

Operation Manual



ZGR SCALABLE 60 – 300 KVA **Online Three-phase UPS**

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1 PRECAUTIONS

1.1 General precautions

For your own safety and that of the unit, you must read and understand the instructions contained in this document before starting work.

Keep these instructions in a place accessible to all the personnel who work with the unit so that they can be consulted.

Only expert and duly authorised personnel may operate our units.



Danger warnings. When handling or accessing the interior of the ZGR SCALABLE 60 – 300 KVA, please remember that some parts may be live. Pay special attention to soldering points, printed circuits, connecting terminals, relay contacts, etc. Before opening the equipment, disconnect the voltage of all poles (both alternating and direct) and wait at least 5 minutes for the internal condensers to discharge.

Arbitrary modifications are forbidden. The unit must not be subjected to any modification regarding its construction or safety without **ZIGOR's** express consent. Any modification will free ZIGOR of any responsibility for any damage caused as a result of the modification. In particular, all repair work, soldering of printed circuit boards and replacing of components, modules and printed circuit boards, without the express authorisation of ZIGOR, is forbidden. Should spare parts be used, only ZIGOR original parts shall be utilised.

Use the unit for the purpose for which it was designed. The system supplied must be used only for the purpose for which it was designed. Any other use is strictly forbidden. ZIGOR cannot accept responsibility for any damage that might result from its use for any other purpose. In such cases, the user shall assume exclusive responsibility for any risk. The use for which the unit was designed is defined in the documentation. The system shall be exposed only to admissible environmental conditions. These are defined in the technical details provided for the equipment.

ZIGOR accepts no responsibility for any inadequate, negligent or incorrect installation of the equipment.



WARNING

This supply equipment contains a lethal voltage. Comply with the instructions set out in this manual to avoid any risk of electrical shock.

Please follow the indications set out below to operate under conditions of complete safety:

- There exists dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it will result in personnel injury or equipment damage.
- The System must be checked once the installation has been completed by a qualified technician and before being put into operation. Should these indications not be adhered to, the warranty shall be considered null and void.
- These units do not contain parts usable for other purposes by the user.
- Do not power up the device before a technician has checked it.
- Given the risk of electric shock or burns, do not try to open the device.
- The unit does not contain any user repairable or replaceable elements. In the case of any malfunction or problems operating the unit, please contact ZIGOR.
- Do not place the system near power magnets as this might cause a malfunction.
- Do not block or cover the ventilation grills in the housing.
- The ZGR SCALABLE 60 – 300 KVA is designed in accordance with current Spanish legislation. Check these regulations against those corresponding to the country in which the unit is to be installed and against the most restrictive regulations of the electricity supplier.
- All user controls are accessible from the exterior.
- Work inside the cabinet should be undertaken only by qualified personnel who are familiar with the safety

measures to be applied and the specific technical characteristics of the unit.

- Even though all the safety systems are in place, before touching any working parts, you must check that they are not live.
- Even with all safety systems, before touching any active point check that there is no voltage.
- This system has been designed for industrial use and not for domestic-commercial use.
- If any liquid is spilt accidentally on the System, disconnect this and consult ZIGOR personnel.
- During assembly work, start-up or maintenance, wear goggles to avoid any damage to your eyes due to accidental electric arcing.
- Use only insulated tools.
- The unit must be protected against rain and excess humidity and installed in a clean atmosphere, without inflammable liquids, gases or oxidising substances.
- The battery may pose a risk of electric shock or burns due to its high short circuit current.
- **Don't open or damage** battery, for the liquid spilled from the battery is strongly poisonous and does harmful to body!
- Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire
- If the batteries lose electrolyte or are physically damaged, they must be placed in a container in resistant to corrosive liquids (acids or alkaline according to the type of battery) and prepared in accordance with local regulations.
- If the electrolyte comes into contact with the skin, the affected area must be washed immediately with clean water.
- **For the sake of human being safety, please well earth the UPS before starting it.**
- Do not throw batteries into a fire as they may explode.
- The standard UPS output with internal batteries can be powered even when the UPS input is not connected to the mains.
- Do not disconnect the input from the UPS and make sure the UPS is completely off before moving it or reconfiguring the connection; otherwise, there is a risk of electric shock.
- Only authorized personnel should repair or install the batteries.
- Should you have any problems with the contents of this manual, you must ask ZIGOR for assistance.

1.2 Storage precautions

The store where the material is kept must protect the material from the elements, risk of flooding or contact with water. Visually check that the warehouse location is adequate, reviewing the characteristics of the place (clean, without leaks and with good ventilation); the floor must be smooth and prepared to bear the weight of the equipment.

The material shall be protected from any risk of overheating due to exposure to direct sunlight or through windows.

The recommended storage temperature of the UPS with internal battery is -20°C to 55°C and that of the reserve model without internal battery is -40°C to 70°C. An increase of 10°C can reduce battery life by 50%. The recommended relative humidity is from 5% to 95%.

When the UPS or batteries are stored, it is recommended to connect them to the network for at least 12 hours every 3 months to prevent the battery from draining excessively.

To avoid any risk of mechanical shock, do not stack the packages. These must be placed in accordance with the silkscreen printed details on the boxes used for packaging.



WARNING

Any failure to respect these precautions may render the product warranty null and void.

1.3 Environmental precautions

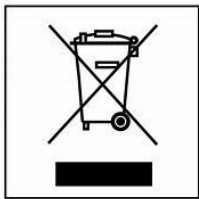


Dispose of the packaging in an ecological way: ZIGOR, based on the exceptions detailed in the First Additional Provision of Law 11/1997 on commercial or industrial packaging, informs that the final holder of the waste of used containers and packaging, as responsible for them, you must deliver them in appropriate conditions for reuse, to an authorized recuperator, recycler or re-valuer.

The subsets of the system are recyclable products and cannot be treated as household / municipal waste at the end of its useful life.

To preserve the environment, manage them in accordance with current environmental regulations and requirements in each country or community. In case of doubt, consult the manufacturer.

Correct product disposal: This electrical-electronic device (AEE) is marked with the symbol of compliance with the European Directive 2012/19 / EU (WEEE) regarding used electrical and electronic equipment (Waste electrical and electronic equipment WEEE, RD 110/2015).



The Directive provides the general framework valid throughout the European Union for the removal and reuse of waste from EEE.

To dispose of this product and ensure its proper management, follow the current local environmental legislation and regulations. In this way it will contribute to conserve the environment.

The wheeled bin crossed out on the product, in the documentation or on its packaging, means that the electrical-electronic devices and batteries must be collected separately at the end of their life cycle.

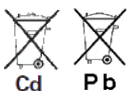
Before the deposit of the RAEE in their collection facilities, the batteries must be removed and deposited separately from the rest of the RAEE for proper management, according to the current local legislation and environmental regulations.

Never dispose of with household waste. In this way it will help preserve the environment.

These symbols are valid in the European Union and in those places where separate collection systems are available.

Correct disposal of batteries: Used batteries are reusable consumer products and a recycling process must be carried out.

Used batteries that do not go through the recycling process must be disposed of according to the instructions regarding special waste, in accordance with the regulations and environmental requirements in force in each country or community. This requirement applies in the European Union and in those places where separate collection systems are available.



In case of doubt, consult the manufacturer.



In this way it will contribute to conserve the environment.

1.4 Precautions on receiving the unit

Visually check that the warehouse location is adequate by checking its characteristics (clean, free of leaks with good ventilation); the floor must be level and have sufficient load resistance for the equipment.

Checking the material

Do not lean the UPS when moving it out from the packaging.

On receiving the material, a visual inspection should be made in order to detect any anomalies that may have occurred during transport.

List and check all the items indicated on the delivery note. Should any component be missing, notify the forwarding agent within the established deadline.

Extract all parts from the packaging and examine the unit for any damage caused during transport.

Report any damage to the forwarding agent and ZIGOR.

Check that the material delivered corresponds to the delivery note. Check the manufacturer's label placed at the rear or on one side of the unit.

Responsibility for the loss or damage of Products shall transfer to the Customer from the moment ZIGOR, places these at his disposal in the place indicated by the Customer.

From then on, the customer will have 24 hours to make any claim under guarantee for any anomaly in the amount or quality of the products received, providing details of the material received in bad condition after reporting this circumstance on the forwarding agent's delivery note on reception.

Should the customer not report any defect within 24 hours, it will be understood that he has accepted delivery of the unit.

1.5 Precautions on the transportation of the unit

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

1.6 Symbol Description

The safety symbols cited in this manual are shown in Table 1-1, which are used to inform readers of safety issues that should be obeyed when installation, operation and maintenance.




SECURITY SYMBOL	INDICATION
	Attention
	Sensitive to electrostatic discharge
	Risk of electric shock

Table 1-1 Symbols meaning

2 GENERAL DESCRIPTION

2.1 Introduction

ZGR SCALABLE 60 – 300 KVA is an intelligent, three-phase in Three-phase out, high frequency online **UPS**, available in three specifications: **60, 150 and 300 kVA**. This UPS enables you to easily increase power and autonomy to meet the changing needs of the end user.

ZGR SCALABLE 60 – 300 KVA is the most advanced modular UPS that adopts the N+X redundancy. Thus, it can flexibly increase the number of the UPS modules according to the load capacity which is convenient for flexible allocation and gradually investment. This UPS has been specially designed for data centers and critical loads offering maximum availability.

The MPW grows as demand for the activity increases, without the need to expand the physical volume of the UPS, optimizing both the initial investment ZGR SCALABLE 60 – 300 KVA as well as the total costs of ownership.

The UPS can solve most of the power supply problems, such as blackout, over-voltage, under-voltage, voltage sudden drop, oscillating of decreasing extent, high voltage pulse, voltage fluctuation, surge, inrush current, harmonic distortion (THD), noise interference, frequency fluctuation, etc..

This UPS can be applied to different applications from computer device, automatic equipment, communication system to industry equipment.

2.2 Main characteristics

- 10k / 15k / 20k / 25k / 30k modules
- Centralized digital control
- Parallel redundancy N + X
- 3-level IGBT technology levels of smart charging
- Power factor up to 1.0
- Efficiency to 95.5%
- Automatic charge current adjustment according to battery capacity connected.
- Configurable battery voltage (300 - 600 Vdc)
- Low harmonic distortion THDi
- High MTBF and MTTR
- **Modularized design and high density of power (module height of 19'')**
- Large LCD touch screen
- Emergency Power Off (EPO)
- Grid Backup function
- Optional Accessories available such as Isolation transformer, distribution Panel, SNMP Card, Relay Contact Board, etc...

2.3 Construction of ZGR SCALABLE 60 – 300 KVA

Below are the different views of the ZGR SCALABLE 60 – 300 KVA in all its formats and available powers (Fig. 2-1 to Fig. 2-11):

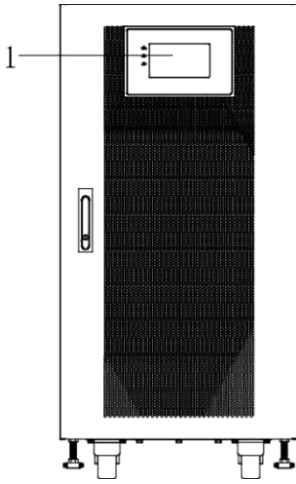


Fig. 2-1 Front view of ZGR SCALABLE 30-60 kVA

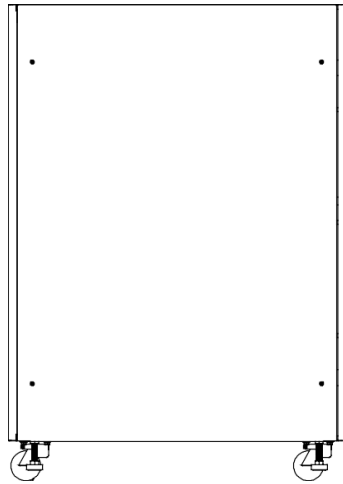


Fig. 2-2 Side view of ZGR SCALABLE 30-60 kVA

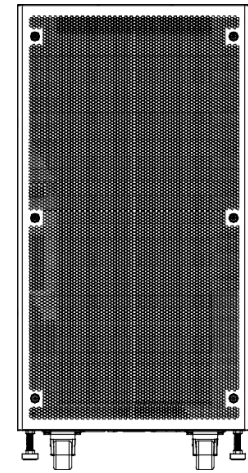


Fig. 2-3 Rear view of ZGR SCALABLE 30-60 kVA

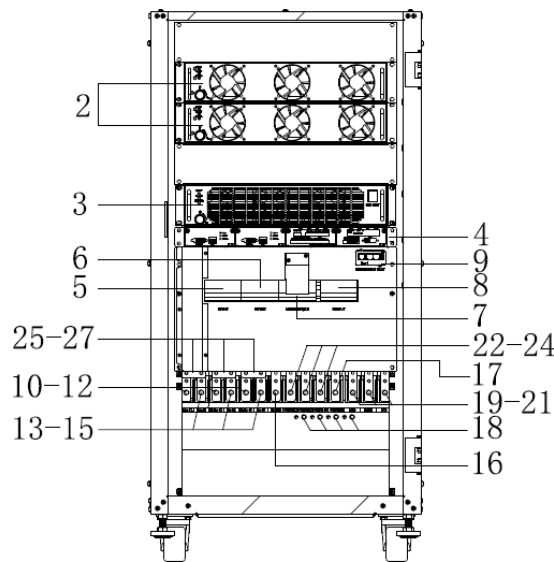


Fig. 2-4 Front view of ZGR SCALABLE 30-60 kVA (redundant power module and bypass module are optional)

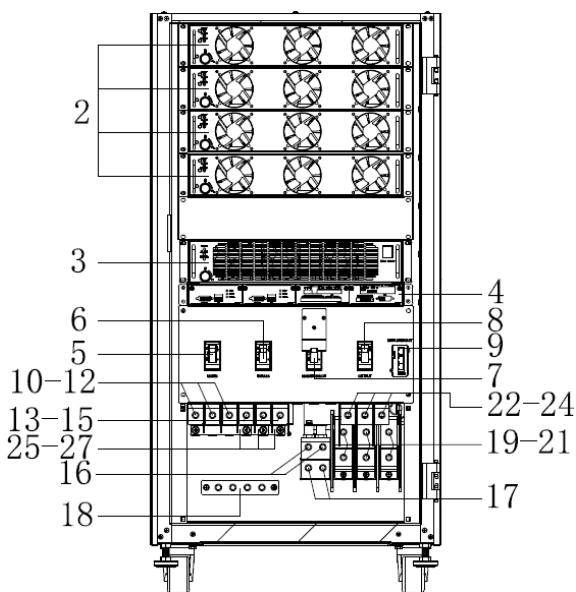


Fig. 2-5 Front view of ZGR SCALABLE 40-120 kVA (redundant power module and bypass module are optional)

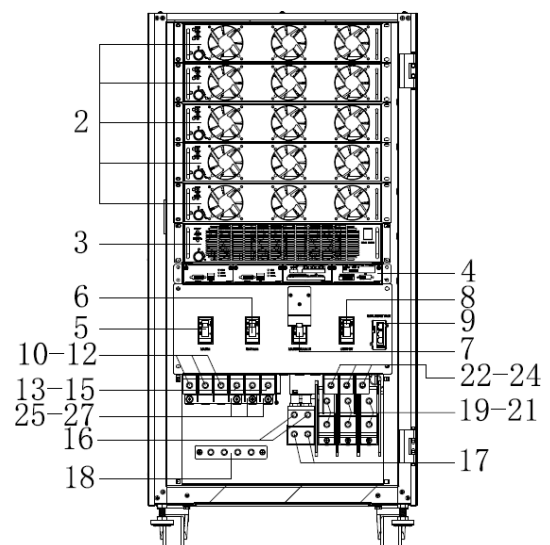


Fig. 2-6 Front view of ZGR SCALABLE 50-150 kVA

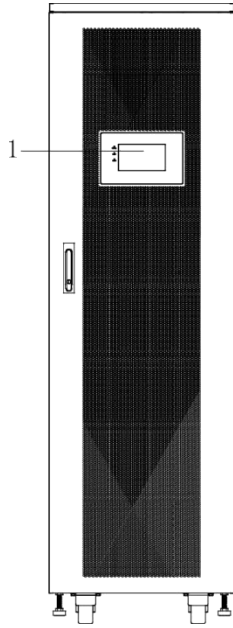


Fig. 2-7 Front view of ZGR SCALABLE 90-300 kVA

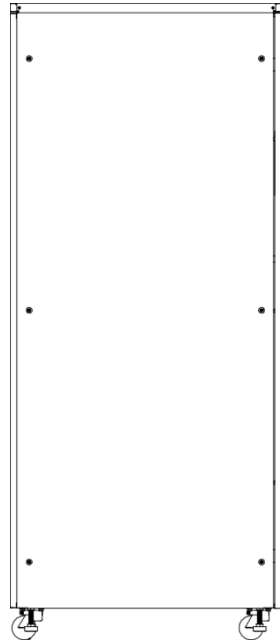


Fig. 2-8 Side view of ZGR SCALABLE 90-300 kVA

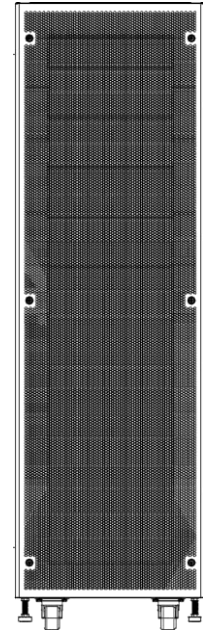


Fig. 2-9 Rear view of ZGR SCALABLE 90-300 kVA

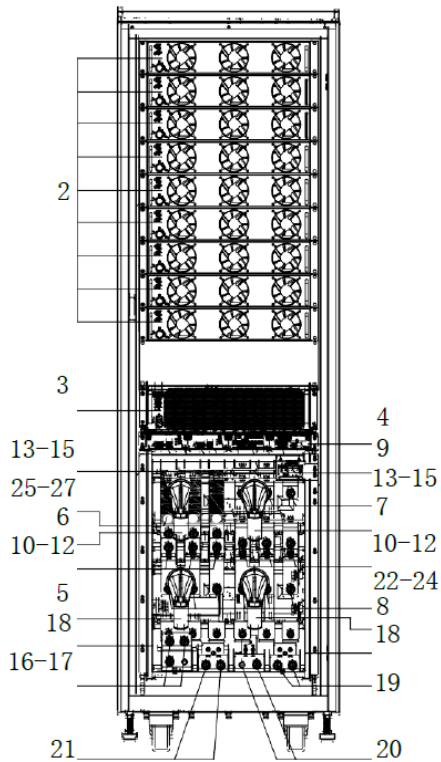


Fig. 2-10 Front view of ZGR SCALABLE 90-270 kVA (Redundant power module and bypass module are optional)

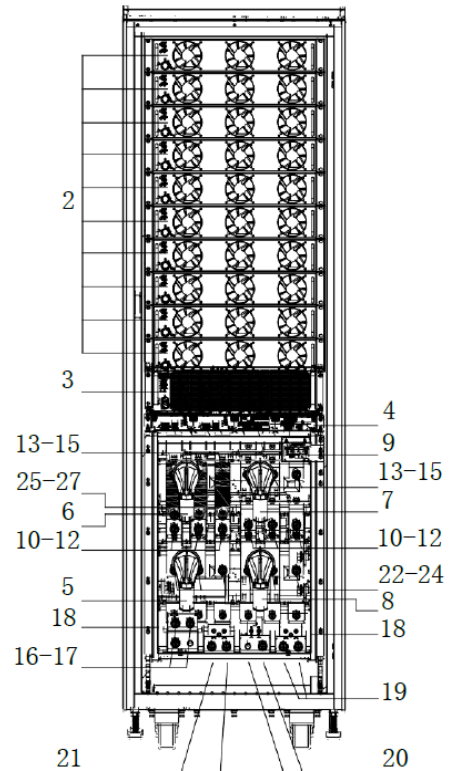


Fig. 2-11 Front view of ZGR SCALABLE 100-300 kVA

The elements that compose the ZGR SCALABLE 60 – 300 KVA are:

1. LCD panel: Display UPS data and status
2. Power module

3. Bypass module
4. Control unit
5. Mains switch
6. Bypass switch
7. Maintenance switch
8. Output switch
9. Intelligent Slot (SNMP card/ Relay card)
10. Mains-A input copper bar
11. Mains-B input copper bar
12. Mains-C input copper bar
13. Bypass-A input copper bar: Wiring must be used when mains-bypass separation
14. Bypass-B input copper bar: Wiring must be used when mains-bypass separation
15. Bypass-C input copper bar: Wiring must be used when mains-bypass separation
16. Input neutral copper bar
17. Output neutral copper bar
18. Ground copper bar
19. Battery positive copper bar
20. Battery neutral copper bar
21. Battery negative copper bar
22. Output-A input copper bar
23. Output-B input copper bar
24. Output-C input copper bar
25. Phase A mains-bypass common input connect copper bar
26. Phase B mains-bypass common input connect copper bar

- Control unit

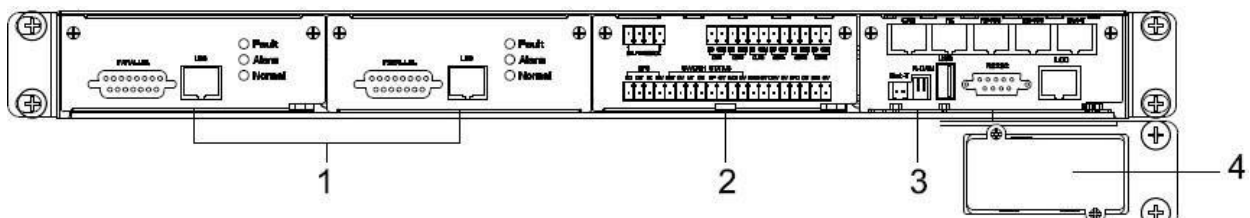


Fig. 2-12 Control unit

The elements that compose the control unit (Fig. 2-12) are:

1. ECU1/2: Centralized control unit
2. Dry-contact unit

- 3. Monitor unit
- 4. Intelligent slot

- ECU unit

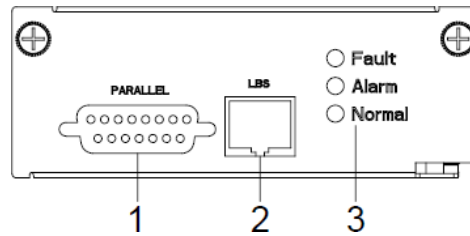


Fig. 2-13 ECU unit

The elements that compose the ECU unit (Fig. 2-13) are:

1. PARALLEL port
 2. LBS port
 3. LED
-
- Dry-contact unit

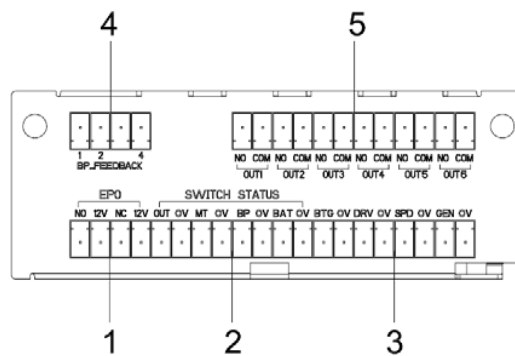


Fig. 2-14 Dry contact unit

The elements that compose the Dry contact unit (Fig. 2-14) are:

1. EPO port: NO-12V: normally open port; NC-12V: normally close port;
2. SWITCH STATUS: OUT-0V: output breaker auxiliary contact signal port; MT-0V: maintenance breaker auxiliary contact signal port; BP-0V: bypass breaker auxiliary contact signal port; BAT-0V: battery breaker auxiliary contact signal port;
3. The other port: BTG-0V: battery grounding detect signal input port; DRV-0V: battery breaker driver signal output port; SPD-0V: SPD detect signal input port; GEN-0V: generator detect signal input port;
4. BP_FEEDBACK: PIN1_NC, PIN2_NO, PIN4_common
5. Optional dry contacts: 6 ports, can optional by LCD.

- Monitor unit

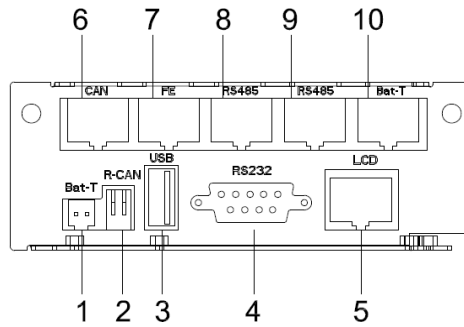


Fig. 2-15 Monitor unit

The elements that compose the monitor unit (Fig. 2-15) are:

1. BAT_T: NTC temperature sensor port
2. R-CAN: CAN communication resistor adjust
3. USB port: for software update and history download
4. RS232 port: for communication
5. LCD port
6. CAN port: BMS port
7. FE: Net port (reserve)
8. RS485 port: for communication
9. RS485 port: for communication
10. BAT_T: battery temperature sensor port (RS485)

- UPS module appearance

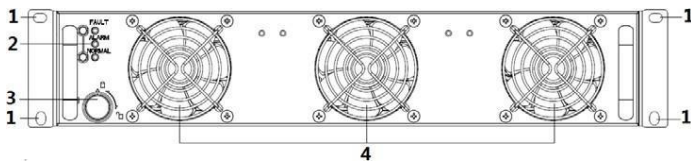


Fig. 2-16 Front view of the UPS module

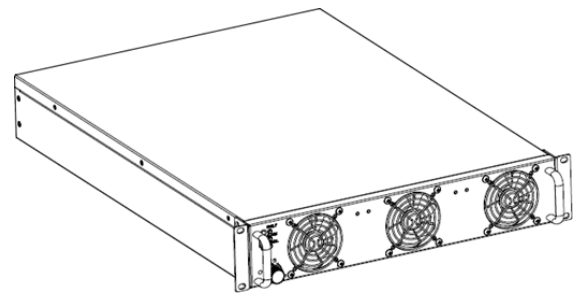


Fig. 2-17 Side view of the UPS module

The UPS module has accessible the following elements (Fig. 2-16):

1. Module fixed screw
2. LED
3. Module switch
4. Fan

3 OPERATION OF ZGR SCALABLE 60 – 300 KVA

3.1 Operation Modes

ZGR SCALABLE 60 – 300 KVA is a double-conversion on-line UPS that may operate in the following alternative modes:

3.1.1 Normal mode

The rectifier/charger derives power from the AC mains and supplies DC power to the inverter while floating and boosting charge the battery simultaneously. Then, the inverter converts the DC power to AC and supplies the load (Fig. 3-1).

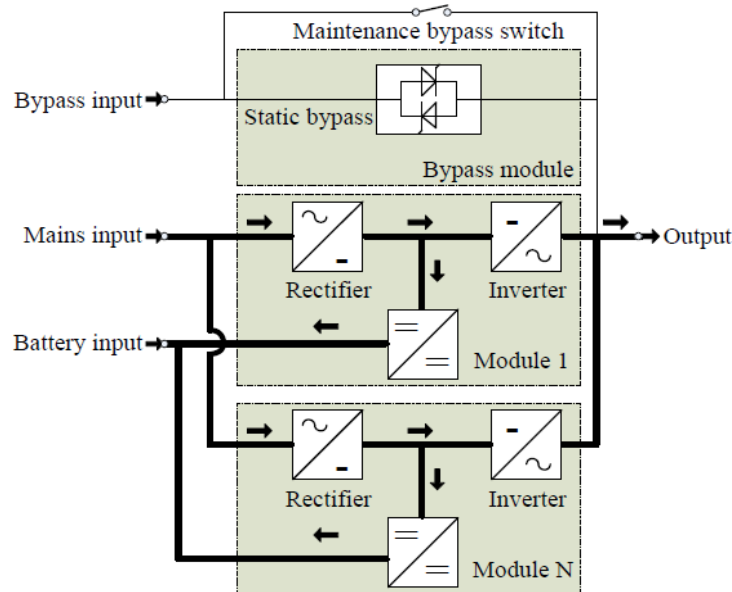


Fig. 3-1 Normal mode

3.1.2 Battery mode (Stored Energy Mode)

If the AC mains input power fails, the inverter, which obtains power from the battery, supplies the critical AC load. There is no power interruption to the critical load. The UPS will automatically return to Normal Mode when AC grid recovers (Fig. 3-2).

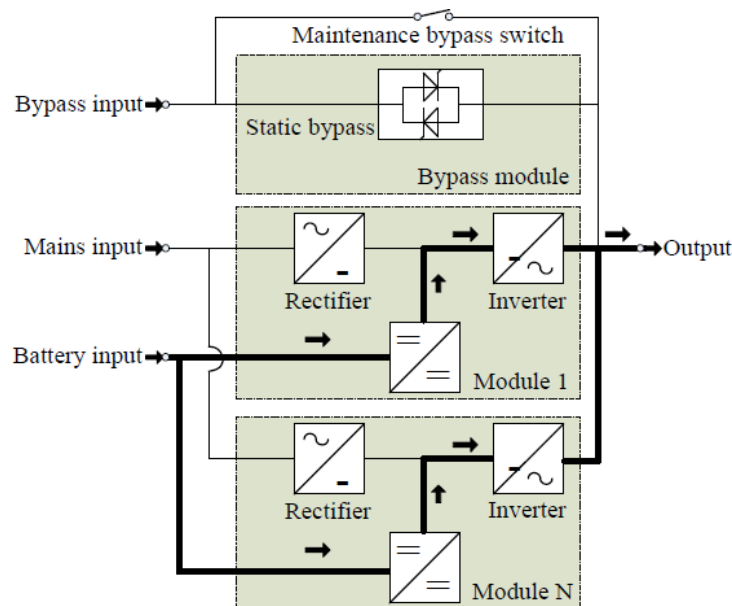


Fig. 3-2 Battery mode

3.1.3 Bypass mode

If the inverter is out of order, or if overload occurs, the static bypass will be activated to transfer the load from the inverter supply to bypass supply without interruption to the critical load (Fig. 3-3).

In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources.

This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15 ms (50 Hz) or less than 13,33 ms (60 Hz).

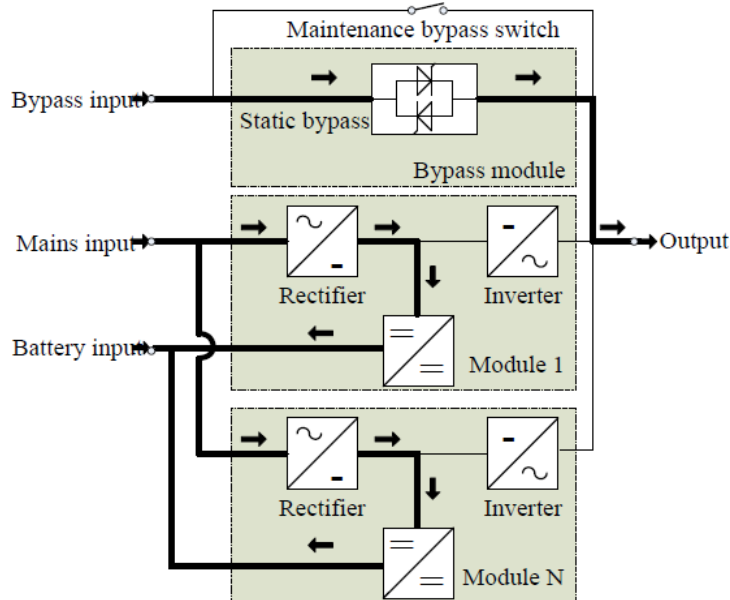


Fig. 3-3 Bypass mode

3.1.4 ECO Mode

When the UPS is at AC Mode and the requirement to the load is not critical, the UPS can be set at ECO mode in order to increase the efficiency of the power supplied (Fig. 3-4). At ECO mode, the UPS works at Line-interactive mode, so the UPS will transfer to bypass supply. When the AC is out of set window, the UPS will transfer from bypass to Inverter and supplies power from the battery, and then the LCD shows all related information on the screen.

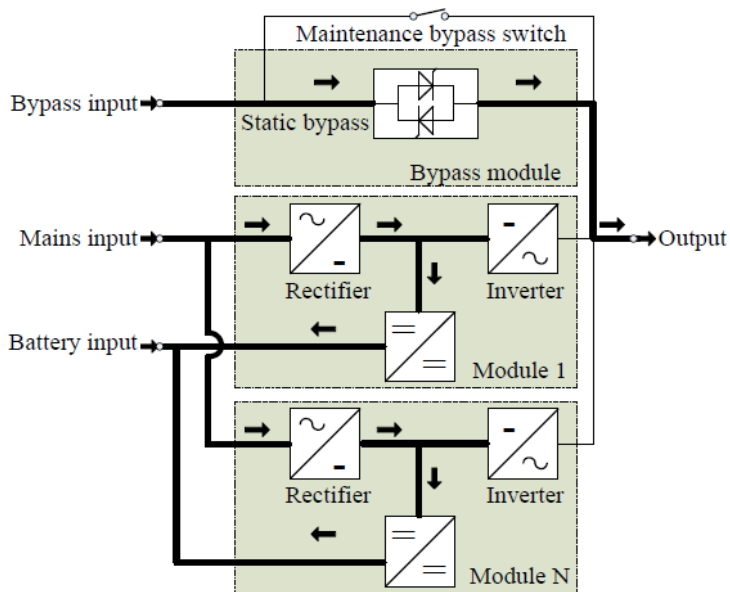


Fig. 3-4 ECO mode

3.1.5 Maintenance mode (Manual Bypass)

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS is out of order or in repair. This manual bypass switch is fitted for all UPS modules and bears for equivalent rated load (Fig. 3-5).

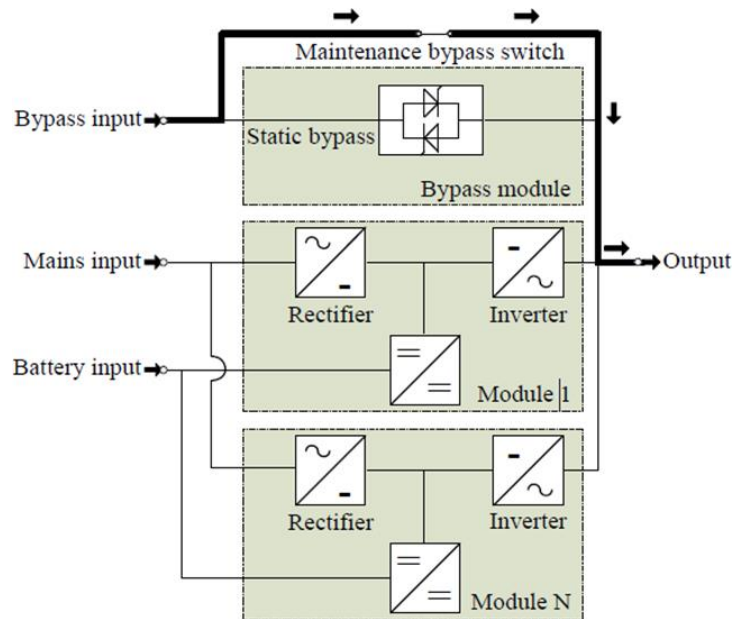


Fig. 3-5 Maintenance mode

3.2 Turn on/off UPS

3.2.1 Restart procedure



Make sure grounding is properly done.

1. Set the Battery Breaker to the “ON” position according to the user’s manual.
2. Open door of the UPS to access to the main power switches. During this procedure the output terminals will become alive.



Check to see if the load is safely connected with the output of the UPS. If the load is not ready to receive power from the UPS, make sure that it is safely isolated from the UPS output terminals.

3. Turn ON the bypass and input switches of the UPS, make sure that “Bypass module” insert the cabinet and fix with screws and the module_in switch at the on status.
4. When AC MAINS input voltage within the range, and the rectifiers of the UPS will be started up in 30 seconds, then the inverter is started completely. When the output switch is “ON”, the inverter LED lights up.
5. Switch ON output switch.

If the rectifier of the module does not start-up, the green LED will flash, bypass module green LED will light on, the power module green LED will flash. when UPS turn to inverter mode power module and display panel green LED will light on.

No matter the UPS is operated normally or not, the LCD display will indicate current status.

3.2.2 Test procedure



WARNING

The UPS is operating normally. It may take 60 seconds to boost up the system and perform self-test completely.

1. Switch off the MAINS to simulate utility failure, the rectifier will turn off and the battery should feed the inverter without interruption. At this time, the LEDs of battery should be turned on.
2. Switch on the MAINS to simulate utility recovery, the rectifier will restart automatically after 20 seconds and the inverter will supply to the load. It is suggested to use Dummy loads for testing. The UPS can be loaded up to its maximum capacity during load test.

3.2.3 Maintenance bypass

To supply the load via Mains, you may simply active the internal mechanical bypass switch.



WARNING

The load is not protected by the UPS when the internal mechanical bypass system is active and the power is not conditioned.

3.2.3.1 Switch to mechanical bypass



WARNING

If the UPS is running normally and can be controlled through the display, carry out steps 1 to 6; otherwise, jump to Step 5.

1. Open the cover of maintenance switch, the UPS turns to bypass mode automatically.
2. Turn on MAINTANCE breaker;
3. Switch OFF BATTERY breaker;
4. Switch OFF MAINS breaker;
5. Switch OFF BYPASS breaker;
6. Switch OFF OUTPUT breaker;

At this time the bypass source will supply to the load through the MAINTENANCE breaker.

3.2.3.2 Switch to normal operation (from mechanical bypass)



WARNING

Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults.

1. Open the front and rear doors of the UPS to be easily access to the main power switches
2. Switch ON the output switch;
3. Switch ON the bypass and mains switch;
4. Switch ON the battery breaker;

The UPS powers from the static bypass instead of the maintenance bypass.

5. Switch OFF the maintenance bypass switch, then the output is supplied by the bypass of the modules.
6. Put on the maintenance switch cover (1.2m cabinet).

The rectifier will operate normally after 30 seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

3.2.4 Cold start procedure



WARNING

Follow these procedures when the input AC Utility Failure, but battery is normal.

1. Switch on the battery switch.
The battery will feed the Auxiliary power board.
2. Switch on the Output switch
3. Trigger the cold start button of the bypass module (Fig. 3-6). When battery normal, rectifier starts operation, 30 s later, inverter starts and operates and the green LED will light on.

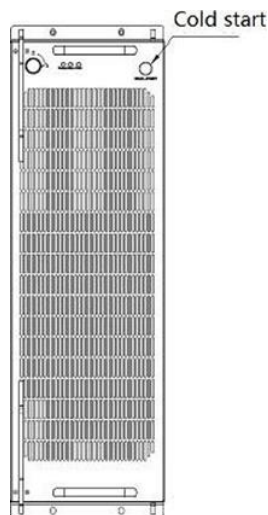


Fig. 3-6 Cold Start



WARNING

Please press the close start button after 30 seconds until closing the battery switch.

3.2.5 Shut down procedure



WARNING

This procedure should be followed to completely shut down the UPS and the LOAD. After all power switches, isolators and circuit breakers are opened, there will be no output.

1. Press the INVERTER OFF key on the LCD display.
2. Switch OFF the BATTERY breaker.
3. Open the UPS door to easily access to the main power switch.
4. Switch OFF the input switch.
5. Switch OFF the OUTPUT switch. The UPS shuts down.



WARNING

Wait for about 5 minutes for the internal DC bus bar capacitors to be completely discharged.

3.2.6 Start-up procedure for parallel system

1. Connect parallel cable, input/output cable, and battery cable well; modify the parallel board jumpers correctly.
2. Measure the positive and negative battery pack voltage. Battery switch is opened temporarily.
3. Switch ON the output switch at the front door.
4. According to the start-up procedure for single unit, set the operation mode of each UPS: single mode is changed to parallel mode; set the parallel number for each UPS; up to 6 units can be parallel; set the ID of each cabinet, the ID of each unit must be different.
5. Switch ON the input switch. Close the external input switch and start from mains.
6. After start from mains, check the LCD interface of each UPS to see if the ID, VA is the same with the actual values.
7. Switch ON the external battery switch of each UPS. Check if the charging current displayed in LCD is normal.



NOTE

The UPS cannot be parallel until each single unit is normal.

4 CONTROL PANEL AND MONITORIZATION

4.1 LCD Display

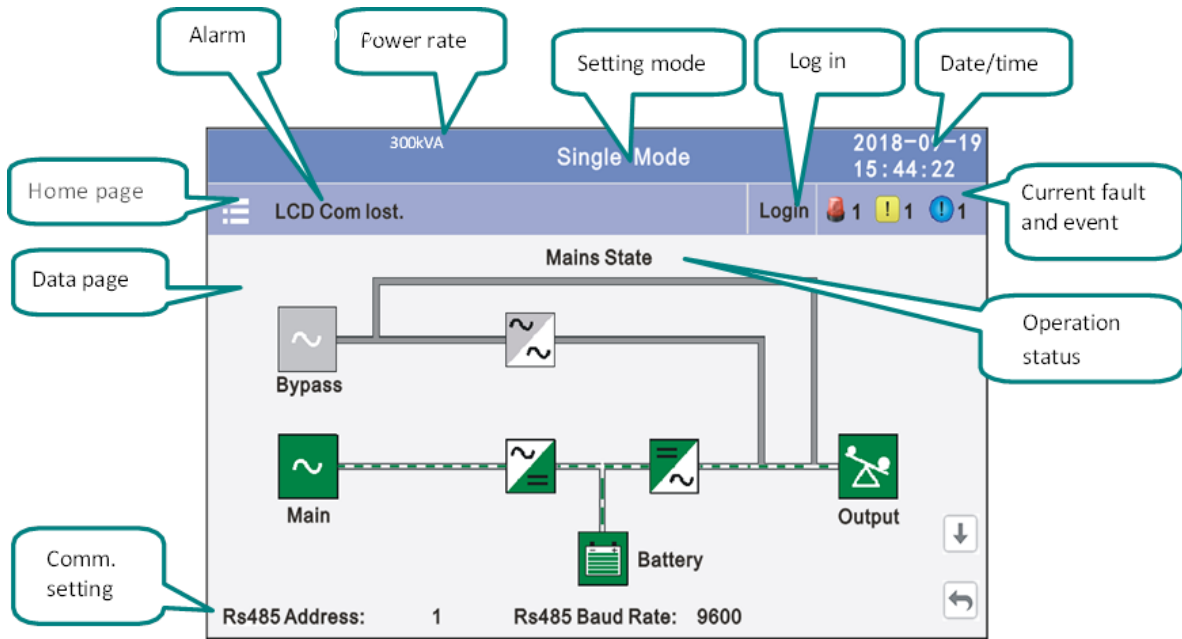


Fig. 4-1 Distribution of the control panel areas and elements



Click the main block to enter the main data display window, click return to return to the previous window, click home page to return to the main page.

4.1.1 Datas menu

This menu displays the flow state of UPS work, and quickly enters real-time data by clicking on the block (Fig. 4-2 and Fig. 4-3).

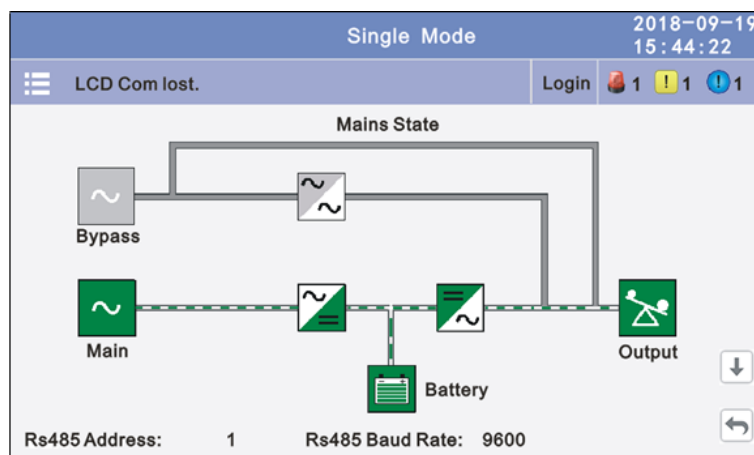


Fig. 4-2 Datas menu

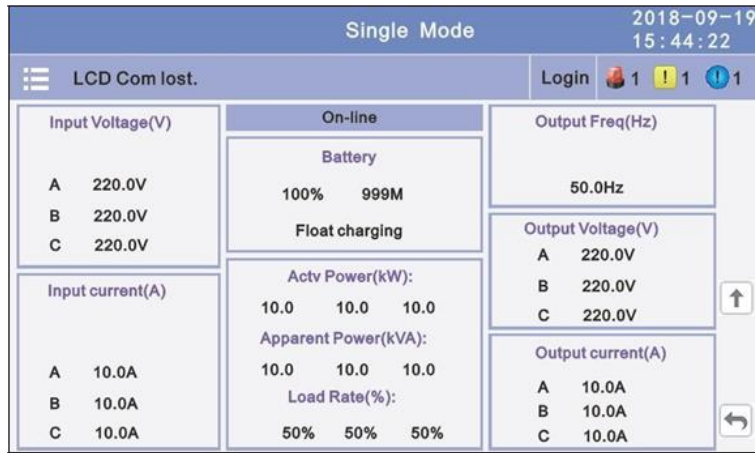


Fig. 4-3 Datas menu detail

4.1.2 Status menu

In this window it can be viewed the voltage and current of the main, bypass, output, battery (Fig. 4-4). Moreover, it can also be entered through by real-time data block), the status of the switches, dry contacts, through clicking on the block, enter the corresponding data window.

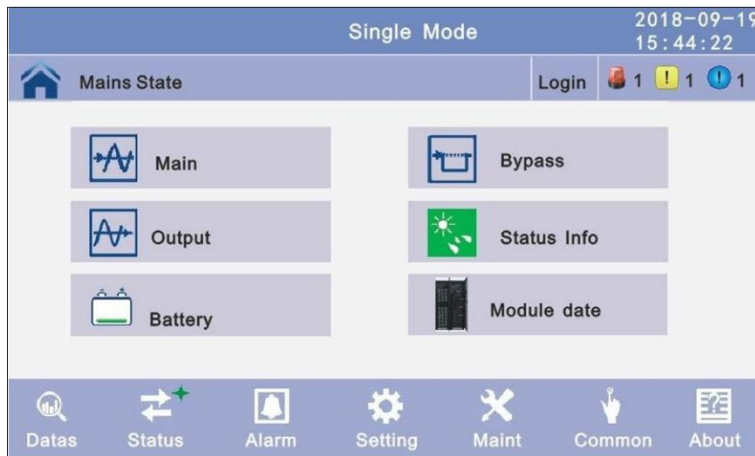


Fig. 4-4 Status menu

4.1.2.1 Main submenu

Clicking on the main block, it can be accessed the main data display window and open the network status display screen (Fig. 4-5).

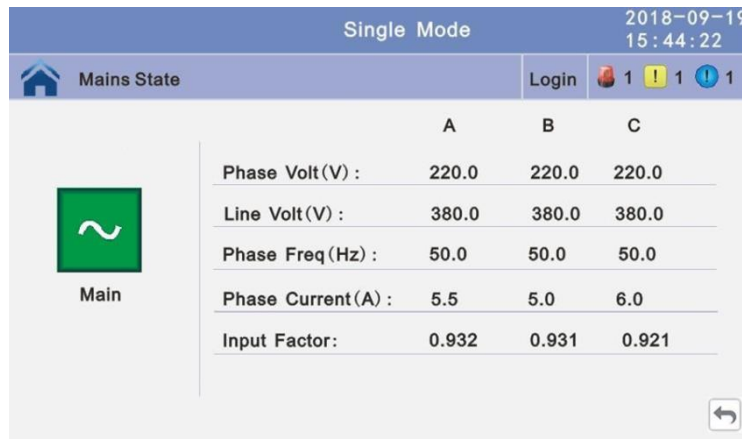


Fig. 4-5 Status/Mains State submenu

4.1.2.2 Bypass submenu

Click the bypass block to enter the bypass data display window (Fig. 4-6).

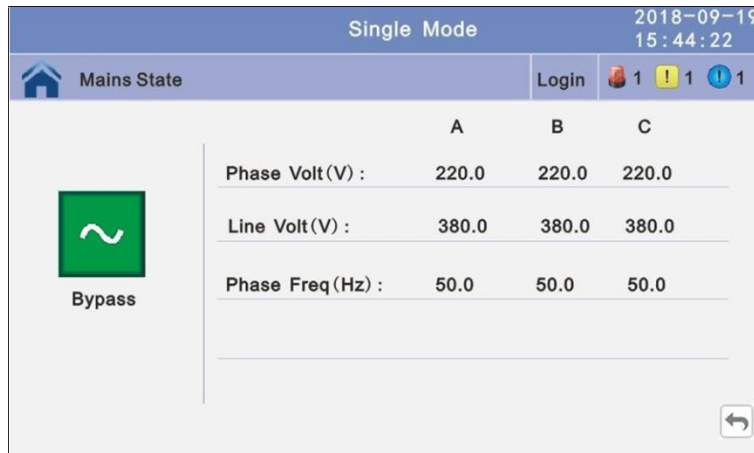


Fig. 4-6 Status/Bypass submenu

4.1.2.3 Output submenu

Click the output block to enter the output data display window (Fig. 4-7 and Fig. 4-8).

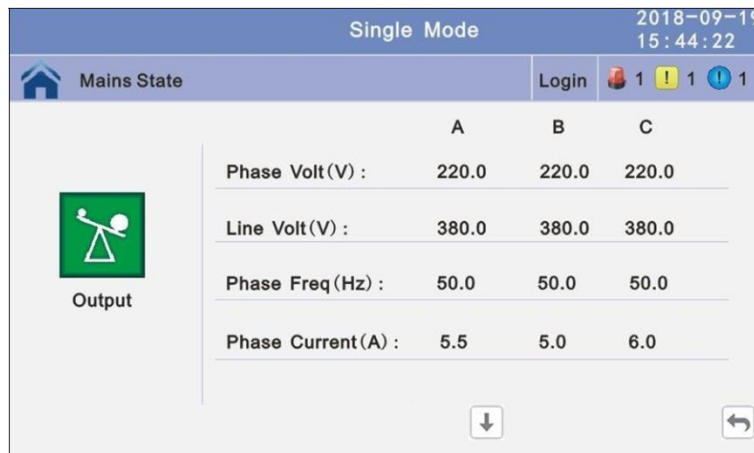


Fig. 4-7 Status/Output (1) submenu



Fig. 4-8 Status/Output (2) submenu

4.1.2.4 Battery submenu

Click the battery block to enter the battery data display window (Fig. 4-9 y Fig. 4-10).



Fig. 4-9 Status/Battery (1) submenu



Fig. 4-10 Status/Battery (2) submenu

4.1.2.5 Status info submenu

To access to the status information click the block to enter the status data display window (Fig. 4-11, Fig. 4-12 and Fig. 4-13).

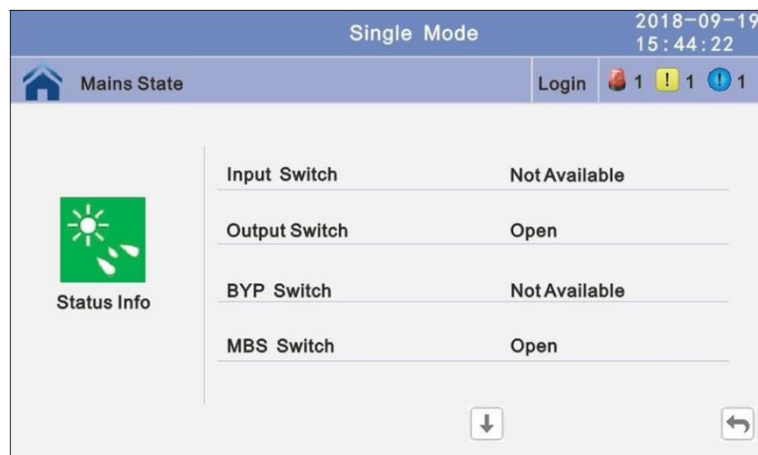


Fig. 4-11 Status/Status Info (1) submenu

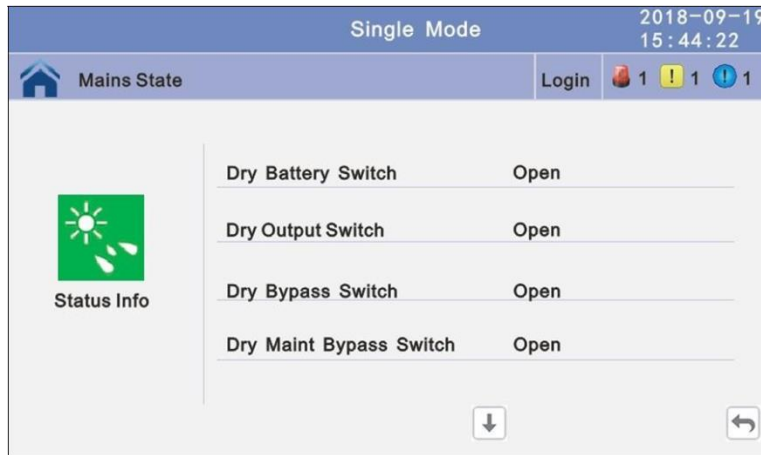


Fig. 4-12 Status/Status Info (2) submenu



Fig. 4-13 Status/Status Info (3) submenu

4.1.2.6 Module submenu

Click the module block to enter the module data display window (Fig. 4-14).

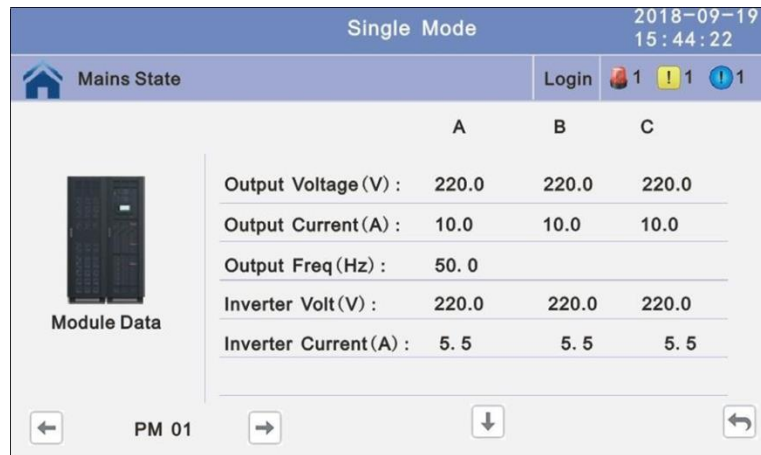


Fig. 4-14 Status/Module submenu

4.1.3 Alarm menu

It allows viewing the alarms and history of the UPS, and activating or deactivating the buzzer (Fig. 4-15).

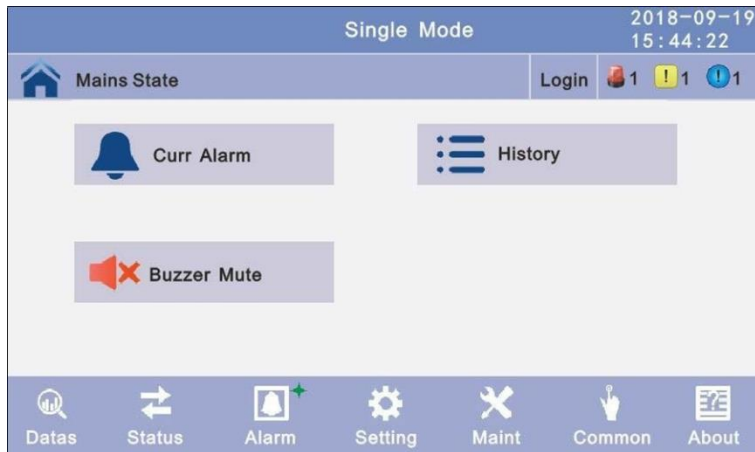


Fig. 4-15 Alarm menu

4.1.3.1 Curr Alarm submenu

Click the curr alarm to enter the current alarm display window (Fig. 4-16).



Fig. 4-16 Alarm/Curr Alarm submenu

4.1.3.2 History submenu

Click the history to enter the history recode display window (Fig. 4-17).

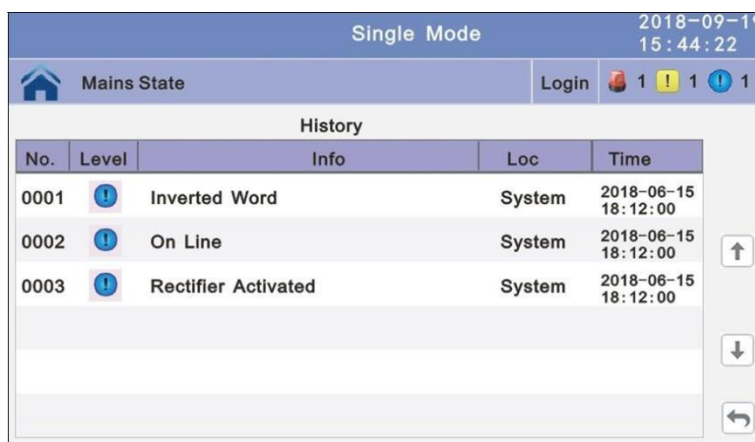


Fig. 4-17 Alarm/History submenu

4.1.3.3 Buzzer submenu

Click the buzzer mute then the buzzer will mute and the red block will change to red (Fig. 4-18); if the buzzer is on, then click the block buzzer will on and the block will change to green (Fig. 4-19).

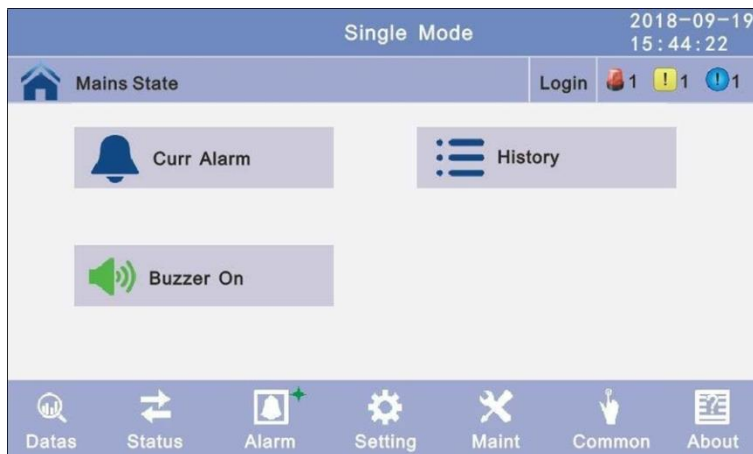


Fig. 4-18 Alarm/Buzzer on submenu

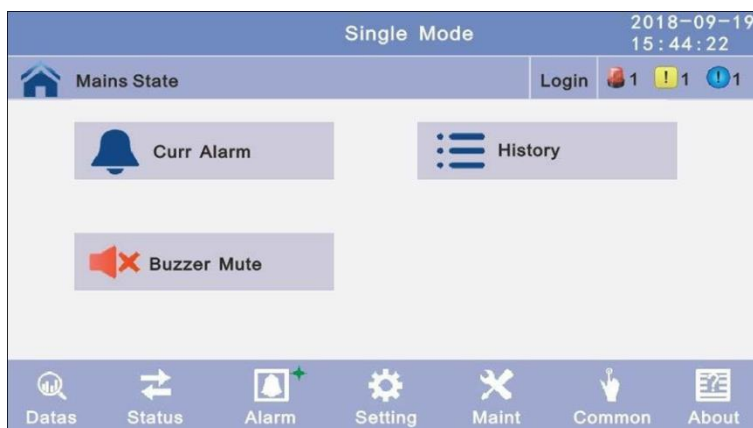


Fig. 4-19 Alarm/Buzzer mute submenu

4.1.4 Setting menu

There are two levels, the basic setting for user settings, advanced setting for technical personnel, please contact the relevant technical personnel to enter advanced settings (Fig. 4-20).



Fig. 4-20 Settings menu

4.1.4.1 Basic Setting submenu

Click basic setting (Fig. 4-23) and enter by input the correct password (Fig. 4-21 and Fig. 4-22). The user password is «111111».

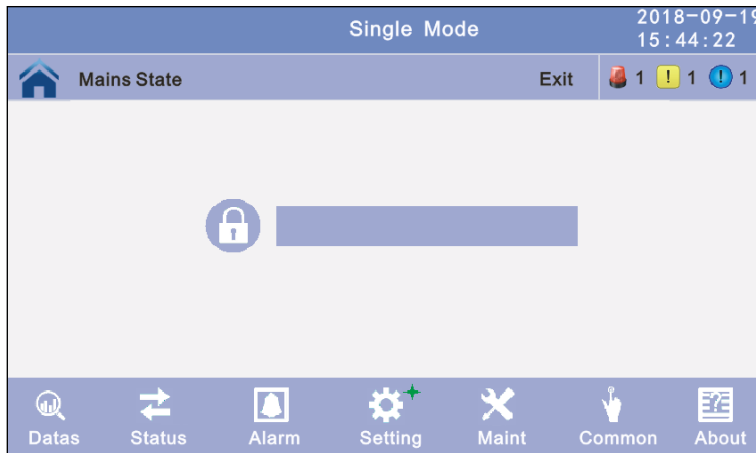


Fig. 4-21 Password window

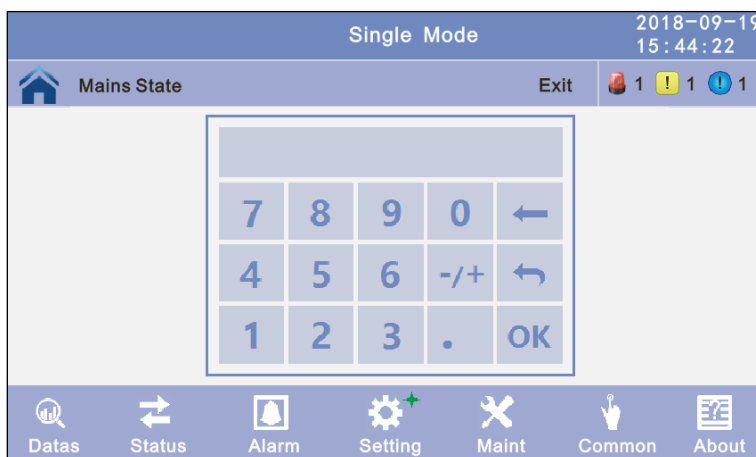


Fig. 4-22 Password keyboard

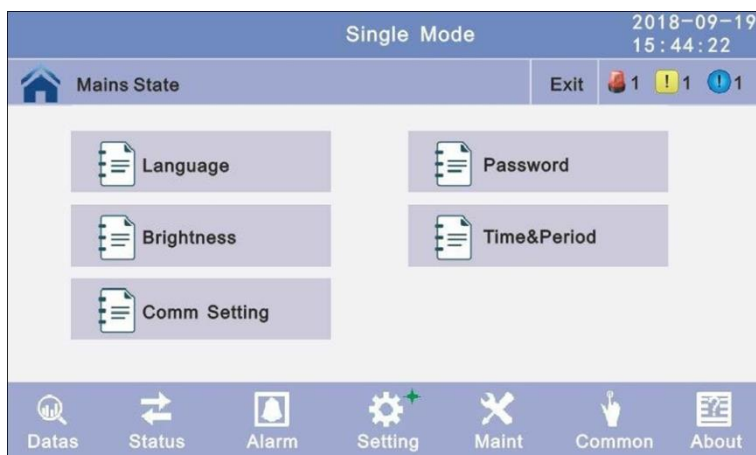


Fig. 4-23 Settings/Basic Settings submenu

- Language submenu

Click the language block witch you want and click the save configuration block to save (Fig. 4-24).



Fig. 4-24 Settings/Basic Settings/Language submenu

- Password submenu

Click password block enter user password setting page, input old password and new password, then click save confirm to save the change (Fig. 4-25). Password format is six numbers.

- Password lock time submenu: When LCD is not touched, it needs to re login when the setting value is set, click left or right block to change the value.

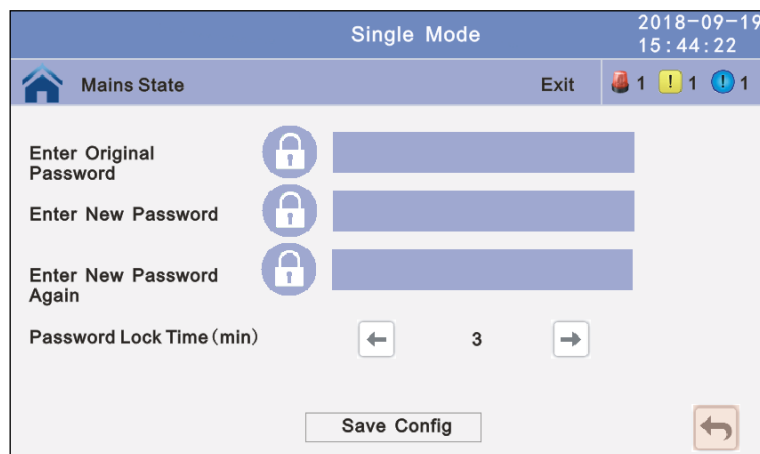


Fig. 4-25 Settings/ Basic Settings/Password submenu

- Brightness and backlight time submenu

Click the block to change value (Fig. 4-26).

- Brightness: Click the text to input new value and click the save configuration block to save. Value range is 1-63, default value is 63. Click return to return to the previous window, click home page to return to the main page
- Backlight *Time*: LCD backlight delay time, click the text to input new value and click save config block to save. Value range is 1-255, default value is 60. Click return to return to the previous window, click home page to return to the main page.

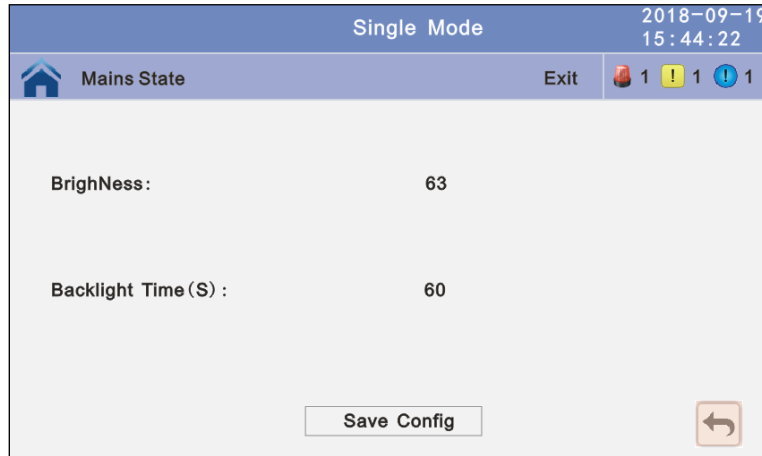


Fig. 4-26 Settings/Basic Settings/Brightness And Backlight Time submenu

- Date and time setting submenu

Click the text to select other value or input new value and click save configuration block to save (Fig. 4-27).

- Date *Format*: has 3 formats.
- Date : current date.
- Time: current time.

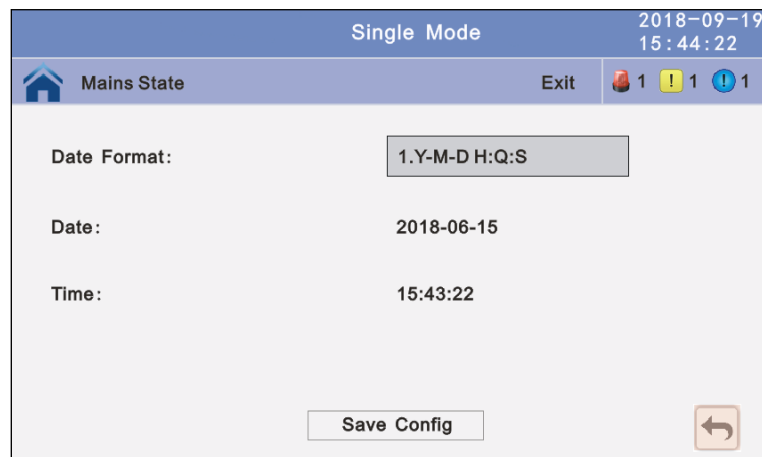


Fig. 4-27 Settings/Basic Settings/Date and Time submenu

- Communication setting submenu

Click the text to select other value or input new value and click save configuration block to save (Fig. 4-28).

- Rs485 *Address*: UPS communication ID, address range is 1~15, default is 1.
- Rs485 *Baud Rate*: baud rate: 2400, 4800, 9600, 14400, 19200, default is 9600.



Fig. 4-28 Settings/Basic Settings/Communications submenu

4.1.4.2 Advanced Setting submenu

Click advanced setting, enter by input the correct password (Fig. 4-29).

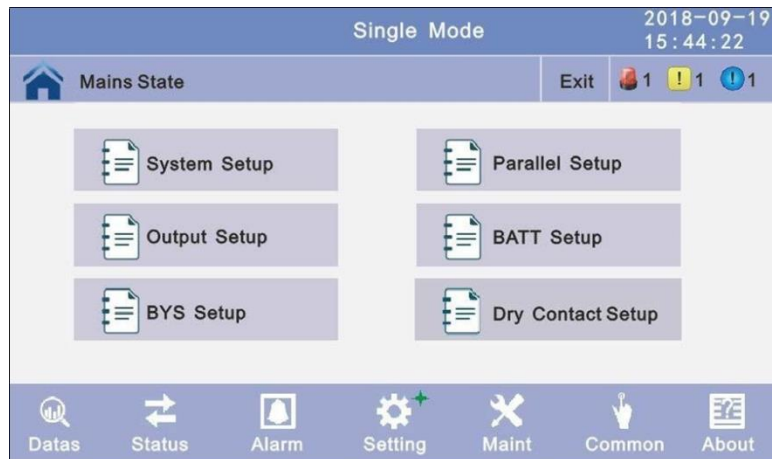


Fig. 4-29 Settings/Advanced Settings submenu

- System setting submenu

Click the text to select other value or input new value and click save configuration block to save (Fig. 4-30 to Fig. 4-46).

- *Working Mode*: Seleccione el modo de trabajo del SAI: «Single Mode» (modo único), «Parallel Mode» (modo paralelo) o «ECO Mode» (modo ECO).
- *Working Mode*: Select the work mode of UPS, work mode: Single mode, Parallel mode, ECO mode.
- *Auto Turn-on*: Select the UPS start logic, Enable: UPS start inverter output automatic, Disable: No output.
- *Aging Load Rate*: The value can be 18~100%, default value: 60%.



Fig. 4-30 Settings/Advanced Settings/System Setting (1) submenu

- *Freq Conv Mode*: Frequency conversion mode, enable: output frequency set 50Hz or 60Hz, input frequency is 60Hz or 50Hz, UPS no alarm not battery and bypass abnormal. Default is Disable.
- *LBS Mode*: setting value: LBS disable, LBS master, LBS slave. Default is LBS disable.
- *Temp Sensor Switch*: temperature sensor compensation switch, when need to connect battery temperature sensor, please change the value to enable.
- *Temp Sensor Select*: temperature sensor type select. Has two types: NTC and RS485. NTC for single and short distance. RS485 for multiple and far distance.



Fig. 4-31 Settings/Advanced Settings/System Setting (2) submenu

- *Power Walk in*: this is enable the UPS to control the interval that each module transfers from battery mode to normal mode, which reduces the impact on the generator or power grid. The value can be 1-20, default value is 1.
- *Inter Power Walk in*: this is enable the UPS to control the interval that each rack transfers from battery mode to normal mode, which reduces the impact on the generator or power grid. The value can be 0-200, default value is 10.
- *Inter sleep mode*: when load less than the software setting value, same parallel rack will turn to standby mode and if the load more than the setting value some rack will turn to inverter mode after setting the sleep mode enable. Default value is disable.



Fig. 4-32 Settings/Advanced Settings/System Setting (3) submenu

- *Basic Unit Numb:* power module number for actual configuration, if setting number no the same to actual number, UPS will alarm.
- *Cabinet Power:* cabinet power range, the same power range of bypass.
- *Sleep Mode:* when load less than the software setting value, same power module will turn to standby mode and if the load more than the setting value some power module will turn to inverter mode after setting the sleep mode enable. Default value is disable.



Fig. 4-33 Settings/Advanced Settings/System Setting (4) submenu

- *Parallel ID:* Parallel operation ID, must modify the ID after set work mode to parallel mode. The value can be 1~6, default value is 1.
- *Cabinet Paral Basic Units:* Parallel cabinet number, must modify the total parallel cabinet number after set work mode to parallel mode. The value can be 2~6, default value is 2.
- *Cabinet Paral Redunt Units:* Parallel redundancy cabinet number, can modify the redundancy cabinet number after set work mode to parallel mode. The value can be 0~5, default value is 0.



Fig. 4-34 Settings/Advanced Settings/System Setting (5) submenu

- o *Output Freq:* Output frequency. The value can be 50Hz or 60Hz.
- o *Output Volt Level:* Output voltage level. The value can be 220V, 230V, 240V.
- o *Inverter Volt Adjust:* Inverter voltage adjust. The value can be -5%~0~+5%, step is 0.5%, default value: 0.



Fig. 4-35 Settings/Advanced Settings/System Setting (5) submenu

- o *Battery Group:* Must modify the number to actual configuration. The value can be 1~8, default value is 1.
- o *Battery number:* Must modify the number to actual configuration. The value can be 30~50, default value is 32.
- o *Single Battery Capability:* Must modify the value to actual configuration, the value can be 7~2000.
- o *Boost/Float conversion:* boost charge and float charge alternate time, the value can be 0~20.



Fig. 4-36 Settings/Advanced Settings/System Setting (6) submenu

- *Chg.cur.limiting coef.:* The charging current limit is a multiple of the battery capacity. The value can be 0.05–0.15, and is 0.1 by default.
- *Cell float voltage:* The float voltage value can be 2.23-2.30 V/cell, and is 2.25 V/cell by default.
- *Cell boost voltage:* The battery equalized voltage value can be 2.30–2.40 V/cell, and is 2.30 V/cell by default.
- *Aver charging Duration:* boost charge time limit, the value can be 1–999min, and is 240 by default.



Fig. 4-37 Settings/Advanced Settings/System Setting (7) submenu

- *EOD Battery Volt:* End of discharge voltage. The value can be 1,60 ~ 1,90, and is 1,80 by default.
- *Float Temp Compens Coeff:* modify the voltage of compensation after enable the switch. the value can be 0,001 ~ 0,007/cell, and is 0,003 by default.
- *Boost Charge Setting:* Boost charge disable or enable, and is enabled by default.
- *No Battery Warning:* can be no warning when no batter after set disable, and is enabled by default.



Fig. 4-38 Settings/Advanced Settings/System Setting (8) submenu

- *Cabinet Shared Battery*: Two parallel ups use common battery bank. The value can be set Disable and enable, disable by default.
- *Generator on prohibit charging*: UPS disable charge the battery if set the value to enable when the generator signal is enable.
- *Single Battery Volt*: Set the battery type, 2 V / 4 V / 6 V / 12 V, 12 by default.



Fig. 4-39 Settings/Advanced Settings/System Setting (9) submenu

- *Bypass Volt Prot Lower Limit*: When the difference between the bypass voltage and the rated voltage exceeds the lower threshold for the bypass voltage, the system determines that the bypass voltage is abnormal and that the bypass is unavailable. The value can be -10%, -15%, -20%, -30%, -45%. The default value is -45%.
- *Bypass Volt Prot Limit*: When the difference between the bypass voltage and the rated voltage exceeds the upper threshold for the bypass voltage, the system determines that the bypass voltage is not normal and that the bypass is unavailable.



NOTA

When the voltage level is 380 V, the value range is 10%, 15%, 20%, and 25% (default).

When the voltage level is 400 V, the value range is 10%, 15%, and 20% (default).

When the voltage level is 415 V, the value range is 10% and 15% (default).

- *Bypass Freq Tracking Range:* When the difference between the bypass input frequency and the rated frequency is greater than this value, the system determines that the bypass frequency is not normal, and that the bypass is unavailable. The value range is 1%, 2%, 4%, 5%, 10%(default).
- *Bypass rate tracking rate:* Inverter frequency tracking to bypass frequency rate. The value range is 0,5 ~ 2, and is 1 by default.

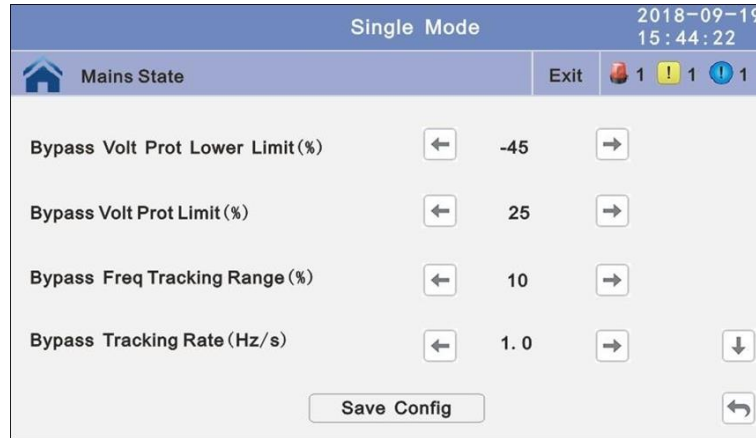


Fig. 4-40 Settings/Advanced Settings/System Setting (10) submenu

- *Power supply upon BYP SCR over temp.:* Specifies whether to start bypass mode when overtemperature occurs. The default value is Enable.
- *Bypass Switches Limit:* Cross currents occur during the transfer between bypass mode and normal mode, which impacts the system. This parameter specifies the number of transfers between bypass mode and normal mode within 1 hour, which ensures system security. The value can be 3 to 10, and is 10 by default.
- *EPO transfers to bypass:* Specifies whether to start bypass mode when EPO occurs. The default value is Enabled.



Fig. 4-41 Settings/Advanced Settings/System Setting (11) submenu

- *Battery Abnormal BCB trip(DRV):* Enable or disable BCB trip single output. The default value is Disable.
- *Bypass Feedback Trip:* Enable or disable bypass feedback output. The default value is Disable.
- *External Maint. breaker:* Enable or disable external maintenance breaker connection detection. The default value is Disable.

- *BATT Switch (BAT)*: Enable or disable battery breaker connection detection. The default value is Disable.



Fig. 4-42 Settings/Advanced Settings/System Setting (11) submenu

- *Output Switch*: Enable or disable output breaker connection detection. The default value is Disable.
- *BYP Switch*: Enable or disable bypass breaker connection detection. The default value is Disable.
- *BATT Ground Fault*: Enable or disable battery grounding failure detection. The default value is Disable.



Fig. 4-43 Settings/Advanced Settings/System Setting (12) submenu

- *Lightning arrester (SPD)*: Enable or disable SPD detection. The default value is Disable.
- *Generator (GEN)*: Enable or disable GEN detection. The default value is Disable.



Fig. 4-44 Settings/Advanced Settings/System Setting (12) submenu

- *OUT01-OUT06*: Output dry contact port, modify on the LCD, the default value is Disable. The output port can set to normally closed or normally opened. The default value is normally opened.

Setting value:

No	ITEM	No	ITEM
1	URGENT_ALARM	7	BYPASS_SUPPLY
2	MINOR_ALARM	8	BATTERY_SUPPLY
3	MAIN_ABNORMAL	9	NO_SUPPLY
4	BATTERY_LOW_VOLT	10	ECO_MODE
5	BATTERY_SELFHECK	11	MAINT_CLOSE
6	MAIN_SUPPLY	12	OIL_MACHINE_CONTROL

Table 4-1 Valor de ajuste de los contactos libres de potencial



Fig. 4-45 Settings/Advanced Settings/System Setting (13) submenu



Fig. 4-46 Settings/Advanced Settings/System Setting (14) submenu

4.1.5 Maint menu

In this menu the History can be downloaded, the touch correction adjusted and done a battery self-test (Fig. 4-47).



Fig. 4-47 Maint menu

4.1.5.1 USB Wizard submenu

This submenu provides the History Output, downloads history and sets the setting record by USB (Fig. 4-48).



Fig. 4-48 Maint/USB Wizard submenu

- Alarm log output submenu (Fig. 4-49)



Fig. 4-49 Maint//USB Wizard/Alarm log output submenu

- Setting log output submenu (Fig. 4-50)



Fig. 4-50 Maint/USB Wizard/Setting log output submenu

4.1.5.2 Battery Self-Check submenu

It can be selected the check by Timing Daily, Timing Weekly. The default value is Timing Self-Check Close (Fig. 4-51).

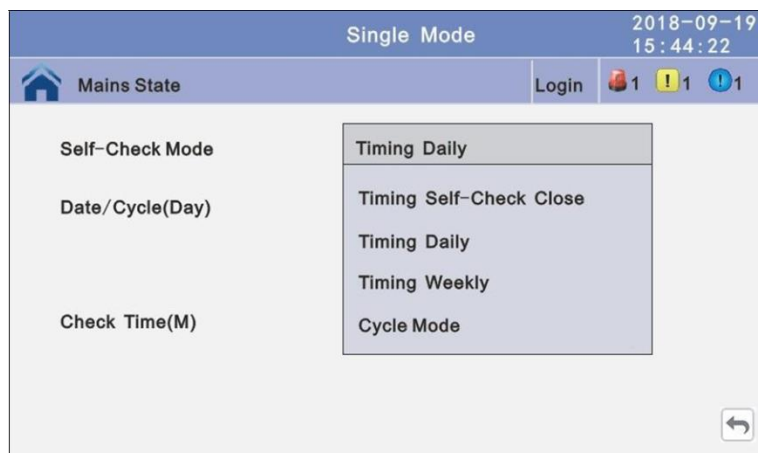


Fig. 4-51 Maint/Battery Self-Check submenu

- Timing daily

Modify the check date, time and check time (10S (default), 10min, EOD) (Fig. 4-52).



Fig. 4-52 Maint/Battery Self-Check/Timing daily submenu

- Timing weekly

Modify the check date, time and check time (10S (default), 10min, EOD) (Fig. 4-53).

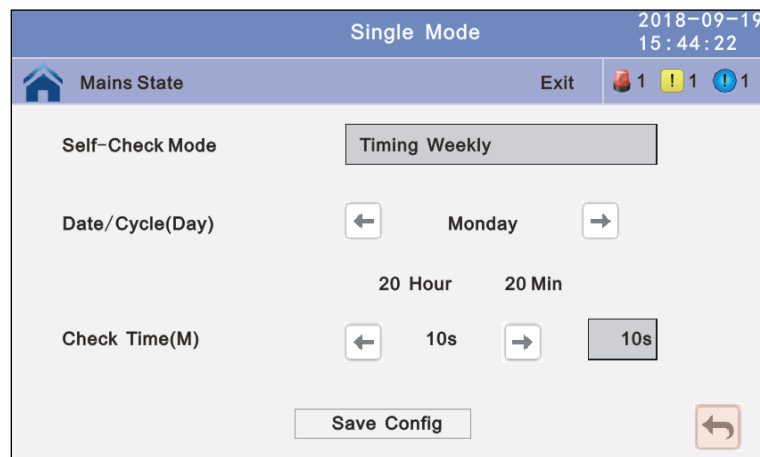


Fig. 4-53 Maint/Autocomprobación de la batería/Timing Weekly submenu

- Timing Cycle mode

Modify the cycle date and check time (10S (default), 10min, EOD) ().



Fig. 4-54 Maint/Battery Self-Check/ Cycle mode submenu

4.1.6 Common menu

Through this menu the inverter can be started-up or switched off (INV ON/OFF), test the battery and clear the faults (Fig. 4-55).



Fig. 4-55 Common menu

4.1.6.1 INV ON/OFF submenu

In this window the inverter can be started-up or switched off (INV ON/OFF) depending on the configuration (Fig. 4-56):

- *Single OFF*: Inverter OFF location UPS
- *Single ON*: Inverter ON location UPS
- *Parallel OFF*: Inverter OFF all parallel UPSs
- *Parallel ON*: Inverter ON all parallel UPSs

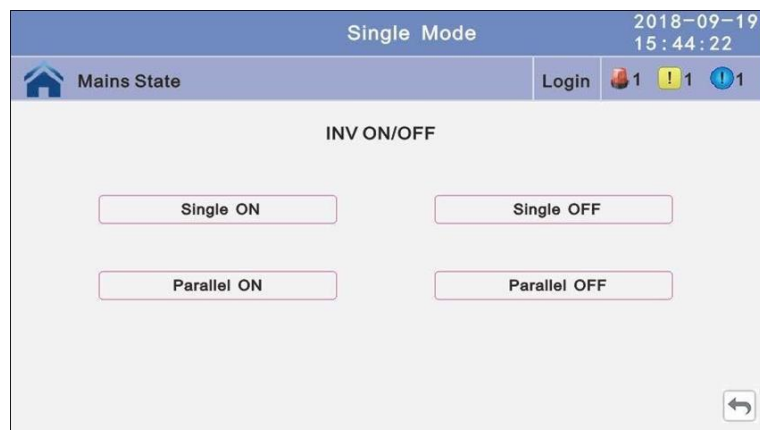


Fig. 4-56 Common/INV ON/OFF submenu

4.1.6.2 Battery Test submenu

To test the battery (Fig. 4-57). It can be tested:

- *10S*: battery test for 10s
- *10min*: battery test for 10min
- *EOD*: battery test to EOD
- *-10%*: battery test down 10% capability.



Fig. 4-57 Common/Battery Test submenu

4.1.6.3 Fault Clear submenu

Clear the current fault (not for all faults) (Fig. 4-58).



Fig. 4-58 Common/Fault Clear submenu

4.1.7 About Menu

It shows the software version Monitor and LCD software version (Fig. 4-59).

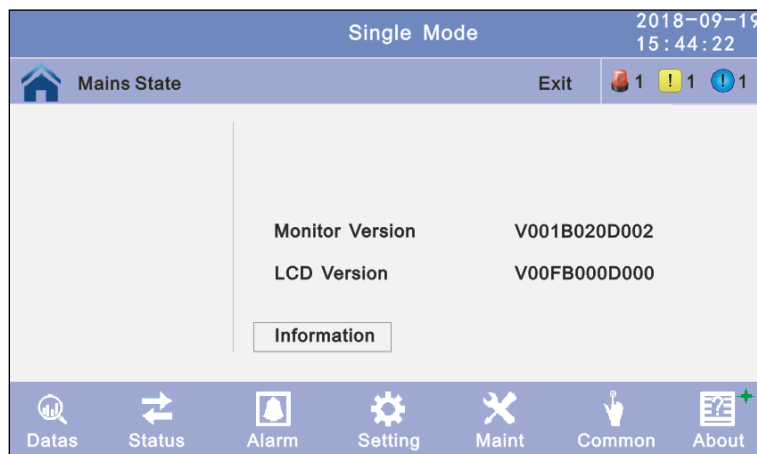


Fig. 4-59 About menu

4.1.7.1 Internal software version

- *Power module software version.* PFC DSP, PFC CPLD, INV DSP and INV CPLD.
- *Center control unit (ECU) software version:* DSP and PFGA.
- *Bypass module software version:* DSP and CPLD



Fig. 4-60 About/Internal software version submenu

4.2 List of events and alarms

This section lists the event and alarm messages that the UPS might display. The messages are listed in alphabetical order. This section is listed with each alarm message to help you troubleshoot problems

4.2.1 Fault Information

NO	FAULT CODE	UPS ALARM WARNING	BUZZER	LED
1	002	REC Over Temperature	Twice per second	Fault LED lit
2	003	REC par. cable Fault	Twice per second	Fault LED lit
3	004	REC Over Current	Beep continuously	Fault LED lit
4	005	REC Power Fault	Beep continuously	Fault LED lit
5	007	Input SCR Fault	Beep continuously	Fault LED lit
6	00A	Battery SCR Fault	Beep continuously	Fault LED lit
7	00C	Charge SCR Fault	Beep continuously	Fault LED lit
8	00E	Fan Fault	Beep continuously	Fault LED lit
9	011	Fan Power fault	Beep continuously	Fault LED lit
10	012	Charger Over Temp.	Beep continuously	Fault LED lit
11	013	Soft Start Failed	Beep continuously	Fault LED lit
12	014	BAT Charger Fault	Beep continuously	Fault LED lit
13	016	REC Comm. Fault	Once per 2 seconds	Fault LED blinking
14	019	REC Initializes Fault	Beep continuously	Fault LED lit
15	01D	Unit insert fault	Once per 2 seconds	Fault LED lit
16	063		Once per 2 seconds	Fault LED lit

17	01E	Rectifier Fault	Beep continuously	Fault LED lit
18	041	Inverter Fault	Beep continuously	Fault LED lit
19	044	INV IGBT SHORT	Beep continuously	Fault LED lit
20	047	Inverter relay Short	Beep continuously	Fault LED lit
21	04A	Inverter relay Broken	Beep continuously	Fault LED lit
22	04D	INV par. cable Fault	Twice per second	Fault LED lit
23	051	Output Short Circuit	Once per second	Fault LED blinking
24	054	INV Comm. Fault	Once per 2 seconds	Fault LED blinking
25	057	INV Initializes Fault	Beep continuously	Fault LED lit
26	05A	INV self-test Fault	Beep continuously	Fault LED lit
27	05E	DC Component Fault	Once per 2 seconds	Fault LED lit
28	061	DC bus abnormal	Beep continuously	Fault LED lit
29	064	INV DSP Power Fault	Beep continuously	Fault LED lit
30	067	INV Over Temperature	Twice per second	Fault LED lit
31	068	Load Sharing Fault	Twice per second	Fault LED lit
32	06A	Cabinet mode Fault	Beep continuously	Fault LED lit
33	06B	Fuse Broken	Beep continuously	Fault LED lit
34	081	Par. cable Fault	Twice per second	Fault LED lit
35	086	ECU Insert Fault	Once per 2 seconds	Fault LED lit
36	088	ECU Power Fault	Beep continuously	Fault LED lit
37	08B	ECU Comm. Fault	Beep continuously	Fault LED lit
38	08D	ECU Initializes Fault	Once per 2 seconds	Fault LED blinking
39	091	Bypass SCR Broken	Beep continuously	Fault LED lit
40	0C2		Beep continuously	Fault LED lit
41	094	Bypass SCR short	Beep continuously	Fault LED lit
42	0C5		Beep continuously	Fault LED lit
43	097	BPS Over Temperature	Beep continuously	Fault LED lit
44	0CF		Beep continuously	Fault LED lit
45	09A	Output CT Reverse	Beep continuously	Fault LED lit
46	09B	Dry-contact Power Fault	Beep continuously	Fault LED lit
47	09C	Dry-contact Comm. Fault	Beep continuously	Fault LED lit
48	09D	Bypass Feedback Fault	Beep continuously	Fault LED lit
49	0C1	BYS Par. cable Fault	Beep continuously	Fault LED lit
50	0C8	BPS Comm. Fault	Beep continuously	Fault LED lit
51	0CA	Bypass Initializes Fault	Beep continuously	Fault LED lit
52	0CD	Bypass connected fault	Beep continuously	Fault LED lit

53	OD2	Bypass Fan Fault	Beep continuously	Fault LED lit
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Table 4-2 Faults list

4.2.2 Alarm Information

NO	ALARM CODE	UPS ALARM WARNING	BUZZER	LED
1	103	Battery Over Voltage	Once per second	Alarm LED lit
2	104	BAT Low Pre-warning	Once per second	Alarm LED lit
3	105	Battery Reverse	Twice per second	Alarm LED lit
4	106	Battery EOD	Once per second	Alarm LED lit
5	107	Battery Voltage low	Once per second	Alarm LED lit
6	108	No Battery	Once per second	Alarm LED lit
7	109	Input Phase Reverse	Once per second	Alarm LED lit
8	10A	Input N-Line lost	Twice per second	Alarm LED lit
9	10B	Mains Freq. Abnormal	Once per 2 seconds	Alarm LED lit
10	10C	Mains Volt. Abnormal	Once per 2 seconds	Alarm LED lit
11	10D	REC Comm. Error	Once per 2 seconds	Alarm LED lit
12	10E	Mains input lost	Once per 2 seconds	Alarm LED lit
13	10F	Set Data Err.	Once per 2 seconds	Alarm LED lit
14	121	INV Par. cable abnormal	Once per 2 seconds	Alarm LED lit
15	125	INV Overload	Once per 2 seconds	Alarm LED lit
16	126	INV not synchronized	Beep continuously	Alarm LED lit
17	12A	INV Set Data Err	Once per 2 seconds	Alarm LED lit
18	129	INV Comm. Error	Once per 2 seconds	Alarm LED lit
19	141	Bypass Switch to Num	Once per 2 seconds	Alarm LED lit
20	142	Unit quantity mismatch	Once per 2 seconds	Alarm LED lit
21	143	Parallel Overload	Once per 2 seconds	Alarm LED lit
22	144	Bypass Overload	Once per 2 seconds	Alarm LED lit
23	145	Maint. Switch Misuse	Once per 2 seconds	Alarm LED lit
24	146	ECU Comm. Error	Once per 2 seconds	Alarm LED lit
25	147	Par. cable abnormal	Once per 2 seconds	Alarm LED lit
26	14B	ECU Par. Cable abnormal	Once per 2 seconds	Alarm LED lit
27	14C	ECU Abnormal	Once per 2 seconds	Alarm LED lit
28	14E	BPS Phase Reversed	Once per second	Alarm LED lit
29	162		Once per second	Alarm LED lit
30	14F	BPS Unable To Trace	Once per 2 seconds	Alarm LED lit

31	163		Once per 2 seconds	Alarm LED lit
32	150	BPS Not Available	Once per second	Alarm LED lit
33	164		Once per second	Alarm LED lit
34	151	Ecu Set Data Err	Once per 2 seconds	Alarm LED lit
35	161	BPS Par.cable abnormal	Once per 2 seconds	Alarm LED lit
36	165	Bypass Comm. Error	Once per 2 seconds	Alarm LED lit
37	166	Bypass module take over	Once per 2 seconds	Alarm LED lit

Table 4-3 Alarms list

5 INSTALLATION

5.1 Unpack checking

Don't lean the UPS when moving it out from the packaging.

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.

Check the accessories according to the packing list and contact the dealer if any parts missing.

From then on, the customer will have 24 hours to make any claim under guarantee for any anomaly in the amount or quality of the products received, providing details of the material received in bad condition after reporting this circumstance on the forwarding agent's delivery note on reception.

5.2 Mechanical installation



WARNING

Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 100 cm and 80 cm respectively when installing the cabinet (Fig. 5-1).

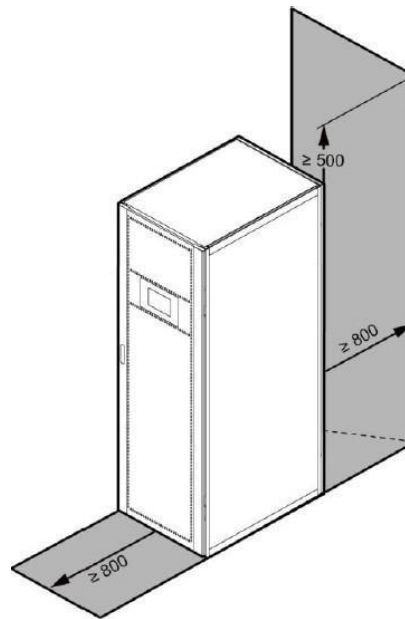


Fig. 5-1 UPS location

- Please place the UPS in a clean, stable environment, avoid the vibration, dust, humidity, flammable gas and liquid, corrosive. To avoid from high room temperature, a system of room extractor fans is recommended to be installed. Optional air filters are available if the UPS operates in a dusty environment.
- The environment temperature around UPS should keep in a range of 0 °C~40°C. If the environment temperature exceeds 40 °C, the rate should be reduced by load 12% capacity 5°C. The max temperature can't be higher than 50°C.
- If the UPS is dismantled under low temperature, it might be in a condensing condition. The UPS can't be installed unless the internal and external of the equipment is fully dry. Otherwise, there will be in danger of electric shock.
- Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C. Keep batteries away from heat sources or main air ventilation area, etc.



WARNING

Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while operation below this range will reduce the battery capacity.

- Should the equipment not be installed immediately it must be stored in a room so as to protect it against excessive humidity and or heat sources.



WARNING

An unused battery must be recharged every 6months Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

- The highest altitude that UPS may work normally with full load is 1500 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1500 meters, shown as the Table 5-1:

(Load coefficient equals max load in high altitude place divided by nominal power of the UPS)

ALTITUDE (m)	1500	2000	2500	3000	3500	4000	4500	5000
LOAD COEFICIENT	100%	95 %	90 %	85 %	80 %	75 %	70 %	65 %

Table 5-1 Load coefficient

- The UPS cooling is depending on fan, so it should be kept in good air ventilation area. There are many ventilation holes on the front and rear, so they should not be blocked by any exotic obstacles.

5.3 Electrical installation

5.3.1 External Protective Devices

For safety reasons, it is necessary to install, external circuit breaker at the input A.C. supply and the battery. This chapter provides guidelines for qualified installers that must have the knowledge of local wiring practices for the equipment to be installed.

- External Battery

The UPS and its associated batteries are protected against the effect of over-current through a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the battery.

- UPS Output

Any external distribution board used for load distribution shall be fitted with protective devices that may avoid the risk of UPS overloaded.

- Over-current

Protection device shall be installed at the distribution panel of the incoming main supply. It may identify the power cables current capacity as well as the overload capacity of the system.



WARNING

Select a thermomagnetic circuit-breaker with an IEC 60947-2 trip curve C (normal) for 125% of the current as listed below.

5.4 Connection of Power Cables

The cable design shall comply with the voltages and currents provided in this section. Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media).



WARNING

Upon starting, please ensure that you are aware of the location and operation of the external isolators which are connected to the UPS input/bypass supply of the mains distribution panel. Check to see if these supplies are electrically isolated. Post necessary warning signs to prevent any inadvertent operation.

5.4.1 Recommended cross-sectional areas for power cables

For future expansion purpose, it is economical to install power cable according to the full rating capacity initially. The diameter of cable is shown below (Table 5-2):

UPS CABINET (KVA)	CABLE DIMENSION				
	AC Input (mm ²)	BPS Input (mm ²)	AC Output (mm ²)	DC Input (mm ²)	Grounding (mm ²)
30	10	10	10	25	10
45	16	16	16	35	16
50	16	16	16	50	16
60	35	35	35	70	35
75	35	35	35	95	35
90	70	70	70	120	70
100	95	95	95	120	95
120	95	95	95	150	95
125	95	95	95	185	95
135	95	95	95	185	95
150	120	120	120	185	120
180	150	150	150	120*2	150
200	185	185	185	120*2	185
225	185	185	185	150*2	185
250	120*2	120*2	120*2	185*2	120*2
270	120*2	120*2	120*2	185*2	120*2
300	150*2	150*2	150*2	240*2	150*2

Table 5-2 Cross-sectional areas for power cables

- When selecting, connecting, and routing power cables, follow local safety regulations and rules.
- If external conditions such as cable layout or ambient temperatures change, perform verification in accordance with the IEC-60364-5-52 or local regulations.
- If the rated voltage is 400 V, multiply the currents by 0,95. If the rated voltage is 415 V, multiply the currents by 0,92.
- If primary loads are non-linear loads, increase the cross-sectional areas of neutral wires 1,5–1,7 times.
- The nominal battery discharge current refers to the current of forty 12 V batteries at 480V in standard configuration.
- The maximum battery discharge current refers to the current when forty 12 V batteries in standard configuration, that is, two hundred and forty 2 V battery cells (1.67 V/cell), stop discharging.
- The battery cable specifications are selected based on 40 batteries by default and compatible with application scenarios with 30–50 batteries.

- When the mains input and bypass input share a power source, configure both types of input power cables as mains input power cables. The cables listed in Table are used only when the following requirements are met:
 - Routing mode: Routing the cables over the cable ladder or bracket in a single layer (IEC60364-5-52 middle E).
 - The ambient temperature is 30°C.
 - The AC voltage loss is less than 3%, and the DC voltage loss is less than 1%.
 - 90°C copper flexible cable.
 - The length of the AC power cables of a UPS is no longer than 30 m and DC power cables no longer than 50 m.

5.4.2 Power cable connector requirements

UPS CABINET (KVA)	CONNECTOR	CONNECTION MODE	BOLT TYPE	BOLT HOLE DIAMETER	TORQUE
30/50 45/60 50/100 75/125 120/150 1,2 m	Mains input connector	Crimped OT terminals	M10	10,5 mm	26 N•m
	Bypass input connector	Crimped OT terminals	M10	10,5 mm	26 N•m
	Battery input connector	Crimped OT terminals	M10	10,5 mm	26 N•m
	Output connector	Crimped OT terminals	M10	10,5 mm	26 N•m
	Grounding connector	Crimped OT terminals	M10	10,5 mm	26 N•m
90/100 135/150 180/200 225/250	Mains input connector	Crimped OT terminals	M12	12,5 mm	26 N•m
	Bypass input connector	Crimped OT terminals	M12	12,5 mm	26 N•m
270/300 2 m	Battery input connector	Crimped OT terminals	M12	12,5 mm	26 N•m
	Output connector	Crimped OT terminals	M12	12,5 mm	26 N•m
	Grounding connector	Crimped OT terminals	M12	12,5 mm	26 N•m

Table 5-3 Power cable connectors

5.4.3 Recommended input front-end and output back-end circuit breakers

UPS CABINET (KVA)	MAINS INPUT CIRCUIT BREAKER	BYPASS INPUT CIRCUIT BREAKER	MAINTENANCE CIRCUIT BREAKER	OUTPUT CIRCUIT BREAKER	BATTERY CIRCUIT BREAKER
30	63A 3P	63A 3P	63A 4P	63A 3P	100A 3P
45	80A 3P	80A 3P	80A 4P	80A 3P	160A 3P
50	100A 3P	100A 3P	100A 4P	100A 3P	160A 3P
60	125A 3P	125A 3P	125A 4P	125A 3P	175A 3P
75	160A 3P	160A 3P	160A 4P	160A 3P	250A 3P
90/100	200A 3P	200A 3P	200A 4P	200A 3P	315A 3P
120/125	250A 3P	250A 3P	250A 4P	250A 3P	400A 3P
135/150	250A 3P	250A 3P	250A 4P	250A 3P	500A 3P
180/200 225	400A 3P	400A 3P	400A 4P	400A 3P	630A 3P
250/270	500A 3P	500A 3P	500A 4P	500A 3P	800A 3P
300	600A 3P	600A 3P	600A 4P	600A 3P	1000A 3P

Table 5-4 Recommended circuit breakers



WARNING

Protective earth cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible.



WARNING

Failure to follow adequate earthing procedures may result in electromagnetic interference or in hazards involving electric shock and fire

5.5 Power cable connection

Before equipment has been installed, must confirm the input source type, common input or Split input, if the input source is dual input, must remove the copper bar that connected bypass and mains (Fig. 5-2).

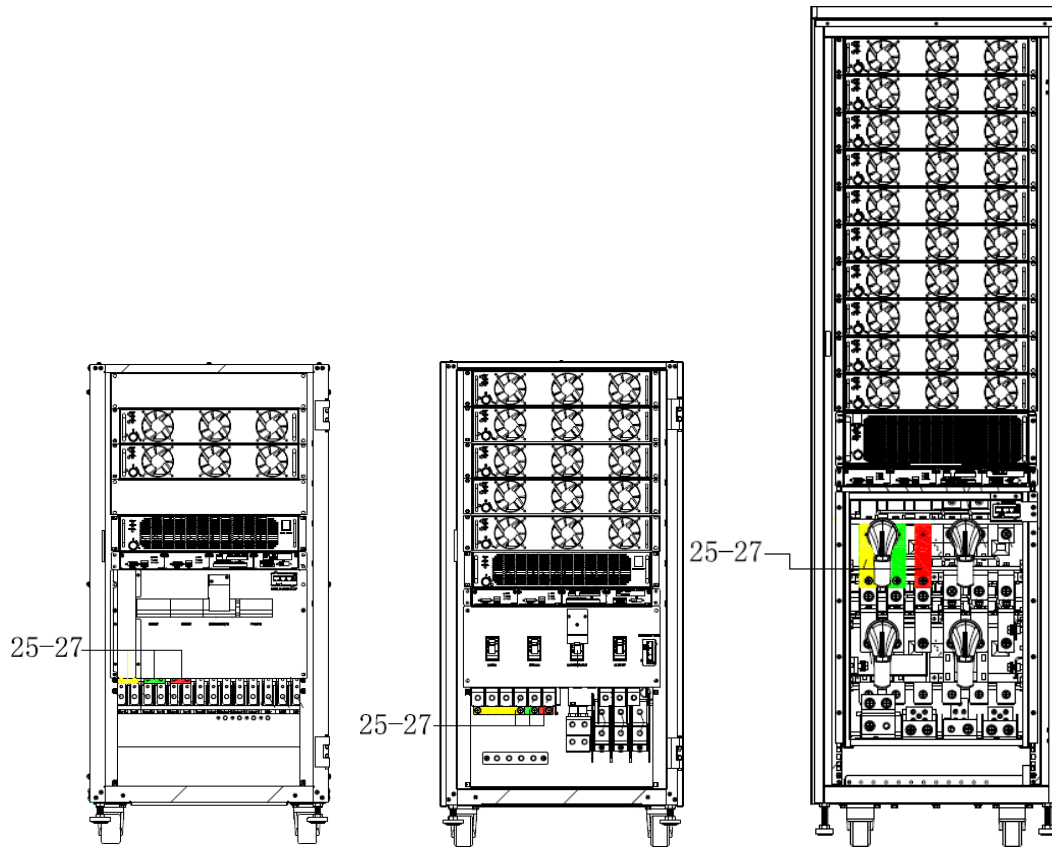


Fig. 5-2 Power cable connection

Choose appropriate power cable. (Refer to the table above) and pay attention to the diameter of the connection terminal of the cable that should be greater than or equal to that of the connection poles.

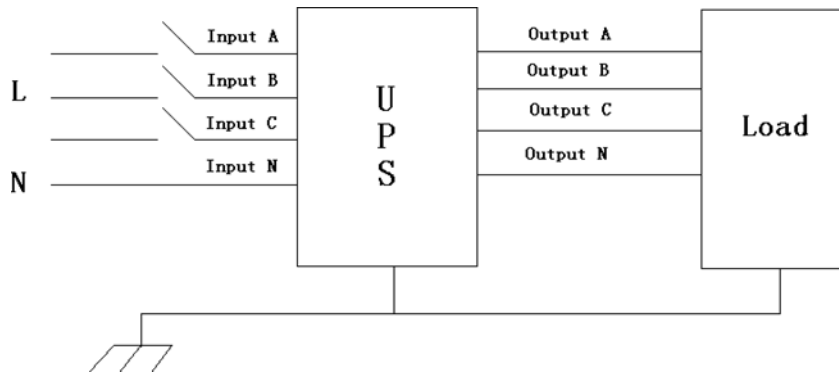


Fig. 5-3 Connection of the UPS to the load



In the case of “Dual input” operation, make sure the copper wire between each input lines have been removed. The AC input and the AC bypass supplies must be referenced to the same neutral point.



WARNING

If the load equipment is not ready to accept power on the arrival of the commissioning engineer then ensure that the system output cables are safely isolated at their ends

Connect the safety earth and any necessary bonding earth cables to the copper earth screw located on the floor of the equipment below the power connections. All cabinets in the UPS must be grounded properly.



WARNING

The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

5.6 Battery connection

The UPS adopts positive and negative double battery framework, total 30 (optional 32/34/36/38/40/42/44/46/48/50) in series. A neutral cable is retrieved from the joint between the cathode of the 15th (16th/17th/18 th/19th/20 th/21 th/22 th/23 th/24 th/25 th) and the anode of the 16th (17th/18th/19 th/20th/21 th/22 th/23th/24 th/25 th/26 th) of the batteries. Then the neutral cable, the battery Positive and the battery negative are connected with the UPS respectively. The battery sets between the Battery anode and the neutral are called positive batteries and that between neutral and cathode are called negative ones. The user can choose the capacity and the numbers of the batteries according to their desire (Fig. 5-4).

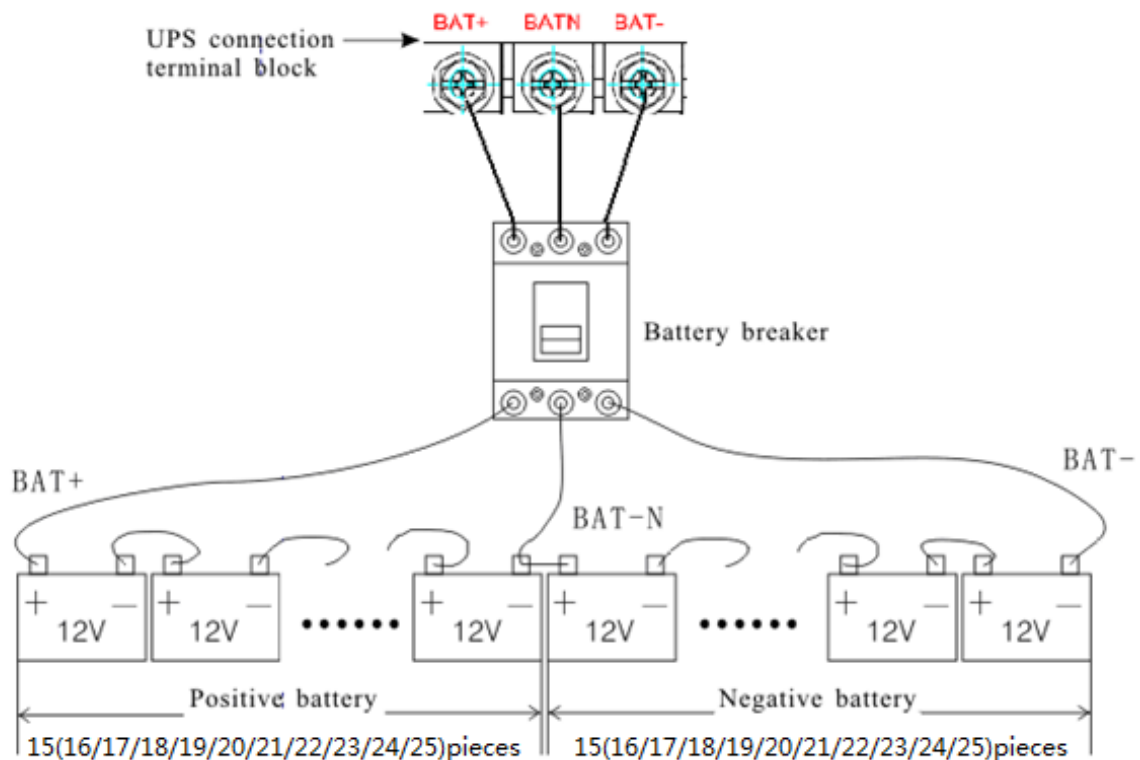


Fig. 5-4 External battery connections for long-run units



WARNING

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery.

Factory setting of the long-run unit is battery quantity---36pcs, battery capacity---12V 100AH. When connecting 30/32/34/38/40/42/44/46/48/50 batteries, please re-set desired battery quantity and its capacity after UPS starts at AC mode. Charger current could be adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software.



WARNING

Ensure correct polarity battery string series connection. I.e. inter-tier and inter block connections are from (+) to (-) terminals.

Don't mix batteries with different capacity or different brands, or even mix up new and old batteries, either.



WARNING

Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker unless authorized by the commissioning engineer.

5.7 Online UPS Modules Replacement

For the UPS, modules must be inserted to make a complete UPS system.

The replacement of UPS module is very simple and can be operated online. The control system of the UPS can detect the inserted or removed module(s) automatically. The user may operate easily by following the steps mentioned below.



WARNING

The UPS module is rather heavy, please move it by two people.

- Module insertion

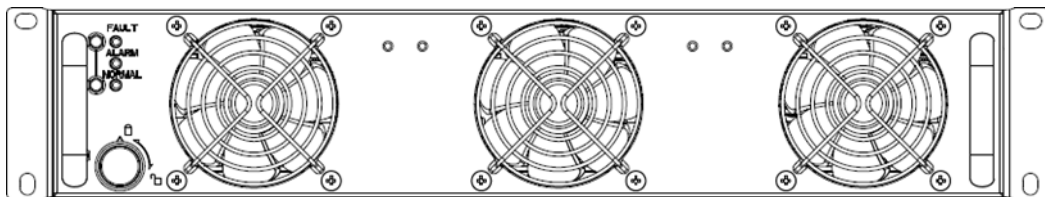


Fig. 5-5 Module insertion

1. Remove decorated panel;
2. Put the UPS module in the cabinet module slot. Push the module (Fig. 5-5) along the slot into the cabinet until the module is inserted properly, then the indicator will flash.
3. Fix the module with screws (1) at the positioning screw holes;
4. Switch on the module_ON switch (3) at the left of the module panel, then the red indicator (2) will off.
5. After the modules start up, the system will detect the modules inserted automatically and parallel up the modules into whole system.

- Remove UPS module

Switch off the module_ON switch (3) at the left of the module panel, then the red indicator (2) will light and green indicator flash. Remove the screws (1) of the module and remove the module from the cabinet.



WARNING

Before start the module, the module_ON switch must on the "ON" status and the red indicator must flash or off.

Before remove the module, the module_ON switch must on the "OFF" status and the red indicator must light.

When insert the module under battery mode, please press "Cold start" button at bypass module panel until the modules starts.

5.8 UPS parallel Installation

A group of paralleled UPS behaves as one large UPS system but with the advantage of presenting higher reliability. In order to assure that all UPS are equally utilized and comply with relevant wiring rules, please follow the requirements below:

1. All UPS must be of the same rating and be connected to the same bypass source.
2. The outputs of all the UPS must be connected to a common output bus.
3. The length and specification of power cables including the bypass input cables and the UPS output cables should be the same. This facilitates load sharing when operating in bypass mode.

The basic installation procedure of a parallel system comprising of two or more UPS modules is the same as that of single module system. The following sections introduce the installation procedures specified to the parallel system.

5.8.1 Cabinet installation

Connect all the UPS needed to be put into parallel system as below picture (Fig. 5-6).

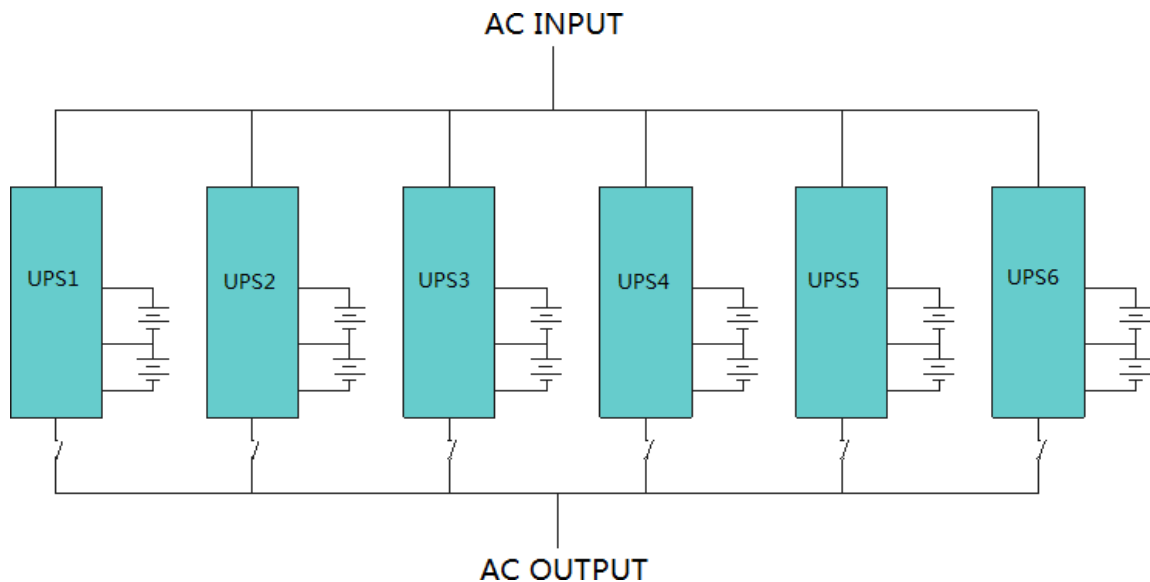


Fig. 5-6 Parallel system

Make sure each UPS input switch is in "off" position and there is no any output from each UPS connected. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and common battery.

5.8.2 Parallel cable installation

Shielded and double insulated control cables available must be interconnected in a ring configuration between

UPS modules as shown below (Fig. 5-7). The parallel control board is mounted on each UPS module. The ring configuration ensures high reliability of the control.

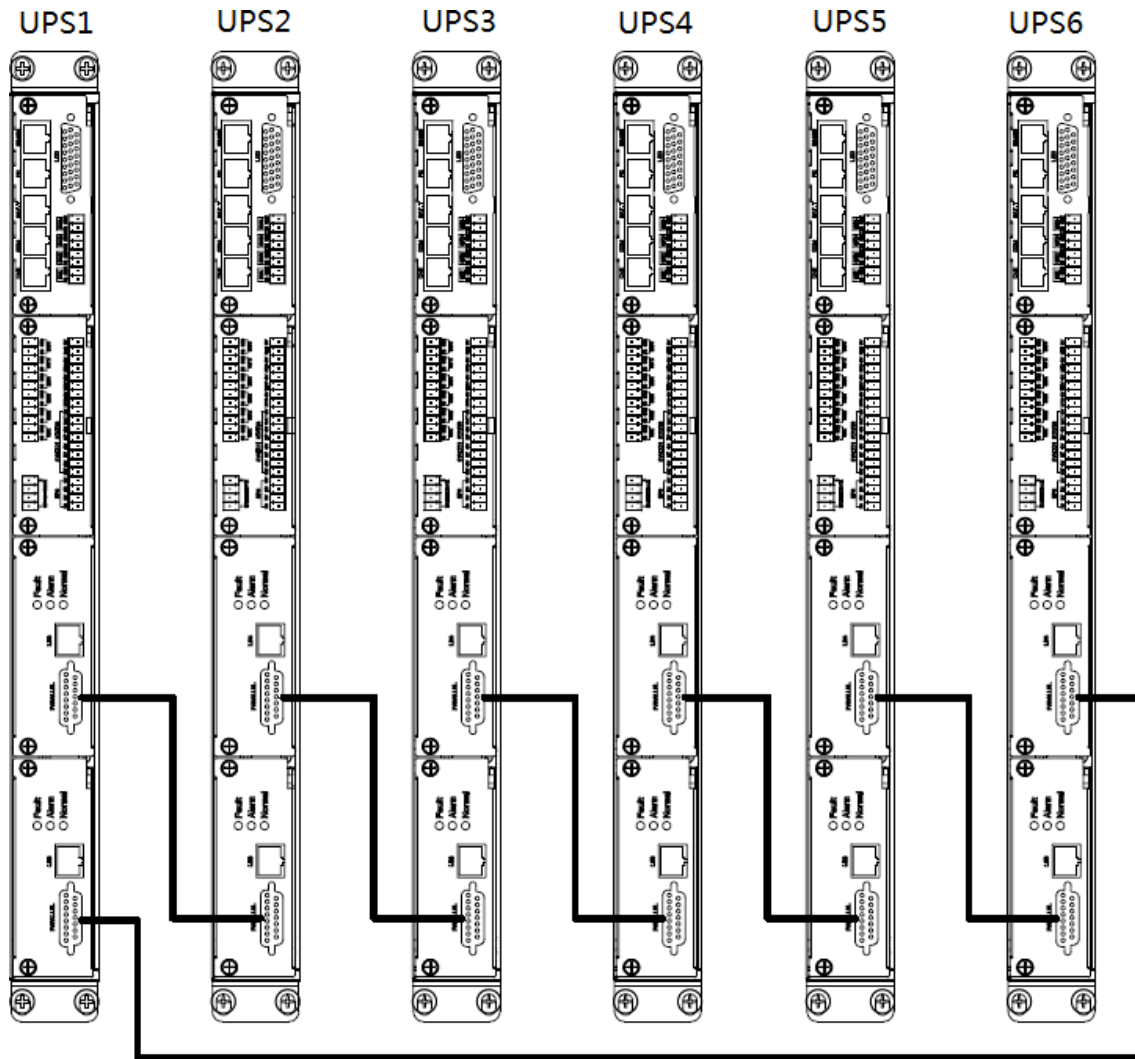


Fig. 5-7 Ring configuration

5.8.3 LBS installation (Load Bus Synchronisation)

The LBS system is a module to keep the outputs of two completely independent UPSs synchronized, even if they come from two different power supplies. LBS system contains LCD set, cable connect and STS device.

5.8.3.1 LCD setting

Set every UPS of the systems to be LBS Master or LBS Slave. For instance, if the UPS belongs to LBS master system, its LBS setting must be set to Master.

5.8.3.2 LBS cable installation

The two ports of one mesh wire should be plug into RJ45 interface of any one UPS of both master and slave system (Fig. 5-8).

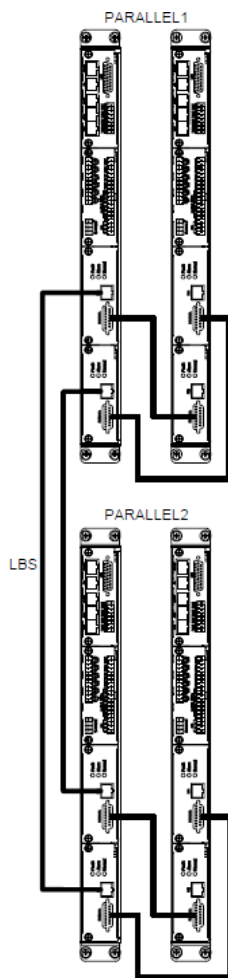


Fig. 5-8 LBS cable installation

5.8.3.3 UPS installation

The whole systems are showed below (Fig. 5-9).

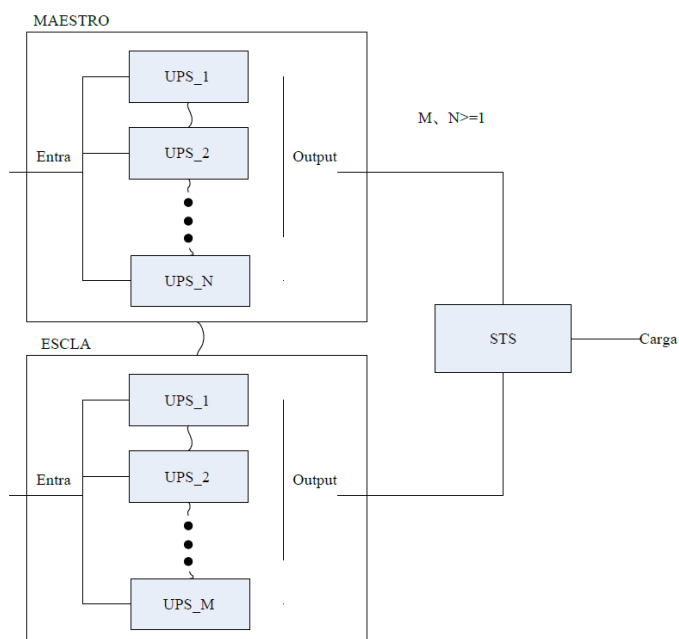


Fig. 5-9 Installation of the whole system

5.9 Communication

5.9.1 CAN communication port definition

Definition of port (Fig. 5-9):

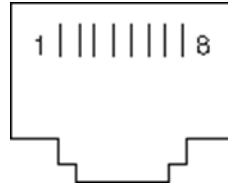


Fig. 5-10 Puerto CAN

Connection between the Device’s CAN converter port and UPS CAN port (Table 5-5).

BMS	SAI (RJ45)	DESCRIPTION
PIN 1	PIN 1	CAN_H
PIN 2	PIN 2	CAN_L
PIN 3/7	PIN 3/7	CAN_GND

Table 5-5 CAN Connection

Available functions of CAN

- Communicate to BMS.
- Communicate to remote LCD.

5.9.2 Definición del puerto de comunicación RS485

Definition of port (Fig. 5-11):

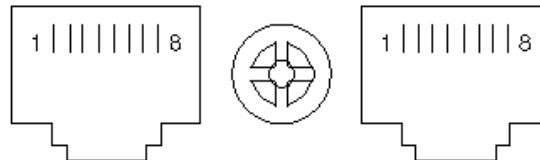


Fig. 5-11 RS485 port

Connection between the Device’s RS485 port and UPS RS485 port (Table 5-6).

DEVICE (RJ45)	UPS (RJ45)	DESCRIPTION
Pin 1/5	Pin 1/5	485+ «A»
Pin 2/4	Pin 2/4	485 - «B»

Table 5-6 RS485 Connection

Available function of RS485

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

RS485 communication data format

- Baud rate: 9600 bps
- Byte length: 8 bit
- End bit: 1 bit
- Parity check: None

5.9.3 BAT_T communication port definition

Definition of port (Fig. 5-12):

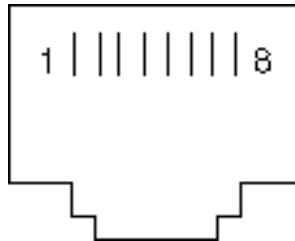


Fig. 5-12 BAT_T port

Connection between the Device’s RS485 port and UPS COM port (Table 5-7).

DEVICE (RJ45)	UPS (RJ45)	DESCRIPTION
Pin 1/5	Pin 1/5	485+ «A»
Pin 2/4	Pin 2/4	485 - «B»
Pin 7	Pin 7	12 Vdc
Pin 8	Pin 8	GND

Table 5-7 BAT_T Connection

Available functions of RS485

- Communicate to temperature sensor

RS485 communication data format

- Baud rate: 9600 bps
- Byte length: 8 bit
- End bit: 1 bit
- Parity check: None

5.9.4 REPO instruction

Connection diagram (Fig. 5-13):

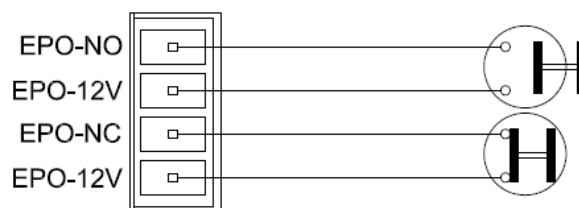


Fig. 5-13 REPO Connection

Connection between the button and UPS REPO port (Table 5-8):

BUTTON	UPS REPO	DESCRIPTION
Pin 1	Pin 1	EPO-NA
Pin 2	Pin 2	EPO-12 V
Pin 1	Pin 3	EPO-NC
Pin 2	Pin 4	EPO-12 V

Table 5-8 REPO Connection

A remote emergency stop switch can be installed in a remote location and connection through simple wires to the REPO connector.

6 OPTIONS

6.1 SNMP card



WARNING

For network management configuration and use, refer to the separate user manual - Network Management Card with Environmental Monitor - shipped with the CARD.

Internal SNMP / external SNMP optional:

1. Loosen the 2 torque screws (on each side of the card).
2. Carefully pull out the card. Reverse the procedure for re-installation

The slot called SNMP supports the MEGAtec protocol. We advise that NetAgent II-3 port is also a tool to remotely monitor and manage any UPS system (Fig. 6-1).

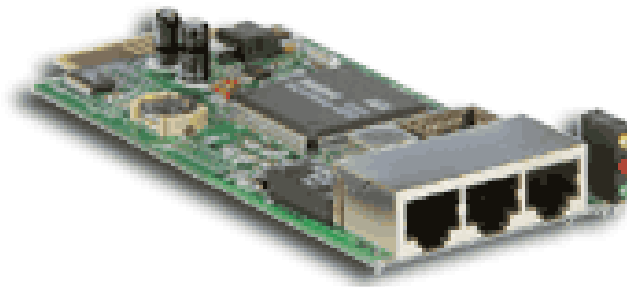


Fig. 6-1 Overview of the SNMP card

NetAgent II-3Ports supports the Modem Dial-in (PPP) function to enable the remote control via the internet when the network is unavailable.

In addition to the features of a standard NetAgent Mini, NetAgent II has the option to add NetFeeler Lite to detect temperature, humidity, smoke and security sensors. Thus, making NetAgent II a versatile management tool. NetAgent II also supports multiple languages and is setup for web-based auto language detection (Fig. 6-2).

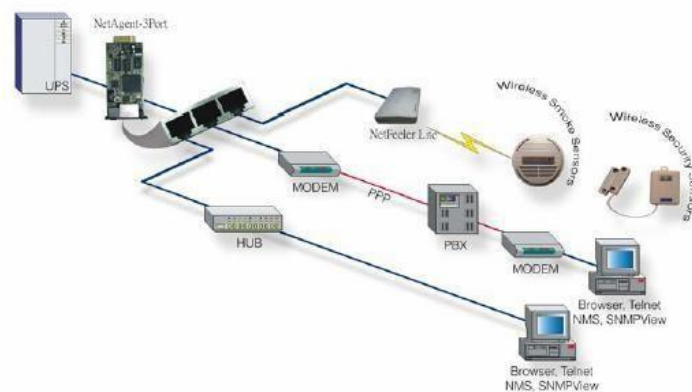


Fig. 6-2 Typical topology of the UPS Network Management

7 TROUBLESHOOTING

7.1 Problems and Solution ZGR SCALABLE 60 – 300 KVA

ZIGOR recommends that, in case of any anomaly, strange noise or supposed malfunction, the equipment should be shut down and ZIGOR customer service should be contacted.

The system ZGR SCALABLE 60 – 300 KVA has a specific section of active system events, in the Events menu (Table 4-2 and Table 4-3).

The following table summarizes different anomalous conditions and their possible solution

NO.	PROBLEM	POSSIBLE REASON	SOLUTION
1	LCD not display	The network cable is not fixed properly or the telephone line of the front door is not fixed properly.	Connect the network cable and telephone cable properly.
2	LCD Blue screen	LCD is Interference	Take out the cable and insert back properly
3	Utility is connected but the UPS cannot be powered ON.	Input power supply is not connected; Input voltage low; The input switch of the module is not switched on.	Measure if the UPS input voltage/frequency is within the window. Check if all modules input are switched on
4	Utility normal but Utility LED does not light on, and the UPS operates at battery mode	The input switch of the Modules are not switched on; input cable is not well connected	Switch on the input switch; Make sure the input cable is well connected.
5	The UPS does not indicate any failure, but output do not have voltage	Output cable does not well connected	Make sure the output cable is well connected.
6	The UPS module cannot transfer to bypass or inverter	Module does not well inserted; The left coronal screw is not tight. Output switch do not switch on	Pull out the module and insert again; Tighten the screw; Switch on the output switch.
7	The UPS module fault LED remains ON	The module is already damaged	Take out this module, replace with a new module.
8	Utility LED is flashing	Utility voltage exceeds UPS input range.	If the UPS operates at battery mode, please pay attention to the remaining backup time needed for your system.
9	Battery LED is flashing but no charge voltage and current	Battery switch does not switch on, or batteries are damaged, or battery is reversely connected. Battery number and capacity are not set correctly.	Switch on the battery switch. If batteries are damaged, need to replace whole group batteries, Connect the battery cables correctly; Go to LCD setting of the battery number and capacity, set the correct data.

10	Buzzer beeps every 0,5 seconds and LCD display “output overload”	Overload	Remove some load
11	Buzzer long beeps, LCD display “output short circuit”	The UPS output is in short circuit	Make sure the load is not in short circuit, and then restart the UPS.
12	The LED of the Module with RED light	The module is not inserted properly.	Pull out the module and insert properly.
13	The UPS only works on bypass mode	The UPS is set to ECO mode, or the transfer times to bypass mode are limited.	Set the UPS working mode to Single Module type(non-parallel) or to reset the times of transferring to bypass or re-start the UPS
14	Cannot Black start	Battery switch is not properly closed; Battery fuse is not open; Or Battery low	Close the battery switch; Change the fuse; Recharge the battery
15	Buzzer beeps continuously and LCD indicates Rectifier fault or output fault	UPS is out of order	Consult with your local agent for repair

Table 7-1 Trouble shooting

Given the complexity of the equipment, when a serious error occurs and causes the equipment to stop, ZIGOR customer service should be contacted to assist you step-by-step to your resolution by providing the information requested.

Para información más detallada: www.zigor.com
sac@zigor.com

7.2 Recommended spare parts

You can ask ZIGOR for a list of recommended spare parts for the client systems so that a large percentage of malfunctions can be quickly and simply repaired.

8 MAINTENANCE

You can ask for an offer to ZIGOR in order to perform a basic maintenance of this equipment, so that it can prolong the life of the system.

In order to guarantee the correct operation of the ZGR SCALABLE 60 – 300 KVA, it is necessary to carry out a number of maintenance tasks. These tasks enable resolving defects before breakdowns occur and to ensure correct operation of active and passive safety devices.

The frequency of maintenance tasks is dependent upon the location and the atmospheric conditions. The air quality (temperature, dust in suspension, etc.) has a great influence on the amount of maintenance work to be done in order to maintain the functionalities of the equipment within an acceptable level of uncertainty. That is, for example, if the air contains a great amount of dust in suspension, the maintenance work must be carried out more frequently than the standard frequency indicated. The recommended maintenance tasks in accordance with frequency are as follows:

- Monthly:
 - Visual control of correct operation:
 - Values within margins.
 - No active event.
 - Control of the event history, in search of sporadic or repetitive failures.
 - Check nothing blocks the ventilation of the front, rear and side panel and the case bottom.
- 6 monthly:
 - Check on the correct ventilation of the location.
 - Cleaning of the equipment's air inlet filters.
 - Removal of foreign bodies both in the air inlet and outlet.
 - Visual verification of the status of connecting wires, rusting, damage to insulation, etc.
- Annually:
 - Cleaning and blowing of electronics.
 - Checking the tightening and condition of the cables, power and signal.
 - Visual checking.
 - Retightening of the connections.
 - Check for colour changes or deformations due to hot spots.
 - Review of hardware (tightening) and wiring (possible rodent involvement or similar).
 - Cleaning control and water filtration of the room where the system is located.
 - Connection of the external AC protections of the equipment (switches, thermal magnets, etc.) and complete controlled start of the equipment.

For some of these maintenance tasks, shutdowns and disconnections must be made.



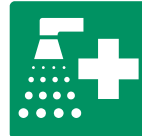
WARNING

Incorrect maintenance can render the warranty null and void.

- Fan: 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.
- UPS status checking:
 - Check to see if there is any fault occurred, fault indicator is on or any alarm there.
 - Please find the cause if the UPS is working in bypass mode.
 - If the UPS is working in battery mode, make sure it is normal; on the contrary, please find out the root cause, such as Utility Failure or self-check of battery.

The rest of the installation must also be maintained adequately. The maintenance tasks to be carried out shall depend on the different elements that make up the installation, emergency generator and cabling. The battery requires special attention.

8.1 Battery maintenance



Efficient maintenance lengthens the service life of batteries and ensures that the unit operates correctly.

Placing the batteries correctly so that all their elements can be easily reached facilitates maintenance. Maintenance consists of checking the following aspects:

- Cleanliness: The elements, their connections and supports must be kept clean and dry. It is recommended to protect the terminals and metal connections with diluted vaseline. Do not use cleaning products containing solvents and/or harmful substances for cleaning elements with plastic containers.
- Connections and terminals: Check the tightness of nuts on the poles of elements as well as the tightness of the electrical connection with at regular intervals of approximately 12 months.
- Checking voltages: Check the voltages of elements in order to detect any possible anomalies in these.

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 °C.
- 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.



WARNING

Before replacing batteries, first please turn off the UPS and break off the mains. Remove your metallic adornment such as finger ring, watch and so on.

When replace batteries, please use the screwdriver with insulating handle. Do not lay the tools or metallic goods on the battery.

Never reverse or short-circuit between the battery anode and cathode.

Do not smoke, light a fire or generate sparks near batteries during recharging as there is a risk of fire and/or explosion.

For cleaning, do not use synthetic material clothes or sponges. Keep batteries clean and dry at all times. Protect them against dirt, dust, metal shavings, etc.

9 TECHNICAL SPECIFICATIONS

CABINET (30 KVA MODULE)		60 KVA	150 KVA	300 KVA
Capacity	UPS cabinet	30 ~ 60 kVA 30 k ~ 60 kW	30 k ~ 150 kVA 30 k ~ 150 kW	30 ~ 300 kVA 30 ~ 300 kW
	Module	30k / 30k		
	Max. Number	2+1	5 / 4	10 / 9
CABINET (25 KVA MODULE)		50 KVA	125 KVA	250 KVA
Capacity	UPS cabinet	25 ~ 50 kVA 25 ~ 50 kW	25 ~ 125 kVA 25 ~ 125 kW	25 ~ 250 kVA 25 ~ 250 kW
	Module	25 kVA / 25k		
	Max. Number	2+1	5 / 4	10 / 9
CABINET (20 KVA MODULE)		60 KVA	100 KVA	200 KVA
Capacity	UPS cabinet	20 ~ 100 kVA 20 ~ 100 kW	20 ~ 200 kVA 20 ~ 200 kW	10 ~ 300 kVA 10 ~ 300 kW
	Module	20 kVA / 20k		
	Max. Number	3	5 / 4	10 / 9
CABINET (15 KVA MODULE)		45 KVA	75 KVA	150 KVA
Capacity	UPS cabinet	15k~75k / 15k~75k	15k~150k / 15k~150k	10k~300k / 10k~300k
	Module	15 kVA / 15k		
	Max. Number	3	5 / 4	10 / 9
CABINET (10 KVA MODULE)		30 KVA	50 KVA	100 KVA
Capacity	UPS cabinet	10 ~ 30 kVA 10 ~ 30 kW	10 ~ 50 kVA 10 ~ 50 kW	10 ~ 100 kVA 10 ~ 100 kW
	Module	10 kVA / 10k		
	Max. Number	3	5 / 4	10 / 9
Redundancy Bypass module (optional)		Yes	NA / Yes	NA / Yes
INPUT ELECTRICAL CHARACTERISTICS				
Phases		Three-phase +N + ground		
Nominal Input voltage		380 / 400 / 415 Vac		
Input voltage Range		138 ~ 485 Vac for 40% Load; 305~485Vac for 100% Load		
Frequency		40 Hz / 70 Hz		
Power factor		≥ 0,99		
Bypass voltage range		220 Vac max+25 % (optional +10 %, +15 %, +20 %); 230 V: +20 % (optional +10 %, +15 %); 240 V: +15 % (optional +10 %) min.: -45 % (optional -10 %, -20 %, -30 %)		
Bypass frequency range		Frequency protection range: 10 %		
THDI		≤ 3 % (100 % lineal load)		
Generator input		Support		
OUTPUT ELECTRICAL CHARACTERISTICS				
Phases		Three-phase +N + ground		
Output voltage		380 / 400 / 415 Vac		
Voltage regulation		±1,0 %		
Voltage distortion (THD)		1		
Voltage distortion (THD)		≤ 2 % al 100 % of lineal load ≤ 4 % al 100 % of non-lineal load		

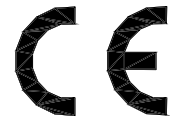
Output frequency	Line Mode: $\pm 1\%$ / $\pm 2\%$ / $\pm 4\%$ / $\pm 5\%$ of the rated frequency (optional) Battery Mode: 50 / 60 $\pm 0,1\%$ Hz		
Crest factor	3:1		
Efficiency	95,8 %		
BATTERY			
Battery voltage	Optional Voltage: ± 180 V / ± 192 V / ± 204 V / ± 216 V / ± 228 V / ± 240 / ± 252 / ± 264 / ± 276 / ± 288 / ± 300 Vdc (30/32/34/36/38/40/42/44/46/48/50 pcs optional) 360 Vdc ~ 600 Vdc (30 ~ 50 pcs, 36 pcs define, 36~50 pcs no power derating; 32~34 pcs output power factor 0.9; 30 pcs output power factor 0,8)		
Power module Charge Current	18 A (Max.)		
UPS cabinet Max. Charge Current	54 A	90 A / 72 A	180 A / 162 A
COMMUNICATIONS			
Monitorization	LCD + Software		
Communications	CAN, RS485, Parallel, Dry contact port, Relay card (optional), SNMP Card (optional), Battery temperature sensor (optional)		
Alarm	Line Mode, Bypass Mode, Battery Low, Battery Bad, Overload & UPS Fault		
Audible & Visual alarms	Line Failure, Battery Low, Overload, System Fault		
OTHERS			
Protections	Short circuit, overload, overtemperature, battery low, fan fault		
Transfer time	Utility to Battery	0 ms	
	Utility to bypass	0 ms	
Overload	Line Mode	110% overload for 60 min; 125% overload for 10 min; 150% overload for 1 min	
	Bypass Mode	135% overload for long term; >1000% overload for 100 ms	
Overheat	Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately		
Low battery voltage	Alarm and Switch off		
Self-diagnostics	Upon Power On and Software Control		
EPO (optional)	Shut down UPS immediately		
MECHANICAL AND ENVIRONMENTAL CHARACTERISTICS			
Noise level	< 58 dB	< 61 dB	< 68 dB
Operating temperature	0 °C – 40 °C		
Storage temperature	-25 °C – 55 °C (without battery)		
Humidity range	0 - 95 % (without condensation)		
Altitude	< 1500 m. When > 1500 m, lower the rated power for use		
Dimensions (AnxAlxF)	UPS cabinet	600 x 1200 x 850 mm	
	Module	440 x 86 (2U) x 620 mm	
Approx. weight	UPS cabinet	142 kg	153 kg
	Module	10 kVA: 19 15 - 30 kVA: 21	
STANDARDS			
Marks	CE		
Directives	EN 60950-1, EN 62040-1:2008/A1:2013, IEC 62040-2:2016, IEC 62040-3:2011, ROHS		

- The technical specifications may be modified without prior notice.
- For any other technical need or modification of existing ones, consult ZIGOR

10 STANDARDS

ZGR SCALABLE 60 – 300 KVA model described in this manual comply with the following European regulations:

- I. European electromagnetic compatibility directive (EMC)
Standard: EN 62040-1:2008/A1:2013
IEC/EN 62040-3:2011
- II. Uninterruptible power supply (UPS)
Standard: IEC/EN 62040-2:2016
- III. Safety:
Standard: EN 60950-1
ROHS



11 WARRANTY

Unless otherwise agreed, ZIGOR guarantees that ZGR SCALABLE 60 – 300 KVA units leave the factory in perfect working order and free of any defects for a period of 12 months to be counted as of the date of sale of the apparatus, shown in the delivery note and/or invoice.

ZIGOR will guarantee to the Buyer, the proper functioning against manufacturing and/or workmanship defects. This Warranty includes, whenever the circumstances of good use on the equipment, replace, repair (workmanship included) or refund the purchase price as paid by the customer within the above specified period according to the type of defect and are only and exclusive remedies guaranteed under this Limited Warranty.

The replacement of spare parts, if required, will be made with other new or repaired parts and the replaced ones will become property of ZIGOR.

Unless otherwise agreed, it's not included any assistance and / or displacement. If demanded by the buyer, he'll be held responsible for it.

The customer will be free of charge provided the cause of equipment failure due to defective material thereof, without being affected by the exclusion of warranty causes described in the next section. In any other circumstances be charged the amount of economic displacement.

The following situations will cancel the guarantee of the product:

- Faults due to improper handling of the product, according to the operating instructions, misuse, default grid or by storm.
- Improper use of the equipment according to the Operating Manual and without respecting the original characteristics of the equipment.
- Installation in a place/ environment that does not meet the requirements indicated in the Operating annual referring to the Installation Conditions.
- When the customer not clearly proves the systematic realization of regular maintenance operations described in the Operating Manual.
- Equipment deterioration due to external agents (water, dirt, animals, etc.)
- Damages caused by accident, theft, fire, inadmissible atmospheric conditions, external agents (animals, insects, etc.) or natural disasters.
- In case of any intervention and/or repair by an unauthorised Technical Service.
- The use of equipment or accessories, not sell and/or installed by ZIGOR or their Authorised Technical Service.
- Environmental Operating Conditions out of range.

When the unit is equipped with lead-acid batteries, it must be considered the following precautions:

Those elements are fully charged before shipment. They can be stored for up 2 years provided that they are charged at minimum intervals of 6 months during their storage.

The installation of elements inside the unit by personnel other than those authorised by ZIGOR, shall render the warranty null and void. ZIGOR will not accept responsibility for the repair of equipment if any of the seals installed for internal checks is broken.

The validity of this guarantee is limited to the proper use of the equipment according to the Operating Manual and while respected the original characteristics of the equipment.

The Spanish Standardisation and Certification Association (AENOR) certifies that the “Quality Assurance ” and “Environmental Management Systems” adopted by ZIGOR CORPORACIÓN, S.A. for the design, development, production and after sales service for electronic equipment for the conversion of direct and alternating current as well as electronic projections, communications systems, telemanagement applications and electrical and electronic turnkey projects, is an agreement with the requirements of the Spanish Standards UNE-EN ISO 9001:2008 and UNE-EN ISO 14001:2004 respectively.





Zigor Corporación
Portal de Gamarra 28- 01013
Vitoria-Gasteiz Álava/Spain
+34 945 21 46 00
www.zigor.com

Consulte nuestra web para contactar con la red de delegaciones comerciales
Refer to our website in order to contact the commercial branches network
Veillez consulter notre page web pour contacter nos délégations commerciales
Consulte a nossa web para contatar com a rede de degações comerciais