# USER MANUAL


## Online UPS: Challenger Series

Stand Alone (SA)

220 VAC

**Capacity: 6 KVA ~ 10 KVA**

| REVISION | DESCRIPTION | DATE |
|---|---|---|
| Rev. 1.1 | Formal Release | 2016/01/27 |

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## Danger: For your safety

**Improper use on this equipment can lead to an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

## Warning: Caution

**Unsafe practices that could endanger health, safety and cause financial damage.**

## Important

**Any important technical and operating information on the equipment, should not neglected.**

## Annotation

**Sy-G reserves the right to alter the features of its products without prior notice.**

## CONTENTS

# 1. Safety Warning

Please read carefully the following user manual and the safety instructions before installing the unit or using the unit!

## 1.1. Transportation

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

The UPS must be stored in the room where it is ventilated and dry.

## 1.2. Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment.
  The UPS system must be absolutely dry before being installed.

**PLEASE ALLOW AT LEAST TWO HOURS FOR THE UPS SYSTEM TO ACCLIMATE THE ENVIRONMENT.**

- **Do not** install the UPS system near water or in moist environments.
- **Do not** install the UPS system where it would be exposed to direct sunlight or near heater.
- **Do not** block ventilation holes in the UPS housing.

## 1.3. Installation

- **Do not** connect appliances or devices which would overload the UPS system (e.g. big motor-type equipment) to the UPS output sockets or terminal.
- Place cables in such a way that no one can step on or trip over them.
- **Do not** block air vents in the housing of UPS. The UPS must be installed in a location with good ventilation. Ensure enough space on each side for ventilation.
- UPS has provided earthed terminal, in the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets.
- The UPS can be **installed only by qualified maintenance personnel.**
- An appropriate disconnect device as short-circuit backup protection should be provided in the building wiring installation.



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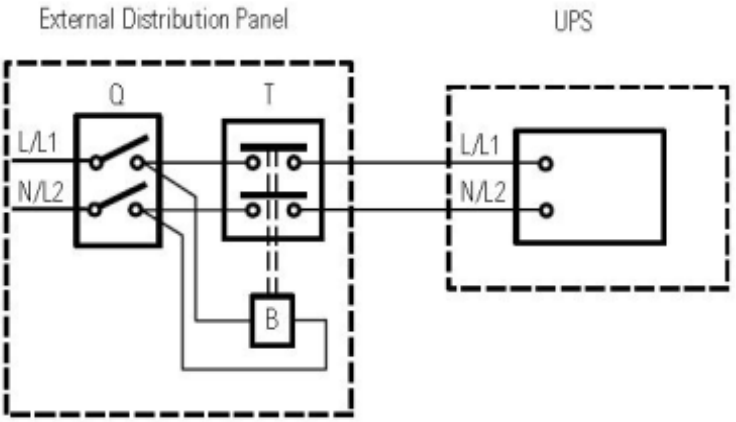
- An integral single emergency switching device which prevents further supply to the load by the UPS in any mode of operation should be provided in the building wiring installation.
- Connect the earth before connecting to the building wiring terminal.
- Installation and Wiring must be performed in accordance with the local electrical laws and regulations.

## 1.4. Connection Warnings

There is no standard backfeed protection inside of the UPS. Please isolate the UPS before working according to Diagram 1. The isolation device must be able to carry the UPS input current.




**Legend**

| | |
|---|---|
| B | Coil Remote Switch |
| Q | Magneto-Thermal Input Main Switch |
| T | **AC Contactor as backfeed protection device** |
| N/L2 | Neutral/L2 |
| L/L1 | L1 Line Input |

- This UPS should be connected with TN earthing system.
- The power supply for this unit must be single-phase rated in accordance with the equipment nameplate. It also must be suitably grounded.
- Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended. Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
- Connect your UPS power module' s grounding terminal to a grounding electrode conductor.
- T he UPS is connected to a DC energy source (battery). The output terminals may be live when the UPS is not connected to an AC supply

**BEFORE WORKIN ON THIS CIRCUIT**

- **Isolate Uninterruptible Power System (UPS).**
- **The check for Hazardous voltage between all terminals including the protective earth.**

**RISK OF VOLTAGE BACKFEED.**

## 1.5. Operation

- **Do not** disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the **OFF** button to disconnect the mains (commercial power).
- Ensure that no liquid or other foreign objects can enter into the UPS system.
- The UPS can be operated by any individuals with no previous experience.

## 1.6. Standards

| **Safety** | |
|---|---|
| IEC/EN 62040-1 | |
| **EMI** | |
| Conducted Emission.....IEC/EN 62040-2 | **Category C3** |
| Radiated Emission.....IEC/EN 62040-2 | **Category C3** |
| **EMS** | |
| ESD.....IEC/EN 61000-4-2 | **Level 4** |
| RS.....IEC/EN 61000-4-3 | **Level 3** |
| EFT.....IEC/EN 61000-4-4 | **Level 4** |
| SURGE.....IEC/EN 61000-4-5 | **Level 4** |
| CS.....IEC/EN 61000-4-6 | **Level 3** |
| Power-frequency Magnetic field.....IEC/EN 61000-4-8 | **Level 4** |
| Low Frequency Signals.....IEC/EN 61000-2-2 | |
| **Warning:** This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances. | |



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## 2. Installation and Setup

**Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.**

**Parallel function is also available for these two types and related installation and operation of Parallel function will be described in detail in the following content.**

### 2.1. Unpacking and Inspection

Unpack the package and check the package contents. The shipping package contains:

- One UPS.
- One user manual.
- One monitoring software CD.
- One RS-232 cable (option).
- One USB cable.
- One battery cable (option).

**NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts. Please keep the original package in a safe place for future use.**

### 2.2. Rear Panel View

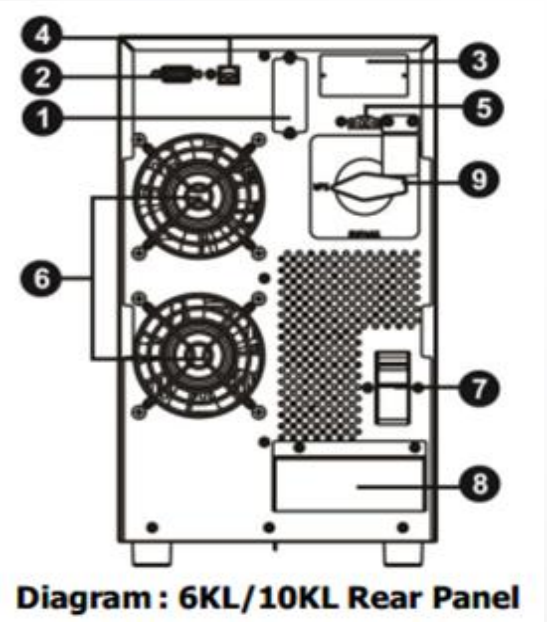
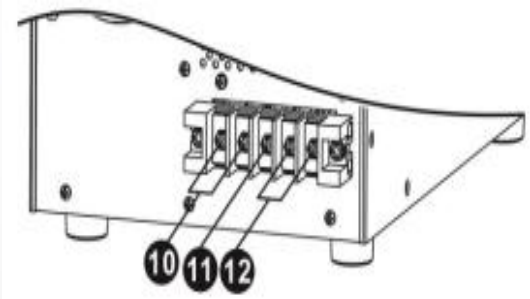



Diagram : 6KL/10KL Rear Panel



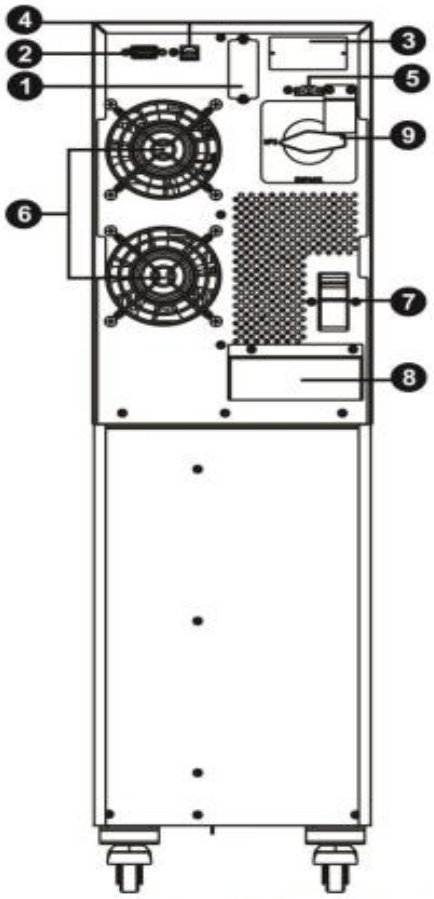
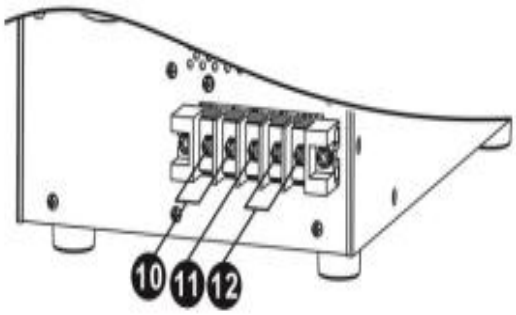



Diagram : 6K/10K Rear Panel




## Description UPS

1. External battery connector.
2. RS-232 communication port.
3. Intelligent slot.
4. USB communication port.
5. Emergency power off function connector (EPO connector).
6. Cooling fan.
7. Input circuit breaker.
8. Input/Output terminals.
9. Maintenance bypass switch (option).
10. Output terminal.
11. Ground.
12. Input terminal.

## 2.3. Single UPS Installation

Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel.

1) Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.

**NOTE: Do not use** the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS' s maximum input current. Otherwise the receptacle may be burned and destroyed.

2) Switch off the mains switch in the building before installation.
3) Turn off all the connected devices before connecting to the UPS.
4) Prepare wires based on the following table:

| MODEL | WIRING SPEC (AWG) | | | |
|---|---|---|---|---|
| | INPUT | OUTPUT | BATTERY | GROUND |
| 6K | 10 | 12 | | 12 |
| 6KL | 10 | 12 | 12 | 12 |
| 10K | 8 | 8 | | 8 |
| 10KL | 8 | 8 | 8 | 8 |

**NOTE 1:** It is recommended to use suitable wire in above table or thicker for safety and efficiency.

**NOTE 2:** The selections for color of wires should be followed by the local electrical laws and regulations.

5) Remove the terminal block cover on the rear panel of UPS. Then connect the wires according to the following terminal block diagrams: (Connect the earth wire first when making wire connection. Disconnect the earth wire last when making wire disconnection!)



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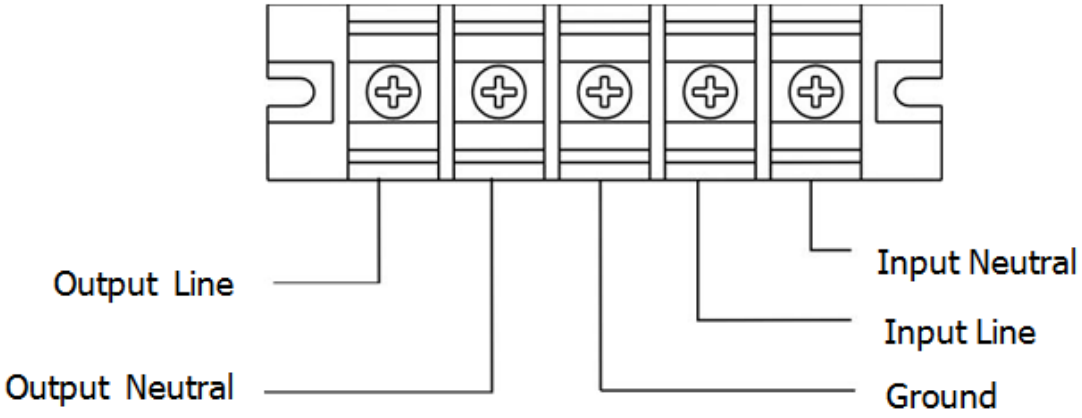


**NOTE 1:** Make sure that the wires are connected tightly with the terminals.

**NOTE 2:** Please install the output breaker between the output terminal and the load, and the breaker should be qualified with leakage current protective function if necessary.

6) Put the terminal block cover back to the rear panel of the UPS.

**Warning: (Only for standard model)**

- Make sure the UPS is not turned on before installation. The UPS should not be turned on during wiring connection.
- Do not try to modify the standard model to the long-run model. Particularly, do not try to connect the standard internal battery to the external battery. The battery type and voltage may be different. If you connect them together, it maybe causes the hazard of electric shock or fire!

**Warning: (Only for long-run model)**

- Make sure a DC breaker or other protection device between UPS and external battery pack is installed. IF not, please install it carefully. Switch OFF the battery breaker before installation.

**Warning:**

- For standard battery pack, there is one DC breaker to disconnect the battery pack and the UPS. But for other external battery pack, make sure a DC breaker or other protection device between UPS and external battery pack is installed. If not, please install it carefully. Switch off the battery breaker before installation.

**NOTE:** Set the battery pack breaker in "OFF" position and then install the battery pack.

- Pay highly attention to the polarity marking on external battery terminal block, and make sure the correct battery polarity is connected. Wrong connection may cause permanent damage of the UPS.
- Make sure the protective earth ground wiring is correct. The wire current spec, color, position, connection and conductance reliability should be checked carefully.
- Make sure the utility input & output wiring is correct. The wire current spec, color, position, connection and conductance reliability should be checked carefully. Make sure the L/N site is correct, not reverse and short-circuited.

## 2.4. Software Installation

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. Use supplied RS-232 or USB communication cable to connect RS-232/USB port of UPS and RS-232/USB port of PC. **Then, follow below steps to install monitoring software.**

1. Insert the included installation CD into CD-ROM drive and then follow the on-screen instructions to proceed software installation. If there no screen shows 1 minute after inserting the CD, please execute setup.exe file for initiating software installation.

2. Follow the on-screen instructions to install the software.

3. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.



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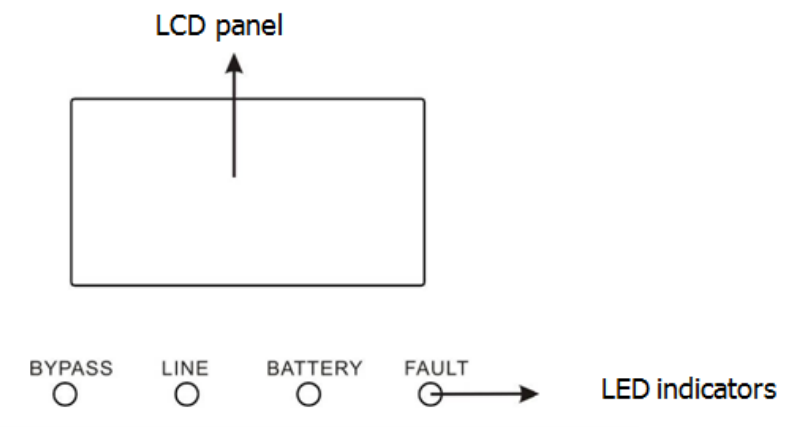
# 3. Operations

## 3.1. Button Operation

| BUTTON | FUNCTION |
|---|---|
| ON/Enter Button | ○ **TURN ON** the UPS: **Press and hold the button more than 1s** to **turn on the UPS**.<br>○ **Enter Key**: Press this button **to confirm the selection in setting menu.** |
| OFF/ESC Button | ○ **TURN OFF** the UPS: **Press and hold the button more than 1s** to turn off the UPS.<br>○ **Esc key**: Press this button **to return to last menu in setting menu.** |
| Test/Up Button | ○ **Battery test**: **Press and hold the button more than 1s** to test the **battery while in AC mode, or CVCF mode** [1].<br>○ **UP key**: Press this button to display **next selection in setting menu.** |
| Mute/Down Button | ○ **Mute the alarm**: **Press and hold the button more than 1s** to mute the buzzer. Please refer to section 3.5.9 for details.<br>○ **Down key**: Press this button to display **previous selection in setting menu.** |
| Test/Up + Mute/Down Button | ○ **Press and hold the two buttons simultaneous more than 1s** to enter/escape the setting menu. |

[1] CVCF mode means converter mode.

## 3.2. LED Indicators




| LED / MODE | BYPASS | LINE | BATTERY | FAULT |
|---|---|---|---|---|
| UPS Startup | ● | ● | ● | ● |
| Bypass mode | ● | ○ | ○ | ○ |
| AC mode | ○ | ● | ○ | ○ |
| Battery mode | ○ | ○ | ● | ○ |
| CVCF mode | ○ | ● | ○ | ○ |
| Battery Test | ● | ● | ● | ○ |
| Fault | ○ | ○ | ○ | ● |

Note: ● means LED is lighting, and ○ means LED is faded.



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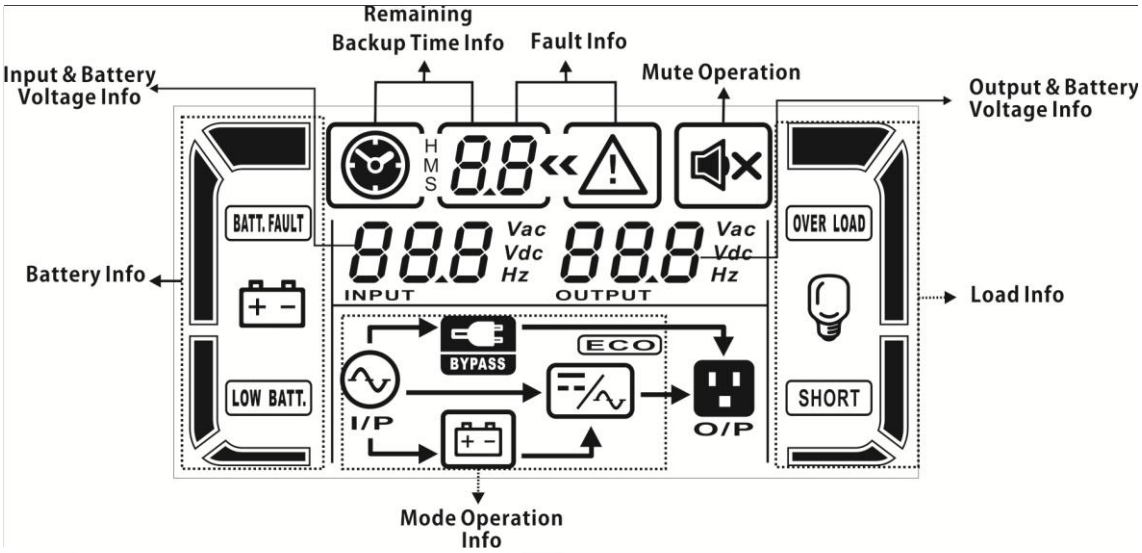
## 3.3. LCD Panel




| DISPLAY | FUNCTION |
|---|---|
| **REMAINING BACKUP TIME INFORMATION** | |
|  | Indicates the remaining backup time in pie chart. |
|  | Indicates the remaining backup time in numbers.<br>H: hours, M: minute, S: second |
| **FAULT INFORMATION** | |
|  | Indicates that the warning and fault occurs. |
|  | Indicates the warning and fault codes, and the codes are listed in details in 3-9 section. |
| **MUTE OPERATION** | |
|  | Indicates that the UPS alarm is disabled. |
| **OUTPUT & BATTERY VOLTAGE INFORMATION** | |
|  | Indicates the output voltage, frequency or battery voltage.<br>Vac: output voltage, Vdc: battery voltage, Hz: frequency |
| **LOAD INFORMATION** | |
|  | Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%. |
|  | Indicates overload. |
|  | Indicates the load or the UPS output is short circuit. |
| **MODE OPERATION INFORMATION** | |
|  | Indicates the UPS connects to the mains. |
|  | Indicates the battery is working. |
|  | Indicates the bypass circuit is working. |

| | |
|---|---|
| ECO | Indicates the ECO mode is enabled. |
| | Indicates the Inverter circuit is working. |
| O/P | Indicates the output is working. |
| **BATTERY INFORMATION** | |
| | Indicates the Battery level by 0-25%, 26-50%, 51-75%, and 76-100%. |
| BATT. FAULT | Indicates the battery is fault. |
| LOW BATT. | Indicates low battery level and low battery voltage. |
| **INPUT & BATTERY VOLTAGE INFORMATION** | |
| 88.8 Vac Vdc Hz INPUT 12 | Indicates the input voltage or frequency or battery voltage.<br>Vac: Input voltage, Vdc: battery voltage, Hz: input frequency |

## 3.4. Audible Alarm

| DESCRIPTION | BUZZER STATUS | MUTED |
|---|---|---|
| **UPS status** | | |
| **Bypass mode** | Beeping once every 2 minutes | **Yes** |
| **Battery mode** | Beeping once every 4 seconds | |
| **Fault mode** | Beeping continuously | |
| **Warning** | | |
| **Overload** | Beeping twice every second | **No** |
| **Low battery** | Beeping once every second | |
| **Battery unconnected** | | |
| **Over charge** | | |
| **EPO enable** | | |
| **Fan failure/Over temperature** | | |
| **Charge failure** | | |
| **Overload 3 times in 30 min** | | |
| **EPO status** | | |
| **Cover of maintain switch is open** | | |
| **Fault** | | |
| **Bus start failure** | Beeping continuously | **Yes** |
| **Bus over** | | |
| **Bus under** | | |



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| | | |
|---|---|---|
| Bus unbalance | Beeping continuously | **Yes** |
| Inverter soft start failure | | |
| High Inverter voltage | | |
| Low Inverter voltage | | |
| Inverter output short circuited | | |
| Over temperature | | |
| Overload | | |

## 3.5. Single UPS Operation

### 3.5.1. Turn on the UPS with utility power supply (in AC mode)

1) After power supply is connected correctly, set the breaker of the battery pack at "ON" position (the step only available for long-run model). Then set the input breaker at "ON" position. At this time the fan is running and the UPS enter to power on mode for initialization, several seconds later, UPS operates in Bypass mode and supplies power to the loads via the bypass.

**NOTE:** When UPS is in Bypass mode, the output voltage will directly power from utility after you switch on the input breaker. In Bypass mode, the load is not protected by UPS. To protect your precious devices, you should turn on the UPS. Refer to next step.

2) Press and hold the "ON" button for 0.5s to turn on the UPS and the buzzer will beep once.
3) A few seconds later, the UPS will enter to AC mode. If the utility power is abnormal, the UPS will operate in Battery mode without interruption.

**NOTE:** When the UPS is running out battery, it will shut down automatically at Battery mode. When the utility power is restored, the UPS will auto restart in AC mode.

### 3.5.2. Turn on the UPS without utility power supply (in Battery mode)

1) Make sure that the breaker of the battery pack is at "ON" position (only for long-run model).
2) Press the "ON" button to set up the power supply for the UPS, UPS will enter to power on mode. After initialization UPS will enter to No Output mode, then Press and hold the "ON" button for 1s to turn on the UPS, and the buzzer will beep once.
3) A few seconds later, the UPS will be turned on and enter to Battery mode.

### 3.5.3. Connect Devices to UPS

After the UPS is turned on, you can connect devices to the UPS.

1) Switch on the devices one by one and it will display total load level in LCD panel.
2) If it is necessary to connect the inductive loads such as a printer, the in-rush current should be calculated carefully to see if it meets the capacity of the UPS, because the power consumption of this kind of loads is too big.
3) If the UPS is overload, the buzzer will beep twice every second.
4) When the UPS is overload, please remove some loads immediately. It is recommended to have the total loads connected to the UPS less than 80% of its nominal power capacity to prevent overload for system safety.
5) If the overload time is over acceptable time listed in spec at AC mode, the UPS will automatically transfer to bypass mode. After the overload is removed, it will return to AC mode. If the overload occurs 3 times in half hour, the UPS will be locked in Bypass mode. UPS can transfer to Line mode only by manual restart. At this time, if bypass is enabled, the UPS will power to the load via bypass. If bypass function is disabled or the input power is not within bypass acceptable range, it will cut off output directly.

### 3.5.4. Charge The Batteries

1) After the UPS is connected to the utility power and working on the AC mode, the charger will charge the batteries automatically except in Battery mode or during battery self-test.
2) Suggest charging batteries at least 10 hours before use. Otherwise, the backup time may be shorter than expected time.
   The charging current can be changed from 1A to 6A via LCD or software. Please make sure that the charging current is suitable to battery specification.

### 3.5.5. Battery Mode Operation

1) When the UPS is in Battery mode, the buzzer will beep according to different battery capacity. If the battery capacity is more than 25%, the buzzer will beep once every 4 seconds; If the battery voltage drops to the alarm level, the buzzer will beep quickly (once every sec) to remind users that the battery is at low level and the UPS will shut down automatically soon. Users could switch off some non-critical loads to disable the shutdown alarm and prolong the backup time. If there is no more load to be switched off at that time, you have to shut down all loads as soon as possible to protect the devices or save data. Otherwise, there is a risk of data loss or load failure.

2) In Battery mode, if buzzer sound annoys, users can press the Mute button to disable the buzzer.
3) The backup time of the long-run model depends on the external battery capacity.
4) The backup time may vary from different environment temperature and load type.
5) When setting backup time for 16.5 hours (default value from LCD panel), after discharging 16.5 hours, UPS will shut down automatically to protect the battery. This battery discharge protection can be enabled or disabled through LCD panel control. (Refer to 3-7 LCD setting section).

### 3.5.6. Turn off the UPS with utility power supply in AC mode

1) Turn off the inverter of the UPS by pressing "OFF" button for at least 1s, and then the buzzer will beep once. The UPS will turn into Bypass mode.
   **NOTE 1:** If the UPS has been set to enable the bypass output, it will bypass voltage from utility power to output terminal even though you have turned off the UPS (inverter).
   **NOTE 2:** After turning off the UPS, please be aware that the UPS is working at Bypass mode and there is risk of power loss for connected devices.
2) In Bypass mode, output voltage of the UPS is still present. In order to cut off the output, switch off the input breaker. A few seconds later, there is no display shown on the display panel and UPS is complete off.

### 3.5.7. Turn off the UPS without utility power supply in Battery mode

1) Turn off the UPS by pressing "OFF" button for at least 1s, and then the buzzer will beep once.
2) Then UPS will cut off power to output and there is no display shown on the display panel.

### 3.5.8. Mute The Buzzer

1) To mute the buzzer, please press the "Mute" button for at least 1s. If you press it again after the buzzer is muted, the buzzer will beep again.
2) Some warning alarms can' t be muted unless the error is fixed. Please refer to section 3.3 for the details.

### 3.5.9. Operation In Warning Status



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1) When Fault LED flashes and the buzzer beeps once every second, it means that there are some problems for UPS operation. Users can get the warning code from LCD panel. Please check trouble shooting table in chapter 4 for details.
2) Some warning alarms can' t be muted unless the error is fixed. Please refer to section 3.3 for the details.

### 3.5.10. Operation In Fault Mode

1) When Fault LED illuminates and the buzzer beeps continuously, it means that there is a fatal error in the UPS. Users can get the fault code from display panel. Please check trouble shooting table in chapter 4 for details.
2) Please check the loads, wiring, ventilation, utility, battery and so on after the fault occurs. Do not try to turn on the UPS again before solving the problems. If the problems can' t be fixed, please contact the distributor or service people immediately.
3) For emergency case, please cut off the connection from utility, external battery, and output immediately to avoid more risk or danger.

## 3.6. Abbreviation Meaning in LCD Display

| ABBREVIATION | DISPLAY CONTENT | MEANING |
|---|---|---|
| ENA | ENA | Enable |
| DIS | dIS | Disable |
| AT | AtO | Auto |
| BAT | bAt | Battery |
| NC | NCF | Normal mode (not CVCF mode) |
| CF | CF | CVCF mode |
| SUB & SU | SUb | Subtract |
| ADD & AD | Add | Add |
| ON | ON | On |
| OFF | OFF | Off |
| FBD | Fbd | Not allowed |
| OPN | OPN | Allow |
| RES | rES | Reserved |



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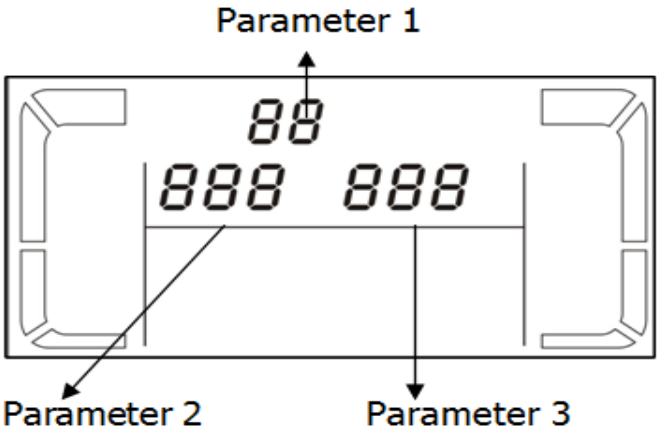
## 3.7. LCD Setting




There are three parameters to set up the UPS.

**Parameter 1:** It is for program alternatives or setting options. Refer to below table.

**Parameter 2 and Parameter 3:** Are the setting options or values for each program.

**Programs available list for PARAMETER 1.**

| CODE | DESCRIPTION | Bypass | AC | CVCF | Battery | Battery Test |
|---|---|---|---|---|---|---|
| 01 | Output voltage | Y | | | | |
| 02 | Output frequency | Y | | | | |
| 03 | Voltage range for bypass | Y | | | | |
| 04 | Frequency range for bypass | Y | | | | |
| 05 | Reserved | N | | | | |
| 06 | Reserved | N | | | | |
| 07 | Reserved | N | | | | |
| 08 | Bypass mode setting | Y | Y | | | |
| 09 | Battery backup time setting | Y | Y | Y | Y | Y |
| 10 | Reserved | N | | | | |
| 11 | Reserved | N | | | | |
| 12 | Reserved | N | | | | |
| 13 | Battery voltage Calibration | Y | Y | Y | Y | Y |
| 14 | Reserved | N | | | | |
| 15 | Inverter voltage Calibration | | Y | Y | Y | |
| 16 | Floating charger voltage adjustment | Y | Y | Y | Y | Y |
| 17 | Constant charger voltage adjustment | Y | Y | Y | Y | Y |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18 | Charger maximum current setting | Y | Y | Y | Y | Y |
| 19 | Battery capacity and groups setting | Y | Y | Y | Y | Y |
| 20 | Backup time calibration | Y | Y | Y | Y | Y |

**Y** means that this program can be set in this mode.

**01:** Output voltage setting.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 3: Output voltage**<br><br>For **208/220/230/240 VAC** models, you may choose the following **output voltage:**<br>**208:** presents output voltage is **208Vac.**<br>**220:** presents output voltage is **220Vac.**<br>**230:** presents output voltage is **230Vac.**<br>**240:** presents output voltage is **240Vac.** |

**02:** Output Frequency.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2: Output Frequency**<br><br>Setting the output frequency. You may choose following three options in **parameter 2**:<br>**50.0Hz:** The output frequency is setting for **50.0Hz.**<br>**60.0Hz:** The output frequency is setting for **60.0Hz.**<br>**ATO:** If selected, output frequency will be decided according to the latest normal utility frequency. If it is from **46Hz to 54Hz,** the output frequency will be 50.0Hz. If it is from **56Hz to 64Hz,** the output frequency will be **60.0Hz.** AT is default setting.<br><br>**Parameter 3: Frequency mode**<br><br>Setting output frequency at CVCF mode or not CVCF mode. You may choose following two options in parameter 3:<br><br>**CF:** Setting UPS to CVCF mode. If selected, the output frequency will be fixed **at 50Hz or 60Hz** according to setting in parameter 2. The input frequency could be from **46Hz to 64Hz.**<br><br>**NCF:** Setting UPS to normal mode (not CVCF mode). If selected, the output frequency will synchronize with the input frequency **within 46~54 Hz at 50Hz or within 56~64 Hz at 60Hz** according to setting in **parameter 2**. |

| | |
|---|---|
| **ATO** [1]<br>  | **If 50 Hz** selected in **parameter 2**, UPS will transfer to battery mode when input frequency is not within **46~54 Hz. If 60Hz** selected in **parameter 2**, UPS will transfer to battery mode when input frequency is not within **56~64 Hz.**<br>[1] If **Parameter 2 is ATO**, the Parameter 3 will show the current frequency. |

**03:** Voltage range for bypass.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2:** Set the acceptable low voltage range for bypass. Setting range is from 110V to 209V.<br>**(Default value is 110V).**<br>**Parameter 3:** Set the acceptable high voltage range for bypass. Setting range is from 231V to 276V.<br>**(Default value is 264V).** |

**04:** Frequency range for bypass.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2:** Set the acceptable low frequency for bypass.<br>**50Hz:** Setting range is from **46.0Hz to 49.0Hz.**<br>**60Hz:** Setting range is from **56.0Hz to 59.0Hz.**<br>**(Default value is 46.0Hz/56.0Hz).**<br>**Parameter 3:** Set the acceptable high frequency for bypass.<br>**50Hz:** Setting range is from **51.0Hz to 54.0Hz.**<br>**60Hz:** Setting range is from **61.0Hz to 64.0Hz.**<br>**(Default value is 54.0Hz/64.0Hz).** |

**05**: Reserved.

| INTERFACE | SETTING |
|---|---|
|  | **Reserved** |

**06:** Reserved.

| INTERFACE | SETTING |
|---|---|
|  | Reserved |

**07:** Reserved.

| INTERFACE | SETTING |
|---|---|
|  | Reserved |

**08:** Bypass mode setting.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2**, please press "Enter" key first. Then, you have the following options:<br>**OP:** Bypass allowed. When selected, UPS will run at Bypass mode depending on bypass enabled/disabled setting.<br>**FBD:** Bypass not allowed. When selected, it' s not allowed for running in Bypass mode under any situations.<br>**Parameter 3:**<br>**ENA:** Bypass enabled. When selected, Bypass mode is activated.<br>**DIS:** Bypass disabled. When selected, automatic bypass is acceptable, but manual bypass is not allowed. Manual bypass means users manually operate UPS for Bypass mode. For example, pressing **OFF button** in AC mode to turn into Bypass mode. |



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**09:** Battery backup time setting.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 3:**<br>**000~999:** Set the maximum backup time from 0min to 999min. UPS will shut down to protect battery after backup time arrives.<br>**DIS:** Disable battery discharge protection and backup time will depend on battery capacity. |

**10:** Reserved.

| INTERFACE | SETTING |
|---|---|
|  | **Reserved** |

**11:** Reserved.

| INTERFACE | SETTING |
|---|---|
|  | **Reserved** |

**12:** Reserved.

| INTERFACE | SETTING |
|---|---|
|  | **Reserved** |



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**13:** Battery voltage calibration.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2:** Select **"Add"** or **"Sub"** function to calibrate battery voltage to real figure.<br>**Parameter 3:** The voltage setting range is from **0V to 5.7V.**<br>**(Default value is 0V).** |

**14:** Reserved.

| INTERFACE | SETTING |
|---|---|
|  | **Reserved** |

**15:** Inverter voltage calibration.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2:** You may choose **"Add"** or **"Sub"** function to inverter voltage.<br>**Parameter 3:** The voltage setting range is from **0V to 6.4V.**<br>**(Default value is 0V).** |

**16:** Floating charger voltage adjustment.

| INTERFACE | SETTING |
|---|---|
|  | **Parameter 2:** You may choose **"Add"** or **"Sub"** to adjust floating charger voltage.<br>**Parameter 3:** The voltage setting range is from **0V to 8V.**<br>**(Default value is 0V).** |



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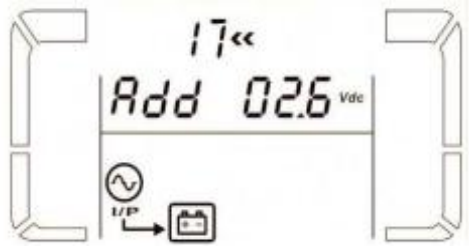
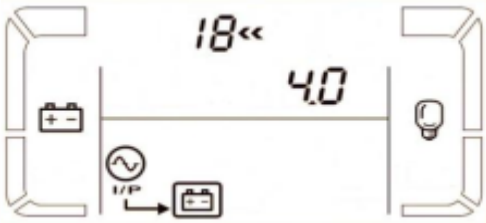
**17:** Constant charger voltage adjustment.

| INTERFACE | SETTING |
|---|---|
|   | **Parameter 2:** You may choose **"Add"** or **"Sub"** to constant charger voltage.<br>**Parameter 3:** The voltage setting range is from **0V to 4V.**<br>**(Default value is 0V).** |

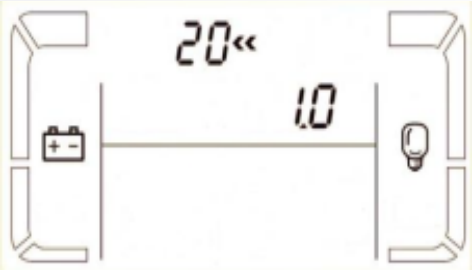
**18:** Maximum charger current setting.

| INTERFACE | SETTING |
|---|---|
|   | **Parameter 3:** The maximum charging current could be adjusted; the available options are 1A, 2A, 4A.<br>**(Default value is 4A for long run model and 1A for standard model).** |

**19:** Battery capacity and groups setting.

| INTERFACE | SETTING |
|---|---|
|   | **Parameter 2:** Set the battery capacity such as 7AH, 9AH, 10AH, 12AH, 17AH, 26AH, 40AH, 65AH, 100AH and so on. **(Default value is 9AH).**<br>**Parameter 3:** Set battery group range from **1 to 6.** These parameters are for the battery backup time calculation. |

**20:** Backup time calibration.

| INTERFACE | SETTING |
|---|---|
|   | **Parameter 3:** Calibrate the displayed backup time by adjusting this multiplier factor. The formulation is listed below:<br>**Displayed backup time=Original calculated backup time x Multiplier factor.**<br>The **default value of multiplier factor is 1.0** and the **setting range is from 0.5 to 2.** |



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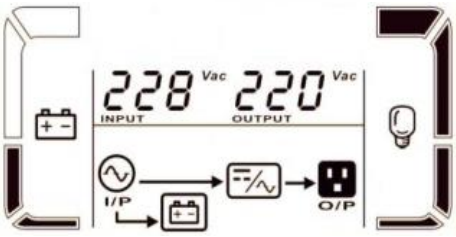
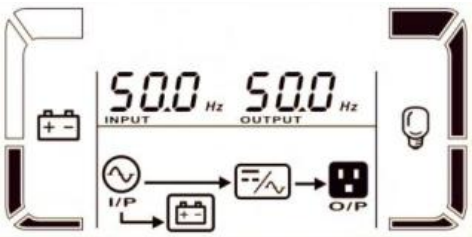
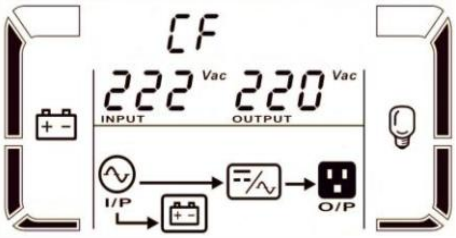
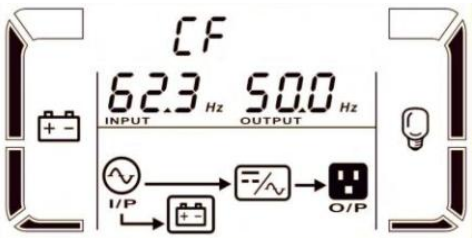
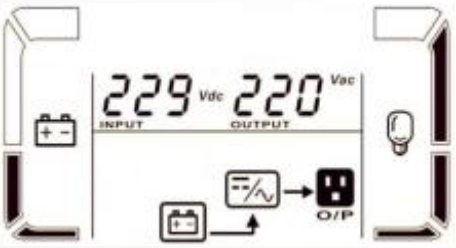
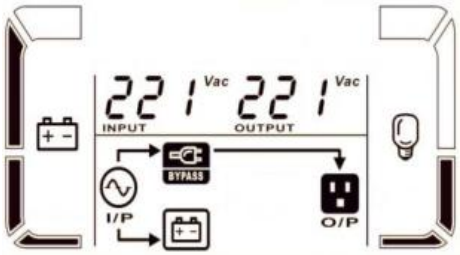
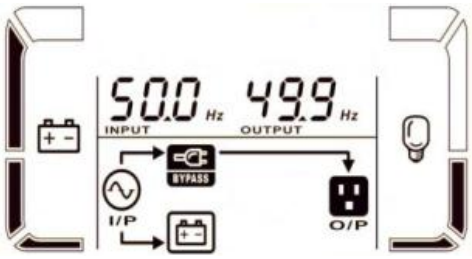
## 3.8. Operating Mode/Status Description

This section describes the **mode and operating status of the UPS, read carefully before making any configuration.**

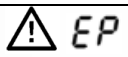
| Operating Mode/Status | | | |
|---|---|---|---|
| AC mode | **Description** | When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at AC mode. | |
| | **LCD display** |  |  |
| CVCF mode | **Description** | When input frequency is within 46 to 64Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode. | |
| | **LCD display** |  |  |
| Battery mode | **Description** | When the input voltage is beyond the acceptable range or power failure, UPS will backup power from battery and alarm will beep every 4 seconds. | |
| | **LCD display** |  |  |
| Bypass mode | **Description** | When input voltage is within acceptable range and bypass is enabled, turn off the UPS and it will enter Bypass mode. Alarm beeps every two minutes. | |

<table>
<tr><td rowspan="2">Bypass mode</td><td>LCD display</td><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Battery test</td><td>Description</td><td colspan="2">When UPS is in AC mode or CVCF mode, press “Test” key for more than 1s. Then the UPS will beep once and start “Battery Test”. The line between I/P and inverter icons will blink to remind users. This operation is used to check the battery status.</td></tr>
<tr><td>LCD display</td><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Fault status</td><td>Description</td><td colspan="2">When UPS has fault happened, it will display fault messages in LCD Panel.</td></tr>
<tr><td>LCD display</td><td> 
</td><td> 
</td></tr>
</table>

## 3.9. Faults Reference Code

| FAULT EVENT | FAULT CODE | ICON | FAULT EVENT | FAULT CODE | ICON |
|---|---|---|---|---|---|
| Bus start failure | 01 | None | Low Inverter voltage | 13 | None |
| Bus over | 02 | None | Inverter output short circuited | 14 | SHORT |
| Bus under | 03 | None | Battery SCR short circuited | 21 | None |
| Bus unbalance | 04 | None | Over temperature | 41 | None |
| Inverter soft start failure | 11 | None | Overload | 43 | OVER LOAD |
| High Inverter voltage | 12 | None | | | |

## 3.10. Warning Indicator

| WARNING | ICON (FLASHING) | ALARM |
|---|---|---|
| Battery low |   | Beeping every second |
| Overload |   | Beeping twice every second |
| Battery unconnected |   | Beeping every second |
| Over charge |  | Beeping every second |
| EPO enable |   | Beeping every second |
| Over temperature |  | Beeping every second |
| Charger failure |  | Beeping every second |
| Overload 3 times in 30 min. |  | Beeping every second |



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## 4. Troubleshooting

If the UPS system does not operate correctly, solve the problem by using the table below:

| SYMPTOM | POSSIBLE CAUSE | REMEDY |
|---|---|---|
| No indication and alarm in the front display panel even though the mains is normal. | The AC input power is not connected well. | Check if input cable firmly connected to the mains. |
| The icon ⚠ and the warning code EP flash on LCD display and alarm beeps every second. | EPO function is enabled. | Set the circuit in closed position to disable EPO function. |
| The icon ⚠ and BATT. FAULT flash on LCD display and alarm beeps every second. | The external or internal battery is incorrectly connected. | Check if all batteries are connected well. |
| The icon ⚠ and OVER LOAD flash on LCD display and alarm beeps twice every second. | UPS is overload. | Remove excess loads from UPS output. |
| | UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the Bypass. | Remove excess loads from UPS output. |
| | After repetitive overloads, the UPS is locked in the Bypass mode. Connected devices are fed directly by the mains. | Remove excess loads from UPS output first. Then shut down the UPS and restart it. |
| Fault code is shown as 43. The icon OVER LOAD lights on LCD display and alarm beeps continuously. | UPS is overload too long and becomes fault. Then UPS shut down automatically. | Remove excess loads from UPS output and restart it. |
| Fault code is shown as 14, the icon SHORT lights on LCD display, and alarm beeps continuously. | The UPS shut down automatically because short circuit occurs on the UPS output. | Check output wiring and if connected devices are in short circuit status. |
| Other fault codes are shown on LCD display and alarm beeps continuously. | A UPS internal fault has occurred. | Contact your dealer. |
| Battery backup time is shorter than nominal value | Batteries are not fully charged | Charge the batteries for at least 7 hours and then check capacity. If the problem still persists, consult your dealer. |



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| | | |
|---|---|---|
| Battery backup time is shorter than nominal value | Batteries defect | Contact your dealer to replace the battery. |
| The icon  and  flash on LCD display and alarm beeps every second. | The UPS temperature is too high. | Check fans and notify dealer. |



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# 5. Storage and Maintenance

## Storage

Before storing, charge the UPS at least 7 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

| STORAGE TEMPERATURE | RECHARGE FREQUENCY | CHARGING DURATION |
|---|---|---|
| -25°C - 40°C | Every 3 months | 1-2 hours |
| 40°C - 45°C | Every 2 months | 1-2 hours |

## Maintenance

The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.

Even after the unit is disconnected from the mains, components inside the UPS system are still connected to the battery packs which are potentially dangerous.

Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.

Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.

Verify that no voltage between the battery terminals and the ground is present before maintenance or repair. In this product, the battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground.

**Batteries may cause electric shock and have a high short-circuit current.** Please **remove all wristwatches, rings and other metal personal objects** before maintenance or repair, and **only use tools with insulated grips and handles for maintaining or repairing.**



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When replace the batteries, install the same number and same type of batteries.

Do not attempt to dispose of batteries by burning them. This could cause battery explosion. The batteries must be rightly deposed according to local regulation.

Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.

Please replace the fuse only with the same type and amperage in order to avoid fire hazards.

Do not disassemble the UPS system.



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## 6. Technical Specifications

| MODEL | | 6 KVA | | 10 KVA | |
|---|---|---|---|---|---|
| Phase | | Single phase with ground | | | |
| Capacity [1] | | 6000 VA / 5400 W | | 10000 VA / 9000 W | |
| **INPUT** | | | | | |
| Nominal Voltage | | 208/220/230/240 VAC | | | |
| Voltage Range | | 110-300 VAC @ 50% Load<br>176-300 VAC @ 100% Load | | | |
| Frequency Range | | 46 - 54 Hz or 56 - 64 Hz (Selectable) | | | |
| Power Factor | | ≥ 0.99, Nominal Voltage (100% load) | | | |
| Rectifier | | IGBT | | | |
| **OUTPUT** | | | | | |
| Output Voltage | | 208 [1]/220/230/240 VAC | | | |
| Voltage Regulation | | ± 1% | | | |
| Frequency Range (Synchronized Range) | | 46 - 54 Hz or 56 - 64 Hz (Selectable) | | | |
| Frequency Range (Batt. Mode) | | 50 Hz or 60 Hz ± 0.1 Hz | | | |
| Current Crest Ratio | | 3:1 | | | |
| Harmonic Distortion (THDv) | | ≤ 3% THD (Linear Load) , ≤ 5% THD (Non-linear Load) | | | |
| Transfer Time | | Zero (AC to DC) ; Zero (Inverter to Bypass) | | | |
| Waveform | | Pure Sine Wave | | | |
| **EFFICIENCY** | | | | | |
| AC Mode | | 92% | | 93% | |
| Battery Mode | | 90% | | 91% | |
| **BATTERY** | | | | | |
| Standard Model | Battery Type | 12V/9 Ah | | | |
| | Numbers | 16 | 20 | 16 | 20 |
| | Typical Recharge Time | 9 hours recover to 90% capacity | | | |
| | Charging Current (max.) | 1A / 2 A (Adjustable) | | | |
| | Charging Voltage | 218.4 VDC ± 1% | 273 VDC ± 1% | 218.4 VDC ± 1% | 273 VDC ± 1% |
| Long-run Model | Battery Type | Depending on the capacity of external batteries | | | |
| | Numbers | 16 - 20 pcs (Adjustable) | | | |
| | Charging Current (max.) | 1A/2A/4A/6A (Adjustable, 6A is only available for 16 pcs batteries) | | | |
| | Charging Voltage | 273 VDC ± 1% (Based on 20 pcs batteries) | | | |
| **INDICATORS** | | | | | |
| LCD Display | | Load level, Battery level, AC mode, Battery mode, Bypass mode, and Fault indicators | | | |
| **ALARM** | | | | | |
| Battery Mode | | Sounding every 4 seconds | | | |
| Low Battery | | Sounding every second | | | |
| Overload | | Sounding twice every second | | | |
| Fault | | Continuously sounding | | | |
| **PHYSICAL** | | | | | |
| Standard Model | Dimensions, D x W x H (mm) | 369 x 190 x 688 | 442 x 190 x 688 | | |
| | Net Weight (kg) | 61 | 74 | 66 | 76 |
| Long-run Model | Dimensions, D x W x H (mm) | 369 x 190 x 318 | | 442 x 190 x 318 | |
| | Net Weight (kg) | 12 | | 16 | |
| **ENVIRONMENT** | | | | | |
| Running Humidity & Temperature | | 0 - 95%, RH (Non-condensing) @ 0 - 40°C | | | |
| Noise Level | | < 55 dB @ 1 meter | | < 58 dB @ 1 meter | |
| **MANAGEMENT** | | | | | |
| Smart RS-232 /USB | | Supports Windows® 2000/2003/XP/Vista/2008, Windows®7/8, Linux, Unix, and MAC | | | |
| Optional SNMP | | Power management from SNMP manager and web browser | | | |
| **STANDARDS & CERTIFICATIONS** | | | | | |
| Quality | | ISO 9001 ; ISO 14001 | | | |
| Compliance | | EN62040-3, EN61000, EN62040-2, EN62040 -1, CE | | | |

[1] - Derate to 60% of capacity in Frequency converter mode and to 90% when the output voltage is adjusted to 208 VAC.

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