

G.P.E. S.r.l.

General Power Equipment

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Publish statement

Thank you for purchasing this series UPS.

This series UPS is an intelligent , single phase in single phase out, high frequency online UPS designed by our R&D team who has sophisticated experience in UPS for years.

With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance & latest EMC and safety standards complied,the UPS meets the world's advanced level. Read this manual carefully before installation.

This manual provides technical support to the operator of the equipment.

Safety Instruction

1.Prohibition

1.1 There is high risk of electric shock from the UPS inside, so please do not open or remove the casing or front panel unless it is operated by authorized technicians; otherwise, the warranty becomes void as well.

1.2 Please contact and discuss with distributors before connecting the UPS to following equipments

- Medical equipments which have direct relationship with patients' life
- Equipments like elevators which may do harm to human beings.
- Similar equipments as mentioned above

1.3 Don't dispose of the battery with fire so as to avoid explosion

2.Safety notice

- 1) The output of the standard UPS with internal batteries may be energized even if the UPS input is not connected to the utility.
- 2) Do disconnect the UPS input and make sure the UPS is complete off before moving the UPS or re-configuring the connection; otherwise, there will be potential electric shock.
- 3) For the sake of human beings' safety, please well earth the UPS before starting it.
- 4) Working environment and storage way will affect the lifetime and reliability of the UPS. Avoid having the UPS work under following environment for a long time
 - Area where the humidity and temperature is beyond the specified range(temperature 0 to 40 celsius degree, relative humidity 5%-95%).
 - Direct sunlight and location nearby heat

- Area which can be crashed easily
 - Area with corrosive gas, flammable gas, excessive dust...etc.
- 5) Keep the ventilations in good conditions otherwise the temperature of components inside UPS will be high and the component and UPS life will be affected.
 - 6) It is forbidden to pour liquid or put any objects into the UPS.
 - 7) Don't use liquid extinguisher if there is a fire, a dry powder extinguisher is recommended.
 - 8) Battery life cycle will be shorter as environment temperature rise. Replacing battery periodically can help to keep the UPS in normal status and assure backup time required. Battery replacement should be done by authorized technician.
 - 9) Keep the UPS in a dry area or environment if it will not be free of operation for a long time. Storage temperature of the UPS with internal battery is $-20^{\circ}\text{C}\sim+55^{\circ}\text{C}$, and extended backup model without internal battery is $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$.
 - 10) Taking out the UPS or batteries from storage, it is recommended to connect them with the utility for at least 12 hours per 3 months to avoid battery from over-draining.
 - 11) Don't open the battery, electrolyte inside will do harm to eyes and skin. Please use plenty of clean water to wash if touching then go to see a doctor.

Contents

1.Product Introduction - - - - -	6
1.1 Application- - - - -	6
1.2 Product range - - - - -	6
1.3 System principle diagram - - - - -	6
1.4 Features- - - - -	7
1.5 Product overview- - - - -	7
1.5.1 Product view- - - - -	7
1.5.2 LCD Operation instruction- - - - -	8
1.5.3 Display instruction - - - - -	10
1.5.4 Rear panel instruction - - - - -	-
-15	
2.Installation- - - - -	16
2.1 Unpack checking- - - - -	16
2.2 Installation procedure - - - - -	16
2.2.1 Installation note- - - - -	-16
2.2.2 Installation - - - - -	17
2.3 Connection of parallel system - - - - -	19
3.Operation- - - - -	-20
3.1 Working Modes- - - - -	-20
3.1.1 AC mode - - - - -	20
3.1.2 Bypass mode- - - - -	20
3.1.3 Battery mode- - - - -	20
3.1.4 ECO mode - - - - -	21
3.2 Operation- - - - -	21
3.2.1 Power on - - - - -	21
3.2.2 System parameter setting- - - - -	21
3.2.3 Start - - - - -	21
3.2.4 Manual battery testing- - - - -	22
3.2.5 Inverter power off- - - - -	22
3.2.6 Power off - - - - -	23
3.3 Working Mode and transferring - - - - -	23
3.3.1 Transfer to bypass if overload - - - - -	23
3.3.2 Normal mode to battery mode - - - - -	-23
3.3.3 Goes to Bypass mode due to over temperature - - - - -	-
23	
3.3.4 Output short circuit - - - - -	-
-23	
3.4 UPS monitoring- - - - -	24
3.5 LCD operation menu- - - - -	-24

3.5.1 Main menu switching - - - - -	24
3.5.2 Submenu switching - - - - -	24
3.5.3 Priority of info displayed on the LCD- - - - -	24
4. Maintenance- - - - -	25
4.1 Fan maintenance - - - - -	25
4.2 Battery maintenance- - - - -	25
4.3 Visual checking- - - - -	25
4.4 UPS status checking- - - - -	26
4.5 Function checking- - - - -	26
5. Trouble shooting- - - - -	27
A1 USB communication port definition - - - - -	28
A2 Specification- - - - -	29
A3 Option - - - - -	31
A4 UPS message table - - - - -	31

1. Product Introduction

1.1 Application

This series UPS, providing reliable AC power to various equipment, can be used for computer center, network management center, auto control system, telecom systems, etc.

1.2 Product range

Capacity	6kVA		10kVA	
Model	Standard model	Extended model	Standard model	Extended model
Remarks	with internal battery	External battery	with internal battery	External battery

1.3 System principle diagram

The system can work as a single unit or parallel one, so as to enhance its Reliability.

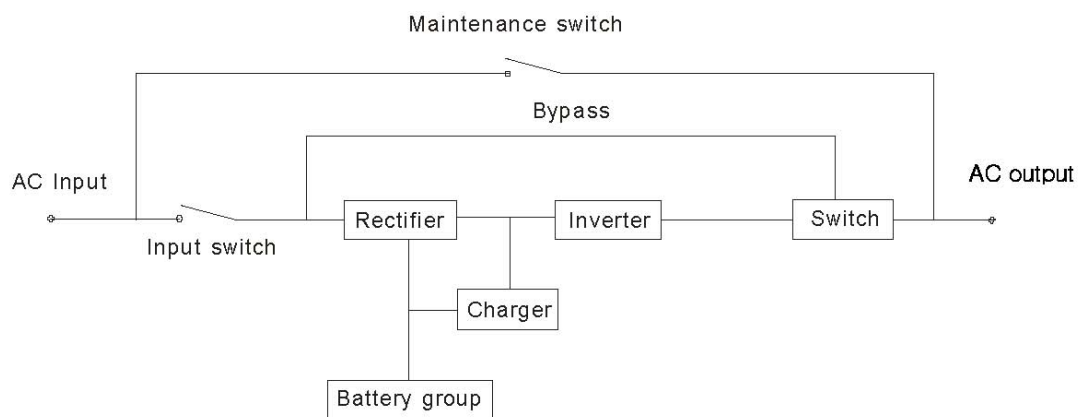


Fig.1-1 Single unit

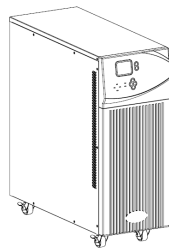
1.4 Features

This series 6kVA/10kVA UPS is newly introduced. It is an intelligent online sine wave UPS.

- High frequency, double conversion, high input power factor, wide input voltage range, the output will not be disturbed by power network, suitable for area with poor power supply condition
- DSP technology for all-digital control, high reliability, self-diagnostics and protections are featured
- Intelligent battery management which extends battery life
- LCD panel and LED indicators clearly indicate the system status and parameters such as input/output voltage, frequency, load, temperature inside UPS, etc.
- Perfect network power management can be achieved by using UPS monitoring software
- Maintenance bypass switch is provided so the power supply to load will not be interrupted during repair.
- Friendly maintenance module design, easy for maintenance.

1.5 Product overview

1.5.1 Product view



F1-2 Complete unit view

1.5.2 LCD Operation instruction

The LCD control panel which consists of LCD display board, LED and buttons(see Fig1-3) displays and controls these information including operating information, alarm information, function setting information.

■ LCD control panel

- 1) Five green LED and one red LED
- 2) LCD control panel which can display four lines of English
- 3) Buttons: On, Off, ESC, Enter, and Left & Right

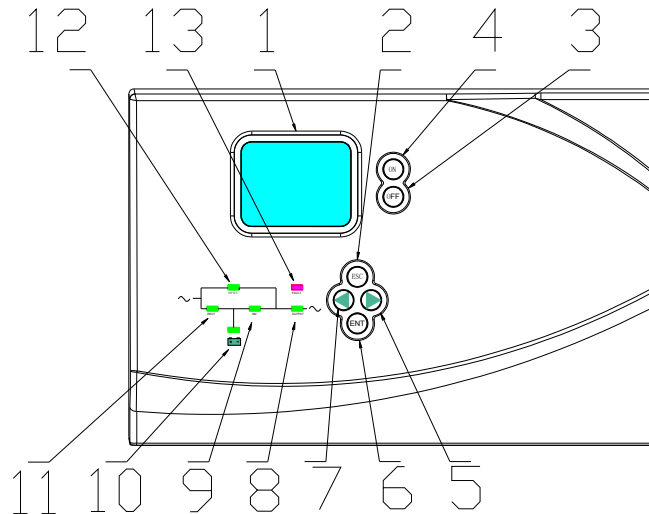


Fig.1-3 LCD control panel introduction

- | | |
|----------------------|--------------------------|
| 1. LCD Display Board | 8. Output Indicator |
| 2. ESC | 9. Inverter Indicator |
| 3. Off button | 10. Battery Indicator |
| 4. On button | 11. Mains (AC) Indicator |
| 5. Right or down | 12. Bypass Indicator |
| 6. Enter | 13. Fault Indicator |
| 7. Left or up | |

■ LED indicator definition

- 1) Fault Indicator (Red) : On: indicates when a fault occurs; Off :means no fault occurs
- 2) Indicator (Green) : On: means AC is normal, Off: means AC is not present,and blinking means voltage is beyond normal range
- 3) Inverter Indicator (Green) : On : means when load is powered by inverter, Off: means when it is not working and blinking when it is overload
- 4) Bypass Indicator (Green) : On : means when UPS is in bypass mode, Off: means not in bypass mode and blinking means when the input is beyond normal range
- 5) Battery Indicator (Green) : On: when UPS is in battery mode, Off : Not in battery mode; Blinking: when battery voltage is low or battery is not connected
- 6) Output Indicator (Green) : On: when there is output, Off: no output.

■ LCD display content

1) Running parameters

Input voltage/frequency, output voltage/frequency/current, temperature inside UPS, battery remaining capacity, battery charging/fully charged, battery voltage.

2) Alarm information (priority from high to low)

It indicates shutting down, auxiliary power fault, output short circuit, inverter fault, rectifier fault, over temperature, overload, charger fault, battery fault, battery capacity low, ready to shut down and output fault

3) Parameter setting

Menu setting, floating /boosting charging setting, battery capacity setting, ID of parallel UPS, output voltage/frequency level/calibration.

- Boosting charging voltage 2.30 to 2.35V per cell, floating charging voltage 2.20 to 2.29V per cell
- Battery capacity setting includes the Ah of each battery unit, battery quantity (8 to 10)*2, parallel group number, low battery voltage alarm value (EOD).
- Parallel setting
- UPS ID setting
- LBS setting (Enable/Disable, Master/Slave)

■ Button Definition

Button	Definition
ON	Switch on the inverter by pressing and holding it for 1s when the UPS is off
OFF	Switch off the inverter output by pressing and holding it for 1s when the UPS is on, load will be powered by bypass output if the bypass is normal
ENT	Confirm the operation
ESC	Cancel and go to previous menu
◀	Turn to another menu or parameter
▶	Turn to another menu or parameter

■ UPS Messages reference table

Explanation	Content
Initialization	CurState: Init
No export	No-Out
At bypass	Bypass
Rectifier working	Mains
Battery mode	Battery
Battery testing	Testing
Starting	Starting
ECO mode	CurState : ECO
EPO mode	CurState: EPO
UPS maintaining	CurState: M-Byp
UPS fault	CurState:Fault
Battery float charging	Battery Charging
Battery Boost charging	Battery Boost
Inverter on/off	Invter ON/ Invter OFF
Master of UPS	Inver Master
Maintenance switch close or open	SWMB ON/ SWMB OFF

1.5.3 Display instruction

- 1) The main interface below comes out when the power is connected or the system is cold start. See Fig1



Fig.1 : Main interface

- 2) Press any key, it will change to the basic status interface , see Fig2 below

Mode:On-Line	
Battery	7AH
Vin 220V	50Hz
Vout 220V	50Hz

Fig.2 : Basic status interface

- 3) Press the ◀ or ▶ button, it will change to main menu, see Fig3 ,

Figure
Status
Setting
Command

Fig.3 : Main menu

- 4) An arrow icon will come out on the LCD when pressing the ENT, then, the data info, status info, setting info, command control can be selected by pressing the right or left arrow button, and checking the details by pressing
- 5) Select and confirm the data info to be viewed in detail. It contains the details of the AC input /output, inverter, battery, BUS, parallel, temperature. See Fig 4 to 12 below.

Figure	
Mains	
220.0V	0.0A
50.0Hz	

Fig.4 : MAIN INPUT INFO

Figure	
Output	
220.0V	0.0A
50.0Hz	0%

Fig.5 : OUTPUT INFO

Figure	
Output	
0.0KW	PAK:
0.0	
0.0KVA	

Fig.6 : OUTPUT INFO

Figure	
Invert	
220.0V	
50.0Hz	

Figure	
PBatt.	
Discharge	
0V	0.0A
0%	0min

Figure	
NBatt.	
Discharge	
0V	0.0A
0%	0min

Fig.7 : INVERT INFO Fig.8 : BATTERY INFO Fig.9 BATTERY INFO

```

Figure
BUS
-390V    +390V
    
```

Fig.10 : BUS
INFO

```

Figure
Parallel ID
ID:01
    
```

Fig.11 : PARALLEL
INFO

```

Figure
Temperature °C
Inner:24
REC:24    INV:30
    
```

Fig.12 : TEMPERATURE
INFO

- 6) Select and confirm the status info can view the details, including status information, alarm information, code, power rating and version. See Fig 13 to 14

```

Status
State            ↩
Alarm & Fault
Rated POWER
    
```

Fig.13 : main menu

```

Status
Rated POWER     ↩
Code
Version
    
```

Fig.14 : main menu

```

Status
State
CurState:Init
SWMB: OFF
    
```

Fig.15 : status info

```

Status
Alarm & Fault
    
```

Fig.16 : Alarm info

```

Status
Rated POWER
MachInfo:0101
Rated:    10KVA
    
```

Fig.17 : type info

```

Status
Code/Status
1        0x00
2        0x000000
    
```

Fig18 : code info

```

Status
Version
LCD Ver. D000B001
DSP Ver. D000B001
    
```

Fig19 : version info

- 7) Select and confirm setting menu , setting information will be displayed on the screen, which includes user set, system set, parallel set, battery set, revise set.

```

Setting
User      set ←
System    set
Parallel  set
  
```

Fig.20 : setting menu

```

Setting
Battery   set ←
Revise    set
  
```

Fig.21 : setting menu

- Select and confirm client setting, then see Fig. 22.

```

Setting
User set
▶BL.      60sec
Contrast  2
  
```

Fig.22 : user setting information

- Select and confirm system setting menu ,then see Fig23to Fig28

```

Setting
System set
▶V-level  220V
F-level   50Hz
  
```

Fig.23 : system setting

```

Setting
System Set
▶Auto     Enable
F-Range   5%
  
```

Fig.24 : system setting

```

Setting
System set ▶
V-upper   15%
V-lower   -45%
  
```

Fig.25 : system setting

```

Setting
System set
▶V-Fine   0.0
SW Times  9
  
```

Fig.26 : System setting

```

Setting
System set
▶Mode     on-line
Power     Enable
  
```

Fig.27 : System setting

```

Setting
System set
▶Output   Enable
Buzzer    Disable
  
```

Fig.28 : System setting

■ Select and confirm parallel menu , then see Fig.29 to Fig.30

```

Setting
Parallel set
▶ ID:      1
P-Amount  1
    
```

Fig.29 : Parallel setting

```

Setting
Parallel Set
▶P-Redund  0
LBS      NO LBS
    
```

Fig.30 : Parallel setting

■ Setting battery see Fig.31 ~ Fig.34

```

Setting
Battery set
▶EOD      1.70
Batt Num  20
    
```

Fig.31 : battery setting

```

Setting
Battery set
▶ Batt-G   1
Batt-C    7
    
```

Fig.32 : battery setting

```

Setting
Battery set
▶Boost    2.30
Float     2.20
    
```

Fig.33 : battery setting

```

Setting
Battery set
▶Boost Enable
    
```

Fig.34 Battery setting

■ Parameter revise , see Fig.35 ~ Fig.38

```

Setting
Revise
▶VinRevise 4096
InvRevise 4096
    
```

Fig.35 Parameter revise

```

Setting
Revise
▶VoutRevise4096
+BusRevise 4096
    
```

Fig.36 Parameter revise

```

Setting
Revise
▶-BusRevise4096
PBatRevise 4096
    
```

Fig.37 Parameter revise

```

Setting
Revise
▶NBatRevise4096
    
```

Fig.38 Parameter revise

- Control operation see Fig.39 ~ Fig.43

```

Command
▶Battery Test
  Turn On Delay
  
```

Fig.39 : control menu

```

Command
▶Battery test
  Turn Off
  Delay
  
```

Fig.40 : control menu

```

Command
For:      1sec
Ent:  sure
ESC:  cancel
  
```

Fig.41 Battery self-test

```

      STOP Testing
Ent:  sure
ESC:  cancel
  
```

Fig.42 stop battery testing

```

Command
After:    1sec
Ent:  sure
ESC:  cancel
  
```

Fig.43 Turn on/off delay

- 8) Warning message see Fig.44 ~ Fig.49

```

Warning!
Set no Echo:31
  
```

Fig.44 no echo for setting

```

Warning!
Set Error:31
  
```

Fig.45 error for setting

```

Warning!
Interrupt
switch prompt
Sure:Ent
No:ESC
  
```

Fig.46 switching delay

```

Warning!
Off will cause
sys.Overload
Sure:Ent No:ESC
  
```

Fig.47 overload due to shutdown

```

Warning!
Off will cause
output fail
Sure:Ent No:ESC
  
```

Fig.48 no output due to shutdown

```

Warning!
Switch Limited
Sure:Ent
  
```

Fig.49 switching times

1.5.4 Rear panel instruction

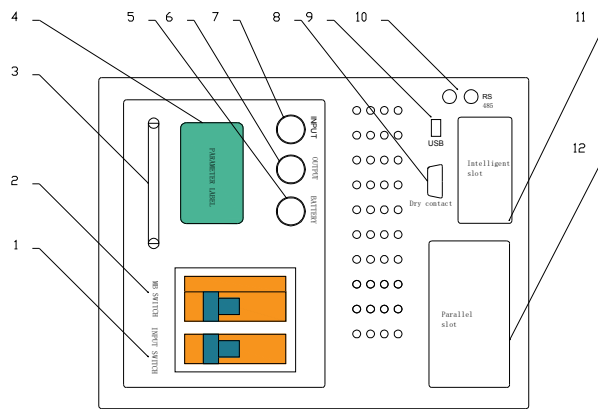


Fig.1-4

Rear Instruction

1. AC input
2. Maintenance bypass switch (covered)
3. Handle
4. Label
5. External battery connector.
6. Output
7. Input
8. Dry contact
9. USB
10. RS485
11. Intelligent slot
12. Parallel slot

2 Installation

2.1 Unpack checking

- 1) Don't lean the UPS when moving it out from the packaging.
- 2) Check the appearance to see if the UPS is damaged during transportation, do not switch on the UPS if any damaged is found and please contact the dealer.
- 3) Check the accessories according to the packing list and contact the dealer if any parts missing

2.2 Installation procedure

2.2.1 Installation note

- * Put the UPS at flat place next to the equipment.
- * Keep the UPS at least 20cm from wall or equipment or other object. Don't block the ventilation holes of the UPS located in the front panel and the bottom part, so as to keep the ventilation in good condition & avoid temperature of components inside getting high.
- * Keep the UPS away from high temperature, water, flammable gas, corrosive gas, dust, direct sunlight and explosive things
- * Don't lay the UPS outdoor.
- * 63A circuit breaker is required at the input L-N for 6KVA UPS, while 100A for the 10KVA UPS.
- * PDU is required to connect to the UPS output so as to weaken the affection between loads
- * In order to fix the UPS, please lock its wheels by shifting the sheet on each wheel
- * RCD load like computer, linear load and small inductive load can be connected with the UPS. Please contact dealer if other types of loads are required to be connected with.
- * For the safety sake of user and equipments, please betake correct power configuration.

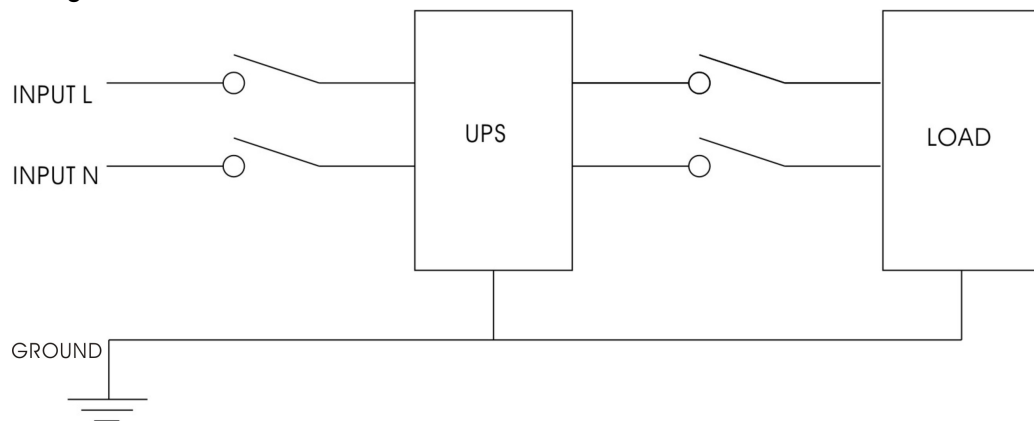


Fig.2-1 Correct power configuration

2.2.2 Installation

■ External battery connection (for extended model only)

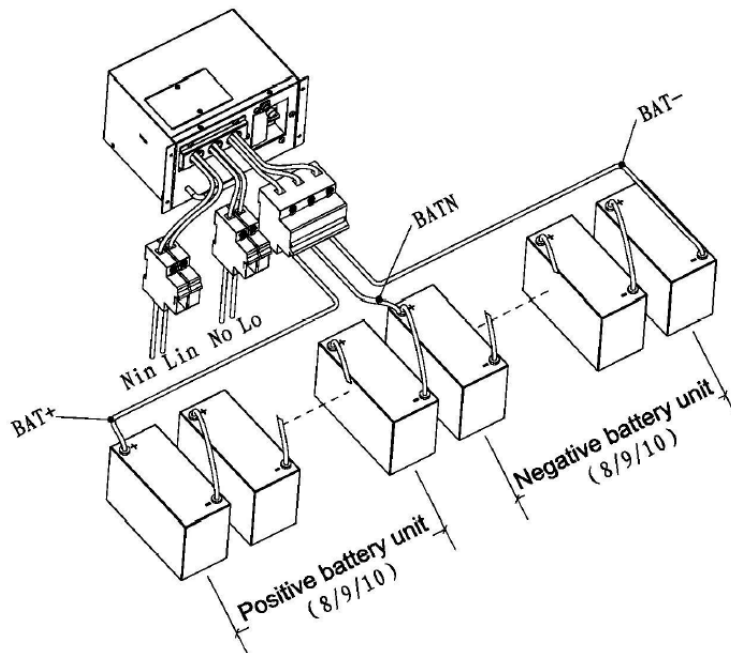
- 1) Make sure battery quantity complies with the specs. Measure the voltage of battery bank after finishing connection and the battery voltage should be around 192/216/240VDC. Don't mix batteries with different capacity & brands and don't mix brand new and old batteries, either.
- 2) The breaker on battery cabinet should be off.
- 3) Take out the connection box and remove the cover of terminals, use multi-meter

to make sure there is no DC voltage at the battery terminals of the UPS.

- 4) Connect battery with positive pole, common pole and negative pole to battery connector(BAT+,BATN,BAT-) , don't reverse battery polarity.

CAUTION

It is recommended to connect or replace battery after switching off the system; don't reverse battery polarity when doing battery hot-swapping.



■ UPS input and output connection

Minimum 10AWG copper wires for input/output & battery cables are required for the 6KVA, and 8AWG for 10KVA.

- 1) Switch off all breakers before connecting cables
- 2) Remove the cover of the terminals, see Fig 2-3, and connect the cables correspondingly

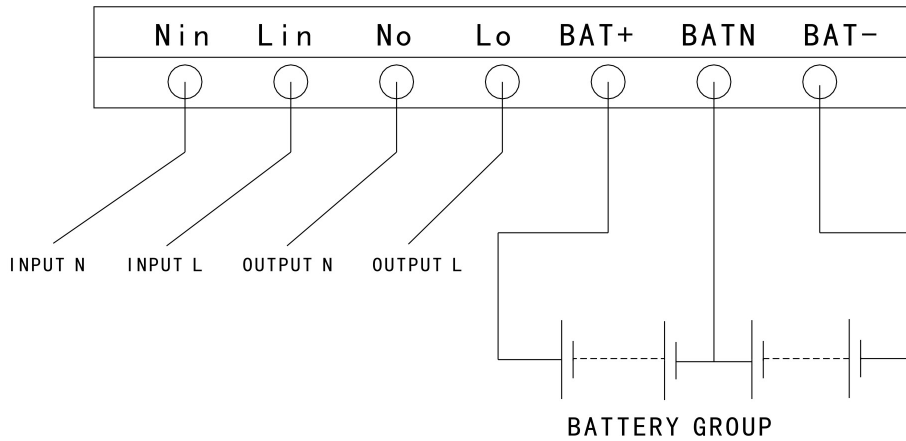


Fig.2-2I/O terminals connection

CAUTION

Terminators are required so as to ensure the connections are firm
 Don't reverse the input L and N
 Don't connect the UPS input to a wall outlet or the outlet will get burnt.

- 3) Connect the UPS output L, N, E to the L, N, E of the load via a PDU. Tighten the screws and shelter the terminals

WARNING !

Please connect the output Earth well before go for other operation.

■ **Connection of the UPS communication cables**

- 1) The USB cable provided in accessories can be used to connect the UPS with PC
- 2) Follow steps below to install SNMP (if purchased) :
 - A. Remove the cover of SNMP slot at UPS rear panel and keep it for further use.
 - B. Insert the SNMP card and tighten the screws
 - C. Connect the UPS with internet by network cable.
 - D. Refer to the SNMP manual provided to do SNMP setting

2.3 The Connection of parallel system

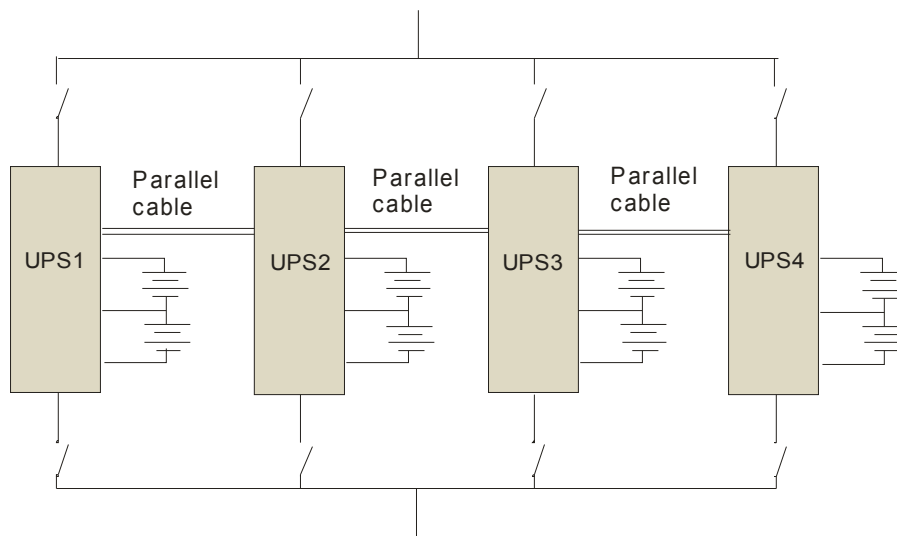


Fig.2-3 parallel system

Make sure all the breakers are off and no output at the UPS output.

CAUTION

Connect the L,N and E well
Configure individual battery bank for each extended backup UPS in parallel system. Also can be use common battery bank.

Extended connecting cables in Parallel :

When the UPSes are connected in parallel, the copper wires required to connect with each UPS is minimum 10AWG for 6KVA and 8AWG for 10KVA, but the main wire for linking all the UPS in parallel should be $N \times 10\text{AWG}$ or 8AWG (N refers to the number of the UPS in parallel.)

Make sure the cables are as shorter as possible to reduce any possible noise interference to data transfer.

3.Operation

3.1 Working modes

The UPS has AC mode, bypass mode, battery mode and ECO mode

3.1.1 AC mode

If the AC input and load capacity are in normal ranges, the load will be powered by inverter output, battery will be charged at the same time. AC and inverter indicators on the LCD control panel will be on(green).

CAUTION

Please note below if the UPS input power is provided by a generator

- 1) Don't switch on the loads before starting UPS. After the UPS has been started and worked steadily, switch on the loads one by one. Suggest that the total capacity of the loads should lower than 30% of capacity of generator
- 2) It is suggested that the rating of generator should be 1.5-2 times of the capacity of the UPS.

3.1.2 Bypass mode

When the AC power is connected and the UPS has not been switched on, or the UPS is overloaded after switching on the UPS, it will go to bypass mode. The Loads will be powered by AC, battery will be charged, and the bypass indicator on the LCD control panel will be on (green). But, if the bypass is beyond normal range or absent, the UPS will not go to bypass mode and no power will be supplied to the loads.

3.1.3 Battery mode

In AC mode, if the AC is absent or beyond normal range, the rectifier and charger will stop working, the loads will be powered by battery bank of which energy goes through inverter circuit. The Inverter's and battery's indicators on the LCD control panel will be on (green) and the alarm will beep every 3 seconds.

In battery mode, if the battery voltage becomes low and reaches the setting value, the system will give low battery voltage alarm, beep once every second and the LCD will give low battery alarm, too.

CAUTION

Charge batteries for at least 8 hours when the UPS is used at the first time, as battery has self-discharge characteristics even though the UPS has been fully charged by manufacturer before shipping.

3.1.4 ECO mode

In AC mode, the UPS can be set to work in ECO mode if the load does require strict power purity and it can be sustained in bypass mode normally. If the AC is beyond normal range, the UPS will transfer back to inverter mode. The Efficiency for the UPS in ECO mode is much higher.

3.2 Operation

3.2.1 Power on

Switch on the AC input and bypass circuit breakers if all connections are correct. If external batteries are connected, please switch on the battery breaker first, then the AC breaker. Fans will spin and the system will execute self-diagnostics. After the self diagnostics is finished, the buzzer inside will beep twice. The system will go to bypass mode, then AC and bypass indicators on front panel will be on (green) and it goes to inverter mode.

3.2.2 System parameter setting

Check the information displayed on the LCD by right or left arrow button, press ESC to quit from the main menu. When the function setting interface as P.11 Fig3, press the ENT and hold it for 1s to enter to function setting such as floating charging, boost charging, temperature compensation function, battery capacity (for extended backup model only)

3.2.3 Start

■ AC available

- 1) Press the On button and hold it for 1s until hearing a beep , wait for a few seconds, the bypass indicator will be off , the inverter indicator will be on, see Fig3-6, then, the UPS is working in AC mode

CAUTION

The UPS can start automatically when the AC power comes back if the UPS was shut down due to battery exhausted last time , or the auto restart function has been enable.

- 2) Gradually increase the load after the UPS working normally. Load information can be checked through the LCD.
- 3) If the buzzer beeps twice per second and overload alarm is displayed on the LCD, it means the system is overloaded. Please decrease the load immediately. 70% load is recommended in case of sudden load added, which will not affect the UPS to work normally

CAUTION

If the UPS has transferred to bypass mode due to overload for several times and reach the setting times in 1 hour, it will keep in bypass mode unless manually transfer to inverter mode or automatically transfer to inverter mode 1 hour later without overloading

■ Battery mode

UPS can start in battery mode even if the AC is absent.

- 1) Press the On button and hold for 1 second until hearing one beep, battery and inverter indicators will be on after finishing self- diagnostics. The UPS will beep once every 3 seconds which means it is working in battery mode
- 2) Add load the same as above AC mode description

CAUTION

Please decrease load immediately if the UPS is overload; otherwise, it will shut it down within its overload capability. Please refer to technical specs for overload capability.

3.2.4 Manual battery testing

When the inverter is working, if the input AC is normal, no overload, battery voltage is not lower than 12V per unit, the battery testing can be carried out by pressing button on the LCD control panel. When the battery is being tested, buzzer beeps, battery indicator blinks. When the testing is accomplished, buzzer stops beeping, battery indicator stops blinking, the UPS will recover to status before the testing. If there are some problems with batteries, the LCD will show the details.

CAUTION

The battery status info will be refreshed every time after testing. Battery fault info checked out by the testing due to battery not fully charged can be confirmed after fully charging.

3.2.5 Inverter shutdown

- 1) If the AC is normal, press the off button and hold for 1 second until hearing one beep, inverter indicator will be off , bypass indicator will be on, and the UPS will work in Bypass mode
- 2) If the AC is absent, press the off button and hold for 1 second until hearing one beep, the UPS will shut down the output and the LCD will display shutting down.

3.2.6 Power off

After switching off the inverter, switch off the AC and battery circuit breakers, the LCD control panel will be off, fan will stop. If there is battery bank connected, it will take 30 seconds to shut down the system completely.

The power of the equipment will be cut off when the UPS is powered off

3.3 Working Mode and transferring

Usually, the UPS should be set to work in AC mode, so it will transfer to battery mode automatically without interruption when AC fails. When the UPS is overloaded, it will transfer to bypass mode without interruption. When the inverter is defective or over temperature occurred inside the UPS, the UPS will transfer to bypass mode if the bypass is normal.

3.3.1 Transfer to bypass if overload

When the load of UPS is beyond normal range and lasts for the time set, it will transfer to bypass mode and beeps twice every second, then the load is powered by AC directly. Please decrease the load immediately until the alarm is eliminated. The UPS will start the inverter after 5 mins. In order to protect the load and the UPS, it is required to set the limitation times of transferring to bypass mode due to overload in 1 hour. If it exceeds the limitation times set, the UPS will keep in bypass mode.

3.3.2 Normal mode to battery mode

The UPS will go to battery mode if the AC is failed. The UPS will shut down automatically if batteries are drained. When AC recovers, the UPS will start the inverter automatically.

3.3.3 Go to Bypass mode due to over temperature

The temperature inside UPS may be high if ambient temperature is high or the ventilation is poor, then the UPS will go to Bypass mode, fault indicator will be on (red), the LCD will display that the inner temperature is high, long beeps will come. If so, please cut off the input power of the UPS, move objects that affecting the ventilation far from the UPS if any or increase the distance between the UPS and

the wall. Wait until the UPS temperature becomes normal then restart it.

3.3.4 Output short circuit

When the UPS output is in short circuit, the UPS will cut off the output, fault indicator will be on (red), the LCD will display output is in short circuit, long beeps come. If so, please disconnect the load in short circuit, cut off the UPS input power and wait for 10mins, the UPS will shut down automatically or press the off button to shut down in after 10s. Before restarting the UPS, please make sure that the short circuit problem has been solved

3.4 UPS monitoring

Please refer to instruction of the UPS monitoring software provided.

3.5 LCD operation menu

3.5.1 Main menu switching

Pressing the left/right arrow and ENT button can switch among alarm info, running parameter and function settings. Press ENT to enter alarm info, running parameters or function settings. To enter function settings, double pressing on ENT is required.

3.5.2 Submenu switching

- 1) Press the arrow button can view the details after entering the running function interface, and press ESC to return to main menu.
- 2) Press the arrow button can view the details after entering the function settings interface, press the ESC to return to main menu
- 3) Parameter which has been selected and changed will be highlighted. Press arrow button to change the value and press ENT to confirm it. Once confirmed, it will not be highlighted.
- 4) Press the arrow button can view the detailed alarm info after entering the alarm info interface, press the ESC to return to main menu

3.5.3 Priority of info displayed on LCD

- 1) If there is alarm but no valid operation on buttons, the alarm info with top priority will be shown on LCD automatically
- 2) When there isn't any alarm and the LCD is displaying the submenu of running parameters, such as output current, these parameters will be always displayed on the LCD if no further operation on buttons. If the LCD is not displaying the submenu of running parameters, it will return to main menu in 30s as long as there isn't any operation on buttons

4 Maintenance

Please follow 2.2.1 to install the UPS

4.1 Fan maintenance

Continual working time of fan is 20000 to 40000 hours. It will be shorter as temperature raises. Please check the fan periodically, make sure there is wind blowing out from it.

4.2 Battery maintenance

There are sealed lead acid maintenance free batteries inside this series standard models. Battery life depends on environment temperature and discharge/charge cycles, it will be shortened if temperature raised or deep discharged. Periodical maintenance is required so as to keep battery in good condition.

- 1) The most proper working temperature is 15 to 25 Celsius degree.
- 2) Avoid small discharging current. Don't let UPS work in battery mode continuously for 24 hours.
- 3) Charge battery for at least 12 hours every 3 months if it is free of operation. If the environment temperature is high, charge it once every 2 months.
- 4) For extended backup models, check and clean the battery connectors periodically..

If backup time has become much less than before, or there is battery fault displayed on the LCD, please contact distributors to confirm whether the batteries are needed to be replaced or not.

CAUTION

- 1) Don't short circuit battery, or it may cause a fire.
- 2) Don't open battery, released electrolyte is harmful to skin and eyes

4.3 Visual checking

Keep ventilation of the UPS in good condition

4.4 UPS status checking

- 1) Check to see if there is any fault occurred, fault indicator is on or any alarm there.
- 2) Please find the cause if the UPS is working in bypass mode.
- 3) If the UPS is working in battery mode, make sure it is normal; on the contrary, please find out the root cause.

4.5 Function checking

Do function checking once every 6 months.

- 1) Press the off button to see if the buzzer and indicators and the LCD are normal or not. Please refer to 3.1
- 2) Press the On button, check the indicators, the LCD and the UPS inverter, make sure they are normal.
- 3) When the UPS is working in normal condition, do the battery testing to ensure battery is in good condition.

5 Trouble shooting

Please contact the distributor if problems can not be solved by the trouble shooting below

No	Problem description	Probable causes	Solution
1	No display on the LCD, no self-diagnostics	A. Input power absent B. Low input	Use Multi-meter to measure the input to see if it is normal or not.
2	AC normal but AC indicator off, the UPS is in battery mode	A. Input circuit breaker off. B. Input power connection problem	A. Switch on input breaker B. Check the connection and re-do.
3	No alarm but no output	Output connection problem	Check the connection and re-do
4	The UPS doesn't start after pressing On button	A. time of pressing ON button is insufficient. B. Overload	A. Press and hold On button for 1s B. Disconnect all loads and restart
5	AC indicator blinking	Input AC is beyond normal range	Pay attention to the backup time if the UPS is in battery mode
6	Buzzer beeps twice every second & LCD shows "output overload"	UPS overload	Disconnect some loads
7	"Fault indicator On and the LCD shows "battery fault"	A. Battery circuit breaker off or poor connection B. Reverse battery connection C. Battery defective	A. Switch On the breaker & check the battery connections B. Check the battery polarity C. Contact distributor to replace the battery
8	Fault indicator on and the LCD shows "charger fault "	Charger defective	Contact distributor
9	Abnormal backup time	A. Battery not fully charged B. Battery Bad	A. Charge battery for 8 hours when AC is normal, then test the backup time again B. Contact distributor to replace battery
10	Long beeps and fault indicator on, the LCD shows over-temperature	Over temperature inside UPS	A Check to see if there is wind blowing out from fans B Move objects away from the UPS C Wait till the UPS becomes cool and restart the UPS

11	Long beep fault indicator on and the LCD shows "output short circuit "	Output short circuit	Eliminate the short circuit and restart the UPS
12	Long beeps and fault indicator on and the LCD shows "rectifier fault"/"inverter fault"/"auxiliary power fault"/"output fault"	Fault inside UPS	Contact distributor
13	Abnormal sound or smell	Fault inside UPS	shut down the UPS immediately and Contact distributor

Please provide the UPS model, SN when calling distributor for maintenance.

Appendix 1. USB communication port definition

Definition of Male port :

1	2
4	3

Pin 1 VCC , Pin 2 D-
pin 3 D+ , Pin 4 GND

Application: use UPSilon2000 Power Management software

Available functions of the USB

- Monitor UPS power status
- Monitor UPS alarm info
- Monitor UPS running parameters
- Timing off/on setting

Appendix 2. Specification

Capacity		6KVA/5.4KW	10KVA/9KW
Type		6KVA-H/S	10KVA-H/S
input	Input mode	single phase +Ground	
	Power factor	≥0.99	
	rating voltage	220VAC/230VAC/240V (settable)	
	rating frequency	50Hz/60Hz (settable)	
	Voltage range	120~276V	
	Frequency range	40~70Hz	
	Bypass voltage range	max : +5% , +10% or +15% , default +15%	
		min : -20%, -30% or -45%, default -45%	
	Bypass frequency range	±1%、±2%、±4%、±5%、±10%	
	THDI	≤5%(100% non-linear load)	
batterv	Battery number	16/18/20pcs (settable)	
	Battery type	VRLA	
	Charge model	Boost charge or float charge auto switch	
	Charge time	Boost charge up to 20Hr(Max)	
	Charge current(A)	6KVA:1A (S) /6A (H)	
10KVA:1A (S) /6A (H)			
	Output type	single phase +Ground	
	Output precision	1.0%	
	Voltage distortion (THD)	less than 2% at 100% linear load	
		less than 5% at 100% non-linear load	
	Rating voltage	220/230/240VAC	
	Frequency precision	±0.1%	
	Rating Frequency	50Hz/60Hz	
	Frequency slew rate	1Hz/s	
	Overload (Normal)	≤110% 3min	
≤125% 30sec			
≤150% 1sec			

o u t p u t		≥150% shut down UPS immediately
	Overload for bypass	Breaker(6KVA:40A/ 10KVA:60A)
	Peak value factor	3:1
	Efficiency at normal	≥90%
	Dynamic respond	5.0%
		20ms
DC heft	≤500mV	
Switch	Between Normal mode and battery mode	0ms
	Between inverter and bypass	0ms unlock : < 15ms (50Hz), < 13.33ms (60Hz)
Display		LCD+LED
Safety		Meeting IEC62040-1 GB4943
Max input voltage		320Vac , 1Hr
EMI	Conduction : IEC 62040-2	
	Radiation : IEC 62040-2	
	Harmonics : IEC 62040-2	
EMS		IEC 62040-2
MTBF		100000Hr
MTTR		30min
Isolation resistance		> 2MΩ (500Vdc)
Isolation intension		2820Vdc , <3.5mA , 1min
Surge		Meeting IEC60664-1 1.2/50uS+8/20uS 6kV/3kA.
Protection		IP20
Parallel circumfluence		1 + 1≤8% , N + 1≤3%
Parallel equal current		1 + 1≤8% , N + 1≤10%

Dimension & weight

DIMENSION		
Capacity	KVA	6KVA/5.4KW 10KVA/9KW
Height	mm	655
Width	mm	250
Depth	mm	590
Net weight	kg	6KVA : 70Kg (S) /30 (H) 10KVA : 80Kg (S) /40 (H)
Color		Blackness

Appendix 3. Option

1. Extended battery box
2. Dry contact card
3. SNMP card
4. Parallel card

Appendix 4. UPS message table

01 (Running)

0x01	No output
0x02	On bypass
0x03	On online
0x04	On battery
0x05	Battery self-testing
0x06	Inverter starting
0x07	ECO mode
0x08	EPO
0x09	Maintenance bypass
0x0A	Fault

02 : (Status)

						8	9	A	B	C	D	E	F	EPO	
			4	5	6	7				C	D	E	F	Rectifier working	
	2	3			6	7			A	B	C		E	F	Rectifier limit
1		3		5		7		9		B		D		F	Input normal

						8	9	A	B	C	D	E	F	Input 1 : main /0 : battery	
			4	5	6	7				C	D	E	F	charging	
	2	3			6	7			A	B	C		E	F	P-battery boost charging

1		3		5		7		9		B		D		F	N-battery boost charging
---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--------------------------

							8	9	A	B	C	D	E	F	Battery self-testing
		4	5	6	7						C	D	E	F	00 : shutdown ; 01 : soft start ;
	2	3		6	7				A	B	C		E	F	0 : no output ; 11 : output normal
1		3		5		7		9		B		D		F	Alarm for switching delay

							8	9	A	B	C	D	E	F	Capacity not enough
		4	5	6	7						C	D	E	F	Overload to shutdown
	2	3		6	7				A	B	C		E	F	Overload to bypass
1		3		5		7		9		B		D		F	Parallel to bypass

							8	9	A	B	C	D	E	F	Switching times up to limit
		4	5	6	7						C	D	E	F	Master
	2	3		6	7				A	B	C		E	F	MB switch close
1		3		5		7		9		B		D		F	Input switch close

							8	9	A	B	C	D	E	F	00 : no output ; 01 : bypass ;
		4	5	6	7						C	D	E	F	10 : inverter
	2	3		6	7				A	B	C		E	F	0 (hold)
1		3		5		7		9		B		D		F	0 (hold)

03 : (Alarm A)

							8	9	A	B	C	D	E	F	Rectifier fault
		4	5	6	7						C	D	E	F	Rectifier over temp
	2	3		6	7				A	B	C		E	F	Invert over temp
1		3		5		7		9		B		D		F	rectifier over current

							8	9	A	B	C	D	E	F	Assistant supply 1 fault
		4	5	6	7						C	D	E	F	Assistant supply 2 fault
	2	3		6	7				A	B	C		E	F	Input SCR fault
1		3		5		7		9		B		D		F	discharge SCR fault

							8	9	A	B	C	D	E	F	Charge SCR fault
		4	5	6	7						C	D	E	F	Fan fault
	2	3		6	7				A	B	C		E	F	Fan supply fault
1		3		5		7		9		B		D		F	BUS over voltage

							8	9	A	B	C	D	E	F	BUS lower voltage
		4	5	6	7						C	D	E	F	BUS voltage of P-N different
	2	3		6	7				A	B	C		E	F	Phases wrong
1		3		5		7		9		B		D		F	Soft start fault

							8	9	A	B	C	D	E	F	N loss
		4	5	6	7						C	D	E	F	Battery polarity reversed

	2	3			6	7			A	B	C		E	F	No battery
1		3		5		7		9		B		D		F	P-charge fault

							8	9	A	B	C	D	E	F	N-charge fault
			4	5	6	7					C	D	E	F	Battery voltage lower
	2	3			6	7			A	B	C		E	F	Battery voltage higher
1		3		5		7		9		B		D		F	pre-alert for battery low

							8	9	A	B	C	D	E	F	Frequency of Input over limit
			4	5	6	7					C	D	E	F	Voltage of Input over limit
	2	3			6	7			A	B	C		E	F	0 (hold)
1		3		5		7		9		B		D		F	0 (hold)

04 : (Alarm B)

							8	9	A	B	C	D	E	F	Inverter fault
			4	5	6	7					C	D	E	F	Bridge cross of the inverter
	2	3			6	7			A	B	C		E	F	Invert SCR short circuit
1		3		5		7		9		B		D		F	Invert SCR open circuit

							8	9	A	B	C	D	E	F	bypass SCR short circuit
			4	5	6	7					C	D	E	F	bypass SCR open circuit
	2	3			6	7			A	B	C		E	F	CAN communication fault
1		3		5		7		9		B		D		F	Current no equality for parallel

							8	9	A	B	C	D	E	F	Bypass phase wrong
			4	5	6	7					C	D	E	F	synchronization failure
	2	3			6	7			A	B	C		E	F	Bypass over track
1		3		5		7		9		B		D		F	Bypass over protection

							8	9	A	B	C	D	E	F	IGBT over current
			4	5	6	7					C	D	E	F	Fuse fault
	2	3			6	7			A	B	C		E	F	Parallel cable fault
1		3		5		7		9		B		D		F	Parallel relay fault

							8	9	A	B	C	D	E	F	LBS unlock
			4	5	6	7					C	D	E	F	Initialization fault
	2	3			6	7			A	B	C		E	F	Cannot start
1		3		5		7		9		B		D		F	overload

							8	9	A	B	C	D	E	F	Parallel overload
			4	5	6	7					C	D	E	F	DC heft over limit
	2	3			6	7			A	B	C		E	F	Bypass over current
1		3		5		7		9		B		D		F	Feedback protection