

HELIOR ONLINE UPS SERIES

# USER MANUAL



Thank you for purchasing the HELIOR ONLINE series UPS.

Safety information and operating instructions are included in this manual.

To ensure correct use of the UPS, please read this manual thoroughly before operating it. Save this manual properly.










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# 1.INTRODUCTION

## ● Description of Commonly Used Symbols

Symbol & Description	
Symbol	Description
	Alert you to pay special attention
	Caution of high voltage
	Alternating current source (AC)
	Direct current source (DC)
	Protective ground
	Recycle
	Keep UPS in a clear area

## ● Available Range of the Manual

This manual is available for the 3N3 UPS of the ONLINE UPS series.

## ● Product Overview

The 3N3 UPS belongs to the ONLINE UPS series. It is a three phase input and three phase output, double conversion pure online uninterruptible power supply (UPS) product with high efficiencies and performance. Like other products of the ONLINE UPS series, the 3N3 UPS adopts the drawer-style high intelligent Modulization design. One module of the 3N3 UPS is a three-phase input and three-phase output UPS with complete function. The user can meet his requirement on power output and reliability by adding or reducing the internal modules of the 3N3 UPS and achieve the optimal price-performance ratio.

The 3N3 UPS is composed of the UPS cabinet, the UPS module, the PDU and the input transformer. The 3N3 UPS provides two sorts of standard cabinet, one of them is 1.6M tall and the other one is 2M tall. You can install at most eight drawer-style UPS modules in the 3N3 UPS. If the output power permits, the whole unit can run normally with one to eight modules installed and the modules can be added, reduced or replaced easily without influencing other modules under all kinds of operating conditions. The capacity of one module is 15KVA and the total capacity of the whole unit is 120Kva when eight modules are installed. The PDU is an optional accessory and you can install at most two of them. The input transformer is  $\Delta/Y$  type and the utility power is connected to the  $\Delta$  terminal and the UPS is connected to the Y terminal. The number of the UPS modules, the PDUs and the input transformers cannot be selected at will due to the limitation of the UPS cabinet space. If you need to add one of them (or adding the quantity), you have to reduce the other one of them (or reducing the quantity). Refer to some other relative documents for detailed information.

The 3N3 UPS uses its powerful communication module to collect the information of each module through the internal network of the unit. It can also gather information of each module for monitoring and display all the messages in English on a large LCD, which makes the UPS operation simple and easy.

The 3N3 UPS is designed to prevent almost all of the power problems, such as blackout, boost, brownouts, sags, decaying oscillation, high voltage impulse, voltage fluctuations, surges, harmonic

distortion, disturbances, frequency fluctuation etc from reaching your equipment.

3N3 UPS is available for use in wide range; all of the computer equipments, communication systems and automatic equipments can use it.

## ● PRODUCT CRITERION

The 3N3 UPS product complies with the following EMC levels:

EMI	EMS	
EMI:EN50091-2( $\geq 25A$ )	IEC: 61000-4-2	LEVEL 4
	61000-4-3	LEVEL 4
	61000-4-4	LEVEL 4
	61000-4-5	LEVEL 4

## 2.SAFETY INFORMATION

- Save this manual properly. This manual includes a lot of important safety information. Read this manual carefully and thoroughly before operating the UPS. Comply with all the warnings and operating instructions on the unit and in the manual strictly.
- Earth connection essential before connecting supply.
- Do not open or mutilate batteries. They contain an electrolyte that is toxic and harmful to the skin and eyes.

CAUTION: Do not dispose of batteries in a fire. The batteries may explode.

CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic

- Do not attempt to open the case of the UPS. There are potential hazards of electric shock.
- Do not plunge or insert any objects into the air vents and other inlets. Place the UPS in an area that has enough space for installation and adequate airflow for heat sinking. Avoid direct sunlight.
- The floor's ability for handling the weight of the unit and battery pack should be taken into consideration before installation.
- The equipment can be operated by laymen
- The equipment can be service person installable
- The equipment is without internal automatic backfeed isolation, a warning label, with the following or equivalent wording:

“ISOLATE UNINTERRUPTIBLE POWER SUPPLY(UPS)

BEFORE WORK ON THIS CIRCUIT”

shall be paste on all primary power isolators installed remote from the equipment area.

- In any emergency, disconnect the mains input breaker and the battery switch of the UPS first.



## 3. UNPACKING

※ Note: Inspect the UPS upon receipt. Accidents and damage may occur during shipment. Notify the carrier and dealer if there is damage.

Check the accessories supplied with the UPS: one user manual, one WINPOWER-XP CD.

### 3.1 Removing the Cabinet

1. Cut off the packing strap and remove the cardboard around the unit (see Fig.3-1);
2. Lift the top cover board of the carton upward to remove it and remove the packing cardboard from the side of the unit (See Fig.3-2);
3. Remove the foam and plastic bag around the unit (See Fig.3-3);
4. Remove the nut fixing the cabinet on the pallet with a wrench (See Fig.3-4);
5. Move the frame smoothly from the pallet to the ground or the reserved position for installation with a forklift. (Fig.3-5);

※ Note: Make sure that the heights of the door and some other obstacles are appropriate.

6. If the installation site permits, you may use a crane for moving. Remove the screws fixing the top cover board of the frame with a hex wrench and then install the M12\*20 screw (optional). Move the cabinet to the installation position according to the following diagram (Fig.3-6).

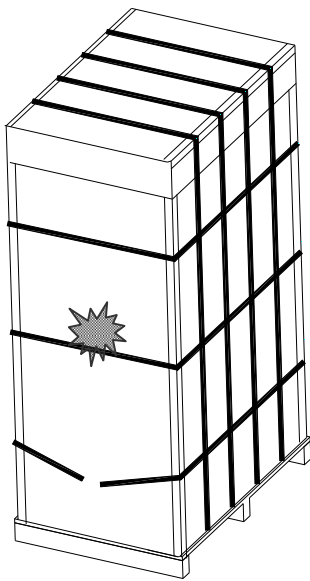


Fig.3-1

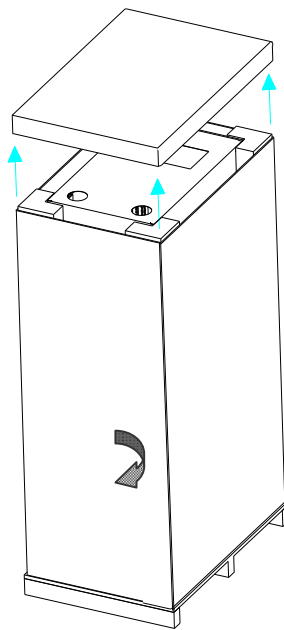


Fig.3-2

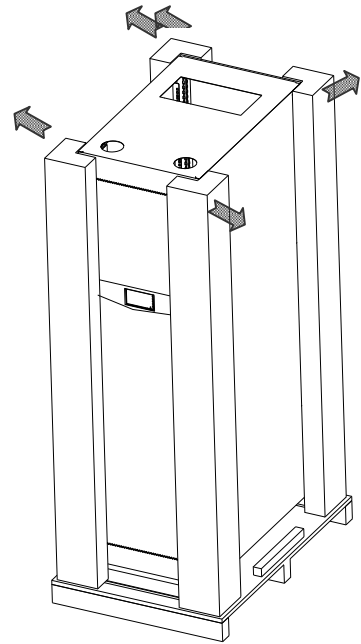


Fig.3-3

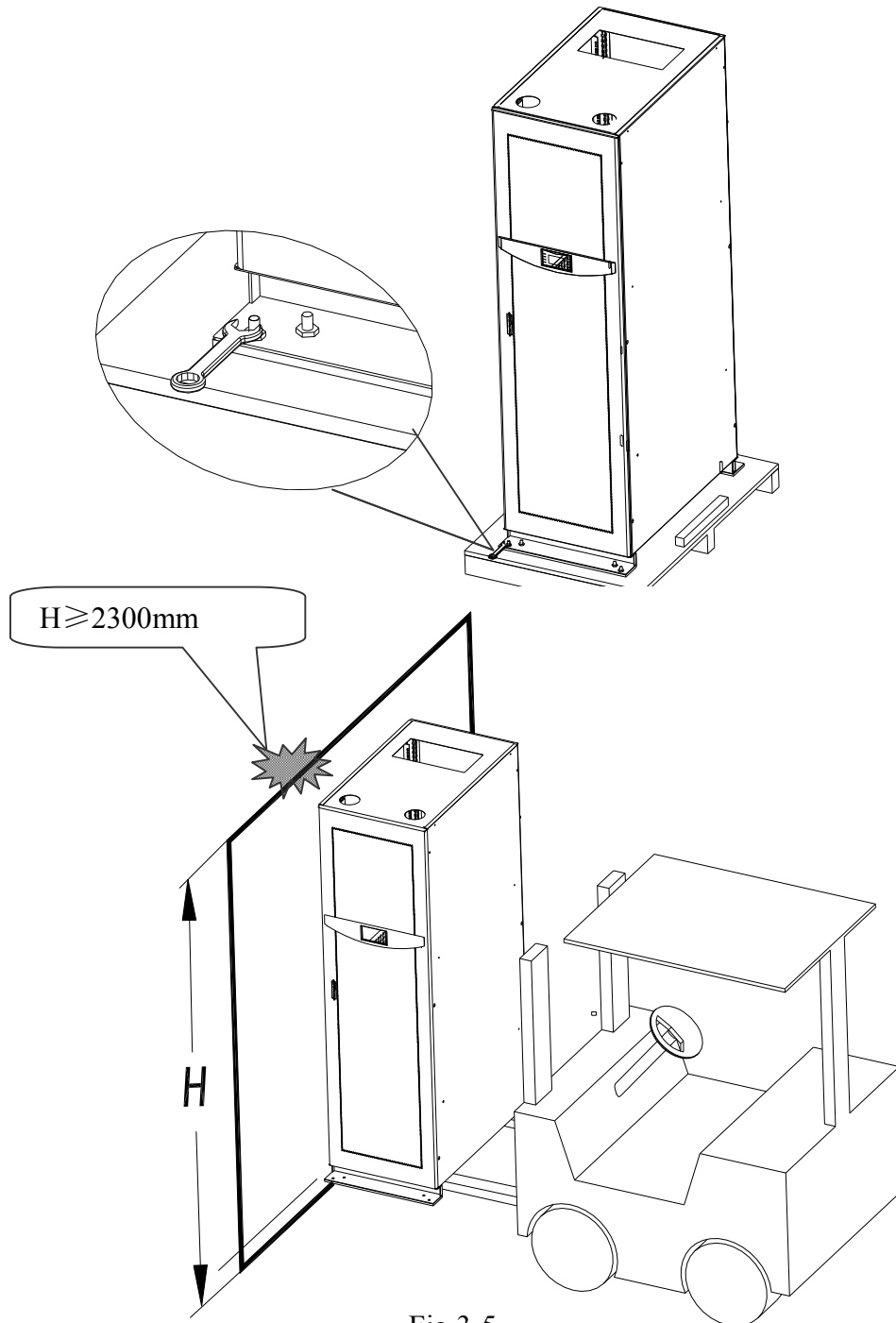
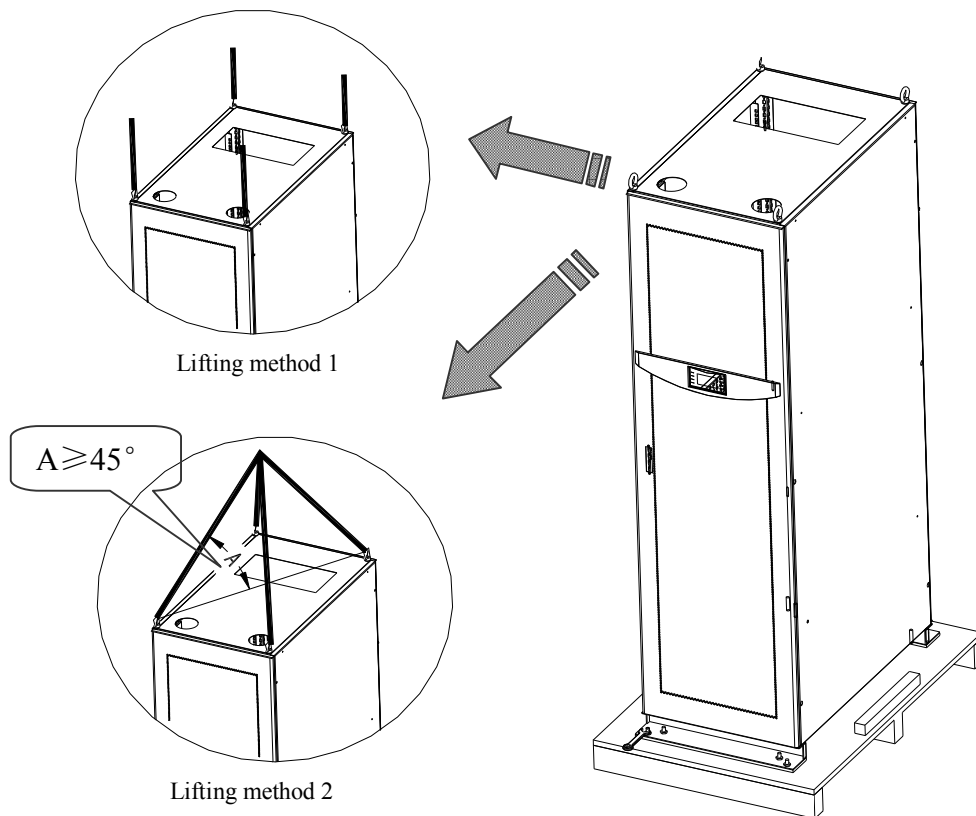


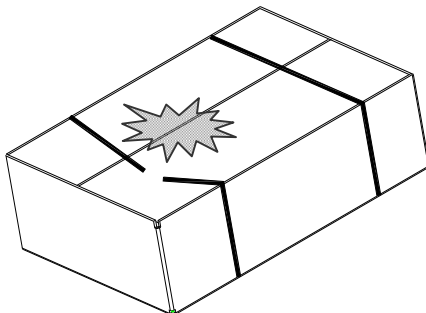
Fig.3-5



### 3.2 Instruction for Removing the Module Packaging

1. Cut off the packing strap and open the carton ( Fig.3-7 ) ;
2. Lift the foam on the UPS module upward to remove them (Fig.3-8);
3. Take out the UPS module. ( Fig.3-9 )

**Note:** The UPS is heavy. It requires two people for transportation due to its weight.



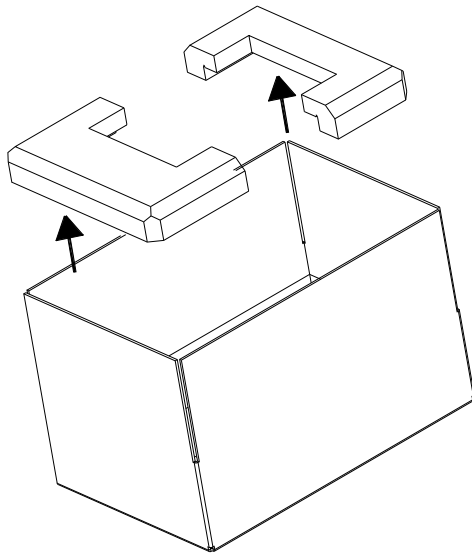


Fig.3-8

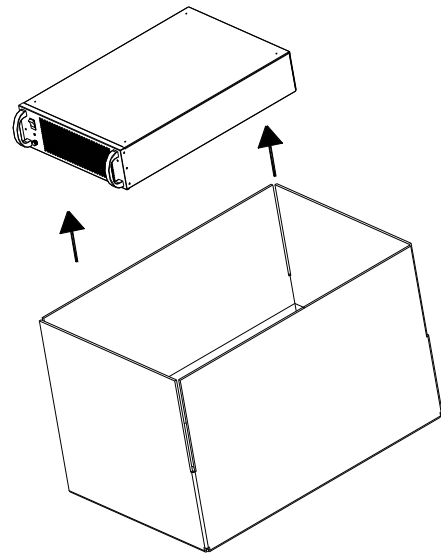
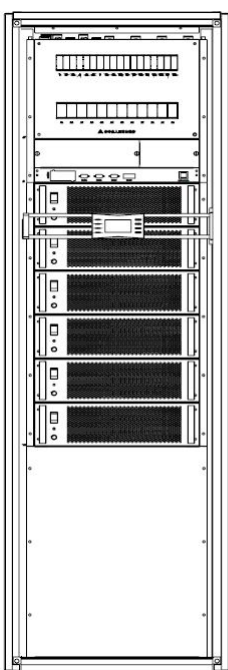


Fig.3-9

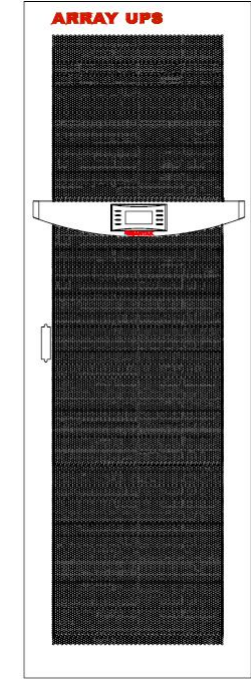
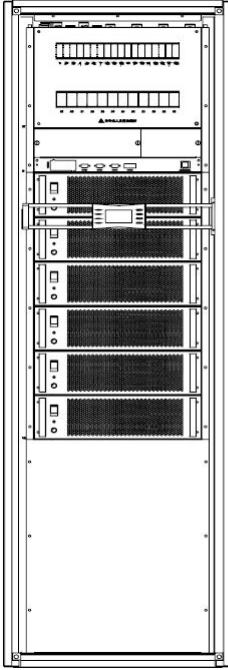
# 4. Appearance of the UPS

## 4.1 The Outside View of the UPS Cabinet

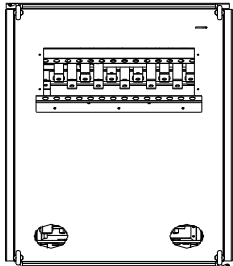
- PDU \_\_\_\_\_
- Communication Interface Port \_\_\_\_\_
- LCD Panel \_\_\_\_\_
- UPS Module. \_\_\_\_\_



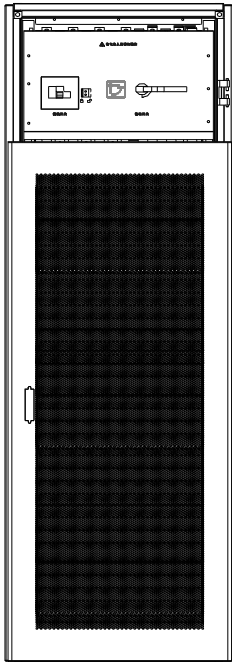
Front View of the Cabinet (Without Front Door)



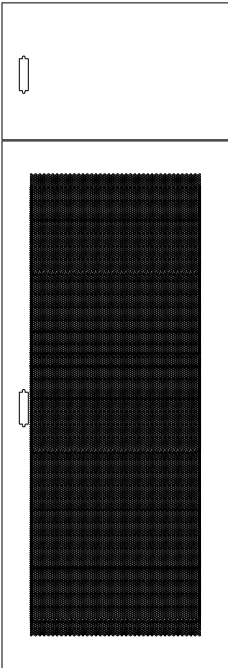
Front View of the Cabinet (With Front Door)



Top View of the Cabinet

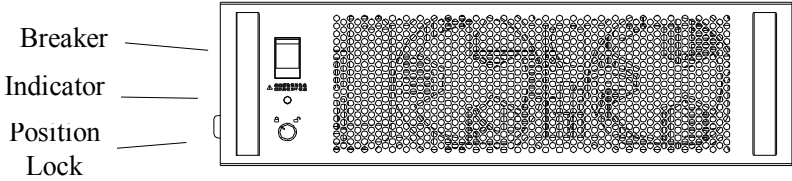


Rear View of the Cabinet  
( Without rear door)

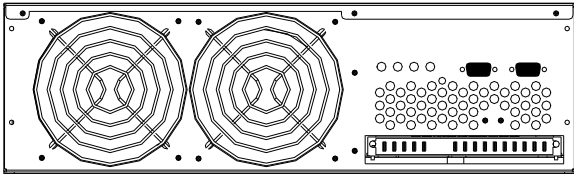


Rear View of the Cabinet

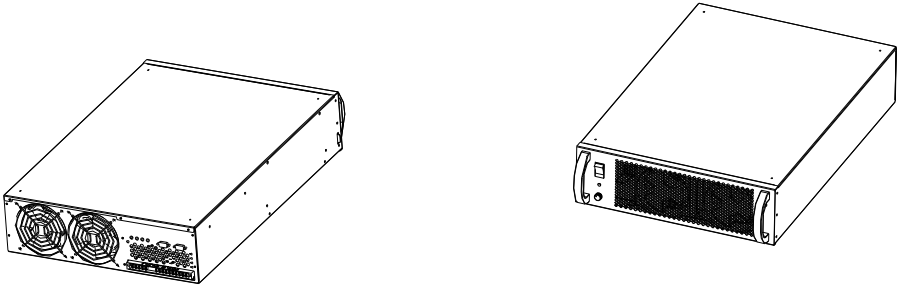
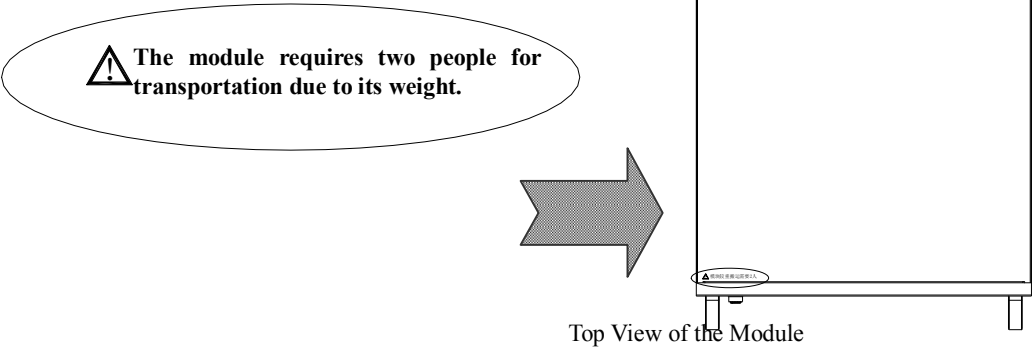
### 4.2 Outside View of the UPS Module



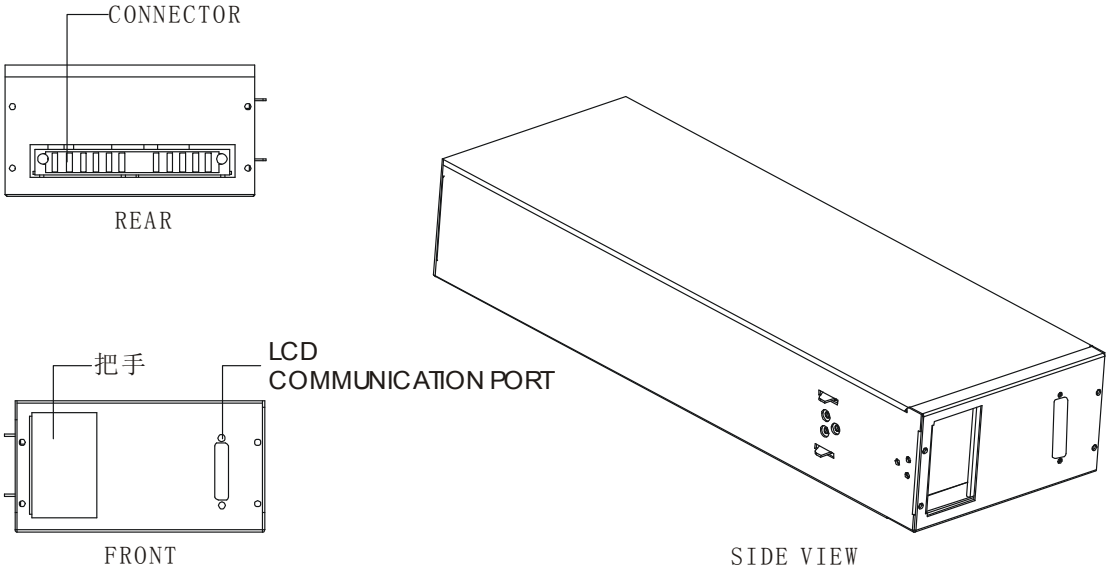
Front View of the Module



Rear View of the Module



4.3 Outside View of the Communication Module





## 5. UPS INSTALLATION

### 5.1 Installation Notice

1. Install the UPS in a clean and stable environment that is free of vibration, dust, high humidity, flammable gas, flammable liquid or caustic substance.
2. The ambient temperature for the normal running UPS is required to be at 0°C - 40°C. If the UPS is operating in a more than 40°C environment, the maximum load capacity is required to be in accordance with the rating by 12% capacity decrease for every 5°C temperature rise. The maximum ambient temperature is required to be no more than 50°C.
3. It is recommended that the battery pack be used at the temperature of 15°C-25°C.
4. The altitude is required to be below 1000 meters for the UPS's normal running with full load. If the A UPS needs to be used above 1000 meters, the load should be reduced. The corresponding table between the altitude and the load is listed as follows:

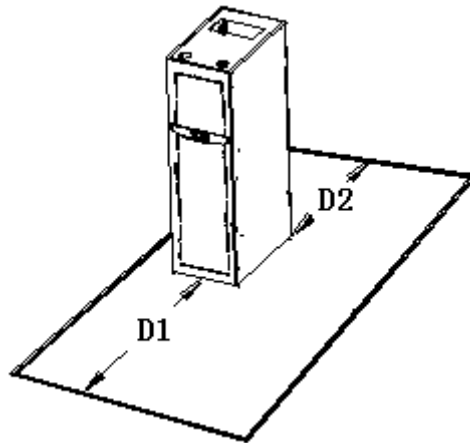
(Derating power = the normal maximum load in the high altitude area ÷ nominal power of the UPS)

Altitude (M)	1000	1500	2000	2500	3000	3500	4000	4500	5000
Derating power	100%	95%	91%	86%	82%	78%	74%	70%	67%

5. The 3N3 UPS utilizes fans for forced cooling, so considering ventilation for installation site is a must. There are netlike air intakes in the front and rear door panels of the UPS, so the door panels cannot be blocked.
6. The 3N3 UPS adopts negative and positive battery supply configuration. One battery pack consists of 40 series connected batteries with same capacity is divided into two parts by a wire connected to the middle of the series batteries, where the No. 20 and No. 21 batteries are connected and this wire is the neutral wire. Therefore there are altogether three wires connected with the UPS terminal blocks including the positive and negative wires of the battery pack. The batteries between the positive terminal of the battery pack and the neutral wire are called positive battery and the batteries between the negative terminal and the neutral wire are called negative battery. Refer to the connection diagram for detailed information and you may choose the battery capacity and battery pack quantity according to your need.
7. Connection method: the 3N3 UPS is a three-phase input and three-phase output UPS and the input wiring must be connected to the three-phase live wire and neutral wire. The output can be connected in different ways (Δ, Y and some other ways) according to the load status. Refer to the connection diagram for detailed information.
8. Wiring standard: the 3N3 UPS adopts modulization design and you may choose the quantity of the modules according to the load capacity. It is recommended that the wiring be connected according to the maximum load for the safe use of the unit and the easy load expansion. The user can also perform the wiring according to the capacity of the modules. Refer to the table of wiring configuration in this manual.
9. Take one standard RS232 communication cable and connect one terminal of the cable to the RS232 Port of the UPS and the other terminal to the RS232 port of the PC. After setting up the Winpower-XP monitoring software, the PC can monitor the UPS.

### 5.2 Installation Space

There must be at least 1000mm ( $D1 \geq 1000\text{mm}$ ) of space in front of the front door panel of the UPS and at least 800mm ( $D2 \geq 800\text{mm}$ ) of space reserved behind the rear door panel of the UPS for maintenance and air-cooling.



Installation Space

### 5.3 Installation Process (With Diagram) :

1. Remove the packaging of the UPS cabinet and put the cabinet on the ground upright;
2. Remove the packaging of the UPS module and check the status of the position lock located on the front panel of the module. In normal condition, the white dot on the position lock should be at the position of “☐” (Fig.5.1); if the white dot is at the position of “🔒”, please turn it to the “☐” position.
3. Slide the UPS module into a bay of the frame until it is in the cabinet completely.

Note: the module is heavy. It requires two people for installation due to its weight.

4. Set the position lock on the front panel of the module to the “🔒” position (Fig.5.2);
5. Repeat the above five steps and install all of the UPS modules into the UPS cabinet in sequence. (Fig.5.3);

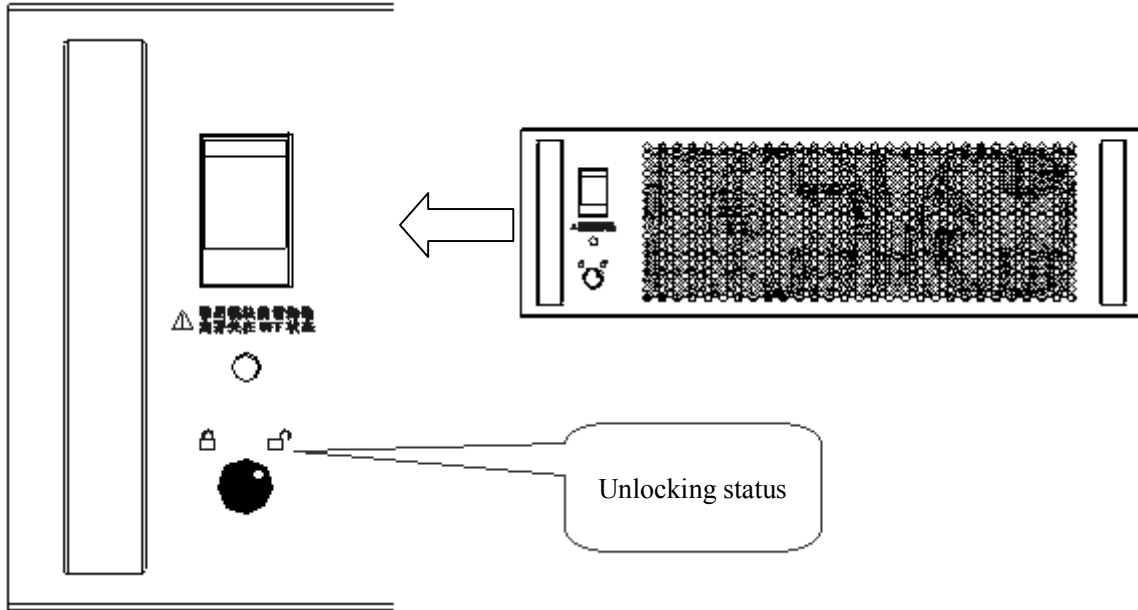


Fig. 5.1

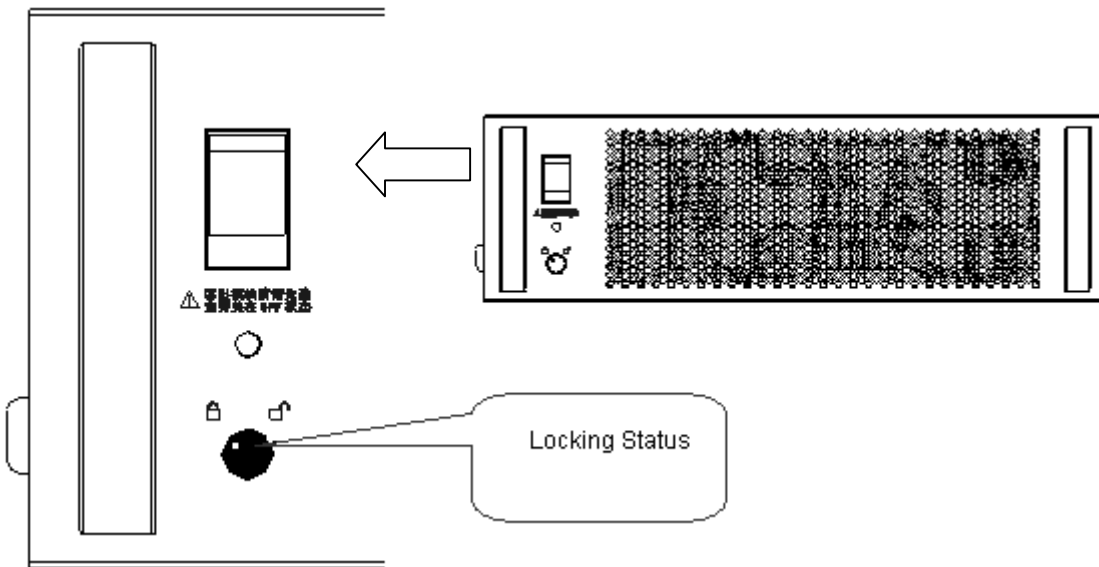
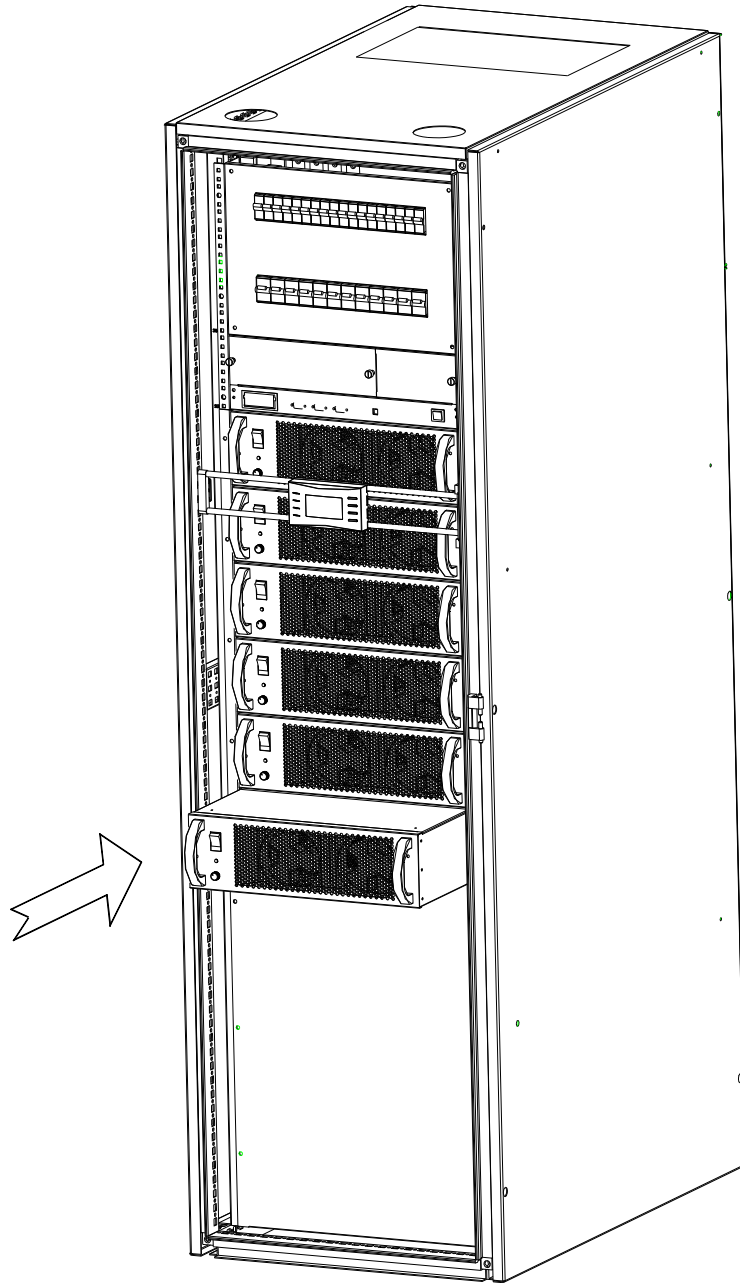


Fig. 5.2



## 6. ELECTRICAL INSTALLATION

The electrical installation of the 3N3 UPS must be performed according to the electrical code and the 3N3 UPS installation specifications by a qualified engineer that has passed the training. Any other personnel with no qualification are forbidden to perform the installation. Only basic installation instructions are included in this manual and please refer to the installation specifications for detailed information.

### Selecting the power line

The 3N3 UPS provides three options on its cabinet capacity (the quantity of the UPS modules that can be contained in the cabinet). One of the options is 60kVA (at most four UPS modules can be contained in the cabinet) and the other two options are respectively 90kVA (at most six UPS modules can be contained in the cabinet) and 120KVA (at most eight UPS modules can be contained in the cabinet). When you choose the thread diameter you should also take into consideration the overload and power grid voltage on the basis of the cabinet capacity options. It is generally recommended that the user choose the power line according to the maximum capacity of the UPS cabinet, which can ensure that the thread diameter does not need to be changed when expanding the capacity of the UPS. Thus the advantages of the 3N3 UPS on online capacity expansion can be embodied more obviously.

If the quantity of the UPS modules having been installed does not reach the capacity of the UPS cabinet, the user can also choose the thread diameter of the power line according to the actual conditions. The thread diameter of the power line can differ along with the variation in quantity of the UPS modules. The corresponding table of the module quantity and the thread diameter of the power line is included in this manual. The user may see table 6.1 for detailed information.

Table 6.1 The corresponding table of the module quantity and the power line diameter

Module quantity	Optional Power Line									
	UPS Input Wire				UPS Output Wire				Battery Cable	
	L		N		L		N			
American Standard	National Standard	American Standard	National Standard	American Standard	National Standard	American Standard	National Standard	American Standard	National Standard	
1	12 AWG	6 mm <sup>2</sup>	6 AWG	16 mm <sup>2</sup>	12 AWG	6 mm <sup>2</sup>	6 AWG	16 mm <sup>2</sup>	12 AWG	6 mm <sup>2</sup>
2	6 AWG	16 mm <sup>2</sup>	6AWG* 2	16mm <sup>2</sup> *2	6 AWG	16 mm <sup>2</sup>	6AWG*2	16mm <sup>2</sup> * 2	6 AWG	16 mm <sup>2</sup>
3	4 AWG	25 mm <sup>2</sup>	4AWG* 2	25mm <sup>2</sup> *2	4 AWG	25 mm <sup>2</sup>	4AWG*2	25mm <sup>2</sup> * 2	4 AWG	25 mm <sup>2</sup>

4	6AWG* 2	16mm <sup>2</sup> *2	2AWG* 2	35mm <sup>2</sup> *2	6AWG* 2	16mm <sup>2</sup> * 2	2AWG*2	35mm <sup>2</sup> * 2	6AWG* 2	16mm <sup>2</sup> *2
5	4AWG* 2	25mm <sup>2</sup> *2	4AWG* 3	25mm <sup>2</sup> *3	4AWG* 2	25mm <sup>2</sup> * 2	4AWG*3	25mm <sup>2</sup> * 3	4AWG* 2	25mm <sup>2</sup> *2
6	4AWG* 2	25mm <sup>2</sup> *2	2AWG* 3	35mm <sup>2</sup> *3	4AWG* 2	25mm <sup>2</sup> * 2	2AWG*3	35mm <sup>2</sup> * 3	4AWG* 2	25mm <sup>2</sup> *2
7	4AWG* 2	25mm <sup>2</sup> *2	2AWG* 3	35mm <sup>2</sup> *3	4AWG* 2	25mm <sup>2</sup> * 2	2AWG*3	35mm <sup>2</sup> * 3	4AWG* 2	25mm <sup>2</sup> *2
8	2AWG* 2	35mm <sup>2</sup> *2	2AWG* 3	35mm <sup>2</sup> *3	2AWG* 3	35mm <sup>2</sup> * 3	2AWG*3	35mm <sup>2</sup> * 3	2AWG* 3	35mm <sup>2</sup> *3

Note:

- 1) \*n represents the number of the wire, which indicates that n same AWG wires are needed. For example, "2AWG\*3" indicates that three 2 AWG wires are needed.
- 2) The diameter of the earth wire needs to be the same as the N wire.

## 6.2 Selecting the NFB and protective components

The 3N3 UPS supplies no breakers and protective components with its cabinet for input (including battery input). For output, only breakers are connected in the cabinet and no protective components are supplied. When installing the 3N3 UPS, the user needs to connect the external breakers and protective components in the input and output terminals. it is recommended to select the NFB instead of the traditional combination kit including breaker and fuse.

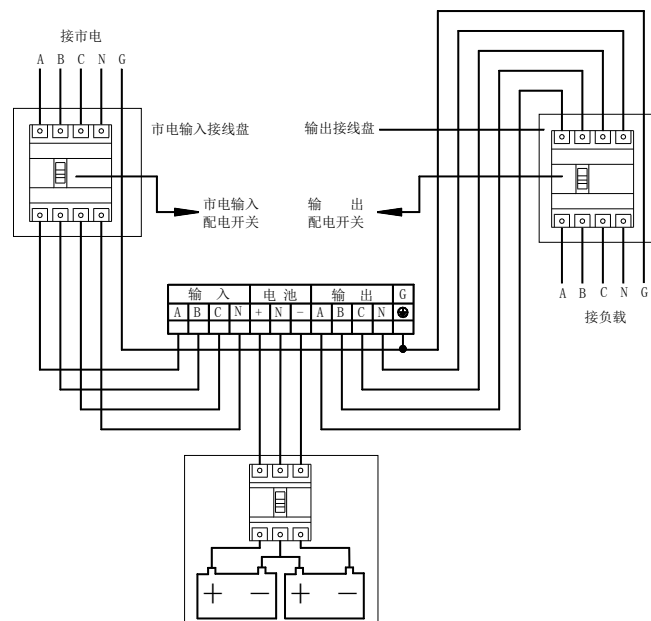
When selecting the NFB, the user needs to take into consideration the voltage and current specifications at the same time. The user can make a choice according to the status of the load. Because NFB is a protective component, it is recommended to choose it according to the real capacity of the UPS. Otherwise it cannot give play to the role of protection. The required voltage and current values of the NFB is listed according to the quantity of the UPS modules in this manual. The user can refer to table 6.2.1 for detailed information when installation.

Table 6.2.1

UPS Module Quantity	UPS INPUT NFB		UPS OUTPUT NFB		BATTERY NFB	
	VOLTAGE	CURRENT	VOLTAGE	CURRENT	VOLTAGE	CURRENT
1	250VAC	40A	250VAC	40A	500VDC	40A
2	250VAC	80A	250VAC	80A	500VDC	80A
3	250VAC	120A	250VAC	120A	500VDC	120A
4	250VAC	160A	250VAC	160A	500VDC	160A
5	250VAC	200A	250VAC	200A	500VDC	200A
6	250VAC	240A	250VAC	240A	500VDC	240A
7	250VAC	280A	250VAC	280A	500VDC	280A
8	250VAC	320A	250VAC	320A	500VDC	320A

Note: it is recommended to choose four-pole NFBs for the input and output of the UPS and a three-pole NFB for the battery. Refer to 6.3 and 6.4 in this manual for detailed information.

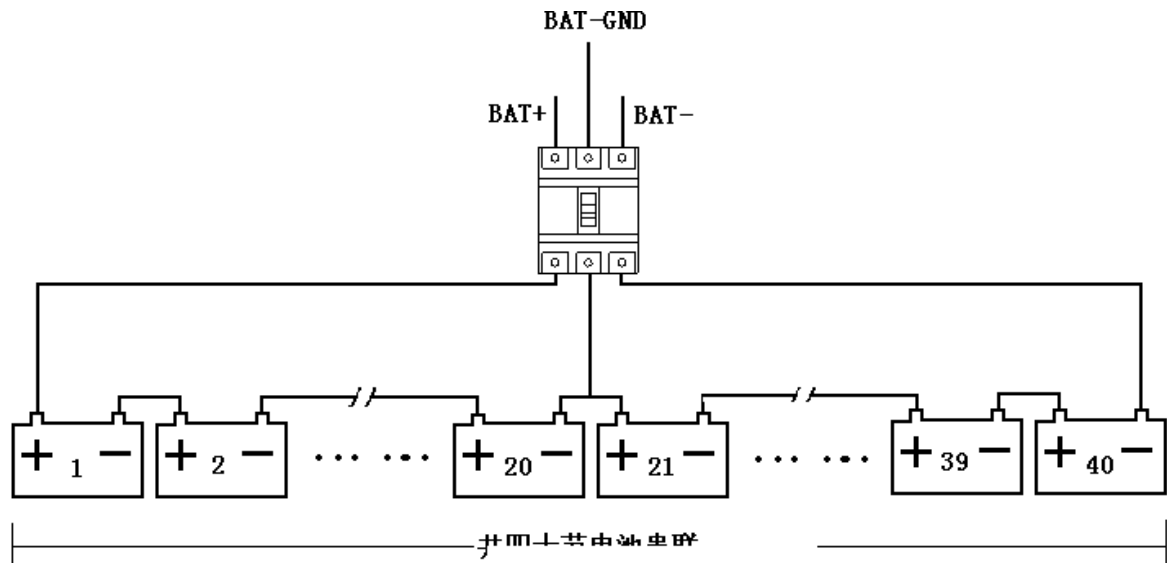
### 6.3 The Power Line Wiring Diagram



#### Remark:

1. The input N wire of the UPS must be connected correctly.
2. One battery pack of the 3N3 UPS consists of 40 series connected batteries. The battery pack is divided into two parts by a wire connected to the middle of the series batteries, where the No. 20 and No. 21 batteries are connected and this wire is the neutral wire. Therefore there are altogether three wires connected with the UPS terminal block including the positive and negative wires of the battery pack. The battery cables have to pass through a DC breaker first and then it can be connected to the terminal block of the UPS. Refer to the following connection diagram for detailed information.





Note: the battery pack supplies three lead wires. Connect the three wires to the UPS correctly according to the mark. Otherwise it may cause hazards of battery short circuit. Double-check before connection. It is required to use DC breakers complying with the safety requirement due to a multiple quantity of batteries in series.

## 6.4. INSTALLATION INSTRUCTIONS

### 6.4.1 Connection Position

The 3N3 UPS has two kinds of cabinet with different height. One is 2M tall and the other one is 1.6M tall. The reserved position for wire connection is located on the top of the 2M tall cabinet (Fig.6.1) and at the bottom of the 1.6M tall cabinet (Fig.6.2). The 2M tall cabinet accepts the bottom wire connection too. But to perform it, the user must put forward a special requirement. The 1.6M cabinet does not accept the top wire connection.

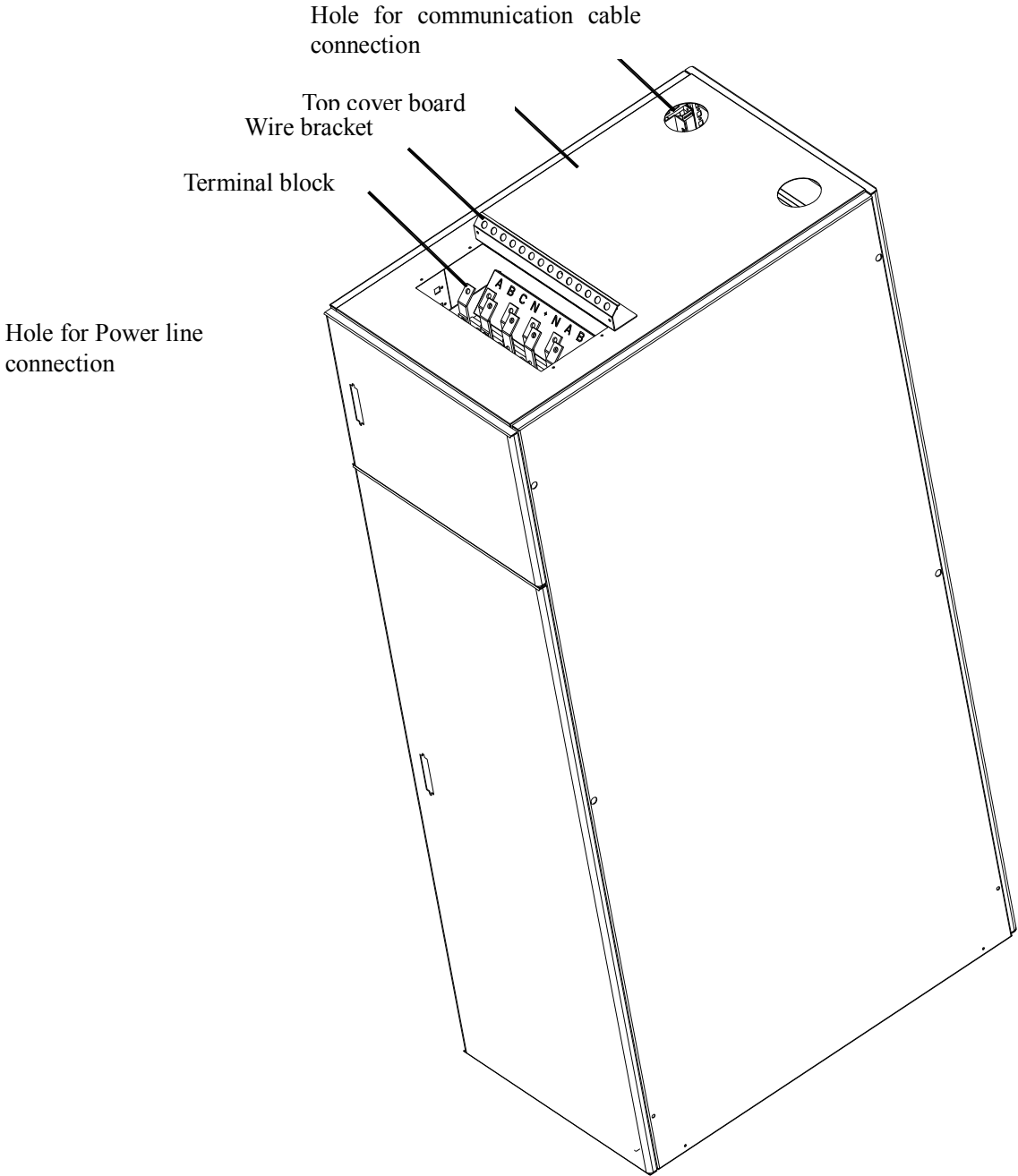


Fig. 6.1

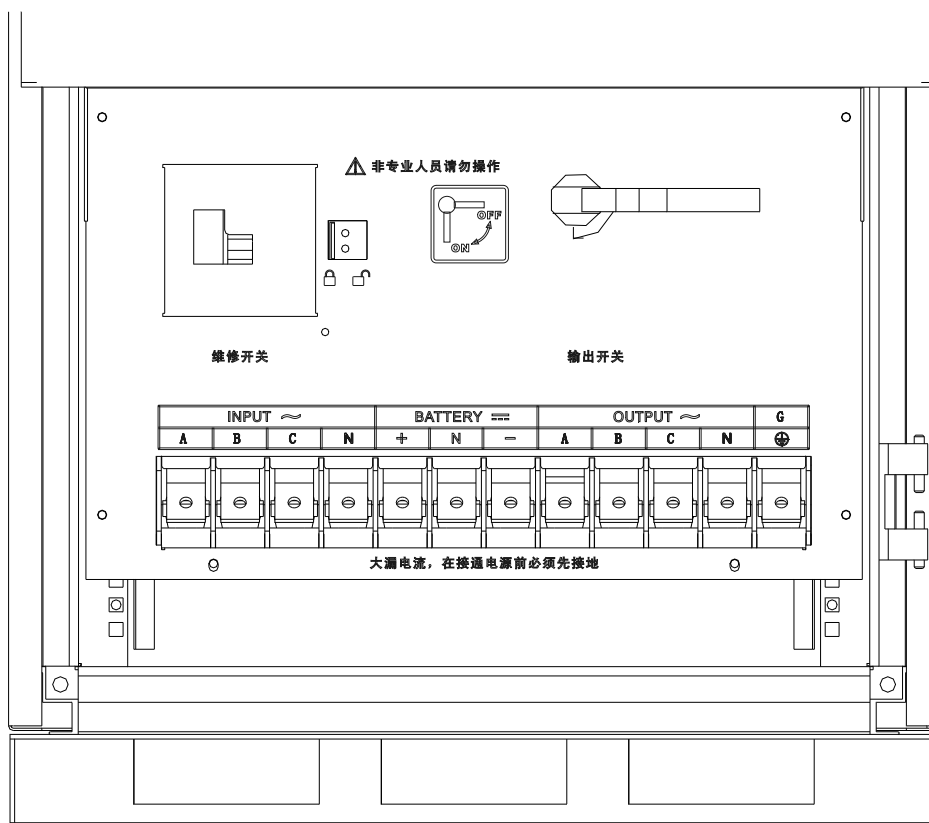


Fig. 6.2

#### 6.4.2 Electrical Installation Illustration

(Take example for the top connection of the 2M cabinet. Refer to the relative documents for some other connection methods.)

1. Remove the screws used for fixing the wire bracket with a cross screwdriver to remove the wire bracket (Fig. 6.3) .

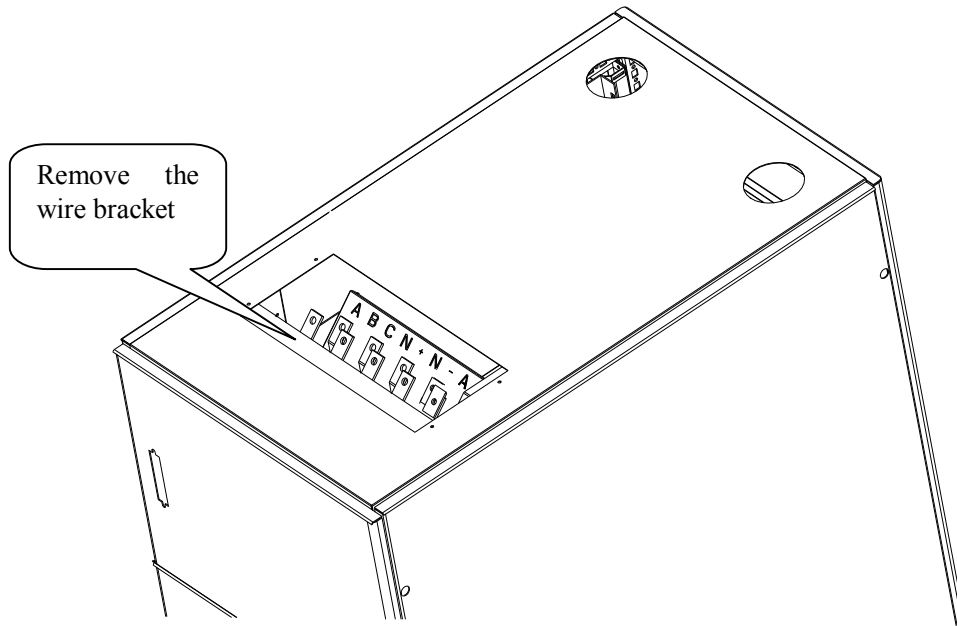


Fig. 6.3

2. Fix the wire bracket on the top cover board of the cabinet with a self tapping screw. ( Fig. 6.4 )

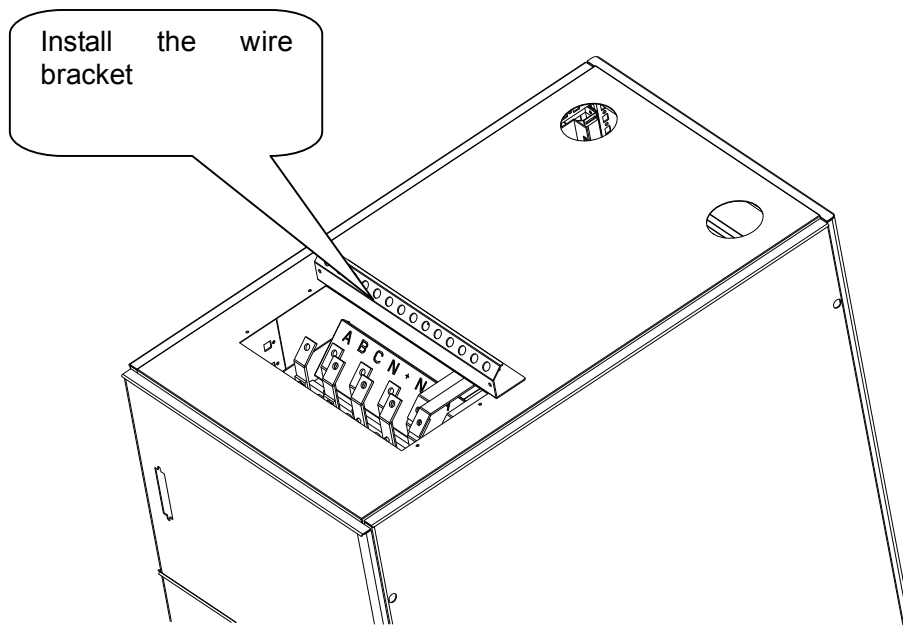


Fig. 6.4

3. Connect the input and output wires of the UPS and the battery cables to the corresponding copper bars according to the marks ( the copper bar mark is shown as Fig. 6.5 ) .

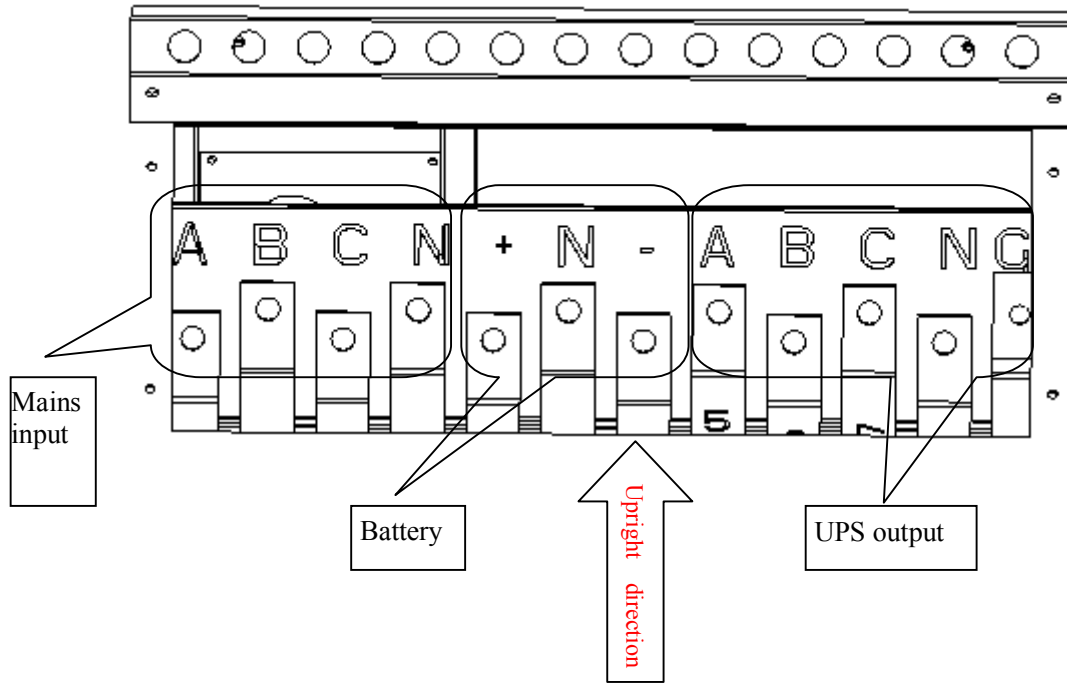


Fig.6.5

4. Fix the power line on the wire bracket with a cable tie.

## 7.Adding/Reducing and Changing the UPS Module Online

N+X is the most reliable power supply configuration at present. N represents the minimum number of modules of the 3N3 UPS that the total load needs; X represents the number of the redundant modules of the 3N3 UPS, i.e. the number of the fault modules that the system can handle simultaneously. The bigger X is, the higher the system reliability is. The 3N3 UPS can be installed up to 8 modules in its cabinet and the N+X parallel redundancy system can be configured as 1+7 or 7+1 etc multiple different modes. The 3N3 UPS modules can be added, reduced and changed online and the quantity of the N and X of the N+X parallel redundancy system can be changed according to requirement at any time. When the modules fail, if only the quantity of the fault modules is less than or equal to X, the fault UPS modules can be changed online without affecting the UPS running.

### 7.1 Options Supplied By the N+X Parallel Redundancy System

The 3N3 UPS can be installed from 1 up to 8 3N3 UPS modules in its cabinet and the user can choose the N+X parallel redundancy solution easily. Suppose the load is 25kVA and the optional solution is listed in the following table 7.1:

Table 7.1:

N+X	Permitted Maximum Power		Permitted quantity of the fault UPS modules
	Apparent Power (KVA)	Active Power (KW)	
2+0	30	24	0
2+1	30	24	1
2+2	30	24	2
2+3	30	24	3
2+4	30	24	4
2+5	30	24	5
2+6	30	24	6

Note:

- 1) The “permitted maximum power” does not mean that the UPS will be overload if this power value


is exceeded. In fact, the power of the UPS can be calculated according to the normal capacity with load, but the original quantity of the redundancy modules of the N+X is destroyed.

2) The “permitted maximum power” indicates the three-phase power, and the permitted maximum power of the single-phase needs to be divided by 3.

## 7.2 Adding, Reducing and Changing the UPS Modules Online

The 3N3 UPS module is hot swappable, but to perform this process, some definite procedures must be complied with. When performing the UPS modules adding, reducing and changing online, the operating instructions must be strictly followed.

### 7.2.1 Removing the UPS Module Online

1. Set the input breaker of the UPS module to the OFF position and set the position lock located on the front panel of the module to “” (Fig.7.1) .
2. Two people each hold the handles located on the front panel of the UPS module with one of their hands and support the bottom of the module with the other hand respectively and they both use their strength together to draw the module outward smoothly and slowly until it is out, and then support it together and put it on the ground or some other temporary supports gently.

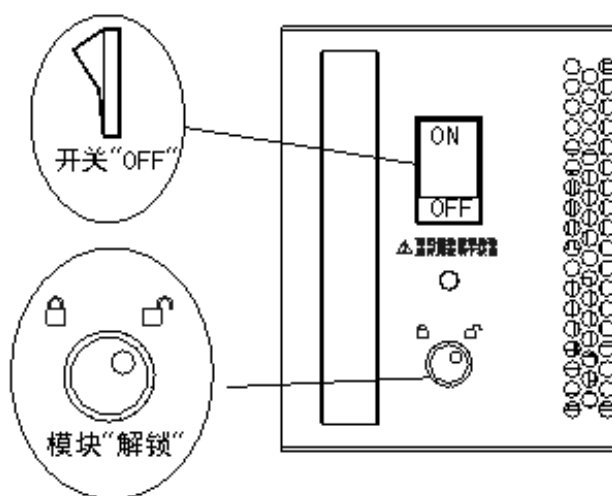



Fig.7.1

## 7.2.2 Adding the UPS Module Online

1. Remove the cover plate located in the position where the module will be installed in the cabinet.
2. Two people each hold the handles located on the front panel of the UPS module with one of their hands and support the bottom of the module with the other hand respectively and slide the module into a bay of the frame together (Refer to 5.4) .
3. Set the position lock located on the front panel of the module to “” and the input breaker of the module to the ON position (Fig. 7.2)

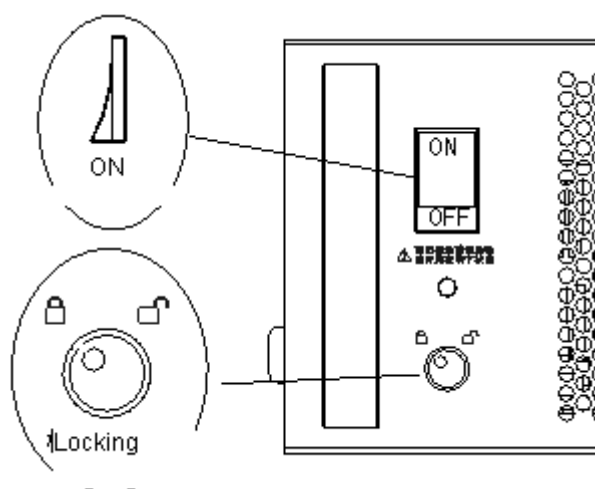


Fig. 7.2

4. If you add a UPS module in the utility power mode, the new added module will enter the parallel system automatically. If you add a UPS module in the battery mode, the new added module will not build a power supply and enter the parallel system until you have completed the above three steps and press the ESC key on the LCD panel for about three to five seconds (Fig. 7.2).

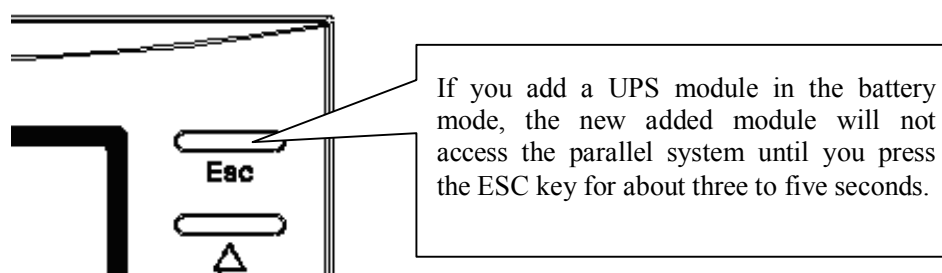


图 7.2



## 8.LCD DISPLAY & OPERATION PANEL

### 8.1 Brief Introduction

The LCD display and the operation panel are located on the front of the cabinet, through which you can see the operating condition of the UPS, query UPS parameters and warning information emitted by the UPS and batteries. After the UPS installation is finished, the user can perform all the UPS operation with the LCD display and operation panel.

The LCD display and operation panel consists of three regions: the LED indication region displaying the UPS status, the LCD data display region and the key-operating region. The LED indication region displaying the UPS status will provide the user with simple information about the UPS status. The LCD data display region will provide the user with detailed information about the UPS status via its LCD screen. The key-operating region will associate the user command with the UPS through its four keys. When the user operates the keys, the corresponding messages will be displayed on the LCD screen. (Fig. 8.1)。

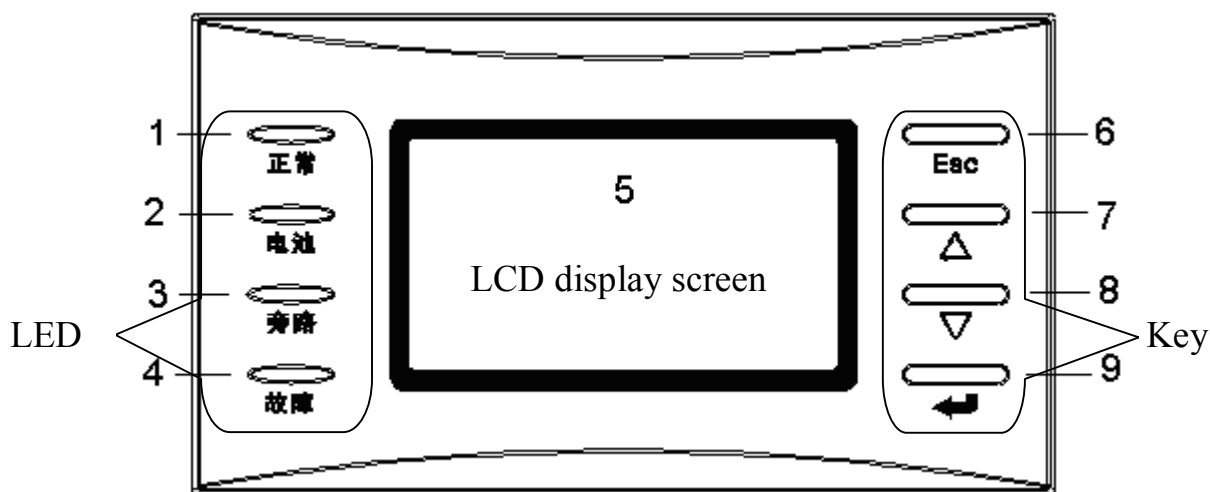


Fig.8.1

The LED indication region displaying the UPS status:

- 1——Green LED: This LED is lit when the UPS supplies power to the load via the inverter.
- 2——Yellow LED: This LED is lit when the utility power fails and the UPS supplies power from its batteries.
- 3——Yellow LED: This LED is lit when the UPS supplies utility power to the load via bypass.
- 4——Red LED: This LED is lit when the UPS is abnormal and emits continuous warning tone simultaneously. Or the LED flashes and the UPS emits fitful warning tone simultaneously.

The LCD data display region:

5—LCD: provides detailed information about the UPS status(Refer to 8.2 for detailed information).

The key-operating region:

6—ESC: Indicates “escape”, you can go back to the last menu or cancel one operation by pressing this key.

7—▲: indicates “scroll up”, you can go back to the last screen message in the same menu by pressing this key.

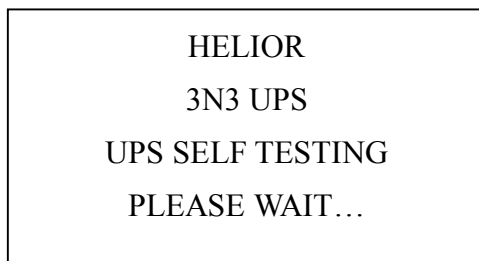
8—▼: indicates “scroll down”, you can skip to the next screen prompt in the same menu by pressing this key.

9—↵: indicates “ENTER”, and you can select one menu or confirm one operation by pressing this key.

Note: Refer to the appendix 1 *the corresponding table of the LED and the UPS status* for detailed information.

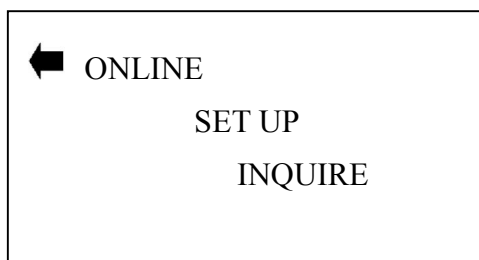
## 8.2 LCD Display Menu Illustration

### 8.2.1 The UPS self test menu

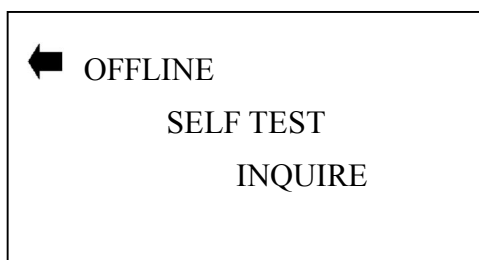


### 8.2.2 Main menu

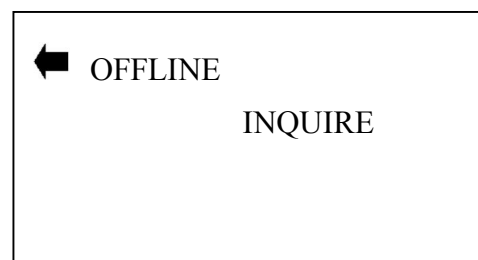
#### 1. Main menu before the unit is ON



#### 2. Main menu after the unit is ON



(self test ON)



(Self test OFF)

## 8.2.3 Parameter menu

Note: the following menu is only for your information and will be subject to change prior to notice.  
Additionally, the parameter value is also only for your information.

## 1. Main parameter menu

LOAD : 0%	P BATT: 271V
I/P VOLT: 220	220 220
O/P VOLT: 220	220 220
O/P FREQ: 50.0Hz	
STATUS: 市电正常供电	

## 2. Input parameter menu

OUTPUT PARAMETER			
	AN	BN	CN
VOLT:	220	220	220
FREQ :	50.0Hz		
ABC	三相输入		

Note: the actual prompt is that the “Positive battery” and the “negative battery” show circularly.

## 3. Output parameter menu

OUTPUT PARAMETER			
	AN	BN	CN
VOLT:	220	220	220
CURR:	20A	20A	20A
FREQ :	50.0Hz		

## 4.Power parameter menu

POWER PARAMETER		
	kW	kVA
TOTAL:	0.00	0.00
A:	0.00	0.00
B:	0.00	0.00
C:	0.00	0.00

Note: The actual prompt is that the “Total”, “UPS01”, “UPS02”, “UPS03”, “UPS04”, “UPS05” and “UPS06” show circularly.

## 5. Battery parameter menu


BATTERY PARAMETER	
P BATT VOLT:	171V
N BATT VOLT:	171V
STATUS:	CHARGING
CAPACITY:	100%

## 9.UPS OPERATION INSTRUCTION

### 9.1 Starting up the UPS

Note: Check that the input wire, output wire and the battery cables are connected correctly before starting up the UPS. If there is something wrong, please connect the wires again according to the instruction. Do not perform the following operation until you make sure that everything is correct.

#### 9.1.1 Turning On the UPS in Normal Condition (the utility power is normal and the battery is dispensable)

1. Check the position lock located on the front panel of the installed UPS module. Make sure that the position locks of all of the modules are in the “” position and set the input breakers of all of the installed UPS modules to the ON position (Fig. 9.1) .

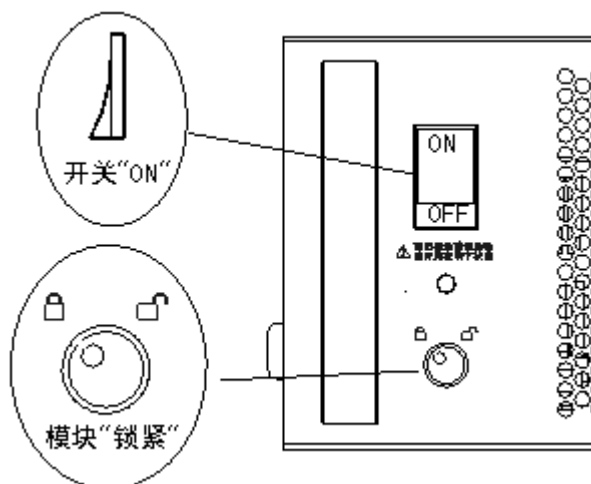


Fig. 9.1

2. Set the battery breaker to the ON position (external breaker) .
3. Set the utility power input breaker (external) to the ON position.
4. Set the “system startup breaker” located on the communication interface to the ON position to perform the UPS self-test (Fig. 9.2).

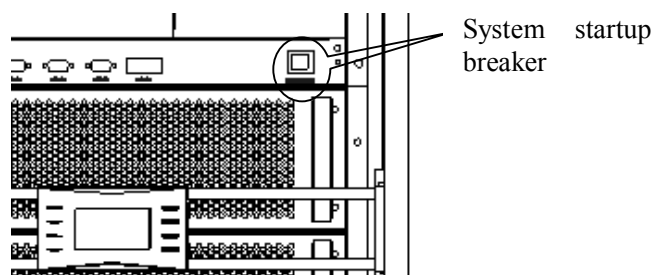


Fig. 9.2

5. The UPS will access the main menu after it finishes the self-test (Fig. 9.3) .

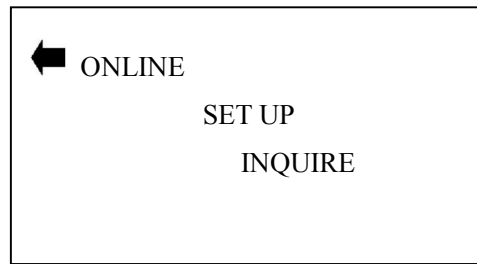


Fig. 9.3

6. Press “↵” and choose “ON” . Confirm according to the LCD prompt message (Fig.9.4)

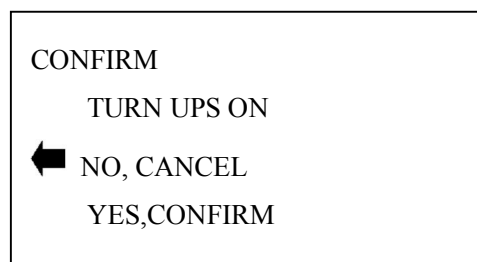



Fig.9.4

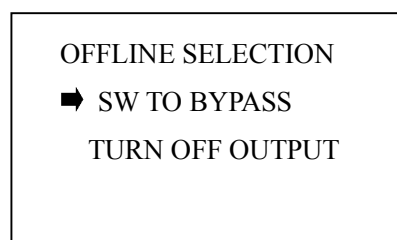
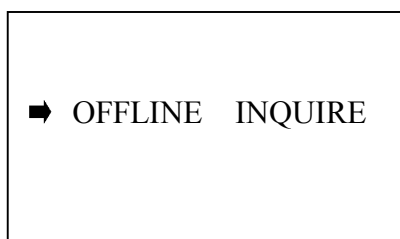
### 9.1.2 Turning on the UPS in DC condition (without utility power)

1. Check the position lock located on the front panel of the installed UPS module. Make sure that the position locks of all of the modules are in the “” position and set the input breakers of all of the installed UPS modules to the ON position (Fig. 9.1) .
2. Set the battery breaker to the ON position (external breaker) .
3. Set the “system startup breaker” located on the communication interface to the ON position to perform the UPS self-test (Fig. 9.2).
4. When the UPS finishes the self-test, press the ESC key located on the LCD display and operation panel for about 3 to 5 seconds to build the UPS power supply (Refer to Fig. 7.2).
5. Press the ESC key located on the LCD display and operation panel to access the main menu (Fig. 9.3).
6. Press “↵” and choose “ON” . Confirm according to the LCD prompt message (Fig.9.4) .

## 9.2 Turning off the UPS

### 9.2.1 Turning off the UPS in the parallel utility power (Line) mode

1. Choose “OFF” in the main menu
2. Press the “↵” key



3. Choose shut down “immediately” and “YES, confirm” ,then the UPS has no output.

Or choose “bypass” and “YES, CONFIRM”, then the UPS transfers to bypass

CONFIRM  
WARNING: OUTPUTOFF  
NO, CANCEL  
➡YES,CONFIRM

CONFIRM  
SWITCH TO BYPASS  
NO, CANCEL  
←YES, CONFIRM

### 9.2.2 Turning of the stand-alone in the utility power mode

1. Choose “OFF” in the main menu

➡OFFLINE INQUIRE

2. Press “↵” key

CONFIRM  
SWITCH TO BYPASS  
NO, CANCEL  
←YES, CONFIRM

3. Choose “YES, CONFIRM” and the UPS transfers to bypass

### 9.2.3 Turning off the UPS in the battery mode

1. Choose “OFF” in the main menu

➡ OFFLINE INQUIRE

2. Press the “↵” key

CONFIRM  
WARNING: OUTPUTOFF  
NO, CANCEL  
➡YES,CONFIRM

3. Choose “YES, CONFIRM” and the UPS has no output

## 9.3 Set up the operation

Note: You can only set up the operation before the UPS starting up.

1. Access the main menu

```

➡ ONLINE  SET UP  INQUIRE
  
```

2. Press the ▼ key and choose “set up”

```

ONLINE➡ SET UP  INQUIRE
  
```

3. Enter the user password (default value is 1234)

```

➡ USER KEY : ****
    SERVICE ONLY : ****
  
```

4. After entering the password, press “↵”

```

SET UP
➡ SELF TEST  TIME
    RE-START  LANGUAGE
    PASSWORD  REDUNDAN
    RETAILER  PHONE
  
```

### 9.3.1 Self test methods:

After you access the “self test” submenu, you will see the following prompt messages:

```

SET UP SELF TEST
➡ RESTORE DEFAULT
    TEST TIME: 1 分
    FUNCTION: ENABLE
  
```

Restoring the original value——this configuration will not work until the other two default values are modified

Self-test time of each time——indicates the battery self-test time and the default value is 1 min. The user can modify the self-test time by himself. The modified time will not work until the user performs “battery self test at fixed time”.

Self-test function——the self-test function is used to set up the ON/OFF condition of the battery self-test function and the default value is “OFF”.

### 9.3.2 Starting up the UPS automatically

The default value of the UPS is “starting up automatically” and there is no ON/OFF configuration.

### 9.3.3 User password

After you enter the “user password” submenu, you will see the following prompt message:

```

SET UP USER KEY

CURRENT: 1234

NEW ENTRY: 0000
  
```

The default password is “1234”. After the user enters new password, the used password will be

changed

### 9.3.4 Distributor Telephone

After you access the “distributor telephone” submenu, you will see the following message:

```

SET UP RETAILER PHONE
PHONE: 000000000000
MOBILE: 000000000000
  
```

The user can input the distributor’s telephone and mobile phone numbers and the input messages can be viewed through “inquiry” (refer to 9.4 for detailed inquiry information).

### 9.3.5 Time Adjustment

The user can adjust the system clock through this configuration.

### 9.3.6 Font Conversion

The user can choose “simplified Chinese character” and “traditional Chinese character” through this configuration. The default value is “simplified Chinese character”.

### 9.3.7 Redundancy Configuration

After you access the “redundancy Configuration” submenu, you will see the following prompt messages (Supposing 6 modules are installed) :

```

SET UP REDUNDANCE
TOTAL NUM: 6
➡ REDUND NUM: 0
MAX POWER CURRENT
SETTING: 90kVA/72kW
  
```

The default value of the quantity of the redundant modules is “0”. When the redundant modules are configured and the load capacity is too high to reach the quantity of the redundant modules, the UPS will display “redundancy overload”. For example, if the configured quantity of the redundant modules is 2, then the menu is changed to:

```

SET UP REDUNDANCE
TOTAL NUM: 6
➡ REDUND NUM: 2
MAX POWER CURRENT
SETTING: 60kVA/40kW
  
```

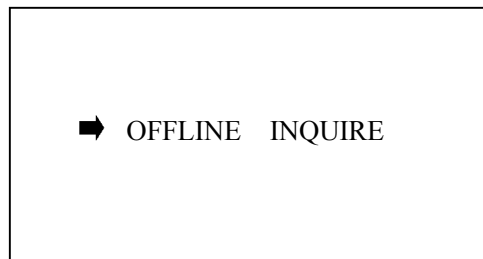
When the load is more than “60KVA/40KW”, the LCD will display “redundancy overload”. But the UPS will not look it as overload and the load percentage is still calculated according to 6 modules, i.e. the true overload will not occur until the load is more than “90KVA/72KW” .



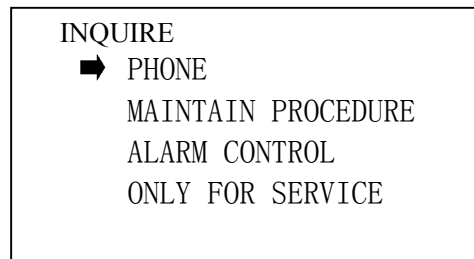
## 9.4 Inquiry Operation

Note: The inquiry operation can be performed both in the condition of the unit being ON and in the condition of the unit being OFF. The following prompt messages are taken from the condition of the unit being ON:

1. Access the main menu



2. Press the ▼ key and choose “inquiry”



There are four optional inquiry items:

Special phone line for Maintenance——you can inquire about the configured phone numbers for the distributor and the 800 toll free hot line of HELIOR company in “configuration”.

Maintenance procedure——you can inquire about the operating procedure that the UPS transfers to the maintenance bypass.

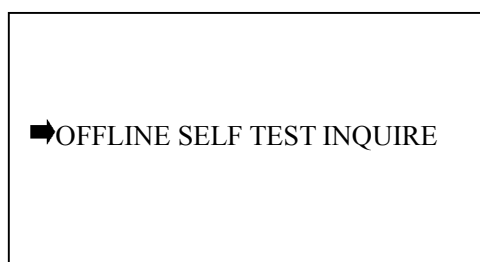
Alarm control——when the UPS is fault or send an alarm, the built-in buzzer will beep continuously or fitfully. The user may turn off the warning tone if he feels it harsh.

Special inquiry item for Maintenance——this configuration is set for maintenance engineer for inquiry and it can not be accessed until the “maintenance password” is entered. Unqualified personnel do not perform this operation.

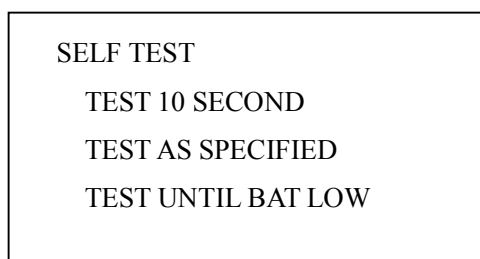
## 9.5 Battery Self-test

Note: the UPS will transfer to the battery mode when the battery performs a self-test. You can stop the battery self-test by pressing the “ESC” key at any time.

The default value of “battery self-test” is off. If you want the battery to perform a self-test, please choose “turn on the battery self-test” in the “self-test mode” of the “configuration”. After the unit is on, the “self-test” menu will appear in the LCD main menu and the prompt messages are as follows:



Press the ▼ key to access the “self-test” menu. You can see four submenus:



10-second self-test——this is the fastest battery self-test mode and it is mainly used for checking that the battery is connected.

(Note: if the discharging time is less than 10 seconds, then take the battery low voltage as a standard)  
configured self-test time——self-test time that set in the “configuration”.

(Note: if the discharging time is less than 10 seconds, then take the battery low voltage as a standard)  
self test until battery low——do not stop performing self-test until the battery low.

## 10.UPS MAINTENANCE

### 10.1 Maintenance Notice

1. The UPS and battery maintenance should be performed by trained and qualified technical personnel. The user can not perform maintenance.
2. If it will not be used for a long time, the battery pack should be recharged full once every three months under normal temperature and every two months under high temperature.
3. The rear part of the UPS comprises two parts, the top part and the lower part. The maintenance bypass breaker is installed in the top part. Do not operate the two breakers in normal condition. Otherwise it may cause the equipment disconnected from power or even more serious accident. The copper bar with electricity is in the lower part. The door of the cabinet is locked. Do not attempt to open the door with any methods. Otherwise electric shock may occur.

### 10.2 Service Methods

If the UPS fails and the user cannot make sure it is what causes the UPS fault, please contact the point of HELIOR service network or the distributor. Do not continue to operate the unit.

### 10.3 Maintenance Bypass Operating Process

Note: this operation is generally only performed by service personnel for maintenance. The user cannot use it until the equipment is disconnected from power due to the UPS fault. Please read the operating flowchart thoroughly before operating it. Any questions, please consult the point of HELIOR service network or the distributor firstly and you cannot operate the unit until you have completely known the flowchart.

#### 10.3.1 Operating process for transferring to maintenance bypass

1. Open the “rear maintenance door” of the UPS cabinet (the top door located on the rear part of the UPS cabinet) .
2. Pull the cover plate of the maintenance breaker rightward to open it (Fig. 10.1)

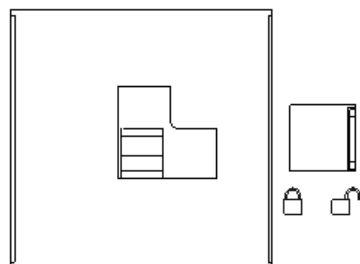


Fig. 10.1

Note: the UPS should transfer to bypass automatically in theory. Please inquire about the prompts shown on

the LCD screen to make sure that the UPS has transferred to bypass. Otherwise, do not continue the next operation.

3. Set the maintenance breaker to the ON position (Fig.10.2) .

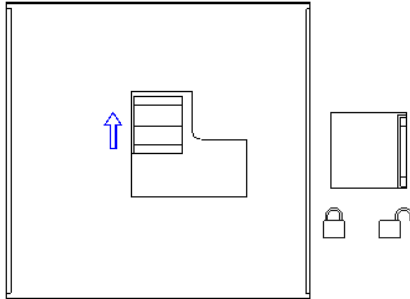


Fig.10.2

4. Turn the UPS output breaker to the position of OFF (Fig.10.3)。

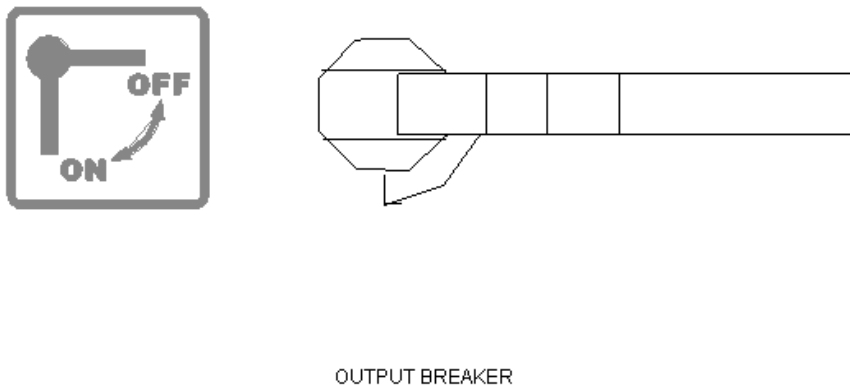


Fig.10.3

5. Set the input breaker of the UPS module and the battery breaker to the position of OFF.

#### 10.3.2 Operating process for recovering from the maintenance bypass to the UPS output

1. Set the battery breaker and the input breaker of the UPS module to the position of ON.
2. After all of the UPS modules have transferred to the bypass mode, set the output breaker of the UPS to the position of ON (Fig. 10.4) .

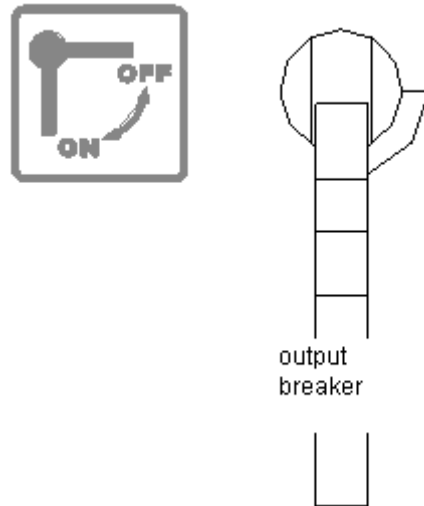


Fig.10.4

3. Set the maintenance breaker to the position of OFF (Fig.10.5)

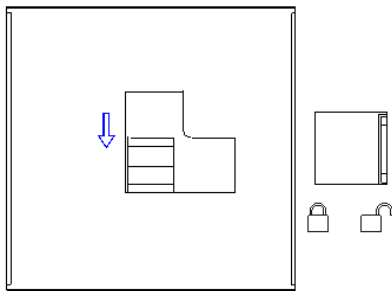


图 10.5

4. Pull the cover plate of the maintenance breaker leftward to close it (Fig.10.6)

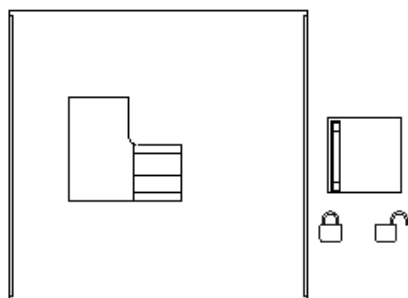


Fig.10.6

5. Turning on the unit by operating the LCD display and operation panel

## 11.COMMUNICATION INTERFACE

The ONLINE series UPS supplies abundant communication interface ports, including RS232, RS485, Intelligent Slot etc external communication ports. Of them, the intelligent slot can be equipped with the AS400 kit (optional) or the WebPower kit (optional) . Through these communication ports, the user can monitor the status of the UPS with computer easily.

The position of the communication port is shown as Fig.11.1:

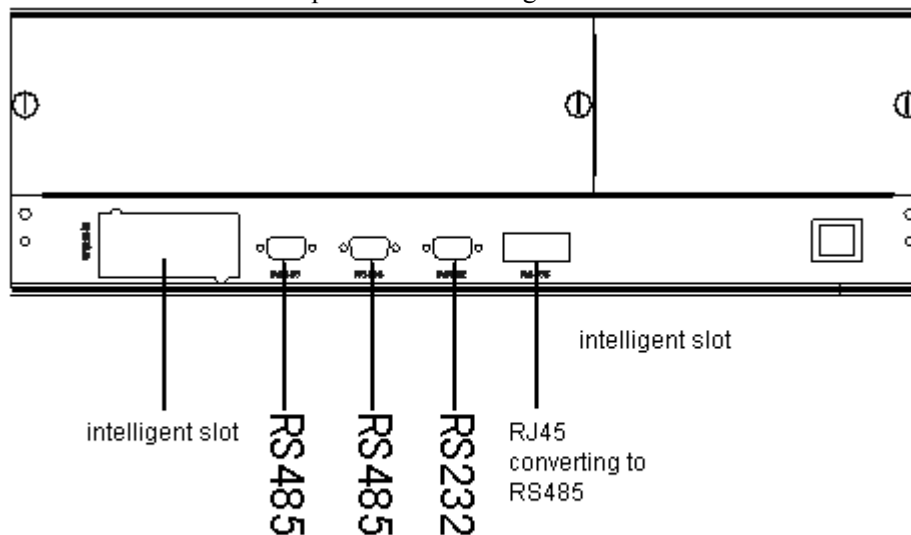


Fig.11.1

**Standard RS232 Port**——If your computer has installed the HELIOR friendly user Winpower-XP software, you can monitor the status of the UPS through this port.

**Standard RS485 Port**——you may telemonitor the UPS within a farer distance through the Winpower-XP software and the status of the UPS power supplying can be controlled completely.

**Intelligent Slot Port**——compatible with the AS400 and WebPower kits. The user may choose one kit from the two types according to his needs. The two types of kit cannot be used together.

**RJ45 converting to RS485**——a nonstandard RS485 port. The user can perform the RS485 communication through the transmission line within the local area network. The connection diagram between the RJ45 and the stand RS485 is shown as Fig.11.2.

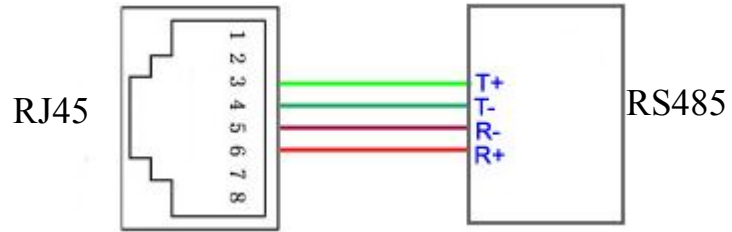


Fig.11.2

Note: refer to some other relative documents for the use of the WINPOWER-XP software and the AS400 and WEBPOWER kits. If you have any questions about the above communication ports, please contact HELIOR customer service center.

## 12.TROUBLESHOOTING

It is possible that the 3N3 UPS fault occurring during the first time installation or use is caused by an improper use. Please check that the installation, wiring connection and use etc are correct. After you make sure that there is no mistake, then contact the HELIOR customer service center. When you contact the service personnel, please provide the following information:

1. The model number of the unit, the serial number (you may see it on the rear cover plate of the unit or inquire about it on the LCD display panel).
2. The prompt messages shown on the LCD screen and the LED status of the unit when the fault occurs.

There are some certain limitation condition in the 3N3 UPS installation and operation, so please pay special attention to the contents in the “Note” part in this manual. In order to help the user to use the unit, some common problems and troubleshooting are listed below:

### 12.1 Common Problems on LCD Display

- Problem 1: LCD display error, white screen, black screen and cannot operate the keys

Possible cause: the communication module and the signal line of the LCD screen is not connected properly

Solution: Connect the signal line again and press any key to restore

- Problem 2: LCD display blur, white screen, black screen

Possible cause: the LCD backlights are not regulated well and they blot out the message

Solution: Pull the lever supporting the LCD display and operation panel out and regulate the potentiometer (blue) on the reverse of the panel with a cross screwdriver to make the LCD display optimal

- Problem 3: the communication interface cannot run normally

Possible cause: the communication module is not fully engaged

Solution: Draw out the communication module and push it to the bay completely again.

### 12.2 Common Problems on the UPS module

- Problem 1: cannot sense the slid module

Possible cause: the UPS module is not fully engaged

Solution: Draw out the module and push it to the bay completely again.

- Problem 2: the UPS cannot start.



Possible cause: the system startup breaker is not in the position of ON

Solution: set the system startup breaker to the position of ON and restart it

- Problem 3: the latest added UPS module cannot be turned on and combined in the network

Possible cause: the position lock of the latest UPS module is in the position of unlocking or the input breaker is in the position of OFF

Solution: Set the position lock to the position of locking and set the input breaker in the position of ON

- Problem 4: UPS will not turn on

Possible cause: the input phase sequence is not correct and the input voltage or the frequency exceeds the specification range

Solution: Check that the utility power (mains) input voltage and frequency are normal. If the phase sequence is reverse, then correct it.

- Problem 5: the communication module does not start up when the system startup breaker is set to the ON position to turn on the unit in the DC condition

Possible cause: the system startup breaker cannot start the communication module until the battery breaker is in the position of ON and the system startup breaker is in the position of OFF for 10 seconds. Maybe it is caused by not waiting enough time.

Solution: Disconnect the system startup breaker for about 10 seconds and then connect it again you may start the module

- Problem 6: the LCD cannot sense the UPS module when starting the unit in DC condition

Possible cause: after the UPS module builds a power supply, if it does not receive the command of starting the unit within 30 seconds, it will cut off the utility power automatically. It may be caused by not turning on the unit in time.

Solution: turn on the unit within 30 seconds after the UPS builds a power supply

- Problem 7: the parallel operation is in the bypass mode and cannot transfer to the utility power (line) mode

Possible cause: the cover plate of the maintenance breaker is not in the position of locking

Solution: set the cover plate of the maintenance breaker to the position of locking

- **Problem 8:** during the course of parallel operation, a blue LED located on one of the modules suddenly flashes and the LCD shows that the position of that module is flashing.

Possible cause: the module internal fault

Solution: draw out the module according to the online module removing process and slide into a new module. Start the module according to the online adding module process

### **12.3 Common Problems on Battery and charger**

- **Problem 1:** no charging voltage and charging current in the utility power (line) mode

Possible cause: the system sense that the battery is disconnected when starting the unit and shut down the charger.

Solution: choose the battery self-test on the LCD panel. The charger will start up automatically after the system sense the battery.

- **Problem 2:** the battery self-test fails although the battery exists

Possible cause: the battery breaker is not in the position of ON or the battery is damaged.

Solution: check the battery breaker. Replace the battery if it is damaged.

## 13.PRODUCT SPECIFICATIONS

### 13.1 Electrical Specification

#### 13.1.1 Input specification:

Connection : three-pole-four-wire & earth wire connected (Note: the N wire must be connected! )

Voltage :  $220 \times (1 + 35\% / -27\%)$  VAC (phase voltage)

$380 \times (1 + 35\% / -27\%)$  VAC (wire voltage)

Frequency :  $50 \times (1 \pm 8\%)$  Hz or  $60 \times (1 \pm 7\%)$  Hz

Power factor :  $\geq 0.99$

Bypass voltage range :  $\pm 15\%$

#### 13.1.2 Output specification:

Connection: three-phase & earth wire connected

Voltage :  $220 \times (1 \pm 2\%)$  VAC

Power factor : 0.8

Dynamic voltage transfer range :  $\leq 10\%$

Frequency distortion :  $\pm 8\%$  in normal condition; the input frequency is more than  $\pm 8\%$  or in the battery mode, the output frequency is  $\pm 0.5\%$

Overload time : 10 min (  $110\% < \text{load} \leq 130\%$  )

1 min (  $130\% < \text{load} \leq 150\%$  )

0.5 sec (  $150\% < \text{load}$  )

UPS efficiency :  $> 90\%$

Transfer time :  $\leq 100$  ms

#### 13.1.3 Battery rated voltage

Positive battery: +240VDC

Negative battery: -240VDC

### 13.2 Noise

$< 62$  dB

### 13.3 Operating Environment

Operating temperature: 0°C~40°C

Ambient humidity: 20%~90%

Altitude: less than 1000m

Storage temperature: -25°C~55°C

### 13.4 DIMENSION AND NET WEIGHT

Name	Dimension W×D×H(mm)	Net weight (kg)
UPS Module	440×700mm×131	35
UPS Cabinet (2.0 M tall)	600×1000×2000	250
UPS Cabinet (1.6 M tall)	600×1000×1600	200

## 14. WARRANTY

HELIOR warrants its products to be offered free warranty service for three years from the date of purchase.

- ★To obtain service under warranty via an valid guarantee offered by distributors;
- ★To obtain service under warranty via serial number.

The transportation cost produced in the warranty period will be settled by the user. If your UPS fails, please contact our service network close to you and contact the distributor. We provide the user with the following services:

- ★One year warranty;
- ★Nationwide warranty;
- ★Technical support at HELIOR's web site <http://www.heliortec.com>;

This limited warranty does not apply to conditions as follows:

- ★Man-made fault and out of warranty;
- ★The finished product that the serial number is changed or lost;
- ★Damage or loss resulted from force majeure or external causes;
- ★Disassembling or modifying the unit with no authorization;
- ★Do not operate/use the unit according to operating/using provisions;
- ★Battery over discharged or man-made damage.

## Appendix 1 : The reference table of the LED display and the UPS status

Serial No.	UPS status	LED Display				Audible alarm	LCD display	Remark
		Normal	Battery	Bypass	Fault			
<b>1. utility power mode</b>								
	Normal voltage of the utility power	•				none	The three-phase supplies power normally	
	the utility power voltage normal, bypass exceeds normal range	•				none	The three-phase supplies power normally, bypass abnormal	
	Utility power high/low voltage protection, transfers to bypass mode and apply power from battery	•	•		★	One beep every 4 seconds	The utility power abnormal	
<b>2. battery mode</b>								
	The Battery voltage is normal	•	•		★	One beep every 4 seconds	The utility power is abnormal	
	Abnormal Battery voltage warning	•	★		★	One beep every 1 second	Battery low	
<b>3. bypass mode</b>								
	The utility power is normal (bypass mode)			•	★	One beep every 2 minutes		The alarm will be turned off when online
	High voltage warning (bypass mode)				★	One beep every 4 seconds	utility power abnormal	
	Low voltage warning (bypass mode)				★	One beep every 4 seconds	Utility power abnormal	
<b>4. Warning for battery disconnected</b>								
	Bypass mode			•	★	One beep every 4 seconds	Battery disconnected	Check that the battery breaker is in the position of ON
	Utility power mode	•			★	One beep every 4 seconds	Battery disconnected	Check that the battery breaker is in the position of ON
<b>5. Warning for input phase loss or phase sequence error</b>								
	phase loss (bypass mode)				★	One beep every 2 seconds	Utility power abnormal and phase sequence error.	Check that the phase sequence of the input wire is correct
	Phase loss (bypass mode)	•	•		★	One beep every 4 seconds	Utility power abnormal and phase loss	Check that the phase sequence of the input wire is correct
	Phase sequence error				★	One beep every 2 seconds	Utility power abnormal and phase sequence error.	Check the sequence of the input wire
<b>6. Output overload protection</b>								
	Overload in the utility	•			★	One beep every	Output overload	Remove some

**APPENDIX 1: THE REFERENCE TABLE OF THE LED DISPLAY AND THE UPS STATUS**

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	power mode. Warning sending...					2 seconds		unimportant load
	Overload in the utility power mode. The UPS is protecting the connected equipment.			●	●	Continuous beep	Output overload	Remove some unimportant load
	Over load in the battery mode. Warning sending	●	●		★	One beep every 2 seconds	Output overload	Remove some unimportant load
	Over load in the battery mode. The UPS is protecting the connected equipment.	●	●		●	Continuous beep	Troubleshooting menu	Remove some unimportant load
7.	Warning for overload in the bypass mode			●	★	One beep every 2 seconds	Output overload	Remove some unimportant load
8.	No UPS modules					None		

If some other conditions that are not included in the above table occur, please contact the distributors or call the HELIOR service hot line for assistance.

● indicates that the indicator lights continuously

★ indicates that the indicator flashes

## APPENDIX 2: BATTERY CONFIGURATION

**The least number of the battery pack:** the batteries with different capacity have different charging and discharging threshold. To maintain the battery's service life, please determine the number of the battery packs according to users' requirement and the following information:

**The configuration table of the number of the battery packs:** (the part with no color in the table indicates configuration prohibition and the dark color part indicates the permitted number of the battery packs.

1.24AH BATTERY PACK Number Configuration table:

功率 \ 电池组	24Ah*1	24Ah*2	24Ah*3	24Ah*4	24Ah*5	24Ah*6	24Ah*7	24Ah*8
15 kVA								
30 kVA								
45 kVA								
60 kVA								
75 kVA								
90 kVA								
105 kVA								
120 kVA								

2.38AH BATTERY PACK Number Configuration table

功率 \ 电池组	38Ah*1	38Ah*2	38Ah*3	38Ah*4	38Ah*5	38Ah*6	38Ah*7	38Ah*8
15 kVA								
30 kVA								
45 kVA								
60 kVA								
75 kVA								
90 kVA								
105 kVA								
120kVA								

3. 65AH BATTERY PACK Number Configuration table



APPENDIX 2: BATTERY CONFIGURATION

功率 \ 电池组	65Ah*1	65Ah*2	65Ah*3	65Ah*4	65Ah*5	65Ah*6	65Ah*7	65Ah*8
15 KVA								
30 KVA								
45 KVA								
60 KVA								
75 KVA								
90 KVA								
105 kVA								
120 kVA								

4. 100AH BATTERY PACK Number Configuration table:

功率 \ 电池组	100Ah*1	100Ah*2	100Ah*3	100Ah*4	100Ah*5	100Ah*6	100Ah*7	100Ah*8
15 kVA								
30 kVA								
45 kVA								
60 kVA								
75 kVA								
90 kVA								
105 kVA								
120 kVA								