Advanced settings			Basic parameters
					Main parameters
			Mode		Bypass
			settings	ECO mode	Battery
					parameters
					Output
					parameters
					Basic parameters
					Main parameters
				EPS mode	Bypass
					Batterv
					parameters
					Output

					parameters	
					Main parameters	
				Frequency	Battery	
				conversion	parameters	
				mode	Output	
					parameters	
					Basic parameters	
				Voltago	Main parameters	
				vollage	Bypass	
				modo	parameters	
				mode	Output	
					parameters	
			Othor	U	SB guide	
			settings	Emp	oty records	
			settings	Communio	cation debugging	
			Serial	The only c	ode of the UPS is	
			number	89200	1602250001	
			System	Provide sy	stem information,	
			model	MODLE: 220	V - 50 Hz – 200kVA	
			Master	Master o	control software	
		System information	control	vers	sion V4.0	
			version			
			Monitoring	Monitoring	software version	
			version		V3.0	
			Manufactur	Manufacture	er name telephone	
			er	nun	nber. URL	
			information			
		Battery test (time)	Manual batte	ery test: Stop to the configure	esting according to d time	
		Battery test (voltage)	Manual batte	ery test: Stop t	esting according to	
		, , ,	the configured voltage			
ΞĮ	Test	Battery test (EOD)	Manual battery test: Stop testing accordi		esting according to	
<u>_~</u>])]	command		the configured EOD voltage			
		Stop testing	Stop manua	al maintenance	e of batteries, Stop	
		Stop testing	manual self-test of batteries or system test			
		MUTE		Turn mutt o	n/off	
		Turn on the LIPS	Turn on the	UPS (Open th	e rectifier, inverter	
			and static switch)			
(J)	UPS	UPS Turn off the UPS and		Close the rectifier and inverter		
	On/Off	switch to bypass				
		Turn off the UPS and cut off the output	Close the re	ectifier, inverte	r and static switch	

Mode back-end parameter settings

Basic parameters	EPO action mode	EPO action modes: 0- transfer to bypass; 1- transfer to UPS shutdown. The default is transfering to bypass.	
	Manual bypass enable	Set startup of manual bypass switch when maintain the UPS: 0- close; 1- open. The default is closing.	
	Altitude derating	0 ~ 6000 m (settable), 1000 m (by default)	
	Numbers of parallel units	The default is 1. 1-8 is settable.	
	UPS number of parallel units	The default is 1. 1-8 is settable.	
	Generator startup	Generator start voltage (dry contact operating	
	voltage	voltage), the default is 550 V.	
	Generator shutdown	Generator shutdown voltage (dry contact operating	
	voltage	voltage), the default is 600 V.	
	Master control test enable	Used in maintenance mode, shutdown by default.	
Main parameters	Rated input phase voltage	Display according to the rated voltage of program initialization, select one from 220 / 230 / 240 or 100 / 110 / 115 / 120 / 127	
	Rated input frequency	Rated input frequency 50 Hz / 60 Hz (optional), the default is 50 Hz.	
	Rectifier delay start	Set delayed start time of rectifier [1,300], the default is 10 s.	
	Input current limit	Set rectifier input current limit [0.1, 1.1], the default is 1.1.	
	Rectifier soft start time	The default is 10 s. 5 - 30 s is settable.	
Bypass parameters	Bypass voltage range upper limit	Bypass voltage range upper limit [10%, 15%, 20%, 25%], the default is 20%.	
	Bypass voltage range lower limit	Bypass voltage range lower limit [10%, 20%, 30%, 40%, 50%, 60%], the default is 20%.	
	ECO voltage upper limit	ECO voltage upper limit range [5%, 10%, 15%], the default is 10%.	
	ECO voltage lower limit	ECO voltage lower limit range [5%, 10%, 15%], the default is 10%.	

		Bypass protection	The default is	startup. Shutdown/	startup is settable.
Pom	enable ' '				
Kem		Single battery	Single battery voltage 2 V. 3.2 V. 12 V. the default is 12		
		voltage	V.		
		Single battery	Single battery capacity range 7 – 2000 AH		
		capacity			
		Number of battery	Number of single group of battery (80 – 500 kVA) [48, 52], the default is 50 pcs		
			[180, 195], the default is 188 pcs [288, 312], the default is 300 pcs		
		Number of battery group	Battery group range 1-8, the default is 1		
			Display different charging current rate range according		
			to single battery	voltage. This parar	neter affects battery
			charging current.		
В		Battery charging current	charging current. I = charging rate capacity humber		
			narallel units, this parameter can only be effective when		
	Battery		start common batteries enable		
	parameters		Start Common Da		
	parametero		battory		Charging rate
				value of charging	range
			2 2 1/	0.1 C	[0.05C, 0.25C]
			12 V	0.3 C	[0.05C, 2C]
		Temperature	Temperature cor	mensation value ([0:030; 0:230]
		compensation	the default is -3mV/°C		
			Display different floating charge voltage range according		
			to single cell voltage of battery		
		Battery floating charge voltage	Single battery voltage	he default alue of floating harge voltage	Floating charge voltage range
			2 V	2.27 V	[2.20, 2.30]
			3.2 V	3.62 V	[3.52, 3.68]
			12 V	13.6 V	[13.2, 13.8]

		Display different equalizing charge voltage range according to single battery voltage. This parameter represents added value on the floating charge voltage. Equalizing charge voltage = floating charge voltage +		
		added value		
	Battery equalizing		The default	Egualizing
	charge voltage	Single battery	value of	charge voltage
		voltage	equalizing	range
			charge voltage	
		2 V	0.08 V	[0.08, 0.17]
		3.2 V	0.13 V	[0.13, 0.27]
		12 V	0.50 V	[0.5, 1.0]
		Display different EOD range according to single battery voltage		
	Battery EOD	Single battery voltage	Default value of EOD	EOD range
	voltage	2 V	1.65 V	[1.60, 1.80]
		3.2 V	2.63 V	[2.56, 2.88]
		12 V	9.9 V	[9.6, 10.8]
		Display different DOD range according to single battery voltage. This parameter represents added value on EOD: DOD = EOD + added value		
	Battery DOD voltage	Single battery voltage	Default value of DOD	DOD range
		2 V	0.17 V	[0.08, 0.17]
		3.2 V	0.27 V	[0.13, 0.27]
		12 V	1.0V	[0.5, 1.0]
		The charging time of equalizing charge constant current can be settable. After detecting the battery, enter stage		
	Stage 1 charging	1 charging. The condition of end of stage 1 charging		
	time	(the following conditions are or relationship) : 1 Time		
		reaches the set value;2 Battery voltage reaches		
		equalizing voltage point [0, 100], 100 H by default		
		The charging time of equalizing charge constant voltage		
	Stage 2 charging	can be settable. T	he condition of end	of stage 2
	time	charging is that the time reaches the set value [0, 24], the default is OH.		

	Battery management enable	Display battery backup time and residual capacity in battery parameters interface. The default is off.
	Battery sharing enable	Share battery pack. The default is off.
	Battery self-test settings	Self-test function enable: off / according to the voltage / according to the time.
		Self-test cycle: self-test cycle setting [30, 365], the default is 90 days.
		Self-test time: self test duration [5, 240], the default is 5 minutes.
		Self-test voltage: voltage point at end of self-test [EOD * battery quantities, floating charge voltage * battery quantities]. For 30 pcs batteries, the default is 360 V. For 50 pcs batteries, the default is 500 V.
		self test [0000, 2359]. The default [0000, 0500] is 0:00 to 6:00 am.
	Online detection function	Battery monitoring method is settable [off / drop the benchmark / auxiliary contact]. The default is dropping the benchmark.
	Battery quality enable	On / off settable, the default is off.
	Battery installation year	
	Battery installation month	Enter the date of battery installation
	Battery installation day	
	Battery quality standards	0 - 100% settable, 20% by default, the default is off.
	Battery replacement cycle	The default is 5 years. 1 - 8 year(s) is settable.

5.1.7 Current Information Record Window

This window records events of UPS under current operating mode, and does not record the solved status.

Click "current alarm" in main interface to browse the events.

For complete historical record, please see historical record information in " Event list of UPS displayed in front panel of it can be seen in Table 5-13.

5.2 Display Events

Table 5-13:	List of	display	events
-------------	---------	---------	--------

UPS Events	Description
Occurrence of equalizing charge for battery	Battery status (is equalizing charging.)
Occurrence of floating charge for battery	Battery status (is floating charging.)
Occurrence of battery discharge	Battery status (is discharging.)
Battery self-testing	Battery status (is self-testing.)
Occurrence of normal working of rectifier	Rectifier is working normally.
No occurrence of battery	Battery is disconnected.
Occurrence of battery connected	Battery is connected.
Occurrence of close of output air switch	UPS output power supply switch is on.
Occurrence of disconnection of output air switch	UPS output power supply switch is off.
Occurrence of power supplied by bypass	Bypass is normal.
Occurrence of power not supplied by bypass	Bypass is abnormal.
Occurrence of soft-start of inverter	Soft-start of inverter.
Occurrence of normal working of inverter	Inverter is working normally.
Occurrence of power not supplied by inverter	Inverter is off or in fault.
Occurrence of no power supplied by inverter	Inverter doesn't supply the power.
Occurrence of power supplying of inverter	Inverter is supplying power.
Occurrence of close of maintenance bypass air switch	Maintenance bypass air switch is on.
Occurrence of disconnection of maintenance bypass air switch	Maintenance bypass air switch is off.
	Emergent power off: directly press EPO button
Occurrence of emergency power off	panel or receive command of external emergency power off.
Occurrence of close of inverter static switch	Inverter static switch is on.
Occurrence of disconnection of inverter static switch	Inverter static switch is off.
Occurrence of effectiveness of manual bypass	Manual bypass is effective.
Occurrence of cancel of manual bypass	Manual bypass is ineffective.
Occurrence of fault of main power	Main power is in fault.
Disappearance of fault of main power	Main power is normal.
Occurrence of fault of rectifier	Rectifier is in fault.
Disappearance of fault of rectifier	Rectifier is normal.
Occurrence of fault of inverter	Inverter is abnormal.

Disappearance of fault of inverter	Inverter is normal.	
Occurrence of fault of bypass	Bypass is in fault.	
Disappearance of fault of bypass	Bypass is normal.	
Occurrence of low output voltage of phase A	Output voltage of A is low.	
Occurrence of high output voltage of phase A	Output voltage of A is high.	
Disappearance of fault for output voltage of phase A	Output voltage of A is normal.	
Occurrence of low output voltage of phase B	Output voltage of B is low.	
Occurrence of high output voltage of phase B	Output voltage of B is high.	
Disappearance of fault for output voltage of phase B	Output voltage of B is normal.	
Occurrence of low output voltage of phase C	Output voltage of C is low.	
Occurrence of high output voltage of phase C	Output voltage of C is high.	
Disappearance of fault for output voltage of phase C	Output voltage of C is normal.	
Occurrence of fault for voltage of main power	Voltage of main power is abnormal.	
Disappearance of fault for voltage of main power	Voltage of main power is normal.	
Occurrence of fault for frequency of main power	Frequency of main power is abnormal.	
Disappearance of fault for frequency of main power	Frequency of main power is normal.	
Occurrence of opposite phase sequence of main	Phase acqueres of main aircuit input is appealite	
circuit input	Finase sequence of main circuit input is opposite.	
Disappearance of opposite phase sequence of main	Phase sequence of main circuit input is normal	
circuit input		
Occurrence of failure for input soft start	Rectifier is abnormal.	
Disappearance of failure for input soft start	Input soft start is normal.	
Occurrence of over-current of rectifier IGBT	Rectifier IGBT is over-current.	
Disappearance of over-current of rectifier IGBT	Rectifier IGBT is not over-current.	
Occurrence of over-voltage of bus	Voltage of DC bus is abnormal.	
Disappearance of over-voltage of bus	Voltage of bus is normal.	
Occurrence of low voltage of bus	Voltage of DC bus is low.	
Disappearance of low voltage of bus	Voltage of bus is normal.	
	Phase sequence of bypass voltage is opposite. In	
	normal condition, phase B is later 120 than phase	
Occurrence of opposite phase sequence of bypass	A, and phase C is later 120 than phase B. Inspect	
	and confirm whether the input phase sequence of	
	UPS bypass power is correct or not. If wrong,	
	correct it.	
Disappearance of opposite phase sequence of	Phase sequence of bypass is normal.	
bypass		
Occurrence of fault for voltage of bypass	Voltage of bypass is abnormal.	
Disappearance of fault for voltage of bypass	Voltage of bypass is normal.	
Occurrence of fault for bypass thyristor	Bypass static switch is abnormal.	

Disappearance of fault for bypass thyristor	Bypass static switch is normal.	
Occurrence of fault for frequency of bypass	Frequency of bypass is abnormal.	
Disappearance of fault for frequency of bypass	Frequency of bypass is normal.	
Occurrence of overdue for overload of the UPS	UPS is overloaded and exceeds the allowed overload time. Note 1: phase with max load displays overdue of overload; note 2: when load exceeds rated value, it shall report "output overload of UPS"; note 3: when it exceeds the allowed overload time, inverter static switch disconnects and load is converted to bypass; inverter is in stand-by. If there is no power down for bypass after 10 s, the load is converted to inverter, and this conversion only can be 5 times within 1h. Note 4: load factor of phase with max load reduces less than 90%, the system will convert to inverter power supply mode. Note 5: The UPS will automatically shut down after overload timeout. If you want to restart the UPS, you need to clear the fault before starting it up	
Disappearance of overdue for overload of the UPS	Output of the UPS is not overload.	
Occurrence of limitation for conversion times within 1h	Overload conversion times in last 1h exceed the set value so that the load stays in bypass power supply mode. Within 1h, UPS can recover automatically and convert to inverter power supply mode.	
Disappearance of limitation for conversion times within 1h	Limitation for conversion times within this hour	
Occurrence of fault of fan	Fan is disconnected or in fault.	
Disappearance of fault of fan	Fan is normal.	
Occurrence of fault of fuse	Fuse is damaged.	
Disappearance of fault of fuse	Fuse is normal.	
Occurrence of over-temperature of inverter	Temperature of inverter is too high.	
Disappearance of over-temperature of inverter	Temperature of inverter is normal.	
Occurrence of over-current of inverter IGBT	Current of inverter IGBT is over.	
Disappearance of over-current of inverter IGBT	Current of inverter IGBT is normal.	
Occurrence of overload for output of the UPS	This alarm is given when load exceeds 105% of rated value. The alarm will recover automatically after the overload status is clear. 1. Confirm the overloaded phase by checking load percentage displayed by LCD panel to confirm whether the	

	alarm is true or not. 2. If it is true, measure the
	actual output current to confirm the correctness of
	display value. Disconnect the unimportant load. In
	parallel system, this alarm also will be given if the
	load is imbalance badly.
Disappearance of overload for output of the UPS	Output of the UPS is not overload.
Delay time of everland for hypage	Load current > 150%, 1min; load current > 200%,
Delay time of overload for bypass	200 ms
Occurrence of fault for inverter thyristor	Inverter static switch is abnormal.
Disappearance of fault for inverter thyristor	Inverter static switch is normal.
Occurrence of short circuit for output	Output is short circuit.
Disappearance of short circuit for output	Output short circuit is excluded.
	Press button of FAULT CLEAR (fault reset) in
	panel.
Occurrence of deletion of historical records	Delete historical records.

6 Maintenance

6.1 UPS Room Management

UPS room management includes environmental safety management and equipment management in UPS room.

- Basic tasks of environmental safety management include: ensure ambient temperature, relative humidity, clean class, electrostatic interference, noise, and strong current electromagnetic interference in UPS room can meet related requirements, guarantee stable performance, reliable operation, and safe production of equipment, and assure normal power supply of electric equipments.
- 2. Basic requirements of equipment management are: guarantee perfect mechanical performance of equipment, electric performance can meet related standard and requirements, stable and reliable operation of equipment, and complete technical data and original records related to the equipment.

6.2 Maintenance Guidance

Correct maintenance (including preventative maintenance and remedial maintenance) is the key to achieve optimum operation of UPS and can ensure long service life of equipment. Preventative maintenance includes some procedures executed frequently, which are used to prevent fault of the system and to ensure maximum operating efficiency of the system. Remedial maintenance includes looking for fault of the system to achieve effective maintenance.

6.3 Safety Precautions

To safely and successfully execute maintenance of the system, it must follow related safety precautions, use necessary tools and testing devices, be operated by qualified maintenance personal, and pay attention to following safe operation regulations:

- 1. Do remember it has danger voltage inside UPS even if it is not under operation.
- 2. Ensure UPS operations and maintenance personal must be familiar with the equipment and content of this manual.
- 3. Please do not wear metal or silver jewelries such as ring and watch when operating UPS.
- 4. Please study to personal who is familiar with it if there is any question.
- 5. Be careful of danger voltage inside the UPS, and inspect and ensure power supply is under safety status before taking maintenance and debugging.

6.4 Preventative Maintenance

Steps for preventative maintenance are described in following, and it can improve operational efficiency and reliability of UPS system after finishing all these steps.

- 1. Keep clean environment and avoid dust or chemical pollution of UPS.
- 2. Keep clean of area around the UPS system and ensure unblock access to the equipment.
- 3. Inspect the wiring terminals of input and output cable once half a year to check and measure whether the contact is well.
- 4. Periodically check working status of radiation fan to prevent block of it by foreign matter, and replace it if there is any damage.
- 5. Periodically inspect battery voltage and working status of UPS.

6.5 Usage and Maintenance of Batteries

6.5.1 Charging and Discharging of Batteries

Battery pack is the key component to guarantee uninterrupted power supply of UPS. Storage battery pack is connected in branch circuit of storage battery for UPS system. If main power is normal, power supply system takes float charge or equal charge for storage battery; if main power is failure, storage battery provides power supply for user equipment through inverter.

6.5.2 Selection of batteries

- 1. Selection of capacity of storage battery is determined by required current of electric equipment of power supply system and expected discharging period of storage battery. For example, if discharging current of storage battery for power supply system is 100 A and continual power supply by storage battery under AC power failure is expected to be 2 h, the required storage battery capacity for the system = discharging current of storage battery × continual power supply period under AC power failure = 200 Ah. The actual required capacity of storage battery is the calculated theoretical value adding a surplus value. Selection of battery capacity shall be little high instead of lowing, but it shall not higher than 20% of required capacity of electric equipment.
- 2. Storage batteries with different capacities cannot be used in series, and storage batteries with different voltages cannot be used in parallel.
- 3. Storage battery packs with different capacities cannot be used in parallel (if internal resistances of batteries are different, capacities cannot be saturated simultaneously due to different current during charging, and it will cause a over-charged battery pack and a under-charged battery pack; and battery packs will discharge mutually during discharging).

6.5.3 Notice for Usage and Maintenance of Batteries

- 1. Total capacity is sum of capacities of all storage batteries when several packs of storage batteries are parallel.
- 2. Using temperature of storage battery is 0~40°C. Service life of storage battery is in inverse

proportion with temperature of storage battery, so it shall fully consider radiation when it is operated under condition, which is easy to cause high temperature of storage battery, to prevent temperature rise of storage battery (when temperature of storage battery rises, corrosion of polar plate caused by sulfuric acid will be worse so that the service life is shorten). If possible, it shall equip air-conditioning device in UPS room to prolong service life of storage battery.

- 3. After finishing installation of power supply system, it must charge the storage battery used for the first time or not used for a long time before usage. Storage battery can loss its capacity during storing due to self-discharging for a long time, and it cannot reach corresponding performance if it is not charged.
- 4. It shall check and fasten all connecting parts and connecting wires of fasteners for battery pack to prevent accident.
7 Annex

7.1 Product Specifications

Product design shall meet following standards:

Table 7-1				
ltem	Standard			
General safety requirements for operational	EN 50091-1-1/IEC 62040-1-1/AS 62040-1-1			
area of UPS				
UPS EMC requirements	EN 50091-2/IEC 62040-2/AS 62040-2 (A class)			
Determination method and test				
requirements of UPS performance	EN 50091-5/IEC 02040-5/AS 02040-5 (VFI 55 III)			

Environmental characteristics of product are as follows:

Table 7-2: Environmental characteristics

Rated power (kVA)	Unit	80 ~ 120	160	200 ~ 300	400 ~ 500		
Noise within 1m	dB	≤ 65			≤ 70		
Altitude	m	\leq 1,000 m (1,000 m above, lower the power for 1% for every increased 100 m)					
Relate humidity	_	5% ~ 95%, no condensation					
Working temperature	Ŷ	0° C ~ 40° C \triangle Note: Service life of battery will be reduced for a half if temperature rises for 10° C when it is higher than 20° C			attery will be reduced vhen it is higher than		
Storage and transportation temperature of UPS	°C	-20°C ~ 70°C					

7.2 SNMP Card

iStars is a new kind of network monitoring product designed for the convenience of UPS management. Real-time network monitoring and management of UPS can be realized through this product. You can look over the real-time dynamic data and control UPS from remote distance by using this product, which facilitates the network management of UPS. You can monitor a

stand-alone UPS through this product. Integrated monitoring management can be realized as well by cooperating with the corresponding PC software.

iStars provides users with convenient installation program. You can search for or set the IP address after PC is installed with iSearch software. Log in homepage of iStars through web browser, and then operating status of UPS can be obtained: such as working voltage, current, frequency, temperature and humidity and so on of UPS. Parameters of equipment and system can be set in web interface: such as set to turn off or test UPS in a certain time; set user permission, user name and IP and so on.

iStars provides different operating systems with shutdown softwares which shut down the system to avoid abnormal shutdown of host caused by abnormal main power.

Main functions are as follows:

- (1) Set different functions through the browser;
- (2) Monitor the real-time status of UPS through the browser;
- (3) Support TCP/IP, SNMP, FTP, NTP, HTTP, SMTP and other protocols;
- (4) Provide software upgrading and configuration tool (iSearch software);
- (5) Send daily statement by Email;
- (6) Send related information to the administrator by SMS, SNMP, Email and so on when UPS goes wrong;
- (7) SMS alarm can be realized by adding GPRS SMS module according to users' needs.

7.3 iStars Hardware Connection

7.3.1 Hardware Port



Figure 7-1 Front view of iStars (External card)



Figure 7-2 Back view of iStars (External card)



Figure 7-3 Front view of iStars (internal card)

SNMP	
Battery temp	
RS232 0	•
RS485-1	
Input dry contact	
1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A	•
Output dry 🔗 °	6
0 S g	e
• FUSE °	
Manual	
0 0	
RS485-2 Parallel	



Figure 7-4: Communication interface module of 200 ~ 300 kVA UPS

FUSE	Manual	Battery temp RS485-1 Output dry RS232 Input dry contact		Ņ	Ì		-	
	auxiliary switch	SNMP	R\$48	2	Pa	rallel		•

Figure 7-5: Communication interface module of 400 ~ 500 kVA

Figure 7-6: Communication interface module of 80 ~ 160 kVA

7.3.2 Descriptions and Connection of iStars Interfaces

NET port: 10/100M Ethernet network line port, connected to network line port of computer UPS port: uses RS232 serial port line, connected to RS232 port of UPS (external DB9 port; internal golden finger port) DC9V port: DC9V power port GPRS port: GPRS SMS module port (DB9 port) Y/G/R indicator light: LED three-color indicating light

7.3.3 LED Indicator Lights

Туре	Indicating signal	Description
Dedlight	Fault indicator	If communication with UPS is interrupted or other systems
Realignt	light	go wrong, the red light flashes.
Green light Power indicator light		After the system is started and enters a normal operating status, the green light flashes, which means the system is running normally.
Yellow light Communication indicator light		Yellow light flashes indicating that there is data communication with UPS. It means to send order when the light is on; it means that data is received when the light is off.

Table 7-3: Instructions of LED indicator light

7.4 Email and SMS Platform of SNMP

7.4.1 Web page login

Before logging in the web page, enter "Function setting" option in the control panel of UPS and set the communication protocol as "EA protocol", and then the following operations can be carried out. After hardware connection between iStars and network and settings are completed, enter the corresponding IP address obtained through iStars in the browser to log in the monitoring web page of iStars to remotely monitor UPS or set the related information.

Please make sure the IP address setting and address of user's host are in the same network segment.

Open the browser and enter the IP address of iStars (such as 192.168.6.6).

Enter user name and password, click on "Enter" to enter the monitoring web page. The user name of default administrator account is admin and password is admin. Users can add or delete user account and permission in setting according to their actual need.

Connect to 192	.168.6.11 🔹 🔀
7	
Welcome	😰 admin 🔍
Password:	•••••
	Remember my password OK Cancel



7.4.2 iStars web page operation

The current user name and the permission, function menu of system, information and status of system, and other information will be displayed on the front page after entering iStars web page. Main functions of system menu includes: UPS information and status, setting and control, query log and miscellaneous function.

em Status info				
5 Status Info		System S	tatus Info	
	iStars Information			
gs and Control	System Name	同城机房	Hardware Version	iStars_MWVZ.0
note Control	System Administrator	59555	Firmware Version	iSturs_SVM.09
6 Setting	System Location	China. DG HAST	S/N	120130319080009
S On/Off Setting	Total Running Time	2 Days 21:00:02		
work Setting				
4P Setting	UPS System			
ai Setting	UPS Last Soffest Time			
S Setting	UPS Next Selftest Time			
9 Module	Email Daily Report Time		16:00	
tem Setting	Time of Send Alarm Information before S	hutdown UPS(Min)	30	
.og Cuery				
	Network Status			
stant Function	MAC Address	00:50:C2:F8:D3:32	Primary DNS Server	8.8.8.9
	Connection Type	100Wbps 7ull-duplex	Secondary DNS Server	61.20.10.00
	IP Address	192, 168, 169, 4	Time Server	tine nist.gw
	Submet Mask	255. 255. 240. 0	Email Server	192. 160. 0. 9
	Gateway IP Address	192. 168. 169. 1	Login IP Address	192. 168. 169. 3

Figure 7-8: Home page of iStars

7.4.3 iStars Email settings

As for this function, events of equipment and daily statement are sent to user by Email.

Function setting: it can be set whether to send the information to an Email of user when iStars detects related data and event of UPS. Page setting includes: Email setting, Email address of recipient (used to receive log file of event), Email address of recipient (used to receive daily statement) and test setting. After settings are completed, click on "Apply" and the operation is completed.

Setting and Control > Innil Setting	Faai	1 Satting			
Email Setting	Emar	1 Setting			
Email Server		192.168.0.9			
Email Ports		25			
Email Address Sender		panxiano@eastups.com			
Email Transmission is Encrypted Using \$\$1.		No 👻			
Email Account		panxiang@eastups.com			
Email Password					
Email Address of Recipient(Receiving the Event Log Available)					
Email Sent When the Event Occurs, Warning Yes 👻					
Account 1	fukw@eastups.com		Event Set		
Account 2	panxiang@eastups.com		Event Set		
Account 3			Event Set		
Account 4			Event Set		
Account 5			Event Set		
Account 6			Event Set		
Account 7			Event Set		
Account 8			Event Set		
Email Address of Recipient(Receiving Daily Report Available)					
Daily Reports Sent on Time		Yes 🔻 18:00			
Account 1					
Account 2					
Account 3					
Account 4					
			Apply		
Test Set					
Test 5 and Backland	provide a file and the second		Devel Freez		

Figure 7-9: Email setting page

Email setting

(1) Email server address

Set the receiver's server address of Email.

(2) Email port

In general, receiving port of Email is 25.

(3) Sender's Email address

Set sender's Email address.

(4) Whether to send Email by SSL encryption transmission

Set whether to send Email by SSL encryption transmission.

(5) Account

Set the sender's Email account, which is the same as the sender's Email address in general.

(6) Password

Set password for the sender's Email account.

Receiver's Email address (used to receive and receive the event and record)

(1) Send Email to warn when event occurs

Set whether to send event by Email when abnormal condition of UPS is detected.

(2) Account 1~8

Account 1~8 is Email account of receiver when UPS goes wrong and it supports 8 accounts at most. (3) Select

This page selects to send part or all of the events detected by iStars to the corresponding Email account. Specific events are shown in Figure 7-10.

		Event Set
(es	No	UPS Event
ų.	6	Battery Fault
ų.	6	Sattery Low
w.	6	Battery 200
e.	6	Battery Mode
¥.	6	Bygass Node
w.	6	bypass fault
w.	6	Imput Fault
e.	6	Output Fault
¥.	0	The UPE Output Stutdown as Requested
w.	e	The UPS freque Exuldows
ų.	6	UPS Fault
¥.	6	Tesperature Over MAT-value
*	6	Loss Over XUX-value
×	6	Test is in Propress
÷	6	UPI Text Failed
*	6	Communications Serveem inters and the UPS Fault
w.	e	UTS Output 15 on Off State
×	6	UPE System is an Off State
¥.	6	UPS Will four off
*	6	tre Shutdown beier Countdown is Underway
w.	e	UTS is on Stanby Node
w.	6	Charger Fault
ų.	0	Pan Pault
¥.	0	Fuse Fault
w.	8	Temperature exceed the preset limit value
ų.	6	Randity exceed the preset limit value
All Yes	All No	

Figure 7-10: UPS event page

Receiver's Email address (used to receive daily statement)

(1) Delivery time for daily statement each day

In this item, whether to send daily statement at the fixed time is set. Format of sending time is set as hour: minute (hh:mm). Hour and minute are tow integer respectively and separated by colon. The hour cannot be more than 23 and the minute cannot be more than 59, such as 12:00.

(2) Account 1~4

Set Email account used to receive daily statement and it supports 4 accounts at most.

Test setting

(1) Test mail recipient

After setting Email address of recipient, and then click on "Send test Email" to test whether sending function of Email is normal or not. If function of Email is normal, Email recipient will receive a test Email.

7.4.4 iStars Short Message Settings

For short message function, iStars should be connected to GPRS module. Related data and event of UPS that detected is sent in the form of short message. The setting interface includes short message communication status, test setting and mobile phone of recipient of short message (used to receive event notification). After settings are completed, click on "Apply" and the operation is completed.

wrrent Location: Setting and Control > SES Setting							
SMS Setting							
SMS Status							
Communication status	Communication Failed	Communication Failed					
Signal Quality							
Manufacturer							
Model							
Software Version							
Operator							
SMS Service Centre Address							
SMS Setting							
Network Standard	GSM 💌						
When the Event Occurs to Send Short Message	Maxim						
Alarm	TOS M						
Phone Number to Receive Event Notific	ations						
Phone Bumber: "Country Code + Phone Bumber"	, for example: Chinese nobile number is 1333333	3333 and country code is 86, so	the phone number is 8613333333333.				
Event Set: Click to set the received alarm event types.							
Phone Number 1	8615918305074	Event Set	Enable Control 💌				
Phone Number 2	8610086	Event Set	Disable Control 💙				
Phone Number 3	8610086	Event Set	Disable Control 💌				
Phone Number 4	8610086	Event Set	Disable Control 💙				
Phone Number 5	8610086	Event Set	Disable Control				

Figure 7-11: Short message setting page

(1) Status of short message

To display communication status, signal quality, manufacture and other related information of external GPRS module of iStars.

(2) Short message setting

Network type-setting and set whether to send the related event through short message when it detects abnormal stats of UPS.

(3) Mobile phone number 1~8

Set receiver's mobile phone number and it supports 8 mobile phone numbers at most.

(4) Select

The page selects the events detected by iStars and sends them, in whole or in part, to the corresponding mobile phone number. Specific events are shown in Figure 7-10.

(5) Test setting

Test receiver's mobile phone number of short messages. Test whether functions of the page can be used and whether the receiver's mobile phone number can receive message. Click on "Test" and then the receiver will receive a test message.