Operation Manual

# ZGR SCALABLE 60 – 300 KVA

## Online Three-phase UPS

# INDEX

# 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 -20ºC to 55ºC and that of the reserve model without internal battery is -40ºC to 70ºC. An increase of 10ºC 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.*

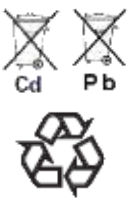
*To dispose of this product and ensure its proper management, follow the current local environmental legislation and regulations. In this way it will contribute to conserve the environment.*

*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. The procedure to transport of the UPS to the final location should follow the procedure:

1. Use a pallet truck to transport the UPS to the installation position.
2. Check the UPS packing.
3. Hold the sliding plate steady. Cut and remove the binding tapes (Fig. 1-1).

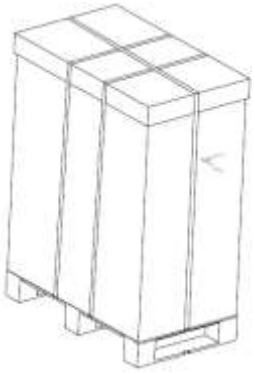


Fig. 1-1 Removing the fastening tapes

4. Remove the plastic bag and take out the fittings box.
5. Check that the UPS is intact.

   Visually inspect the UPS appearance for shipping damage. If it is damaged, notify the carrier immediately.

   Check the accessories according to the packing list and contact the dealer in case of missing parts.

6. Remove the front panel and real panel to remove the L-shaped bracket that secures the cabinet and the pallet, and secure the sliding (Fig. 1-2).

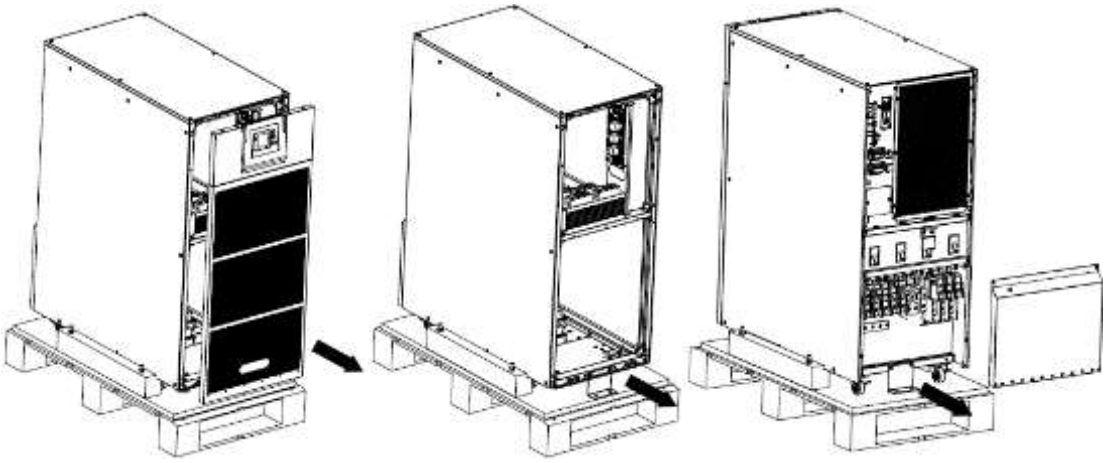


Fig. 1-2 Front and rear panel removal

7. Remove the front panel and real panel to remove the L-shaped bracket and the plates at the left and right side of the UPS that secures the cabinet and the pallet, and secure the sliding (Fig. 1-3).

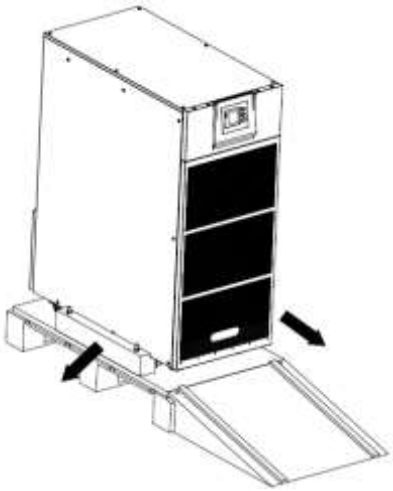


Fig. 1-3 Removing the original packaging

## 1.6 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.

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

## 1.7 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
- LBS function support for synchronized outputs even when different mains supply.
- 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):

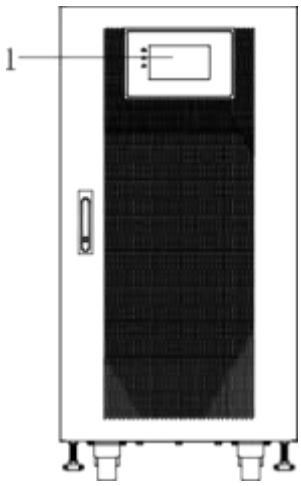



Fig. 2-1 Front view of ZGR SCALABLE 30-60 kVA

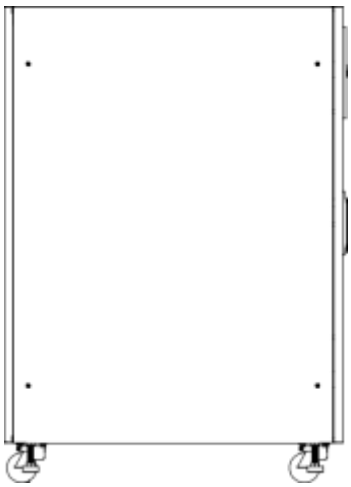


Fig. 2-2 Side view of ZGR SCALABLE 30-60 kVA

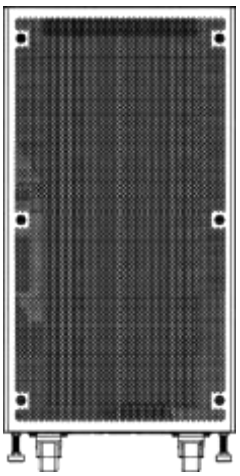


Fig. 2-3 Rear view of ZGR SCALABLE 30-60 kVA

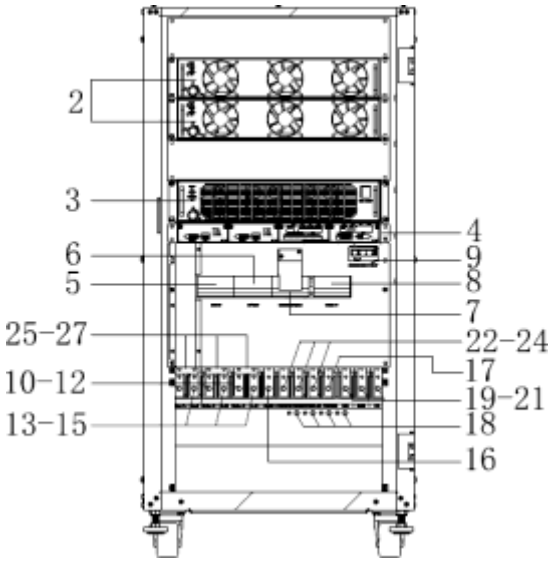



Fig. 2-4 Front view of ZGR SCALABLE 30-60 kVA (redundant power module and bypass module are optional)

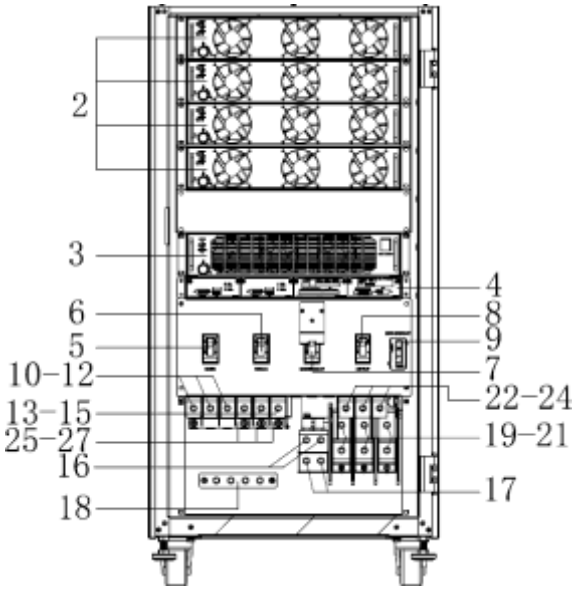



Fig. 2-5 Front view of ZGR SCALABLE 40-120 kVA (redundant power module and bypass module are optional)

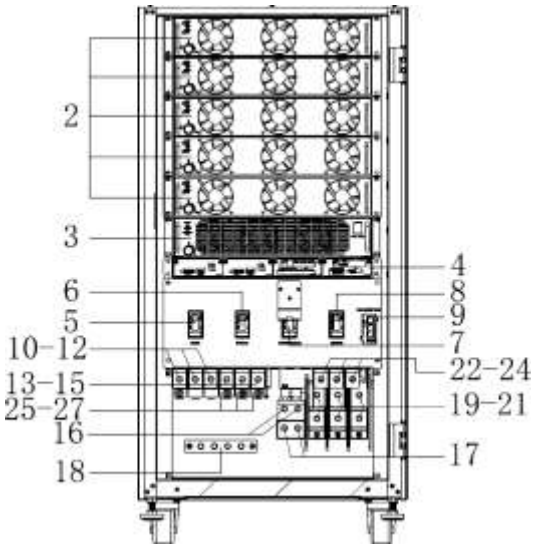



Fig. 2-6 Front view of ZGR SCALABLE 50-150 kVA

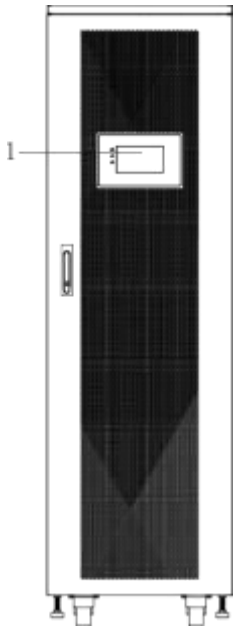



Fig. 2-7 Front view of ZGR SCALABLE 90-300 kVA

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

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

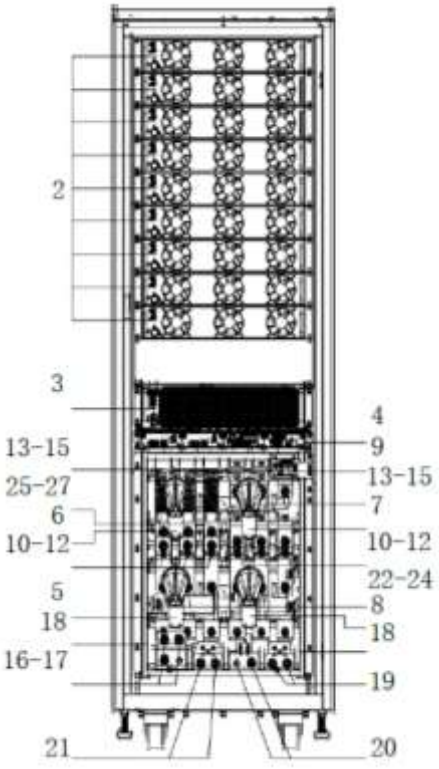



Fig. 2-10 Front view of ZGR SCALABLE 90-270 kVA (Redundant power module and bypass module are optional)

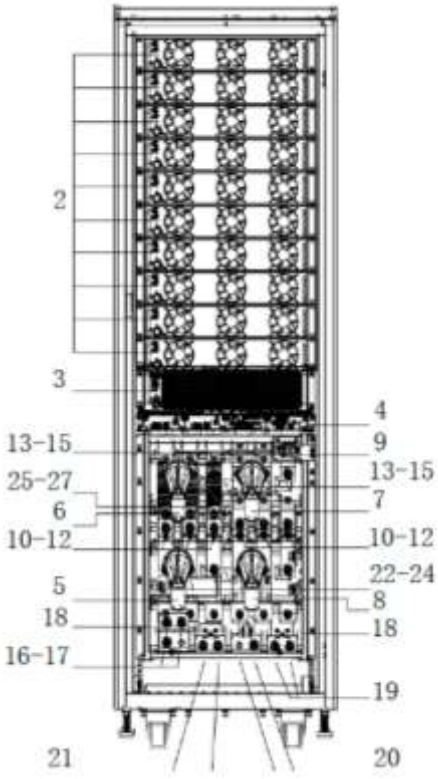



Fig. 2-11 Front view of ZGR SCALABLE 100-300 kVA

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

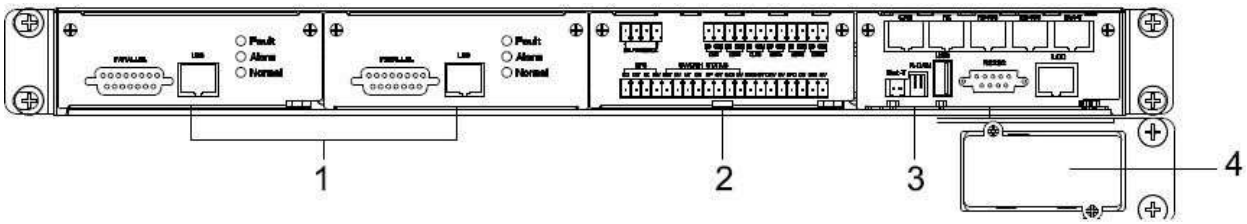



Fig. 2-12 Control unit

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

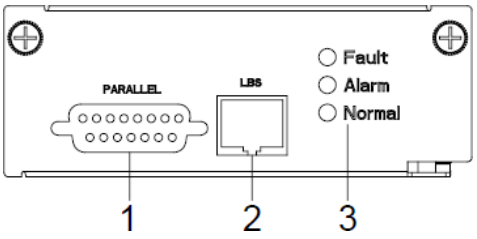



Fig. 2-13 ECU unit

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

Parallel port

1. LBS synchronization port
2. Status LEDs

- Dry-contact unit

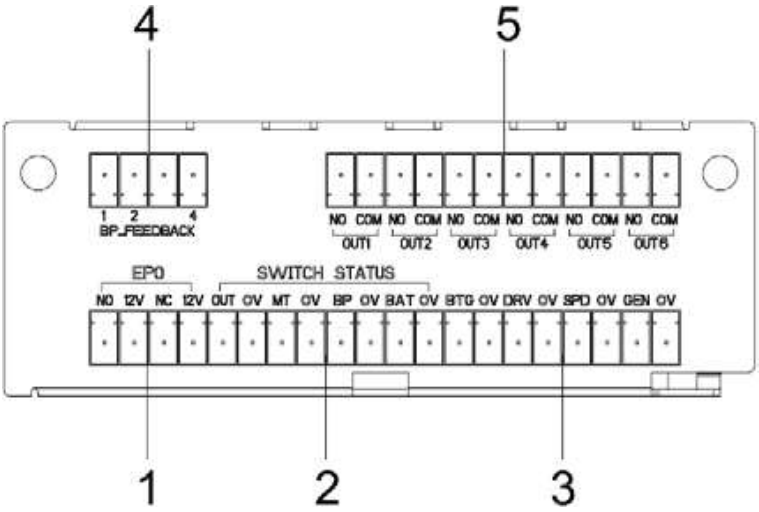



Fig. 2-14 Dry contact unit

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

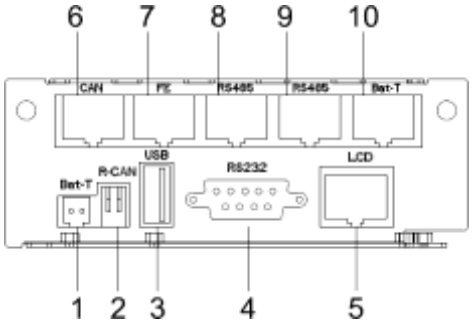



Fig. 2-15 Monitor unit

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 “terminator”
3. USB port: for software update and history download
4. RS232 port: for communication
5. Dedicated LCD display port
6. CAN port: BMS port
7. FE: Factory port (reserve)
8. RS485 port: for communication
9. RS485 port: for communication
10. BAT_T (RJ45): external long distance battery temperature sensor port. (RS485)

- UPS module appearance

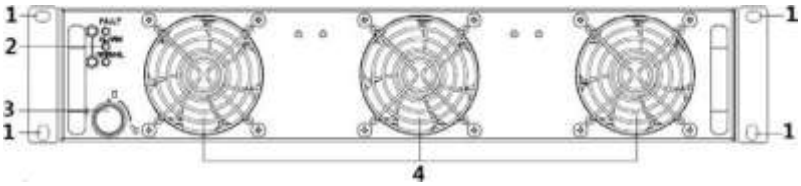



Fig. 2-16 Front view of the UPS module

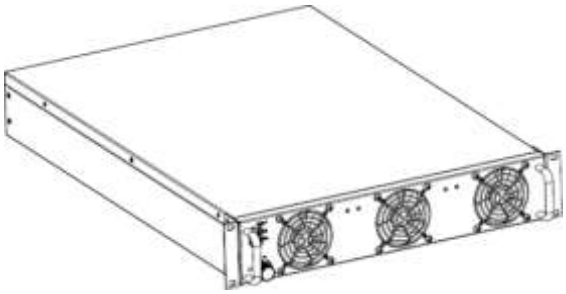
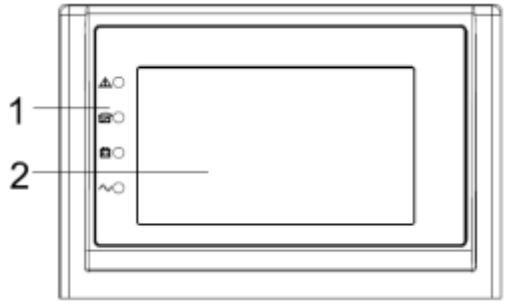


Fig. 2-17 Side view of the UPS module

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

1. Module fixed screw
2. Status LEDs
3. Lock and module activation switch
4. Cooling fans

- Front LCD panel



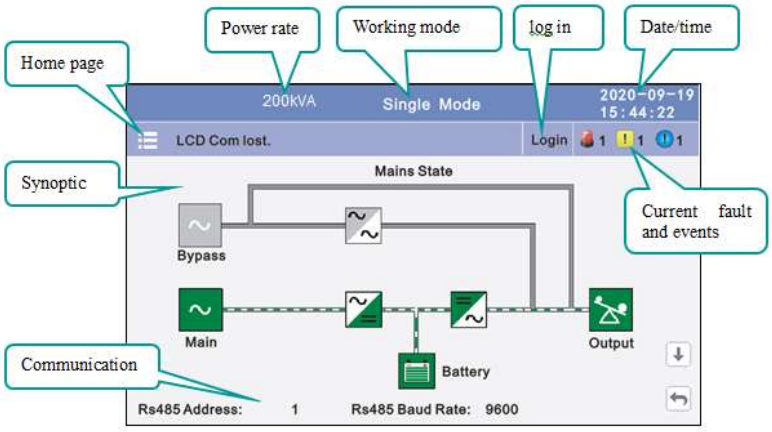

(1) Informative LED

UPS Fault

Bypass ON

On battery

Inverter ON)




(2) LCD touch screen

# 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).

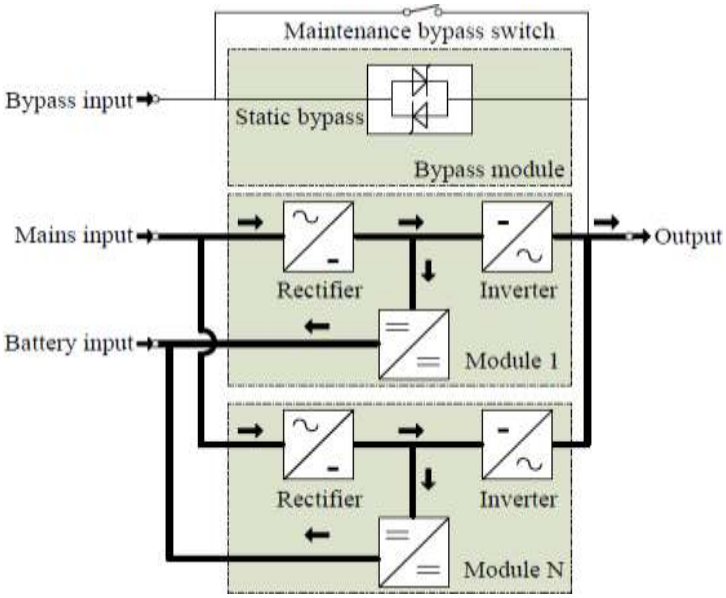



Fig. 3-1 Normal mode

### 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).

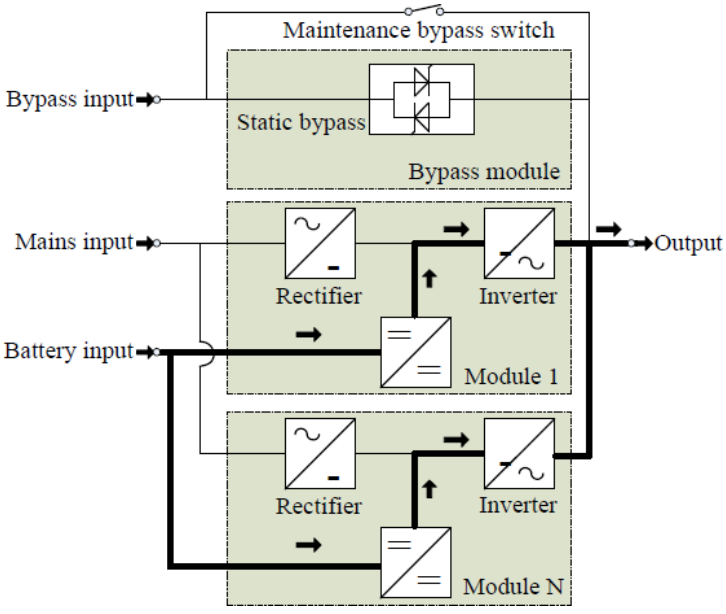



Fig. 3-2 Battery mode

### 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).

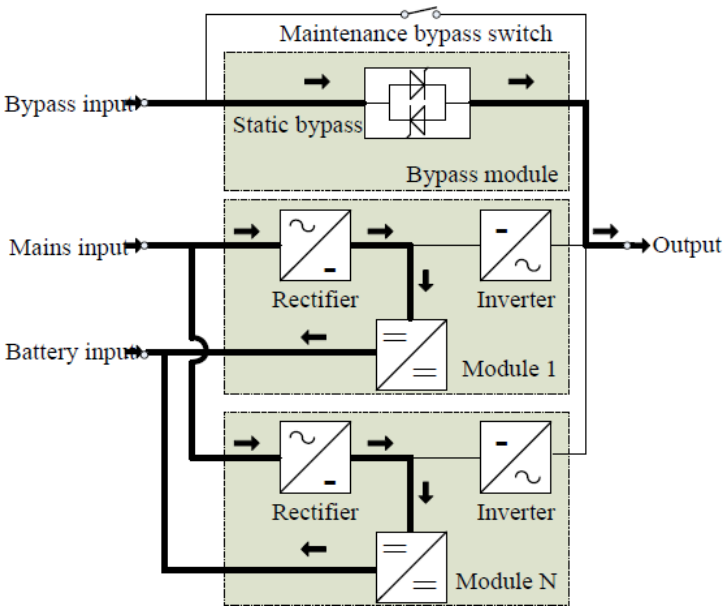



Fig. 3-3 Bypass mode

### 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.

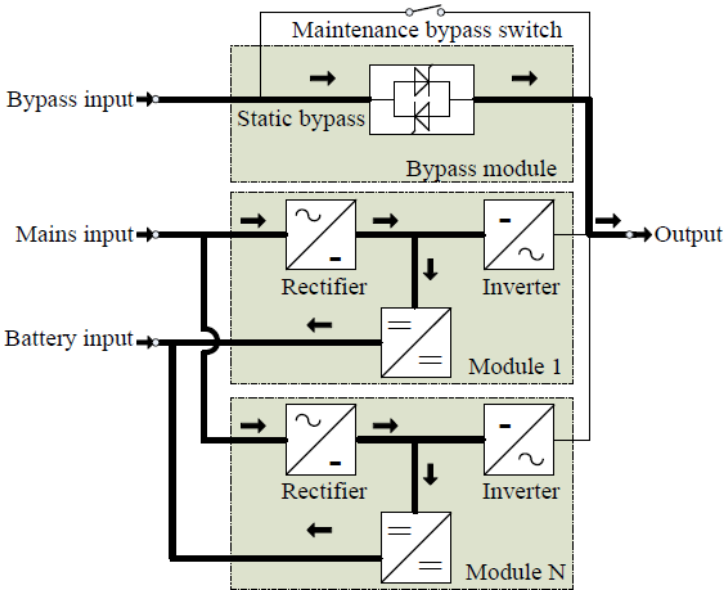



Fig. 3-4 ECO mode

### 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).

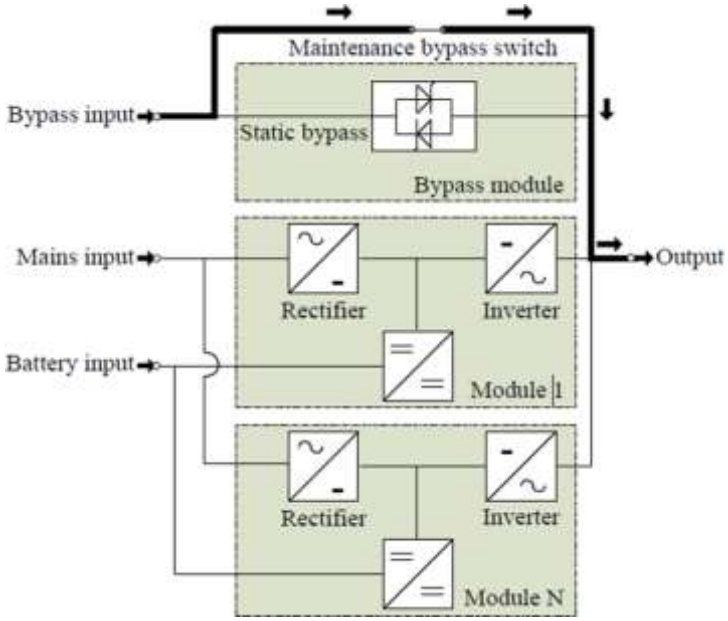



Fig. 3-5 Maintenance mode

### 3.1.6 LBS sync output

These UPSs have built-in LBS function, which allows 2 sets of UPSs with unsynchronised loads to be paralleled, keeping the inverter outputs synchronised.

This allows installations that are sensitive to phase sequence and synchronisation to continue to operate without problems.

An external STS switch is required and this may incur a small transfer delay.

Contact ZIGOR to check whether your installation can be compatible with this function.

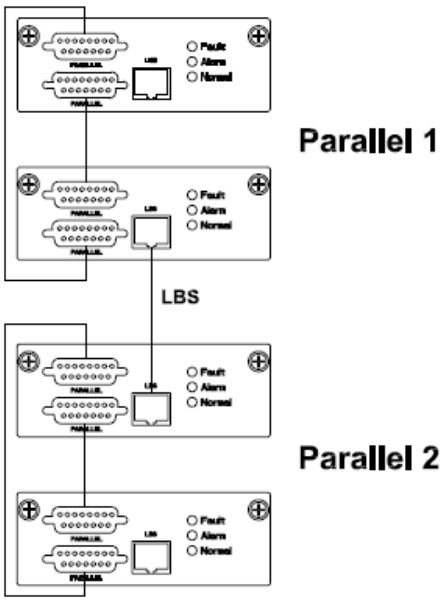



Fig. 3-6 LBS cable installation

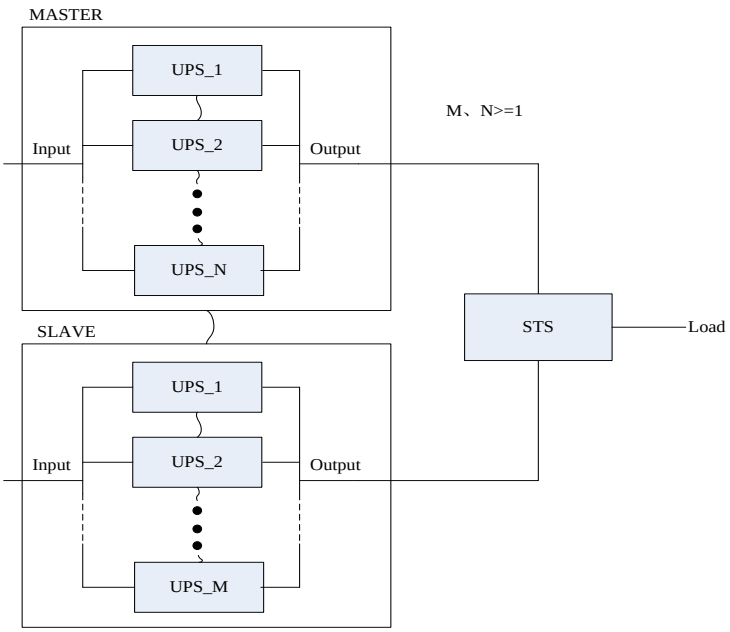



Fig. 3-7 Whole systems installation

## 3.2 Turn ON/ OFF UPS

### 3.2.1 Restart procedure

*WARNING*

*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.

*WARNING*

*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 in AC Utility failure or absence, 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. Push COLD start RED button of the bypass module.

   When battery is normal, rectifier starts operation, 30 s later, inverter starts and operates and the green LED will light on.

*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

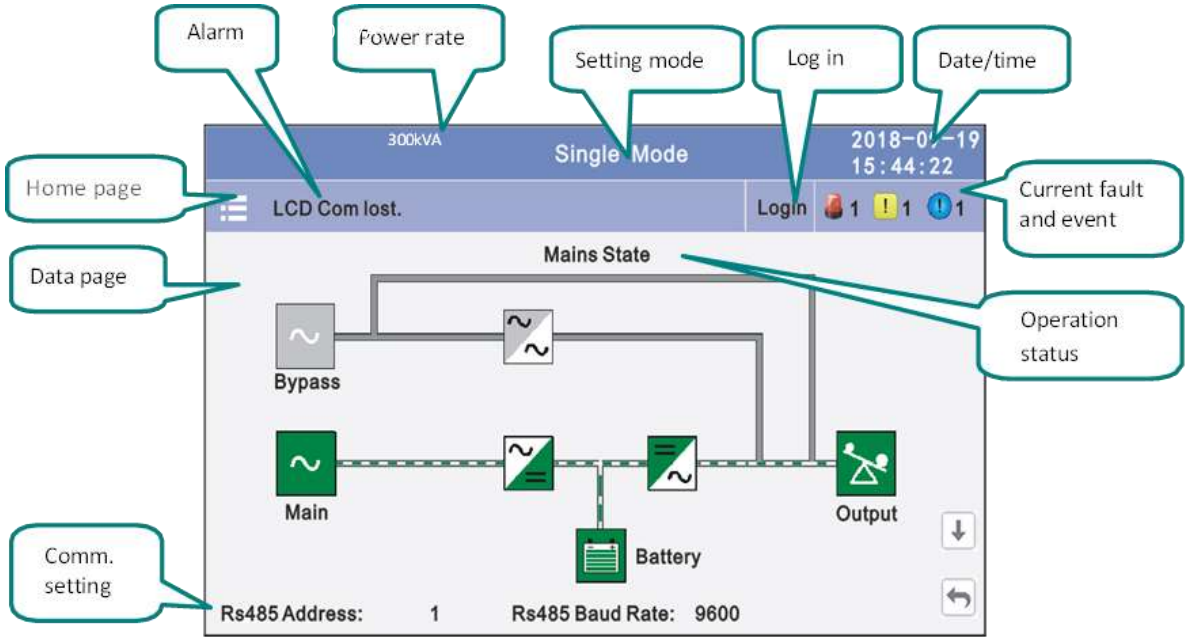



Fig. 4-1 Distribution of the control panel areas and elements

 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 Data 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).

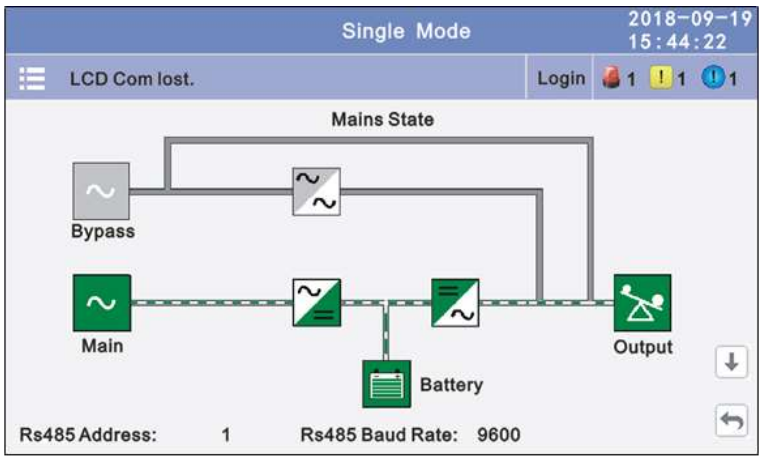



Fig. 4-2 Data menu

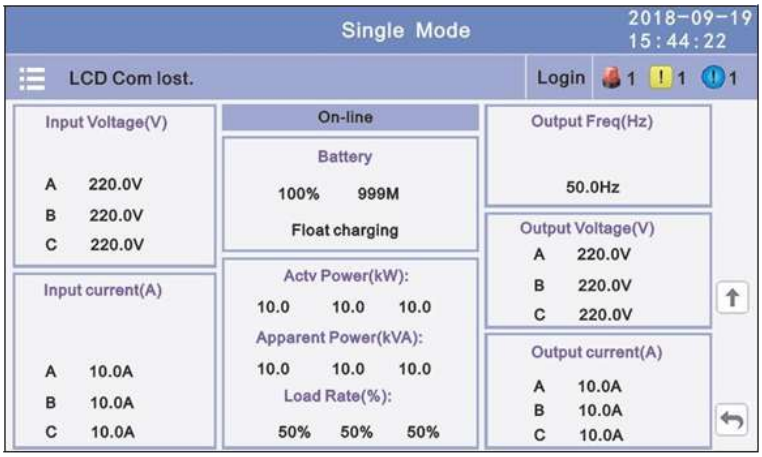



Fig. 4-3 Datas menu detail

### 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.

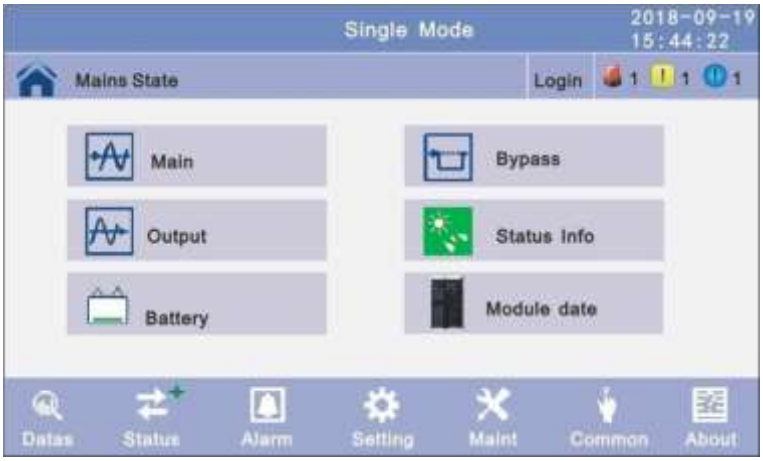



Fig. 4-4 Status menu

#### 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).

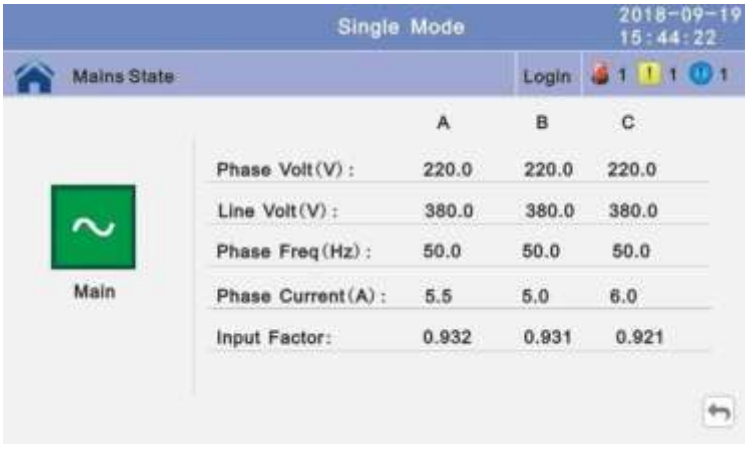



Fig. 4-5 Status/Mains State submenu

#### 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).

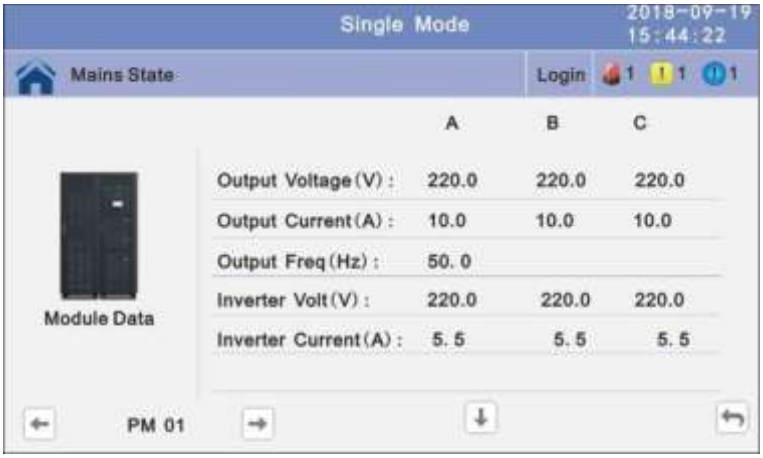



Fig. 4-14 Status/Module submenu

### 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».

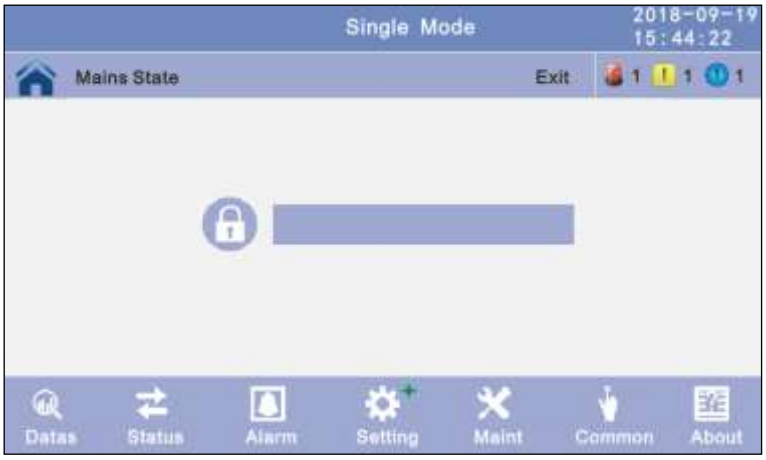



Fig. 4-21 Password window

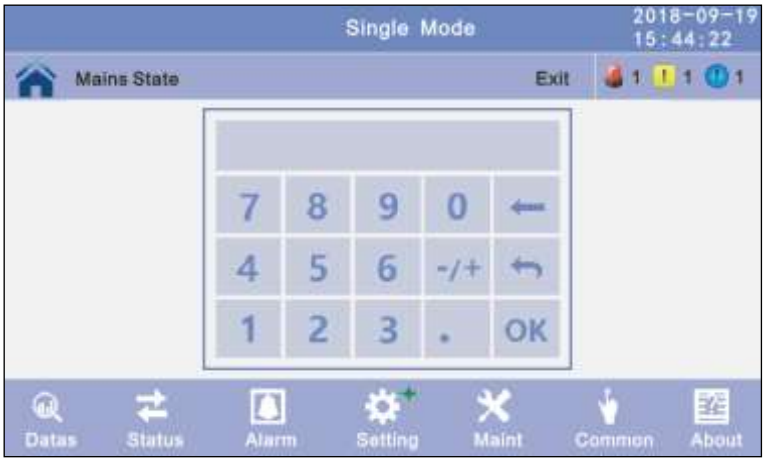



Fig. 4-22 Password keyboard

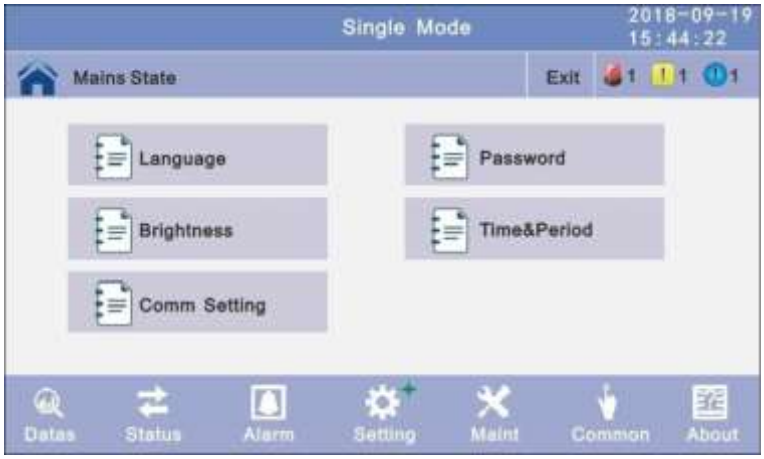



Fig. 4-23 Settings/Basic Settings submenu

- 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).

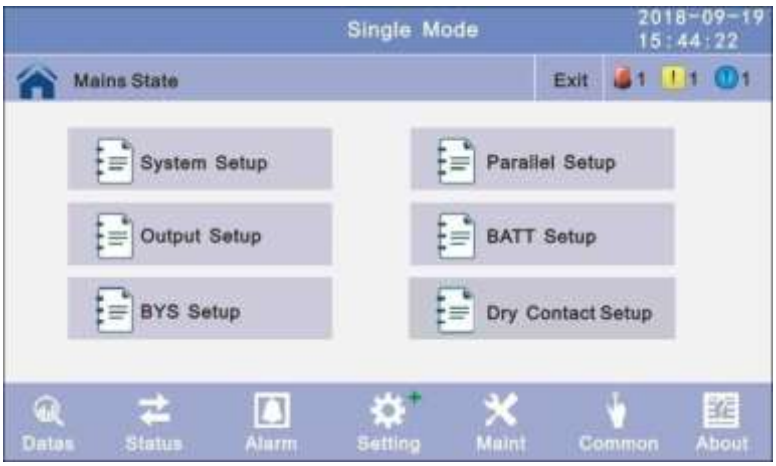



Fig. 4-29 Settings/Advanced Settings submenu

- 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 charge 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

- *Paralallel 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

- *Output Freq:* Output frequency. The value can be 50Hz or 60Hz.
- *Output Volt Level:* Output voltage level. The value can be 220V, 230V, 240V.
- *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

- *Battery Group:* Must modify the number to actual configuration. The value can be 1~8, default value is 1.
- *Battery number:* Must modify the number to actual configuration. The value can be 30~50, default value is 32.
- *Single Battery Capability:* Must modify the value to actual configuration, the value can be 7~2000.
- *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 Compen 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:* Tow parallel ups use common batter 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_SELFCHECK | 11 | MAINT_CLOSE |
| 6 | MAIN_SUPPLY | 12 | OIL_MACHINE_CONTROL |

Table 4-1Valor 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).

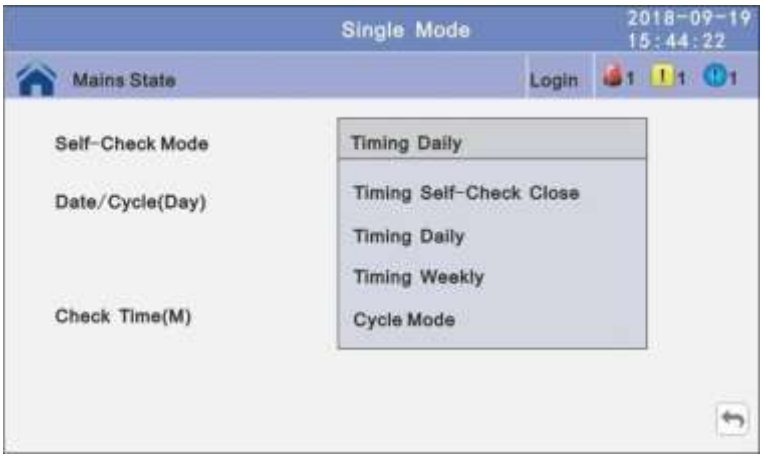



Fig. 4-51 Maint/Battery Self-Check submenu

- 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

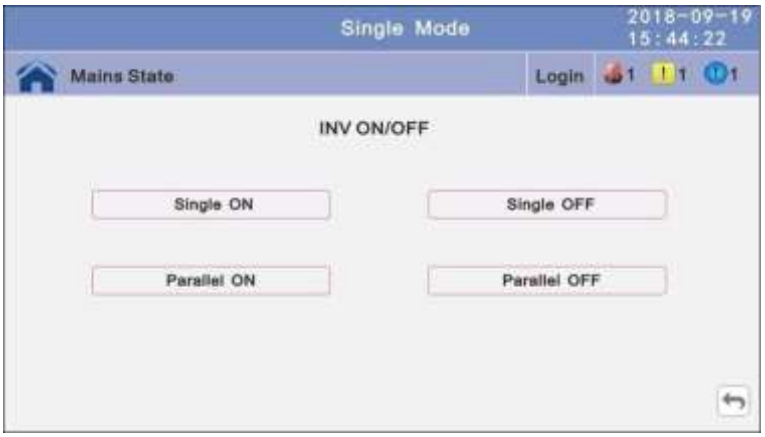



Fig. 4-56 Common/INV ON/OFF submenu

#### 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 | 0D2 | Bypass Fan Fault | Beep continuously | Fault LED lit |

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).*

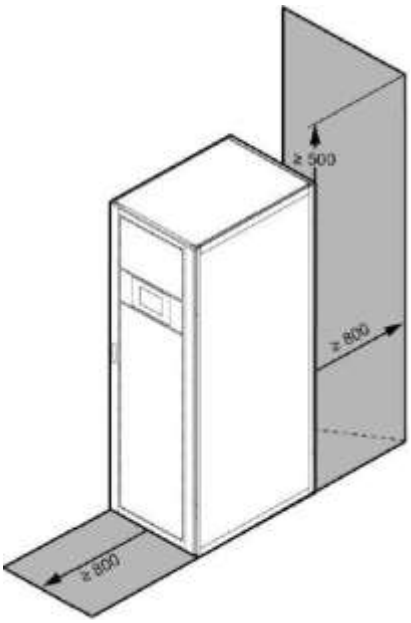



Fig. 5-1 UPS location

- 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 ℃～40℃. If the environment temperature exceeds 40 ℃, the rate should be reduced by load 12% capacity 5℃. The max temperature can't be higher than 50℃.
- 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 wires1,5–1,7 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<br>45/60<br>50/100<br>75/125<br>120/150<br>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<br>135/150<br>180/200<br>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<br>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).

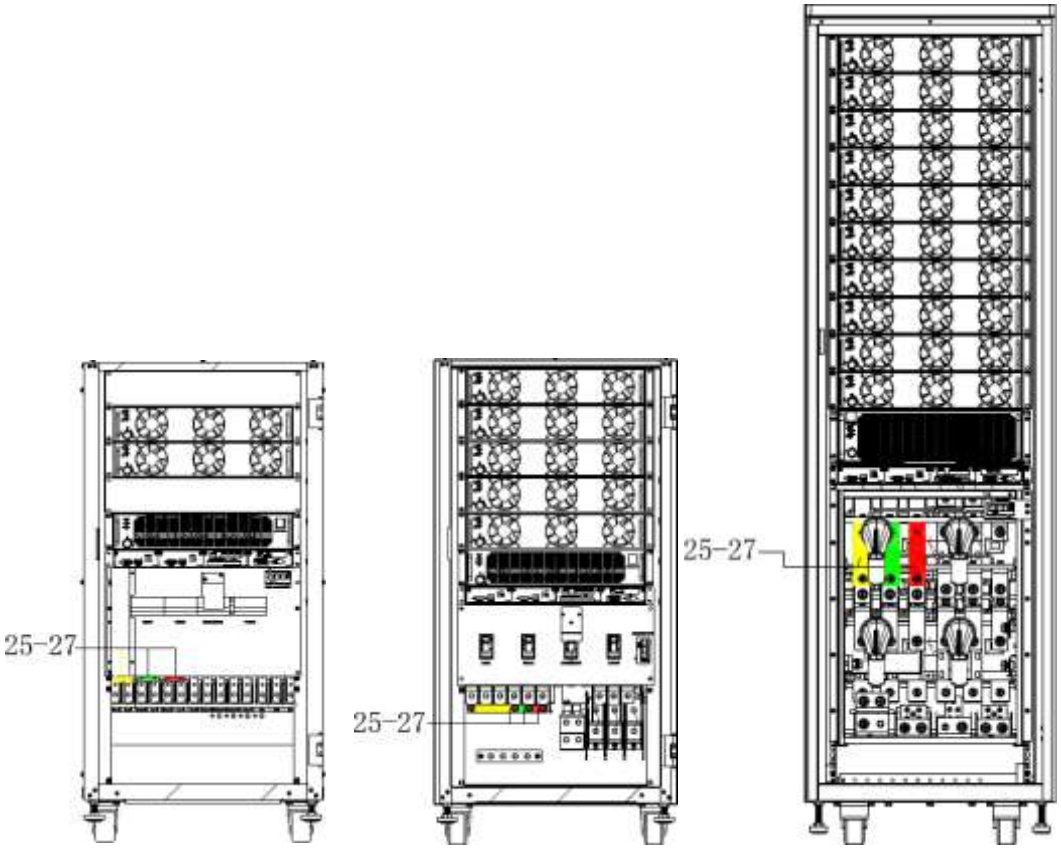



Fig. 5-2 Power cable connection

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.

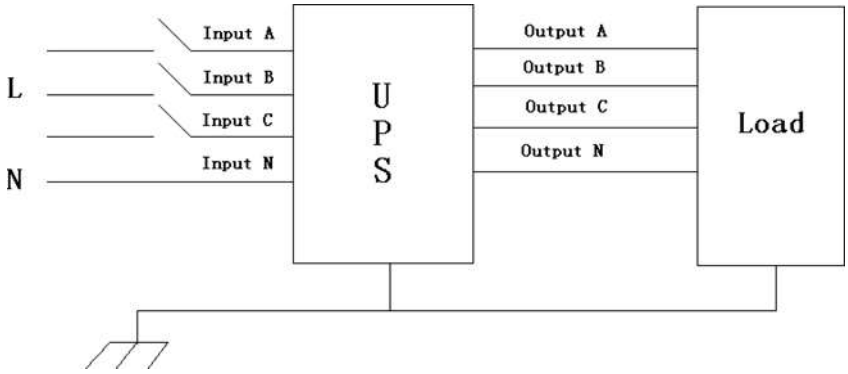



Fig. 5-3 Connection of the UPS to the load

*WARNING*

*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).

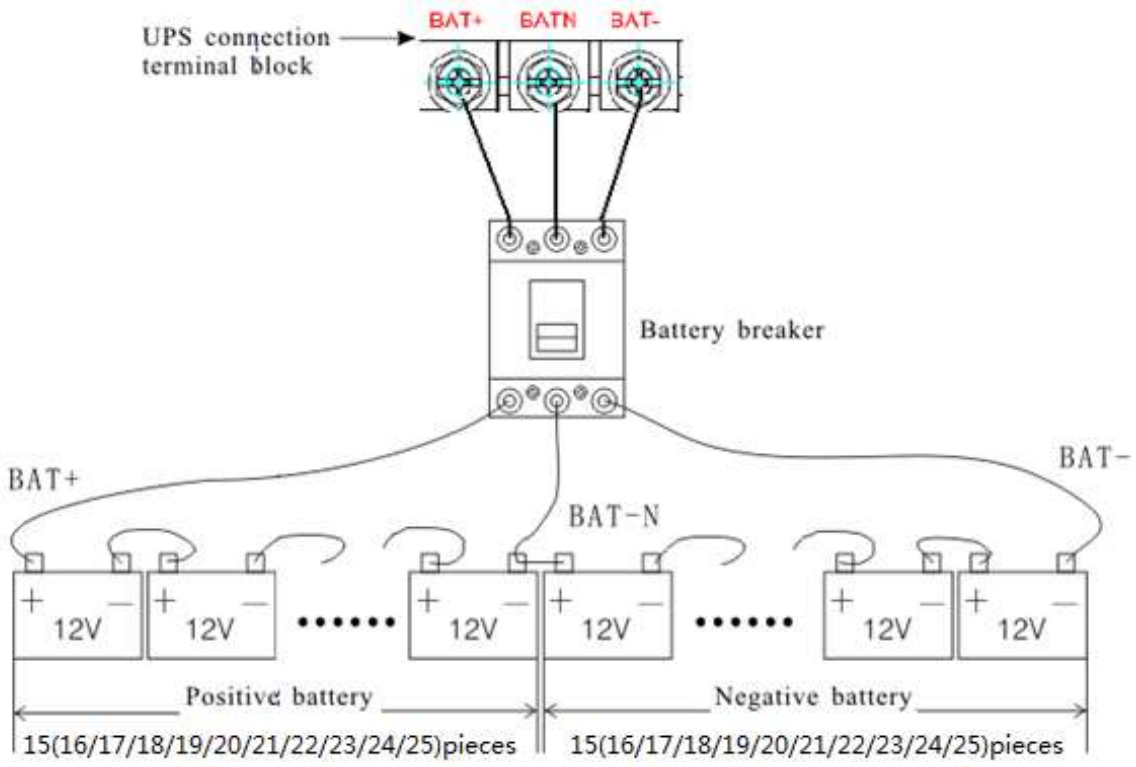



Fig. 5-4 External battery connections for long-run units

*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

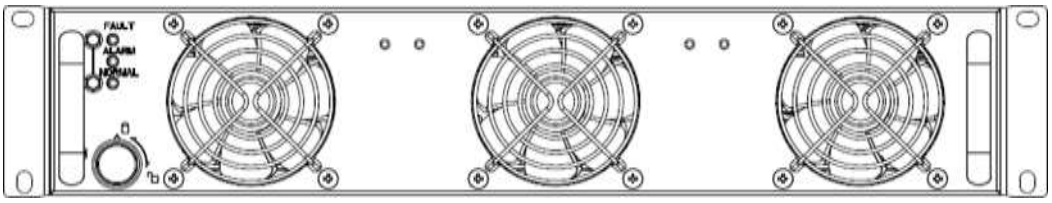



Fig. 5-5 Module insertion

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).

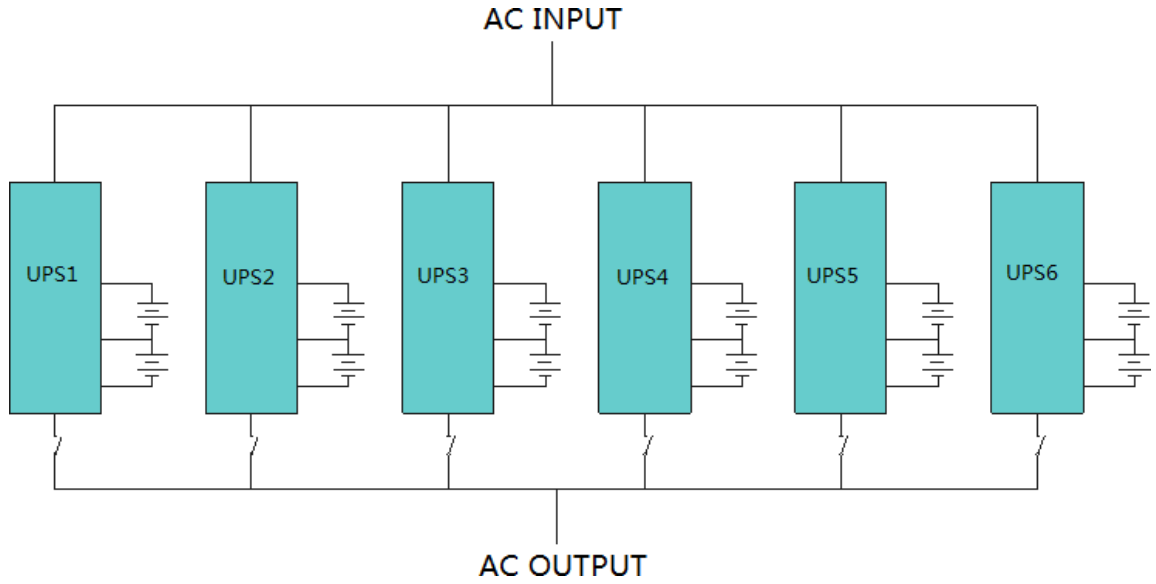



Fig. 5-6 Parallel system

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.

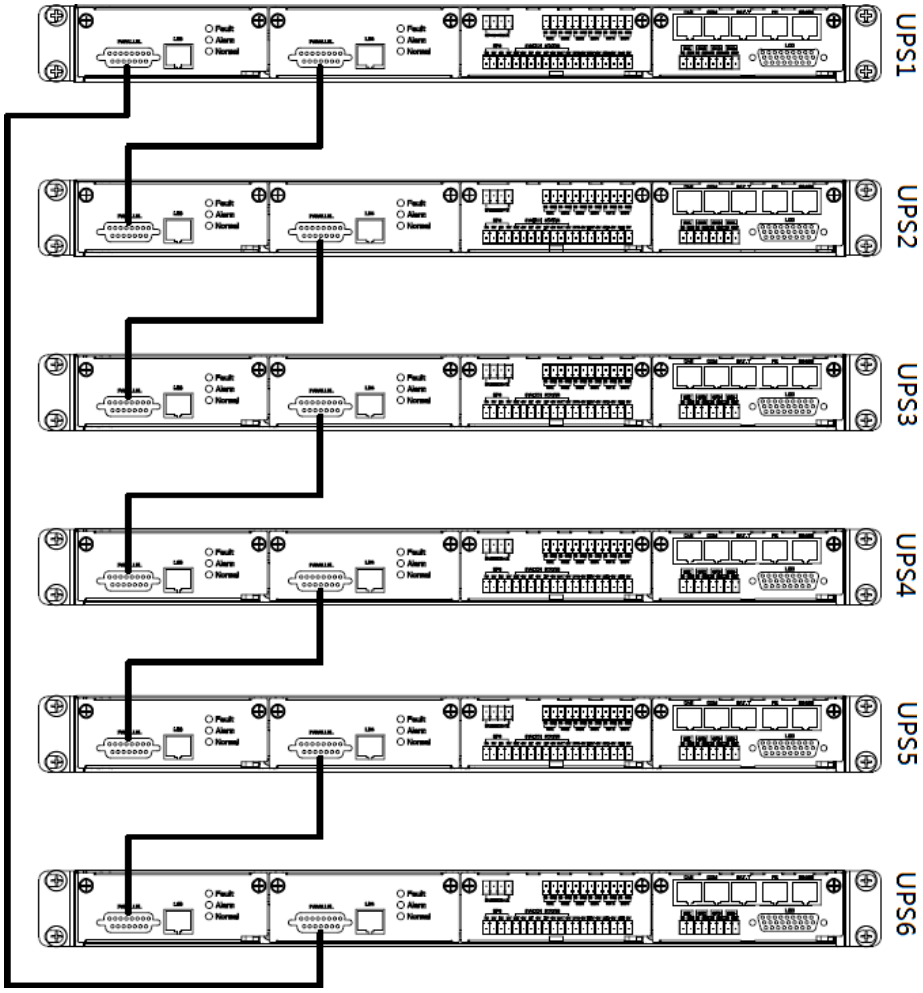



Fig. 5-7 Ring configuration

### 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).

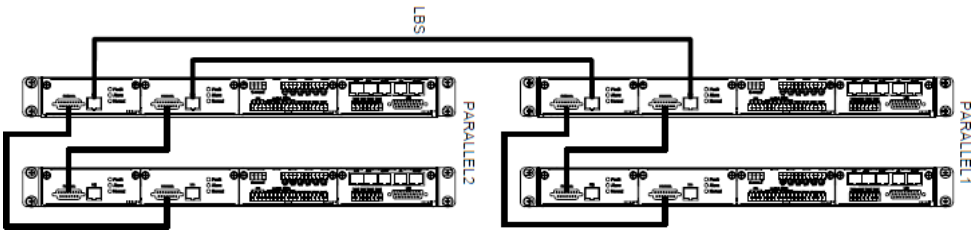



Fig. 5-8 LBS cable installation

### 5.8.3.3 UPS installation

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

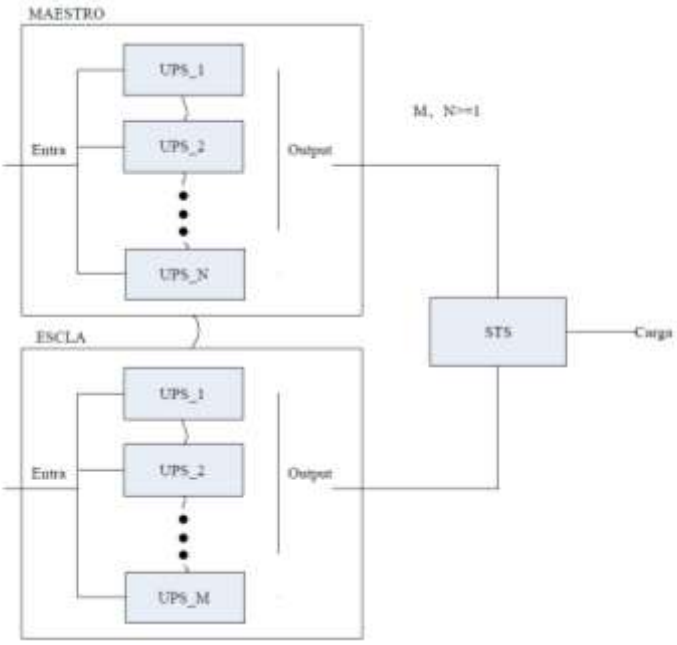



Fig. 5-9 Installation of the whole system

# 6 COMMUNICATIONS

## 6.1.1 Definición del puerto de comunicación RS485

There are 2 connectors to continue the RS485 communication chain.

Port definitions and pinout for both connectors.

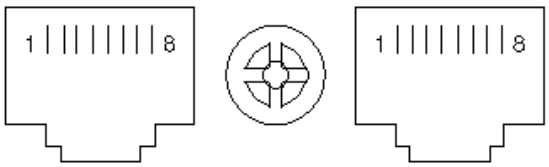



Fig. 6-1 RS485 port

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

Table 6-1 RS485 Connection

Communication settings; RS485 9600bps / 8bit / 1bit stop / Parity none

Available function of RS485

- Monitor UPS power status.
- Monitor UPS alarm info.
- Monitor UPS running parameters.

## 6.1.2 BAT_T communication port definition

Port for long distance external temperature sensor communication.

Port definition and pinout.

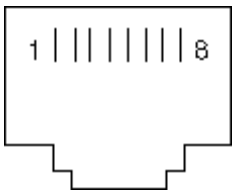



Fig. 6-2 BAT_T port

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

Table 6-2 BAT_T Connection

Communication settings; RS485 9600bps / 8bit / 1bit stop / Parity none

*WARNING*

*RS485 port pin7 is 12Vdc/100mA.*

*Avoid using this terminal to continue the communication chain.*

*Use with caution or you may damage the RS485 communication port.*

### 6.1.3 CAN communication port definition

Port definitions and pinout for both connectors.

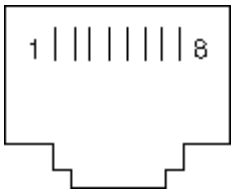



Fig. 6-3 Puerto CAN

| UPS (RJ45) | DESCRIPTION |
|---|---|
| Pin 1 | CAN_H |
| Pin 2 | CAN_L |
| Pin 3/7 | CAN_GND |

Table 6-3 CAN Connection

Available functions of CAN

- Communicate to remote LCD.
- Communicate to BMS (option).

### 6.1.4 EPO terminal (Emergency Power OFF)

This terminal is intended to force an emergency shutdown of one or more UPS simultaneously.

In the event of a critical risk to the UPS itself or the installation, the UPS shutdown can be triggered as a firewall.

The remote switch can be connected to several UPS in a parallel architecture, allowing the user to shut down all units simultaneously. Normally it is connected to remote emergency stop button.

Suggested connection diagram (¡Error! No se encuentra el origen de la referencia.) and EPO terminals on UPS rear panel. (Table 6-4)

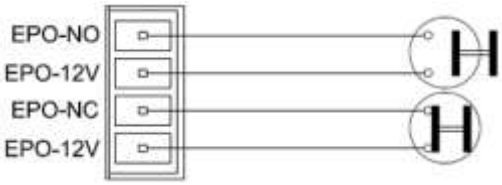



Fig. 6-4 EPO connection

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

Table 6-4 EPO connection

## 6.2 Intelligent slot

The UPS is equipped with a slot that is designed optionally for either SNMP/Modbus or dry contact cards.

This UPS family has 2 card slots.

- 1 slot for "mini" size cards, mainly for TCP-IP Ethernet communications.
- 1 slot for "standard" size cards, normally for dry-contact alarms (relays).

These slots are Plug&Play, so once the card is inserted, communication will be established without the need for any adjustment on the UPS screen.


Fig. 6-5 SNMP/Modbus card view

Fig. 6-6 SNMPview software image

### 6.2.1 TCP-IP communications card (optional)

The SNMP/Modbus communications card has an RJ45 female connector to allow advanced UPS management remotely via an Ethernet network.

It also has a mini-USB connection to optionally connect a concentrator (HUB) of environmental sensors with sound alarm. (Temperature, Humidity, Flood,...)

*IMPORTANT: INTERNET SECURITY*

*On newer models these cards includes several advanced security protocols such as HTTPS, SSL, TLS, SNMP v3.*

*If you are going to expose this card to the internet, you must ensure that you have other protection/security systems that prevent vulnerabilities from being traced, and in any case disable the functionalities that you do not wish to use.*

*ZIGOR cannot be held responsible for damage caused by cyber-attacks if exposed directly to the internet.*

The most common UPS monitoring protocols are included; SNMP and Modbus TCPIP.

This card, autonomously and without the need for additional software, allows notifications to be sent via e-mail of different events that occur in the UPS. For example, when there is a loss of main AC power supply, an overload due to a short circuit at the output, a defect in the device itself, and others. Even send daily reports of important events.

The most advanced model of this card also allows notifications via TELEGRAM, SKYPE, LINE.

It includes BACnet protocol support, GigaLAN connectivity (1000Mbit), more notifications and selectable recipients and up to 13 languages.

All functionalities can be managed via an integrated web server that can be accessed from any web browser (Safari, Edge, Chrome, Firefox, Edge and others).

A proprietary software package (NetAgent) compatible with various Operating Systems (Windows, MAC, Linux, VMware) is also available to monitor / manage one or multiple UPS simultaneously.

*(1) NetAgent updates are limited and there may be incompatibilities on newer OS.*

*IMPORTANT: ELECTRONIC SECURITY*

*This card only allows monitoring and modification of certain parameters that do not affect the electronic operation of the UPS.*

*It is not possible to modify the most important electronic operating settings defined by the display. (voltage, frequency, type and capacity of battery)*

*To avoid damaging the UPS, these settings must only be made manually and in person by authorised and experienced personnel.*

### 6.2.2 Dry-contact relay card (optional)

Dry contact card has a terminal connector and could be used to monitor UPS status in real time through relay contacts.

Consists of 6 non-programmable contacts and selectable by jumpers: Norm.Open (NO) and Norm.Closed (NC)

The programmed functions are as follows:

| PIN | UPS ENERGIZED ( NO ALARMS ) | Relay | Function | EXAMPLE ( MAINS FAIL ) |
|---|---|---|---|---|
| 8-1 |  | ( K1 ) J1 / J2 | AC mains lost (UPS in battery mode) |  |
| 8-2 |  | ( K2 ) | Low battery |  |
| 8-3 | | | | |
| 8-4 |  | ( K3 ) J3 / J4 | Bypass active (unprotected load) |  |
| 8-5 |  | ( K4 ) J5 / J6 | Internal UPS critical fail |  |
| 8-6 |  | ( K5 ) J7 / J8 | Inverter mode. ONLINE active |  |
| 8-7 |  | ( K6 ) J9 / J10 | Rectif, Invert, Temp, Shortcirc alarm |  |
| 8 | COM | | Common terminal | |
| 9 | +Vcc | | Remote OFF input | Range +5…+12v |
| 10 | GND | | | |

Table 6-5 Dry-contact terminals function

J1/J3/J5/J7/J9 default setting NC

Fig. 6-7 Dry-contact card image

For more information or support, please consult its respective manual or contact our Customer Service Support (sac@zigor.com)

## 6.3 UPS remote access

If you have purchased a communications card:

- Connect the Ethernet cable to establish communication within your LAN.
- Locate and run the NETILITY software (Fig. 6-8)
  - It will search your LAN for any compatible communications cards.
  - If there are multiple cards detected, you will see a list of all of them.
  - By default, DHCP service is enabled for automatic IP assignment.
- Once detected, you will be able to view the IP, MAC address, serial number and firmware version.
- Select the "Launch Web" icon and you will access the card management webserver.

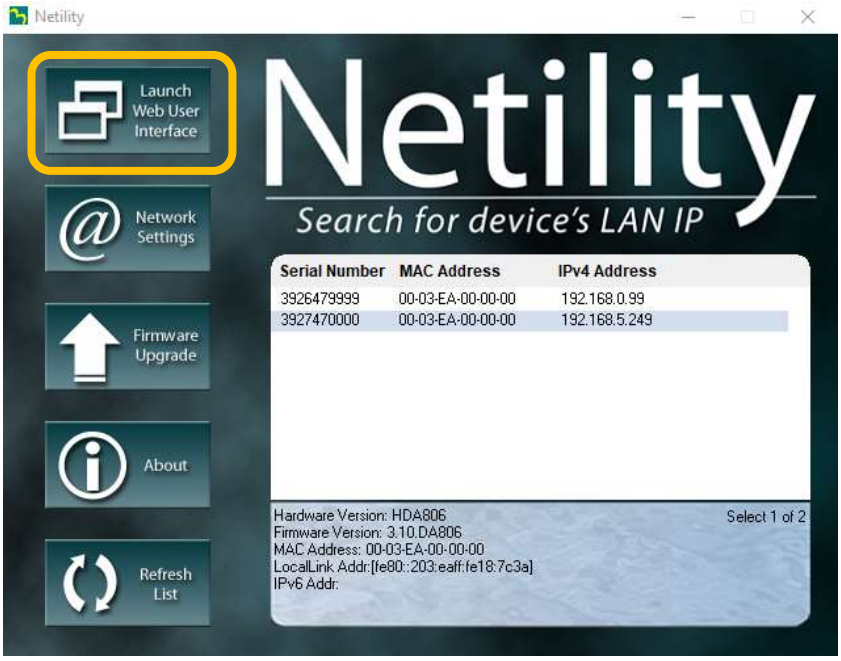



Fig. 6-8 Netility software main screen

### 6.3.1 IP manual assignment

Using the "Network settings" icon, you can manually assign the IP address to your card, modify the HTTP/HTTPS/Telnet/SSH management ports and assign a main access password to the webserver.

*PASSWORD RESET*

*To reset and disable the password you must remove the card and on bottom PCB will be a model label, then you will see the reset password (the password is unique and non-transferable for each card).*

*Access the IP of the card http://xxx.xxx.xxx.xxx/password.cgi and on the screen that will appear, as user ID: admin and as password: (see label password).*

*If you lose or do not have this label it will not be possible to reset the card and you will have to buy a new one.*

### 6.3.2 NetAgent webserver main screen

When accessing the webserver through the Netility application or directly if you already know the IP address, you will find a main screen similar to the one shown in (Fig. 6-9)..

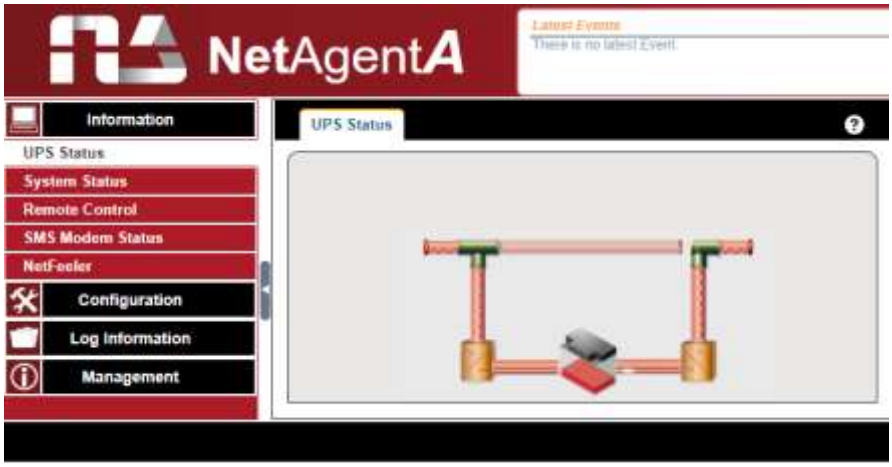



Fig. 6-9 NetAgent main webserver screen

- In the "Configuration" menu you can find the main settings of the card (Fig. 6-10).


Fig. 6-10 Configuration menu

*Note: The available options may differ depending on the card model purchased or may change without prior notice.*

For more information or support, please consult its respective manual or contact our Customer Service Support (sac@zigor.com)

# 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;<br>Input voltage low;<br>The input switch of the module is not switched on. | Measure if the UPS input voltage/frequency is within the window.<br>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;<br>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;<br>The left coronal screw is not tight.<br>Output switch do not switch on | Pull out the module and insert again; Tighten the screw;<br>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.<br>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.

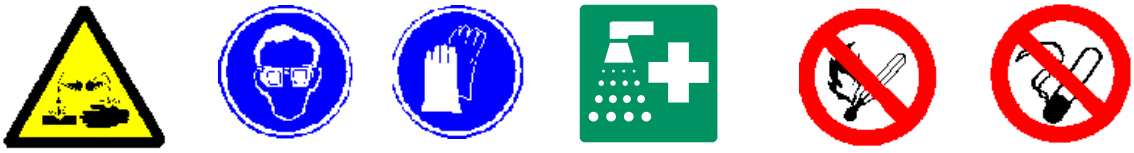
*WARNING*

*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 indictor 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 ºC.
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<br>30 k ~ 60 kW | 30 k ~ 150 kVA<br>30 k ~ 150 kW | 30 ~ 300 kVA<br>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<br>25 ~ 50 kW | 25 ~ 125 kVA<br>25 ~ 125 kW | 25 ~ 250 kVA<br>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<br>20 ~ 100 kW | 20 ~ 200 kVA<br>20 ~ 200 kW | 10 ~ 300 kVA<br>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<br>10 ~ 30 kW | 10 ~ 50 kVA<br>10 ~ 50 kW | 10 ~ 100 kVA<br>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 %);<br>230 V: +20 % (optional +10 %, +15 %);<br>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:±1 % / ± 2 % / ± 4 % / ± 5 % of the rated frequency(optional)<br>Battery Mode: 50 / 60 ± 0,1 % Hz | | |
| **Crest factor** | | 3:1 | | |
| **Efficiency** | | 95,8 % | | |
| **BATTERY** | | | | |
| **Battery voltage** | | Optional Voltage:<br>±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)<br>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 ºC – 40 ºC | | |
| **Storage temperature** | | -25 ºC – 55 ºC (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 | | 600 x 2000 x 850 mm |
| | **Module** | 440 x 86 (2U) x 620 mm | | |
| **Approx. weigth** | **UPS cabinet** | 142 kg | 153 kg | 295 kg |
| | **Module** | 10 kVA: 19<br>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 and UNE-EN ISO 14001 respectively.

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