Uninterruptible Power Supply UPS

# COVER FLIX
# 6 kVA / kW

# User manual

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## 1. Safety rules

This manual provides information on the safe use of the UPS. Before unpacking and installing the power supply, read its contents and follow its recommendations.

| ⚠ | MET STANDARDS - EXECUTION |
|---|---|
| EN 62040-3 | Uninterruptible Power Systems (UPS): Performance Methods and Test Requirements. |

| **Safety** | |
|---|---|
| IEC/EN 62040-1-1 | |
| **EMI** | |
| Conducted Emission……IEC/EN 62040-2 | Class A |
| Radiated Emission.....IEC/EN 62040-2 | Class A |
| **EMS** | |
| ESD.....IEC/EN 6100-4-2 | Level 4 |
| RS.....IEC/EN 6100-4-3 | Level 3 |
| EFT.....IEC/EN 6100-4-4 | Level 4 |
| SURGE.....IEC/EN 6100-4-5 | Level 4 |
| Low Frequency Signals……IEC/EN 6100-2-2 | |
| **Warning:** This is a product for commercial and industrial application in the second environment-installation restriction or additional measures may be needed to prevent disturbances. | |

- Keep this manual! The manual contains important instructions for the use of the UPS, which should be followed during the installation and use of the UPS device and batteries.
- Condensation may occur if the UPS is cold and is brought into a warm room. Therefore, you should wait at least 2 hours until it starts.
- To reduce the risk of electric shock, the UPS should be installed in a dust-free room with appropriate temperature and humidity. The ambient temperature must not exceed 40°C.
- Do not install the power supply in a place exposed to direct sunlight or other sources of heat.
- Do not connect devices to the UPS output that may overload it, e.g. laser printers, electric heaters, etc.
- Cables should be connected and placed in such a way that no one can accidentally step on or disconnect them.
- The UPS must be connected to a socket with a pin with a functional protective conductor (PE).
- Do not block the ventilation openings in the UPS. Make sure that the vents are uncovered and there is a minimum of 25 cm of free space for free ventilation.
- The UPS power socket should be protected by a suitable overcurrent circuit breaker.
- The UPS has its own battery power source, so there may be voltage at the output sockets even though the UPS is not connected to the mains.
- Batteries should be handled by trained personnel who are familiar with the use of batteries and take appropriate precautions when using them.
- If it is necessary to replace the batteries, use batteries with the same number and the same parameters, i.e. rated voltage, capacity and dimensions.

***ATTENTION!*** *Do not throw batteries into fire. The battery may explode.*

***ATTENTION!*** *Do not open or damage the battery. The released electrolyte is harmful to the skin and eyes. It can be toxic.*

- The battery may present a risk of electric shock. Observe the following precautions when working with batteries:
  - Remove watches, rings and other metal objects from your hand.
  - Use tools with insulated handles.
  - Wear rubber gloves and boots.
  - Do not place tools or metal parts on top of the battery.
  - Disconnect the battery charging source before connecting or disconnecting the battery terminals.
- Check that the battery is not inadvertently grounded. If present, remove the source of the ground fault. Contact with any part of a grounded battery can cause electric shock.

## 2. Transportation, UPS unpacking

Check carefully that the carton and contents are not damaged. If any damage is found, immediately inform the transport company and the distributor of the power supply.
Do not throw away the power supply packaging.

1. If no damage is found, carefully open the carton.
2. Unpack all protective elements (sponges, fillers).
3. Carefully remove the UPS from the protective film and place it on a clean, flat and stable surface.

*Only transport the UPS in its original packaging to prevent mechanical damage, shocks and impacts.*

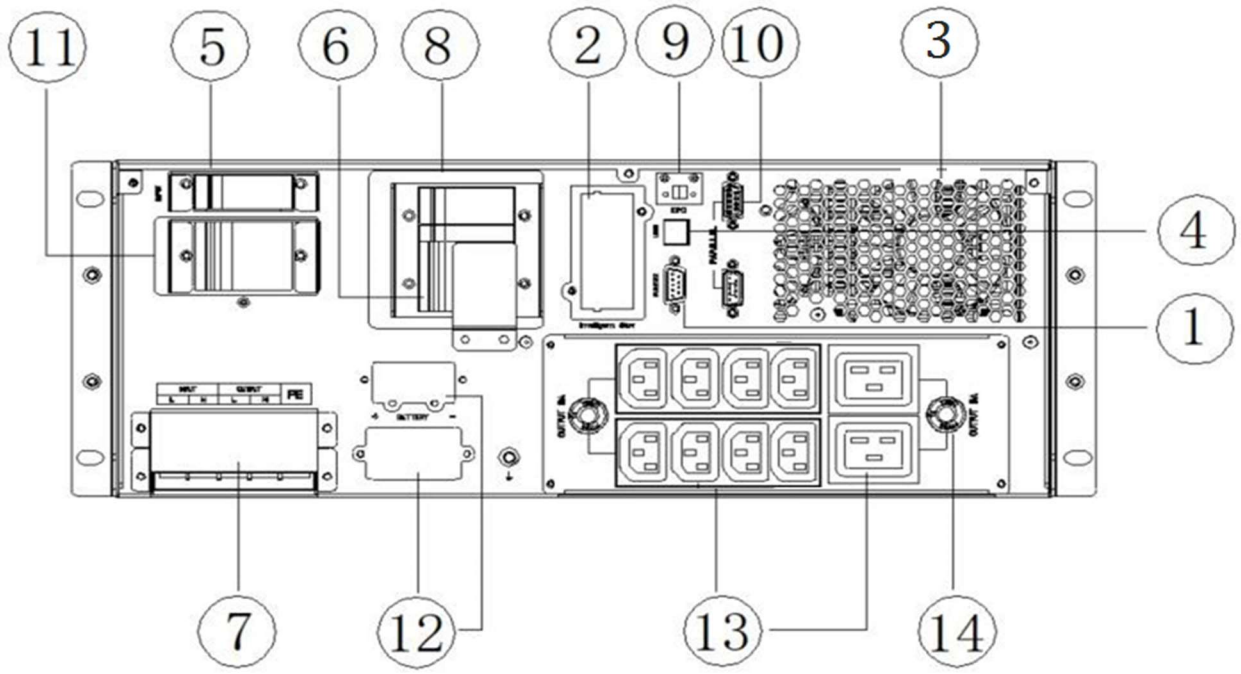
### 2.1. Horizontal installation in a 19'' rack

The FLIX series power supply can be mounted in a 19'' Rack. UPS with internal batteries module require 4U space for installation. UPS requires optional brackets (rack rails) for mounting in the rack.

### 2.2. Vertical installation (Tower)

To install the power supply in the Tower position, use special supports that secure the power supply and enable its stable positioning in a vertical position. Design and connection

### 1.1. Back panel of UPS



① RS232 port
② Smart slot
③ Fan
④ USB Port
⑤ Input breaker
⑥ Maintenance bypass switch(optional)
⑦ Terminal block
⑧ Output breaker(optional)
⑨ EPO
⑩ Parallel kit (optional)
⑪ Battery breaker
⑫ External battery connection port (optional)
⑬ Output sockets
⑭ Over current protection device

### 1.2. Power supply connection

| Power of UPS | Minimum protection value | Reccomended wires |
|---|---|---|
| 6 kVA | 32 A | 6mm2 |

1. Please choose the wire according to the table of wiring.
2. Remove the terminal cover on the back panel of the UPS.
3. Connect the input and output wires to the corresponding input and output terminals.
4. Tie the wire tightly and pass through the holes.
5. Tie the input, output and battery wire with the wire, adjust the wire to the appropriate position and fix the cable.
6. Reinstall the cover and lock the cover with a screwdriver.
7. After connecting the wire and AC, then put the UPS input breaker to "ON", the UPS will be powered.

### 1.3. Connecting loads directly to the UPS output

The UPS is equipped also with standard IEC 320 sockets. Connecting receivers requires the use of standard IEC 320 C13 - C14 (10A) or IEC 320 C19-C20 (16A) cables. The UPS is equipped with 8 x IEC 320-C13 (10A) sockets and 2 x 16A (IEC 320-C19) socket.

*Do not connect devices to the UPS output that may overload it, e.g. laser printers, electric heaters, heaters, etc.*

*Cables should be connected and placed in such a way that no one can accidentally disconnect them.*

### 1.4. Remote REPO switch connection

The UPS is equipped with an EPO port for connecting a remote REPO (Remote Emergency Power Off) switch.
By default, the EPO port is configured as NC (normally closed), EPO is activated by breaking the connection between Pin 1 and Pin 2 (jumper removed).

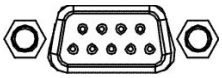
### 1.5. Connection of communication options

The UPS has three communication ports:

USB



RS-232



Slot SNMP/AS-400



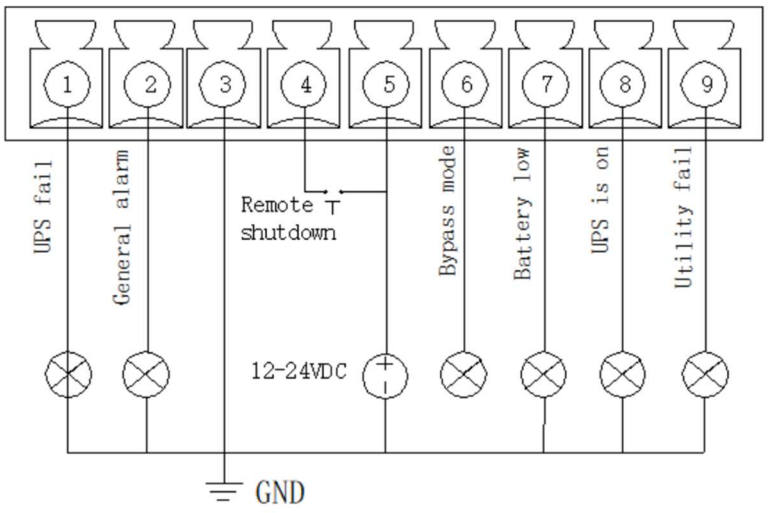
To enable automatic management and monitoring of the UPS, connect the USB cable to the USB port on the UPS on one end and the USB port on the computer on the other.

The UPS also has a slot for additional cards, which enables retrofitting with an SNMP network card for remote communication via the Internet or an AS-400 relay contact card for communication with external supervision systems, e.g. BMS.

Attention! RS-232 and USB port cannot be used simultaneously.

#### 1.5.1. AS-400/Dry contact

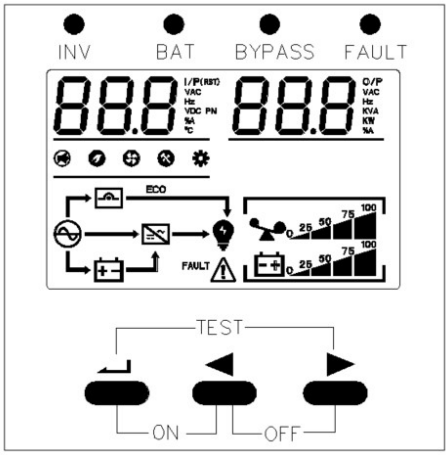
Maximum output current for dry contact is 1A. The function of dry contact is listed as below:




| Function | PIN | Description |
|---|---|---|
| UPS fault | 1 | Open from common connection: UPS is abnormal. Closed: UPS is normal. |
| General alarm | 2 | Open from common connection: UPS is warning Closed: UPS is normal |
| GND | 3 | Internal GND, used to connect external power supply 12-24Vdc |

| | | |
|---|---|---|
| Remote shutdown | 4 | Input port. Used with external power supply. If connected to power supply, UPS transfer to bypass. UPS shutdown if bypass is abnormal. |
| Common connection | 5 | Common connection of output signal. Connected to power supply for input signal. |
| Bypass mode | 6 | Closed to common connection: UPS is working in bypass mode.Open: UPS is not working in bypass mode. |
| Battery low | 7 | Open from common connection: battery low alarm Closed: battery capacity is normal or not in battery mode |
| Normal mode | 8 | Closed from common connection: UPS is working in normal mode. |
| Utility failure | 9 | Open form common connection: utility input fails. |

## 2. LCD display suport




### 2.1. Panel d

| Display | Function |
|---|---|
| Error message | |
| FAULT | Failure occurred |
| ⚠ | Warnings |
| 88 | Fault code |
| Mute | |
| | Mute function |
| Input and output voltage, DC voltage, UPS internal temperature | |
| 88.8 | VAC: input and output voltage; VDC: DC voltage<br>℃: UPS internal temperature; Hz: Frequency |
| Load information | |
| | The load volume(0-25%, 26%-50%, 51%-75%, 76%-100%) is shown here, and the overload icon flashes when the battery is low or not connected |
| Battery information | |
| | The battery capacity(0-25%, 26%-50%, 51%-75%, 76%-100%) is displayed separately, and the battery icon flashes when the battery is low or not connected |
| Other information | |
| | AC |
| | Battery |
| | Bypass |
| | Inverter |
| | Output working |
| | Fan status: LED will always be on when the fan is normal, and flashes when the fan fails |
| | Setting icon: when entering the setting menu, the icon will light up, and the icon is not shown in the other cases |
| | ECO function: the icon light up when ECO function is used, otherwise the icon is not displayed |
| | Maintenance icon: when the maintenance switch is turned on, the icon lights up, in the other cases, the icon is not displayed |

## 2.2. Function of buttons

| Button | Functional Description |
|---|---|
| Combo key for **turning on** the UPS<br>( ↵ + ◄ ) | **AC Mode:** press the two buttons at the same time for 1 second above to start UPS.<br>**Battery Mode:** please press (↵) confirmation button first, after turning on the screen, please press the two buttons at the same time for 1 second above to start UPS. |
| Combo key for **turning off** the UPS<br>( ◄ + ► ) | **AC Mode:** press the two buttons at the same time for 1 second above to turn off the inverter, the system will turn to Bypass Mode.<br>**Battery Mode:** press the two buttons at the same time for 1 second above to turn off the inverter, and after 1 minute, the system will shut down, and the screen will turn off. |
| Combo key for self-checking and mute function<br>( ↵ + ► ) | **Testing:** in AC Mode, press the two buttons at the same time for 2 seconds above to test the battery.<br>**Mute:** in Battery Mode/Alarm/Testing Mode, press two buttons at the same time for 2 seconds above to erase alarms, press two buttons again for 2 seconds above to recover alarms. |
| Function setting/confirmation key<br>( ↵ ) | **Function setting:** press the key more than 2 seconds to enter the function setting page, after completing the setting, press the key more than 2 seconds again to return to the main page.<br>**Confirmation:** in the function setting page, press the confirmation key 1 to 2 seconds to confirm the setting options. |
| Page turning/query key<br>( ◄ , ► ) | **Page turning:** press ◄ or ► key 1 to 2 seconds to turn to left or right page.<br>**Polling Mode:** press the ► key more than 2 seconds to enter Polling Mode, circularly display each page content for 2 seconds, press ► more than 2 seconds again to return to the main page. |

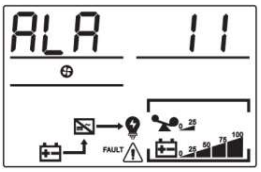
## 2.3. LED indicators

| Indicator | Colour | Instruction |
|---|---|---|
| INV | Green | **ON:** UPS working in Line Mode<br>**OFF:** UPS not working in Line Mode |
| BAT | Yellow | **ON:** UPS working in Battery Mode<br>**OFF:** UPS not working in Battery Mode<br>**Flickering:** Battery voltage low |
| BYPASS | Yellow | **ON:** UPS working in Bypass Mode<br>**OFF:** UPS not working in Bypass Mode<br>**Flickering:** Bypass abnormal |
| FAULT | Red | **ON:** fault; **OFF:** Normal; **Flickering:** Alarm |

## 2.4. Audible alarms

| Buzzer alarms | Description |
|---|---|
| Continuous beeping | Fault |
| Sounding every one second | Battery voltage low |
| | Overload |
| Sounding every two minutes | Bypass mode |
| Sounding every four seconds | Other alarms except the above |

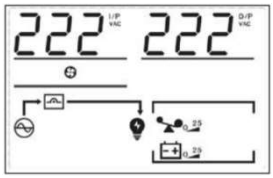
## 2.5. UPS working status table of LCD display

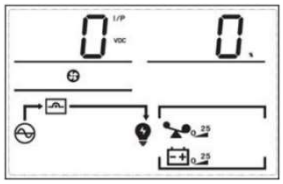
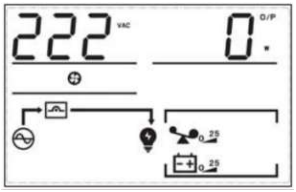
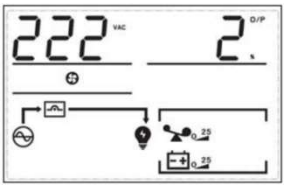
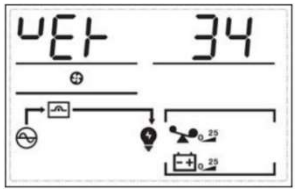
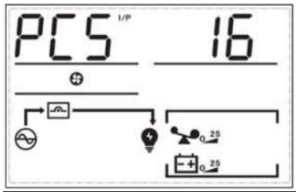
| AC Mode | |
|---|---|
| LCD display content | Instruction |
|  | UPS can provide stable AC output when AC input in the permissible range. In AC Mode, batteries will also be charged by the UPS. |
| **Battery Mode** | |
| LCD display content | Instruction |
|  | When the AC input is out of limited range or shut off, the UPS will turn to Battery Mode. The batteries supply the inverter and have beep every 4 seconds. |
| **Bypass Mode** | |
| LCD display content | Instruction |
|  | When the AC input keeps normal, start the bypass mode and close the UPS on the panel. The UPS will turn to Bypass Mode, and have beep every 2 minutes. |
| **Error Condition** | |
| LCD display content | Instruction |
|  | When the UPS has faults or alarms, LCD display will show the information. |

## 2.6. Parameter query

Normally the LCD display can show 8 pages totally. Pressing the query button ◄ or ► for 0.1-2 sec can enter into the different pages which show all information, such as input, battery, output, load, software version, temperature, and etc. If alarms occur, the display will add one more page to show the alarm information. If the UPS has faults, the default display will turn to the Fault code page automatically, the home page will show the fault or alarm information by default. When UPS keeps normal working, the home page default display will show the output voltage and frequency information.

Press ► (right button) more than 2 sec, LCD will turn to the polling mode. Every 2 sec the shown display will turn pages. Press ► long time, LCD will exit the polling mode.

| LCD Display 1: UPS input & output voltage | LCD Display 2: UPS input & output frequency |
|---|---|
|  |  |
| LCD Display 3: Battery voltage and capacity | LCD Display 4: Output voltage and output active power |

| | |
|---|---|
|  |  |
| LCD Display 5: Output voltage and output apparent power | LCD Display 6: Output voltage and load percentage |
|  |  |
| LCD Display 7: UPS system software version | LCD Display 8: connected battery quantity |
|  |  |

## 2.7. Function settings

**Note: Before setting, must transfer the UPS to internal bypass, so the setting would be available.**

01: Output voltage

| LCD Display | Setting |
|---|---|
|  | Press the function setting button (⏎)over 2 sec, then go to the setting page. Press the page turning buttons till the setting page of output voltage, and the word "OPU" flashing.<br>Press confirmation button (⏎)0.5-2 sec, then go to the setting page of output voltage OPU. The "OPU" words light on, and the numbers by left side of OPU keeps flashing. Press page turning buttons(◄) or(►) 0.5-2sec to choose different output voltage value, the optional voltage values are 208V, 220V, 230V and 240V. The default output voltage is 230V. Please save after setting.<br>Turn to the voltage value which you need, and press confirmation button (⏎) 0.5-2sec, then finish the OPU setting. The number by left side of OPU will keep lighting on, no flashing.<br>Press functional setting button(⏎) over 2 sec, quit the setting page and back to the home page.( Or no operation, waiting more than 30 sec, the page will come back to home page automatically).<br>Note: When the output voltage setting with 208V, the output needs to decrease to 90% of rated power. |

02: Other functional setting

02-1: Expert Mode(EP)

| LCD Display | Setting |
|---|---|
| <br> | The expert mode setting with ON, then go to the functional setting page again. The functional setting will show battery QTY(PCS), EPO, charging current and other items can be selected. When the expert mode setting with OFF, functional setting page will show only the general options.<br>Note: The expert mode default to OFF. When setting as ON then re-connected the AC power, the EP can be recovered as OFF. |

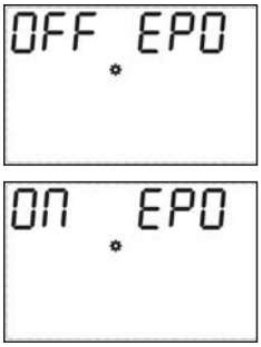
02-2 Battery low voltage shutdown point/End of discharge voltage(EOD)

| LCD Display | Setting |
|---|---|
| <br> | The options of EOD setting are dEF, 9.8V, 9.9V, 10V, 10.2V, 10.5V.<br>By default, the EOD is dEF<br>(The EOD will be changed according to loading condition. 10.5V@load ＜25%，10.2V@25%＜load＜50%，10V@load＞50%). |

02-3: Economic Operation Mode

| LCD Display | Setting |
|---|---|
| <br> | ECO is OFF by default, can be set as ON to improve the efficiency of system operation.<br>Note: For the models with PF ＜1, OFF by default, and unable to set. |

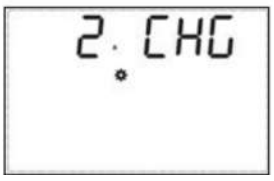
02-4: Emergency shut down(EPO)

| LCD Display | Setting |
|---|---|
|   | When EP is set to ON, the EPO option appears on the function setting page. Emergency shutdown can be set as closed or open to trigger, the default is open to trigger.<br>Note: After EPO action, emergency shutdown, close all outputs immediately. |

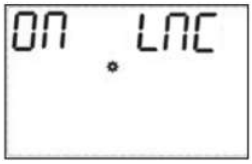
02-5: Battery quantity(PCS)

| LCD Display | Setting |
|---|---|
|   | When EP is set to ON, the PCS option appears on the function setting page, will enter the password page, enter the password (the general password is 135), you can set the number of batteries. The default battery number is 16pcs,which can be set to 16/18/20pcs. |

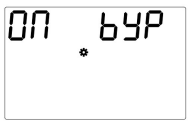
02-6: Charger Current(CHG)

| LCD Display | Setting |
|---|---|
|   | When EP is set to ON, the CHG option appears on the functional setting page, the charging current can be set, 1-12A optional, default 1A. Noted: if UPS built-in batteries, the charger current default 1A, and cannot be changed. |

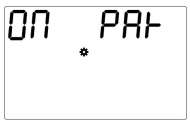
02-7: Input Neutral and Live cable reverse alarm function

| LCD Display | Setting |
|---|---|
| <br> | The input neutral and live cable reverse alarm mode is closed by default, can choose to open to improve the safety of the system.<br>Note: Factory settings default closed, please open if you need. |

02-8: Static switch avaiability

| LCD Display | Setting |
|---|---|
| <br> | When EP is set to ON, the BYP option appears on the function setting page. BYP is ON by default, When you set this to OFF, bypass will be disabled. |

02-9: Parallel switch

| LCD Display | Setting |
|---|---|
| <br> | When it is set to OFF, parallel operation can't be performed. When set to ON, parallel operations can be performed.<br>Note: This operation is only applicable to 6-10kVA models, and is not applicable to 1-3kVA models. |

# 3. Warning and fault codes

## 3.1. Warning codes

When the "⚠" symbol on the UPS LCD flashes, the UPS is in alarm state. Press the page turning key to the error state page(refer to 3.5), observe the alarm code and make appropriate processing according to the table below.

| Alarm code | Indication | Possible reasons | Solutions |
|---|---|---|---|
| 1 | No battery connection | No battery connected<br>Battery damaged | Check the battery connection.<br>Change the batteries. |
| 2 | Battery low voltage | The battery voltage is less than the low voltage warning point. | After utility recovers, the built-in charger can be turned on to charge the battery. |
| 4 | Input neutral and live cables are reversed | Input neutral and live cables are reversed.<br>Input ground cable is not connected.<br>Output ground cable is not connected. | Reverse the neutral and the live cables.<br>Check the ground cable connection. |
| 8 | Battery over voltage | UPS detects high battery voltage | Check that the battery quantity setting is consistent with the actual battery quantity. |
| 9 | Charger failure | Abnormal charger hardware | Contact the supplier. |
| 10 | Over temperature alarm | Fan fault<br>Air duct of UPS rear panel is blocked.<br>Overload<br>NTC sensor abnormal or connection abnormal<br>Power component IGBT is damaged. | Check the rectifier fan.<br>Remove blockages on the rear panel of the UPS.<br>Check the load.<br>If the above treatments do not work, contact the supplier. |
| 12 | Fan fault | Fan wiring is loose.<br>Fan hardware abnormal | Check the fan and connection |
| 13 | AC fuse open | Fuse blown | Contact the supplier. |
| 14 | EEPROM fault | EEPROM chip damages. | Contact the supplier. |
| 21 | Overload | The loads exceed the rated power. | Check the load. |
| 22 | 3 times consecutive overload locks | 3 times consecutive overload locks | Shut down and restart UPS. |
| 23 | EPO action | Press EPO button. | Release EPO button.<br>Check the wiring harness on EPO button. |
| 24 | Maintenance switch action | The maintenance switch is pressed. | Release maintenance switch. |

### 3.2. Fault code and solution

When the "**FAULT**" is long bright, and "⚠" symbol on the UPS LCD flashes, the UPS is in fault state. UPS automatically switches to the error status page (refer to 3.5) to observe the fault code and make appropriate processing according to the following table.

| Fault code | Indication | Possible reasons | Treatment measures |
|---|---|---|---|
| 1 | Bus boosting soft-starting fail | AC abnormal<br>Abnormal soft-starting circuit of bus | Check the mains, if all normal, please contact the supplier. |
| 2 | Bus over voltage | AC abnormal<br>Software processing error<br>Bus capacitor failure | Check the mains, if all normal, please contact the supplier. |
| 3 | Bus under voltage | City electricity is too low.<br>Software processing errors<br>Bus capacitor failure | Please check the rectifier fan.<br>Clean the obstacles on the air duct of the rear panel of the UPS.<br>Check the loads.<br>If all of above do not work, please contact the supplier. |
| 7 | Over temperature | Fan failure<br>The air duct on the rear panel of the UPS is blocked;<br>Overload<br>NTC sensor abnormality or abnormal wiring<br>Power component IGBT is damaged. | Please check the rectifier fan;<br>Clean the obstacles on the air duct of the rear panel of the UPS;<br>Check the loads;<br>If all of above do not work, please contact the supplier. |
| 8 | Battery relay short circuit | Relay RL1/RL3 hardware damaged | Please contact the supplier |
| 9 | Bus relay soft-starting fail | City electricity abnormal<br>Bus soft-staring circuit abnormal | Please check the city electricity power, if no abnormal, please contact the supplier. |
| 17 | Inv soft-starting fail | Some hardware of the inverter is damaged;<br>The control panel fails. | Please contact the supplier. |
| 18 | Inv output over voltage | Some hardware of the inverter is damaged;<br>The control panel fail. | Please contact the supplier. |
| 19 | Inv output under voltage | Some hardware of the inverter is damaged;<br>The control panel fails. | Please contact the supplier. |
| 20 | Inv short circuit | Some hardware of the inverter is damaged.<br>Output short circuit | Check if the short circuit exists on the output of UPS.<br>If no abnormal, please contact the supplier. |

| | | | |
|---|---|---|---|
| 26 | Negative power protection(output with AC input fail) | Bypass reverses to the inverter.<br>load abnormal | Check the loads and if no abnormal, please contact the supplier. |
| 33 | Inv relay or SCR open circuit | Relay RL8 is damaged. | Please contact the supplier. |
| 34 | Inv relay or SCR short circuit | | |
| 35 | Bypass relay or SCR open circuit | Relay RL4/RL6 is damaged. | Please contact the supplier. |
| 36 | Bypass relay or SCR short circuit | | |
| 37 | I/O connection reversed | Reverse wiring on input and output. | Please check the wiring harness of input and output. |
| 39 | Charger short circuit | Output of charger short circuit<br>Charger hardware abnormal | Please contact the supplier. |
| 66 | Over load fault | Overload too much<br>The voltage reduction causes the system rated power to decrease. | Check if the load is within the specified range;<br>Check if the voltage has been reduced. |
| 67 | Charging over voltage or battery connection reversed | Hardware error<br>Number of battery wrong;<br>Wiring wrong. | Check whether the battery wiring or battery number meets the requirements.<br>If no any abnormal, please contact the supplier. |
| 68 | Unknown machine model | Software version error | Restart the machine;<br>If no any abnormal, please contact the supplier. |
| 72 | Charger over current | Hardware error;<br>Battery abnormal. | Check whether the battery wiring or battery number meets the requirements;<br>If no any abnormal, please contact the supplier. |
| 73 | No bootstrap | Software version error | Restart the machine;<br>If no any abnormal, please contact the supplier. |
| 81 | Unknown battery QTY setting | Number of battery wrong | Check whether the battery number meets the requirement;<br>Check if the configuration of the battery jumper cap is the same as the software setting. |
| 82 | Battery QTY setting matching error | Number of battery setting wrong and can not be matched with software setting. | |

### 3.3. Common faults and trouble shooting

| Number | Phenomenal description | Reasons | Solutions |
|---|---|---|---|
| 1 | Connect to city electricity, and no display on LCD display panel | No input power | Check if the input wiring harness of UPS is in well connection. |
| | | Input voltage under voltage or overload | Use voltage meter to check the input voltage if in normal or meets the requirement. |

| | | | |
|---|---|---|---|
| 2 | City electricity in normal, no AC input indication, UPS is still working in battery mode | UPS power switch is still off | Press UPS city electricity power button on |
| | | The wiring harness is loosen or in poor connection. | Check the input wiring harness whether in normal. |
| 3 | UPS not display error, but no output voltage | The wiring harness is loosen or in poor connection | Make sure the wiring harness in well connection. |
| 4 | Press ⏎ button, UPS doesnt start | Press button too shortly | Press ⏎ over 5 seconds, hear "Di" sound |
| | | Overload | Remove all loads and restart the machine. |
| 5 | With city electricity, but no city electricity indication | Mains voltage or frequency over UPS input range | Use a multi-meter to check whether the input voltage and the input frequency meets the requirements. |
| 6 | The battery discharge time is lower than the standard time | The power of batteries has been used. | Change new battery |
| | | The batteries were not be charged fully. | Charge the batteries more than 8 hours under normal city electricity, then retest it. |
| 7 | Abnormal sound or smell come out from the inside of UPS | Inner of UPS may be damaged | Please immediately turn off the UPS, cut off the power input and contact the customer service center for technical support. |
| 8 | Battery mode display yellow light, long buzzer sounds, battery capacity is insufficient, ready to shut down | The power of battery is low, UPS is ready to shut down, and the loads will be cut off. | Save the data on the loads immediately and complete shutdown the important loads to avoid data loss or damage.<br>Immediately connect the UPS input terminal to the standby AC power supply. |

# 4. UPS working environment and operation

## 4.1. Working conditions

To ensure proper working conditions for the uninterruptible power supply system, the room where the power supply is located must be clean, dust-free.
From time to time (at least every 6 months or more often depending on the degree of dirt), clean the ventilation holes on the power supply to ensure free air flow.
To extend battery life, the ambient temperature should be between 15-25°C.

## 4.2. The storage conditions

If the UPS is not in use and is intended to be stored or stored, it is necessary to recharge the batteries periodically to avoid damaging the batteries. Depending on the storage temperature, connect the power supply to charge the battery at least every 6 months. Typically, the batteries are charged within 4 hours to 90% capacity, but it is recommended to leave the power supply turned on for 24-48 hours to fully charge the batteries, which will extend their life.

*Temp. storage up to 20°C - charging every 6 months.*

*Temp. storage between >20°C ÷ 30°C - charging every 3 months.*

*Temp. storage between >30°C ÷ 40°C - charging every 1 month.*

## 4.3. Battery change

If the operating time of the UPS is less than half of the nominal with good batteries, or if the UPS reports a battery alarm, the batteries should be replaced immediately.

Attention! The UPS is equipped with internal batteries that can be replaced during operation without switching off the UPS and connected loads (hot-swap function).

*Although battery replacement is possible in Hot Swap mode, it is not recommended to replace the batteries while the UPS and receivers are operating. A possible power failure may result in loss of data or damage to receivers.*

It is safe for the user to replace the battery according to the following recommendations.
Only use batteries with the same capacity, voltage and dimensions as the original.

*After disconnecting the battery, the receivers are not protected against power failures.*

*The batteries must not be replaced while the UPS is operating in battery mode!*

# 5. UPS operations

## 5.1. Turning On US from mains

1. Switch the Battery Circuit Breaker (11) located on the rear panel of the UPS to the ON position.
2. If external batteries are also present, turn on the external battery circuit breakers on the additional battery modules.
3. Turn on the UPS power supply at the UPS switchboard.
4. Turn on the Input Switch (5) and the Output Switch (8).
5. At this moment the LCD panel illuminates, the LED indicators light up to indicate the UPS test, and the fans (3) start working. A few seconds later, the UPS starts the startup procedure and starts up in Normal mode.

Note: For maximum autonomy, the batteries should be charged at least 10 hours after the first startup. Maximum battery capacity is achieved after two full discharge/charge cycles.

## 5.2. Turning off UPS

1. Turn off the UPS inverter by pressing the OFF keys simultaneously for min. 1 sec.
2. The UPS will switch to Bypass mode or shut down if Bypass is not active.

*Bypass mode during UPS shutdown may not be active if it has been disabled in the Menu UPS settings, Expert Mode.*

3. To turn off the UPS, turn off the Input Switch (5) and turn off the Output Switch (8) and turn off the Battery Circuit Breaker (11).
4. If present, also turn off the external battery disconnects on additional battery modules.
5. A few seconds later, the UPS turns off the LCD panel and stops the fans.
6. Turn off the UPS power at the UPS switchboard.

## 5.3. Turning to Maintenance Bypass mode

*In Maintenance Bypass mode only terminal output is supplied (7).*

*Outlets (13) are not supplied in Maintenance Bypass mode.*

1. Turn off the UPS inverter by pressing the OFF keys simultaneously for min. 1 sec.
2. The UPS will switch to Bypass mode or shut down if Bypass is not active.

*Bypass mode during UPS shutdown may not be active if it has been disabled in the Menu UPS settings, Expert Mode.*

3. Remove metal plate from maintenance byass switch (6).
4. Turn On Maintenance Bypass switch On

5. To turn off the UPS, turn off the Input Switch (5) and turn off the Output Switch (8) and turn off the Battery Circuit Breaker (11).
6. UPS is working in maintenance bypass mode.
7. A few seconds later, the UPS turns off the LCD panel and stops the fans.

### 5.4. Turning from Maintenance Bypass to Online

1. Switch the Battery Circuit Breaker (11) located on the rear panel of the UPS to the ON position.
2. If external batteries are also present, turn on the external battery circuit breakers on the additional battery modules.
3. Turn on the Input Switch (5) and the Output Switch (8).
4. At this moment the LCD panel illuminates, the LED indicators light up to indicate the UPS test, and the fans (3) start working.
5. Make sure the UPS is working in electronic bypass mode (Bypass LED On).
6. Turn Off Maintenance bypass switch (6).
7. Mount back the metal plate on the maintenance bypass switch (6).
8. Turn on the UPS inverter by pressing the ON keys simultaneously for min. 1 sec.
9. UPS should switch from Bypass to Normal mode.