USER MANUAL

PowerValue 11T IN

6-10 kVA

Safety symbols and warnings

	This symbol in conjunction with the signal word “DANGER” indicates an imminent electrical hazard. Failure to observe the related safety note may cause injury, death or equipment damage.
	This symbol in conjunction with the signal word “WARNING” indicates a potentially dangerous situation. Failure to observe may cause injury, death or equipment damage.
	This symbol in conjunction with the signal word “NOTE” indicates operator tips or particularly useful or important information for the use of the product. This symbol and wording do not indicate a dangerous situation.
	This symbol indicates that reading the instruction manual/booklet before starting work or before operating equipment or machinery is compulsory.
	Recycle
	Do not dispose of with ordinary trash.

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1. Important safety instructions

Read this important safety instruction chapter before reading the operating manual

1.1 Operator precautions

Always follow the precautions and instructions described in this manual. Any deviations from the instructions may result in electric shock or cause accidental load loss.

ABB does not take any responsibility for damages caused through incorrect use of the UPS system.

DANGER!

Do not remove any screws from the UPS system or from the battery cabinet: danger of electrical shock.

High fault currents (leakage currents) before connecting the mains, ensure that the UPS is earthed!

Display a warning label on all primary power isolators installed away from the UPS area to warn electrical maintenance personnel that the circuit feeds a UPS.

Make sure that warning label contains the following text or Equivalent: Isolate the UPS (Uninterruptible Power Supply) before working on this circuit.

1.2 Environmental considerations

To operate the UPS with optimal efficiency, your installation site should meet the environmental parameters outlined in this user manual.
Excessive amounts of dust or moisture in the operating environment may cause damage or lead to malfunction. The UPS should always be protected from the weather and sunshine.
The operating environment must meet the weight, airflow, size and clearance requirements specified in the technical datasheet.
Under no circumstances, should the UPS be installed in an airtight room, in the presence of flammable gases, or in an environment exceeding the environmental requirements specified below.
An ambient temperature of +20°C to +25°C is recommended to achieve a long life of the UPS and batteries. The cooling air entering the UPS must not exceed +40 °C and the humidity should be below 95 percent (non-condensing).

1.3 Declaration of safety conformity and CE marking

The **PowerValue 11T 1-3 kVA** is designed, manufactured and commercialized in accordance with the **EN ISO 9001** standard relating to quality management systems.

These products conform with the following directives:

- 2014/35/EU Low voltage directive
- 2014/30/EU Electromagnetic Compatibility directive (EMC)
- 2011/65/EU Restriction of the use of certain hazardous substances (RoHS) directive

WARNING!

This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

These products also meet the following product standards:

Table 1: Standards

	Product standards
ESD	IEC 61000-4-2 Level 3
Low frequency signals	IEC 61000-2-2 Disturbing voltage:10V
RS	IEC61000-4-3 Level 3
EFT	IEC 61000-4-4 Level 4
Surge	IEC 61000-4-5 Level 4
CS	IEC 61000-4-6 Level 3
Power frequency magnetic Field immunity	IEC 61000-4-8 Level 4
Conducted	IEC 62040-2 Category C2
Radiated	IEC 62040-2 Category C2
Performance classification	VFI-SS-III
Safety	IEC 62040-1:2008+A1+2013
Transportation	IEC 60068-2-31
	IEC 60068-2-64
	IEC 60068-2-27

1.4 Inquiries

Inquiries regarding the UPS should be addressed to the local ABB office or agent authorized by ABB. Note the type code and the serial number of the equipment before contacting ABB or authorized agent. The serial number is shown on the nameplate of the product. For further information on troubleshooting, see Chapter 6.

1.5 Installation

WARNING!

Do not connect appliances or devices which would overload the UPS (e.g. big motor-type equipment) to the UPS output sockets or terminal.

WARNING!

Place cables in such a way that no one can step on or trip over them.

WARNING!

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.

WARNING!

UPS is provided earthed terminal, in the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets.

WARNING!

The UPS can be installed only by qualified maintenance personnel.

WARNING!

An appropriate disconnect device as short-circuit backup protection should be provided in the building wiring installation.

WARNING!

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.

WARNING!

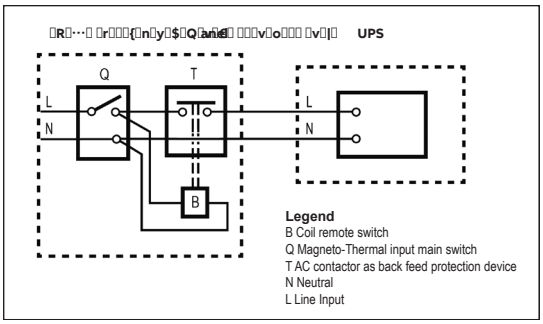
Connect the earth before connecting to the building wiring terminal.

WARNING!

Installation and wiring must be performed in accordance with the local electrical laws and regulations.

1.6 Connection warnings

- There is no standard back feed protection inside, please isolate the UPS before working according to this circuit. The isolation device must be able to carry the UPS input current.



- 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.
- The 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 working on this circuit
- Isolate Uninterruptible Power System (UPS)
- Then check for hazardous voltage between all terminals including the protective earth

DANGER!

Risk of voltage backfeed

1.7 Operation

WARNING!

Do not disconnect the mains cable from the UPS or the building wiring socket during operation, as this removes the ground from the UPS and all connected loads.

NOTE!

Press the off button to fully disconnect the UPS. Ensure the UPS is on bypass or on standby mode before disconnecting it from the mains.

NOTE!

To reduce the risk of fire, connect the UPS to a circuit provided with branch circuit protection with an ampere rating in accordance with the IEC/EN 60934 standard or your local electrical code.

,See technical specifications for recommendations.

WARNING!

Indiscriminate operation of switches may cause output loss or damage to equipment.

WARNING!

Never dispose of batteries in a fire as they may explode.

WARNING!

Do not open or damage the batteries.

WARNING!

Released electrolyte is harmful to the skin and eyes.

2. Maintenance

DANGER!

To prevent risk of electric shock, only qualified personnel may remove the UPS cover

DANGER!

To prevent risk of shocks and risk of failure do not cut, rework or manipulate the material delivered with the UPS

PowerValue 11T 6-10 kVA UPS requires only minimal maintenance.

Charge the UPS regularly to maximize the expected life of the battery. When connected to mains power, the UPS charges the batteries and prevents the batteries from overcharging and over-discharging.

- Replace the batteries when the battery service life has been exceeded (around three to five years at 25 °C ambient temperature). Contact your local ABB or an agent authorized by ABB for replacements.
- Charge the UPS once every four to six months, if it is not used regularly.
- In high-temperature regions, charge and discharge the battery every two months. The standard charging time should be at least 12 hours.
- Replace the battery when the discharge time is less than 50 percent of specified after fully charging. Check the battery connection or contact your local dealer to order a new battery.

DANGER!

Servicing of batteries involves energy and shock hazard and should be performed by personnel knowledgeable about batteries and required precautions

WARNING!

Do not dispose of batteries in a fire. the batteries may explode

WARNING!

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

DANGER!

Components inside the UPS are connected to the battery even when the UPS is disconnected from the mains power supply.

DANGER!

Disconnect the batteries before carrying out any kind of service and/or maintenance. Verify that no current is present, and no hazardous voltage exists in the capacitor or bus capacitor terminals.

DANGER!

The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is present before servicing.

DANGER!

A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed.
When working on batteries:

- Remove watches, rings or other metal objects
- Make use of proper ppe (personal protection equipment) as per local policies and rules
  - Wear flame/arc resistant whole body clothing
  - Wear suitable voltage rated gloves
  - Use safety dielectric footwear
  - Wear arc flash face shield
  - Use voltage rated tools
- Do not lay tools or metal parts on top of batteries
- Disconnect the charging source prior to connecting or disconnecting battery terminals.

WARNING!

When replacing batteries, replace with the same type and number of batteries or battery pack.

WARNING!

Replace fuses only with fuses of the same type and of the same amperage to avoid fire hazards.

2.1 UPS disposal and recycling

2 .1 .1 For professional users in the European Union

The crossed - out wheeled bin symbol on the product(s) and / or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste.

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

2 .1 .2 For disposal in countries outside of the European Union

The crossed - out wheeled bin symbol is only valid in the European Union (EU) and means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste.
If you wish to discard this produc,t please contact your local authorities or dealer and ask for the correct method of disposal.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

3. Installation

3 .1 Delivery, transportation, positioning and storage

3 .1 .1 Receipt of the UPS and visual inspection

When receiving the UPS, carefully examine the packing container and the UPS for any signs of physical damage.

WARNING!

In case of recognizable damage: do not connect any voltage to the unit / Do not put the unit into operation

The packing container of the UPS protects it from mechanical and environmental damage.
To increase protection, the UPS is wrapped in a plastic sheet. Keep the packaging for later re-use.

3 .1 .2 Unpacking list

After examining the package, open the box and check the following items are included:

- 1 x PowerValue 11T UPS
- 1 X USB with complete documentation in 5 languages
- Multi-language quick installation guide
- 1 x India-IEC C13 cable (only for 1KB/1KS)
- 1 x India-IEC C19 cable (only for 2KB/2KS/3KB/3KS)
- 1 x external battery cable (only for S models)
- 1 x USB cable
- 1 x fixing plate for battery cable

Examine the UPS for any signs of damage and ensure that the received UPS corresponds to the material indicated in the delivery note. Notify your carrier or supplier immediately in case of any damage.

3 .1 .3 Operation of UPS

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.

Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

3 .1 .4 Storage of UPS

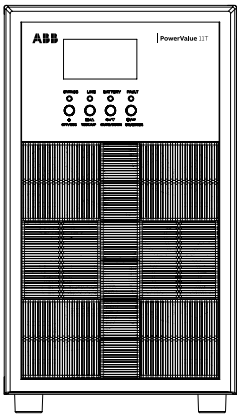
Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

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

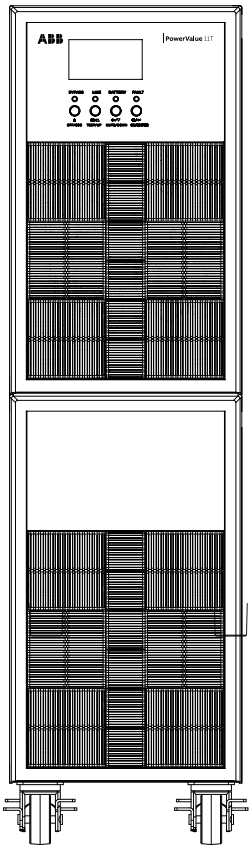
3 .2 General characteristics

3 .2 .1 Front panel

Figure 3.3.1-1 shows the front panel of the UPS.



PowerValue 11T
6KL/10KL



PowerValue 11T
6K/10K

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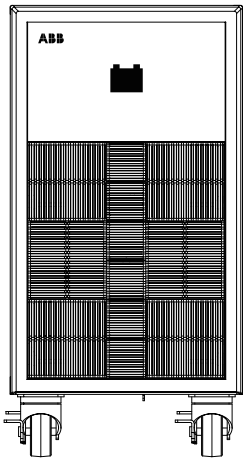
3.2.1-1:
PowerValue 11T - UPS front panel



PowerValue 11T
6K/10K

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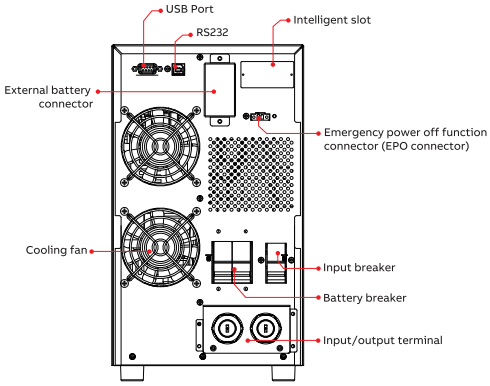
3.2.1-2:
PowerValue 11T - External battery front panel

3.3.2 Rear panel

The figures below show the connectors and ports in the UPS and external battery module rear panel.



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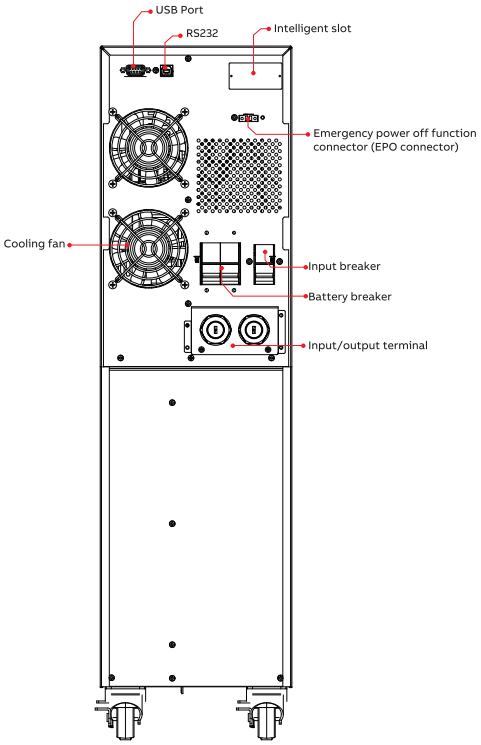
3.2.2-1
PowerValue 11T - 6kVA/10kVA rear view



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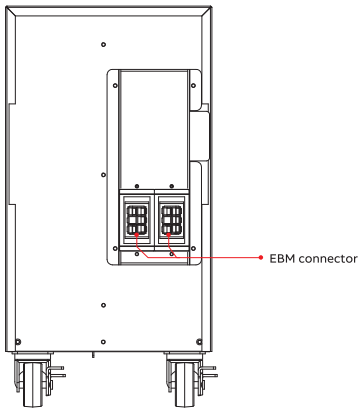
3.2.2-2
PowerValue 11T - 6kVA/10kVA rear view



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3.2.2-3
External battery - rear view

3 .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 in compliance with the standard of 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' 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
6KB	10	12		12
6KS	10	12	12	12
10KB	8	8		8
10KS	8	8	8	8

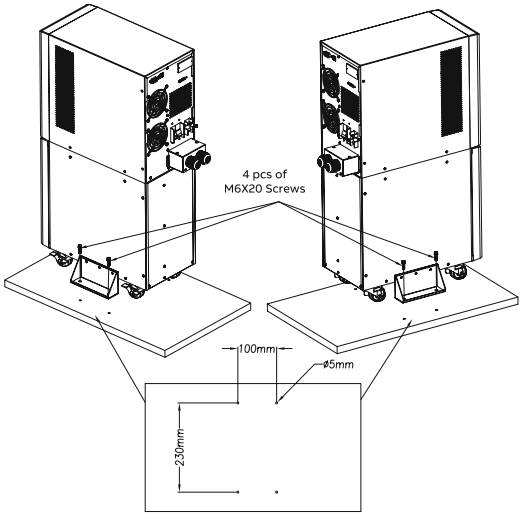
NOTE!

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

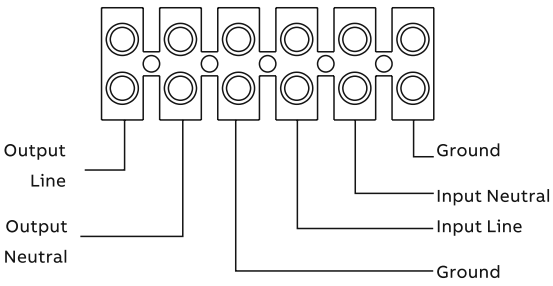
NOTE!

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

5) Cabinet placement: Secure the UPS to the ground with two shipping brackets A by fixing four screws as shown below chart.



6) Remove the cable gland 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!)



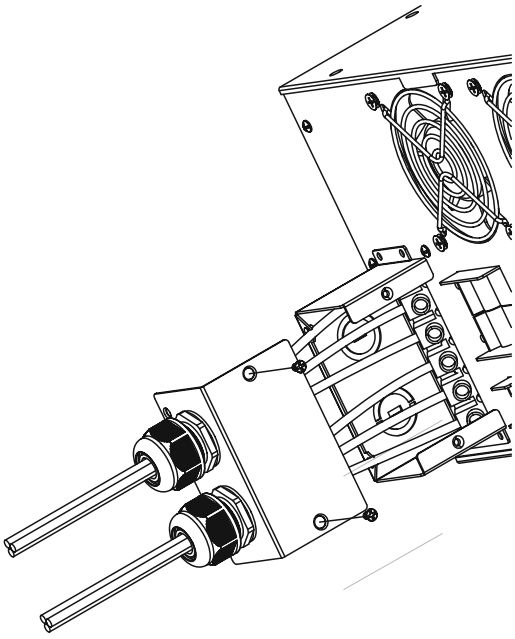
NOTE!

Make sure that the wires are connected tightly with the terminals.

NOTE!

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.

7) To guarantee wire connection reliability, it is necessary to put the cable gland cover back to the rear panel of the UPS. Keep all cables through the cable gland cover as shown in below chart. Be sure that the length of output wire cable is not over 3 meter. Cable gland size of 6KB/6KS is M20 and the suitable diameter of cable is 9-14 mm2.
Cable gland size of 10KB/10KS is M25 and the suitable diameter of cable is 10-18 mm2



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 and numbers may be different. If you connect them together, it may cause 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 are 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 high attention to the rated battery voltage marked on the rear panel. If you want to change the numbers of the battery pack, please make sure you modify the jumper setting on control board simultaneously. The connection with wrong battery voltage may cause permanent damage to the UPS. Make sure, the voltage of the battery pack is correct.
- Pay high 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 to the UPS.
- Make sure the protective earth ground wiring is correct. The current spec, color, position, connection and conductance reliability of wire should be checked carefully.
- Make sure the utility input & output wiring is correct. The current spec, color, position, connection and conductance reliability of wire should be checked carefully. Make sure the L/N terminal is correct, not reverse or short-circuited.

4. Operation

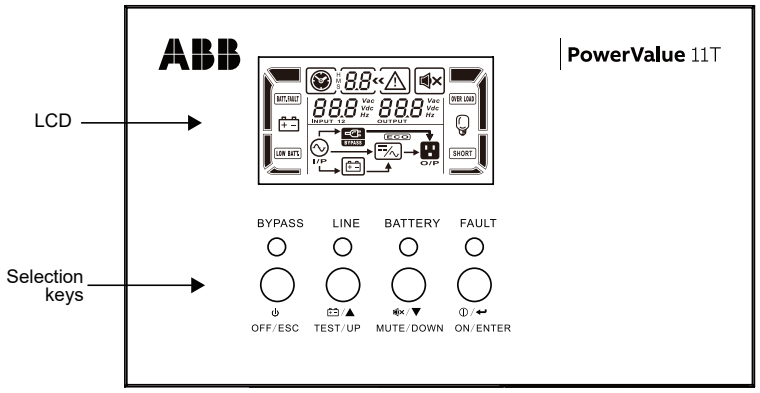
This chapter describes how the UPS is operated through the LCD.
The user can:

- Operate the LCD
- Start up and shut down the UPS (excluding the commissioning start up)
- Operate additional SNMP adapters and their software

4 .1 Control panel

The user-friendly control panel has two parts:

- Selection keys
- Power management LCD (PMD)



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4.1-1
Control panel

The user-friendly control panel has two parts:

- Selection keys
- Power management LCD (PMD)

4.1.1 Selection keys

Table 2: UPS selection keys

Button	Function	Illustration
⏻/↵ ON/Enter	ON/Enter button	• Turn on the UPS: Press and hold the button more than 1s to turn on the UPS. • Enter key: Press this button to confirm the selection in setting menu.
⏻ OFF/ESC	OFF/ESC button	• Turn off the UPS: Press and hold the button more than 1s to turn off the UPS. • Esc key: Press this button to return to last menu in setting menu.
🔋/▲ Test/Up	Test/Up button	• Battery test: Press and hold the button more than 1s to test the battery while in AC mode, or CVCF mode. • UP key: Press this button to display next selection in setting menu.
🔇/▼ Mute/Down	Mute/Down button	• Mute the alarm: Press and hold the button more than 1s to mute the buzzer. Please refer to section 3-4 “Mute the buzzer” for details. • Down key: Press this button to display previous selection in setting menu.
🔋/▲ Test/Up 🔇/▼ Mute/Down	Test/Up + Mute/Down button	• Press and hold the two buttons simultaneous more than 1s to enter/escape the setting menu.

4 .1 .2 LCD

The LCD shows an overview of the status of the UPS:

- Input
- Output
- Battery
- Load parameters
- Working mode
- Frequency
- Bypass presence

The LCD backlight automatically dims after two minutes of inactivity (except in cases of a UPS fault). Press any button to wake up the screen.

A buzzer indicates UPS status. Table 3 lists the buzzer status meanings.

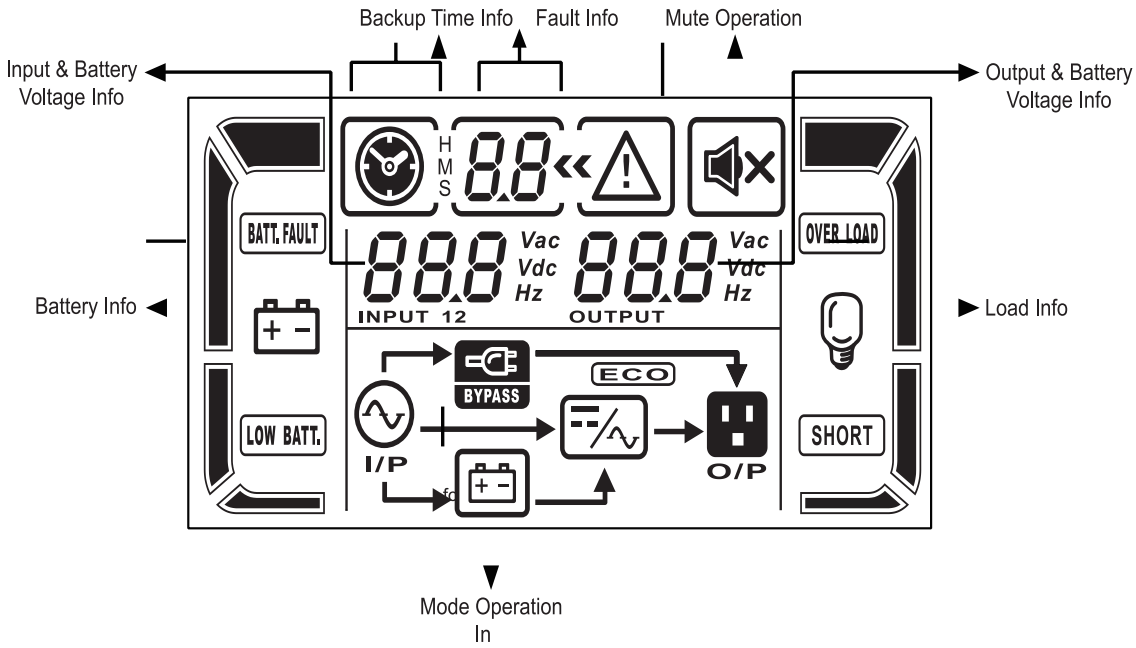
Table 3: Definition of alarms

UPS condition	Buzzer status
Active fault	Continuous
Active warning	Beep every second
Battery	UPS on battery: Beep every 4 seconds Low battery: Buzzer beeps every second
Bypass	Beep every 10 minutes
Overload	Beep twice every second

The status screen shows the following information:

- Status summary, including operating mode and load information
- Alarm status, if present (including fault and warning information)
- Battery and charger status (including battery voltage, charge level and charger status)

For more information on how to use the LCD, see Chapter 4.6.



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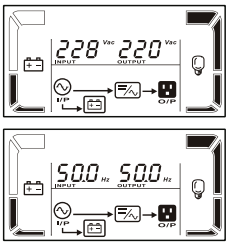
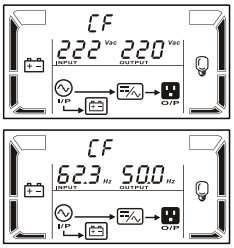
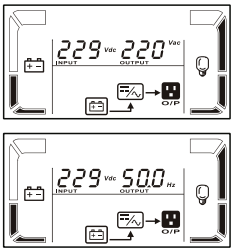
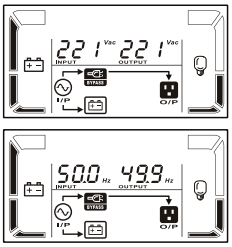
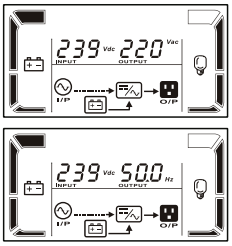
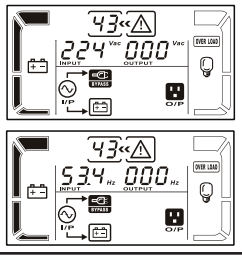
4.1.2-1
The default LCD

4 .2 Operating mode

The following table describes the UPS status information:

Table 4: Symbols in operating mode

Status	LCD Screen	Description
AC mode		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.
CVCF mode		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.
Battery mode		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.
Bypass mode		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.
Battery test		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.
Fault status		When UPS has fault happened, it will display fault codes in LCD panel.

4.3 UPS operation

- 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 supplies power to the loads via the bypass. The UPS is operating in Bypass mode.

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 1s 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.

- **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 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.

- **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 power failure.

2) In Battery mode, if buzzer sound annoys, users can press the Mute button to mute 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)

- **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!

If the UPS has been set to enable the bypass output, it will bypass voltage from utility power to output sockets and terminal even though you have turned off the UPS (inverter).

NOTE!

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 LCD panel and UPS is complete off.

- **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.

- **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.

- **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 the trouble shooting table in chapter 4 for details.

2) Please check the loads, wiring, ventilation, utility, battery and so on after the fault occurs. Don’t 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.

4 .4 LCD wordings index

The following table describes the UPS status information:

Table 5: Symbols in operating mode

Abbreviation	Display content	Meaning
ENA	ENA	Enable
DIS	dIS	Disable
ATO	AtO	Auto
BAT	bAt	Battery
NCF	nCF	Normal mode (not CVCF mode)
CF	CF	CVCF mode
SUB	SUb	Subtract
ADD	Add	Add
ON	On	On
OFF	OFF	Off
FBD	Fbd	Not allowed
OPN	OPn	Allow
RES	rES	Reserved

4.5 LCD panel

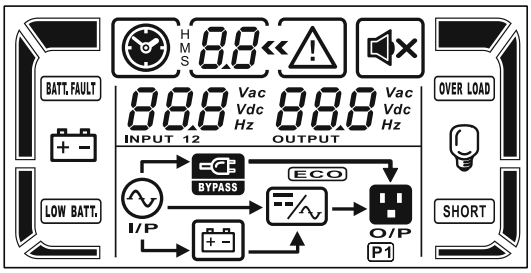


Table 6: Symbols in operating mode

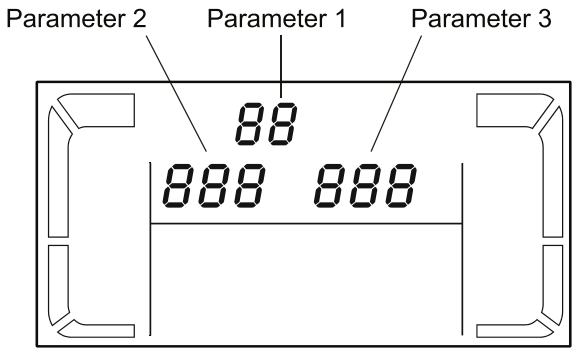
Display	Function
H M S	Indicates the remaining backup time in numbers. H: hours, M: minutes, S: seconds
	Indicates that the warning and fault occurs
	Indicates the fault codes, and the codes are listed in details in section 3-9.
	Indicates that the UPS alarm is disabled.
Vac Vdc Hz OUTPUT	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency
	Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%.
OVER LOAD	Indicates overload.
SHORT	Indicates the load or the UPS output is short circuit.
I/P	Indicates the UPS connects to the mains.
	Indicates the battery is working.
BYPASS	Indicates the bypass circuit is working.
	Indicates the inverter circuit is working.
O/P	Indicates the output is working.
	Indicates the battery capacity 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.
Vac Vdc Hz OUTPUT	Indicates the input voltage, input frequency and battery voltage. Vac: AC voltage, Vdc: DC voltage, Hz: frequency

4.6 LCD settings

WARNING!

Changing ups settings might adversely impact the load supply or load functionality.
It is recommended to disconnect the load before proceeding.

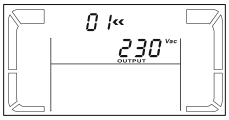
Press and hold select button for 5 seconds to enter UPS settings mode when UPS is in standby mode or bypass mode. Press and hold "Off/Enter" and "select" buttons for 5 seconds to switch LCD screen in rack or tower display.



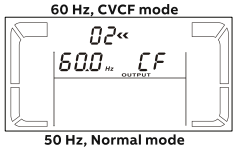
There are three parameters to set up the UPS. Refer to following diagram.
Parameter 1: It's for program alternatives. Refer to below table for the programs to set up.
Parameter 2 and parameter 3 are the setting options or values for each program.

Note: Please select **"Up"** or **"Down"** button to change the programs or parameters.

01: Output voltage

Interface	Settings
	**Parameter 3: Output voltage** You may choose the following output voltage in parameter 3: **208:** Presents output voltage is 208Vac **220:** Presents output voltage is 220Vac **230:** Presents output voltage is 230Vac **240:** Presents output voltage is 240Vac

02: Output frequency

Interface	Settings
60 Hz, CVCF mode  50 Hz, Normal mode  ATO 	**Parameter 2: Output frequency** Setting the output frequency. You may choose following three options in parameter 2: **50.0Hz:** The output frequency is setting for 50.0Hz. **60.0Hz:** The output frequency is setting for 60.0Hz. **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. ATO is default setting. **Parameter 3: Frequency mode** Setting output frequency at CVCF mode or non-CVCF mode. You may choose following two options in parameter 3: **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. **NCF:** Setting UPS to normal mode (non-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. 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. *If Parameter 2 is ATO, the Parameter 3 will show the current frequency.

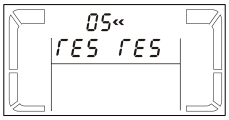
03: Voltage range for bypass

Interface	Settings
	**Parameter 2:** Set the acceptable low voltage for bypass. Setting range is from 110V to 209V and the default value is 110V. **Parameter 3:** Set the acceptable high voltage for bypass. Setting range is from 231V to 276V and the default value is 264V.

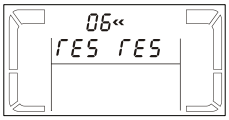
04: Frequency range for bypass

Interface	Settings
	**Parameter 2:** Set the acceptable low frequency for bypass. 50 Hz system: Setting range is from 46.0Hz to 49.0Hz. 60 Hz system: Setting range is from 56.0Hz to 59.0Hz. The default value is 46.0Hz/56.0Hz. **Parameter 3:** Set the acceptable high frequency for bypass. 50 Hz: Setting range is from 51.0Hz to 54.0 Hz. 60 Hz: Setting range is from 61.0Hz to 64.0Hz. The default value is 54.0Hz/64.0Hz.

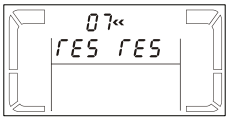
05: Reserved

Interface	Settings
	**Reserved**

06: Reserved

Interface	Settings
	**Reserved**

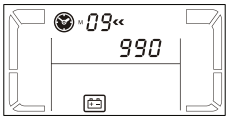
07: Reserved

Interface	Settings
	**Reserved**

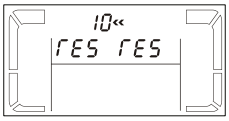
08: Bypass mode setting

Interface	Settings
	**Parameter 2:** **OPN:** Bypass allowed. When selected, UPS will run at Bypass mode depending on bypass enabled/disabled setting. **FBD:** Bypass not allowed. When selected, it's not allowed for running in Bypass mode under any situations. **Parameter 3:** **ENA:** Bypass enabled. When selected, Bypass mode is activated. **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.

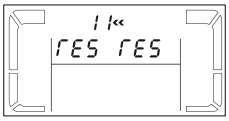
09: Battery maximum discharge time setting

Interface	Settings
	**Parameter 3:** **000~999:** Set the maximum discharge time from 0 min. to 999 min. UPS will shut down to protect battery after discharge time arrives. The default value is 990 min. **DIS:** Disable battery discharge protection and backup time will depend on battery capacity.

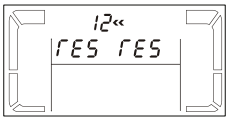
10: Reserved

Interface	Settings
	**Reserved**

11: Reserved

Interface	Settings
	**Reserved**

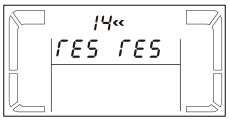
12: Reserved

Interface	Settings
	**Reserved**

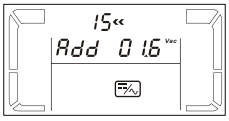
13: Battery voltage calibration

Interface	Settings
	**Parameter 2:** Select “Add” or “Sub” function to calibrate battery voltage to real figure. **Parameter 3:** The voltage setting range is from 0V to 5.7V. The default value is 0V.

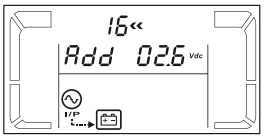
14: Reserved

Interface	Settings
	**Reserved**

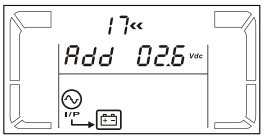
15: Inverter voltage calibration

Interface	Settings
	**Parameter 2:** you may choose Add or Sub to calibrate inverter voltage **Parameter 3:** The voltage setting range is from 0V to 6.4V. The default value is 0V.

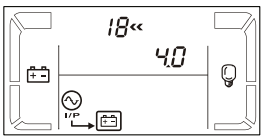
16: Floating charger voltage adjustment

Interface	Settings
	**Parameter 2:** you may choose Add or Sub to adjust floating charger voltage. **Parameter 3:** the voltage range is from 0V to 8V, the default value is 0V.

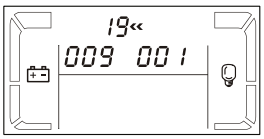
17: Constant charger voltage adjustment

Interface	Settings
	**Parameter 2:** you may choose Add or Sub to adjust constant charger voltage. **Parameter 3:** the voltage range is from 0V to 4V, the default value is 0V.

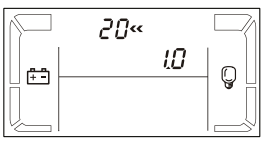
18: Maximum charger current setting

Interface	Settings
	**Parameter 3:** The maximum charging current could be adjusted. Default value is 4A for long run model and 1A for standard model. The available options are 1A, 2A, 4A and 6A. 6A is only available for the UPS with 16 pieces of batteries.

19: Battery capacity and groups setting

Interface	Settings
	**Parameter 2:** Set the battery capacity such as 7AH, 9AH, 10AH, 12AH, 17AH, 26AH, 40AH, 65AH, 100AH and so on. The default value is 9AH. **Parameter 3:** Set battery group range from 1 to 6. The default value is 1 group. These parameters are for the battery backup time calculation.

20: Bypass mode setting

Interface	Settings
	**Parameter 3:** Calibrate the displayed backup time by adjusting this multiplier factor. The formulation is listed below: Displayed backup time=Original calculated backup time x multiplier factor The default value of multiplier factor is 1.0 and the setting range is from 0.5 to 2.

5. Communication

A USB and an RS-232 port are available to enable communication between the UPS and a remote computer/ station. Only one communication port can be active at a time and priority is given to the USB port.

Once the communication cable is installed, the power management software can exchange information with the UPS. The software collects information from the UPS and indicates the status of the device, the power quality of the mains and the battery autonomy of the units.

If there is a power failure and a predicted shutdown of the UPS due to low battery autonomies, the monitoring system can save the load data and initiate shutdown of the equipment connected to the UPS.

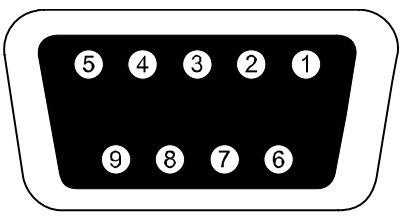
NOTE!

Lengths of cables shall not exceed 10 m
Keep routing of communication cables separated from mains supply AC and DC cables

5.1 RS-232 port

The UPS has an RS-232 port for UPS monitoring, control and firmware updates. To establish communication between the UPS and a computer, connect one end of the serial communication cable to the RS-232 port on the UPS and the other end to the RS-232 port of a computer.

The cable pins for the RS-232 communication port are described in Figure 5.1-1 and Table 7.



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5.1-1
RS-232 Communication Port (DB-9 Connector)

Table 7: Communication port pin assignment

PIN	Signal name	Function	Direction from UPS
2	TxD	Transmit to external device	Out
3	RxD	Receive from external device	in
5	GND	Signal common	-

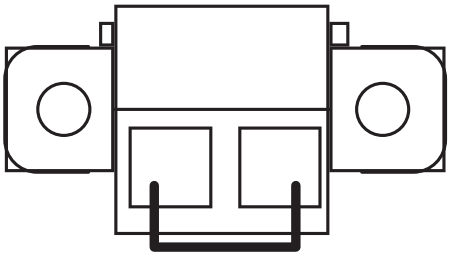
5.2 USB port

The UPS can communicate with USB-compliant computers that run power management software. To establish communication between the UPS and a computer, connect the USB cable to the USB port on the UPS. Connect the other end of the cable to the USB port on a computer.

5.3 Emergency power off

The EPO connector can be used to block the output of the UPS in case of an emergency.
The EPO connector can be configured as Normally Closed (NC) or Normally Open (NO) through the USB or RS232 port.

By default, the EPO connector is Normally Closed (NC) by a jumper in the rear panel. If the jumper is removed, the UPS output will not supply power to the load until the EPO status is changed. It's necessary for UPS normal operation to change EPO connector to Normally closed status. Then, the EPO warning will clear and UPS will be back to Bypass mode. It's necessary to turn on UPS manually.



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5.3-1
EPO (Emergency power off)

6. Troubleshooting

6.1 Fault identification and rectification

Alarms and events indicate warnings and notify of errors or potential failures in the system.
The output of the UPS is not necessarily affected when an alarm arises but taking the correct actions may prevent loss of power to the load.

6.2 Accessing alarms

6.2.1 Faults reference code

Fault event	Fault code	Icon
Bus start fail	01	X
Bus over	02	X
Bus under	03	X
Bus unbalance	04	X
Inverter soft start failure	11	X
High Inverter voltage	12	X

Fault event	Fault code	Icon
Low Inverter voltage	13	X
Inverter output short-circuited	14	SHORT
Battery voltage too low	21	x
Over temperature	41	x
Overload	43	OVER LOAD

6.2.2 Warning indicator

Warning	Icon (flashing)	Code	Alarm
Low battery	LOW BATT.		Sounding every second
Overload	OVER LOAD		Sounding twice every second
Battery unconnected	+ −		Sounding every second
Over charge			Sounding every second
EPO enable		EP	Sounding every second
Over temperature			Sounding every second
Charger failure			Sounding every second
Overload 3 times in 30min			Sounding every second
Cover of maintain switch is open			Sounding every second

6.2.3 Audible alarm

UPS status	Buzzer status	Muted
Bypass mode	Beeping once every 2 minutes	Yes
Battery mode	Beeping once every 4 seconds	
Fault mode	Beeping continuously	

Warning	Alarm	Muted
Overload	Beeping twice every second	NO
Low battery	Beeping once every second	
Battery unconnected	Beeping once every second	
Over charge	Beeping once every second	
EPO enable	Beeping once every second	
Fan failure/Over temperature	Beeping once every second	
Charger failure	Beeping once every second	
Overload 3 times in 30min	Beeping once every second	
EPO status	Beeping once every second	
Cover of maintain switch is open	Beeping once every second	

Fault	Alarm	Muted
Bus start failure	Beeping continuously	Yes
Bus over	Beeping continuously	
Bus under	Beeping continuously	
Bus unbalance	Beeping continuously	
Inverter soft start failure	Beeping continuously	
High Inverter voltage	Beeping continuously	
Low Inverter voltage	Beeping continuously	
Inverter output short-circuited	Beeping continuously	
Battery SCR short-circuited	Beeping continuously	
Over temperature	Beeping continuously	
Overload	Beeping continuously	

6.2.4 Troubleshooting

If the UPS system does not operate correctly, please 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 power cord is 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 very second.	UPS is overloaded.	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 overloaded too long and becomes fault. Then UPS shuts 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 shuts 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 at least 7 hours and then check capacity. If the problem still persists, consult your dealer.
	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.
UPS cannot start up, the icon ⚠ flashes on LCD display, and alarm beeps every second.	Cover of maintain switch is open.	Check if the cover of maintain switch is screwed tightly.

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