tuncmatik
PLUS X9 3 Uninterruptible Power Supply

tuncmatik PLUS X9 3 Uninterruptible Power Supply User Manual

Contents

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Product Information

Specifications

- **Model:** NEWTECH PLUS X9 3/1
- **Capacity:** 10-15-20kVA
- **Type:** Uninterruptible Power Supply (UPS)
- **Contact:** info@tuncmatik.com / www.tuncmatik.com

Product Usage Instructions

- **Safety and EMC Instructions**
  Please read the user manual and safety instructions before installing or using the UPS.
- **Transportation and Storage**
  Transport the UPS system only in the original package to protect against shock. Store in a ventilated, dry room.
- **Preparation**
  - Ensure the UPS system is dry before installation to prevent condensation. Allow at least two hours for acclimation.
  - Avoid installing near water, direct sunlight, or heat sources in moist environments. Keep ventilation holes unblocked.
- **Installation**
  Avoid connecting appliances that may overload the UPS output sockets. Do not connect big motor-type equipment.
- **Connection Warnings**
  Isolate the UPS before working on the circuit. Check for hazardous voltage between all terminals, including protective earth, to avoid voltage backfeed.
- **Operation**

Do not disconnect the earth conductor cable on the UPS or building wiring terminals, as doing so cancels the protective earth of the system and connected loads.

Frequently Asked Questions (FAQ)

- **Q: Can I connect big motor-type equipment to the UPS?**
  A: No, avoid connecting appliances that may overload the UPS output sockets, including big motor-type equipment.
- **Q: How should I store the UPS when not in use?**
  A: Store the UPS in a ventilated, dry room to prevent damage from moisture or condensation.

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

Safety and EMC instructions

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

Transportation and Storage

- 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.

Preparation

- Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate to 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 a nearby heater.
- Do not block ventilation holes in the UPS housing.

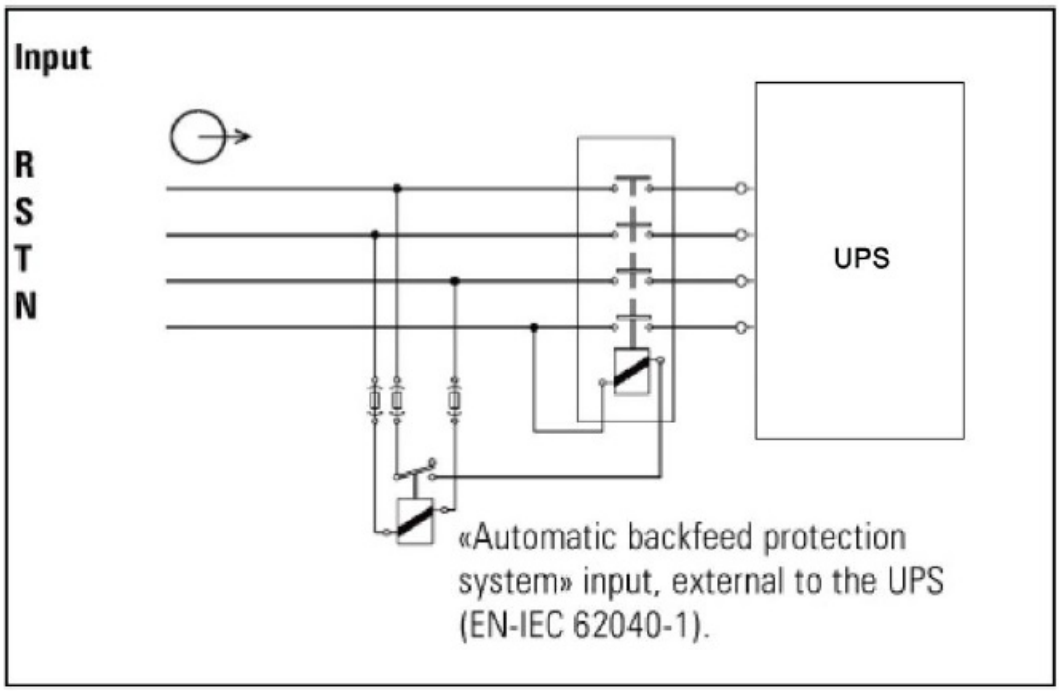
Installation

- Do not connect appliances or devices that would overload the UPS (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 an earthed terminal, in the final installed system configuration, with 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.

- An integral single emergency switching device that 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 under the local electrical laws and regulations.

Connection Warnings

- There is no standard backfeed 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 to the TN earthing system.
- The power supply for this unit must be three-phase rated under the equipment nameplate.
- It also must be suitably grounded.
- Use of this equipment in life support applications where the 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.

Risk of Voltage Backfeed

Operation

- Do not disconnect the earth conductor cable on the UPS or the building wiring terminals in any time since this would cancel the protective earth 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 terminal blocks may be electrically live even if the UPS system is not connected to the building wiring outlet. (Only for the standard model)
- To fully disconnect the UPS system, first press the “OFF” button and then disconnect the mains.
- Ensure that no liquid or other foreign objects can enter into the UPS system.
- The UPS can be operated by any individual with no previous experience.

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 Contact Air…… : IEC/EN 61000-4-2	Level 2 Level 2
RS…… : IEC/EN 61000-4-3	Level 3
EFT…… : IEC/EN 61000-4-4	Level 3
SURGE…… : IEC/EN 61000-4-5	Level 3
CS…… : IEC/EN 61000-4-6	Level 3
Power-frequency Magnetic field……. : IEC/EN 61000-4-8	Level 4
Low-Frequency Signals…….. EC/EN 62040-2 Category C3	
Warning: This is a product for commercial and industrial application in the second environment restrictions or a dditional measures may be needed to prevent disturbances.	

Installation and Operation

There are two different types of online UPS: standard and long-run models. Please refer to the following model table.

Model	Type	Model	Type
3/1 10K	Standard model	3/1 10KL	Long-run model
3/1 15K		3/1 15KL	
3/1 20K		3/1 20KL	

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 lack of some parts. Please keep the original package in a safe place for future use.

Rear Panel View

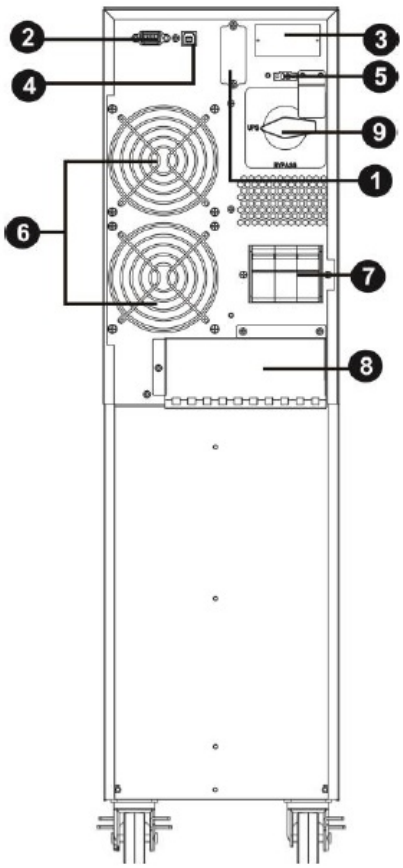


Diagram1: 3/1 10K Rear Panel

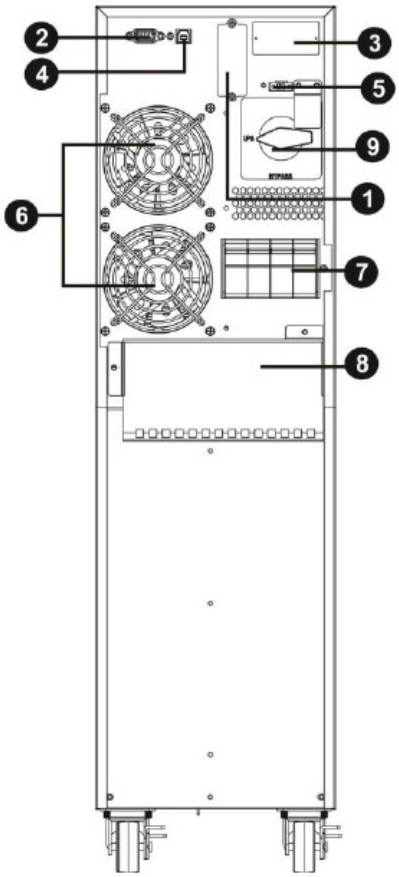


Diagram 2: 3/1 15K Rear Panel

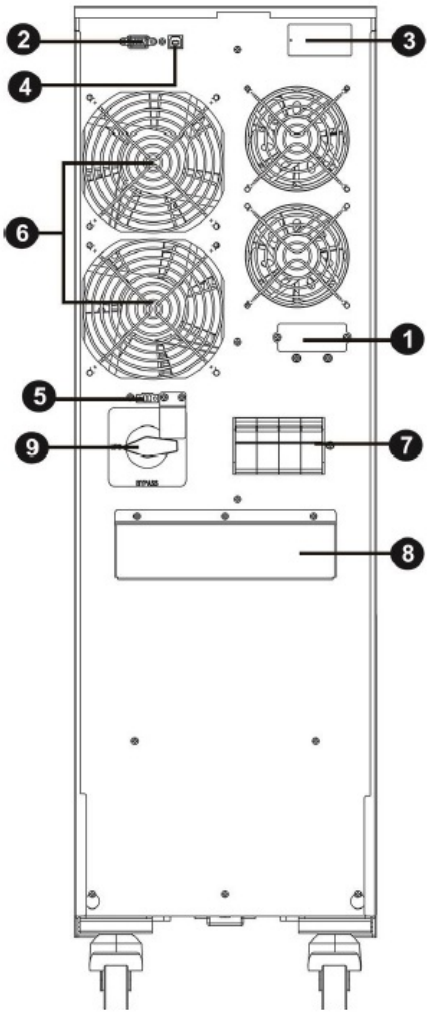


Diagram 3: 3/1 20K Rear Panel

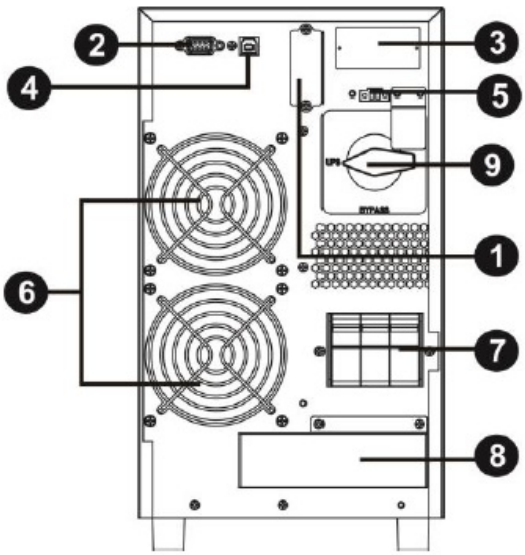


Diagram 3: 3/1 10KL Rear Panel

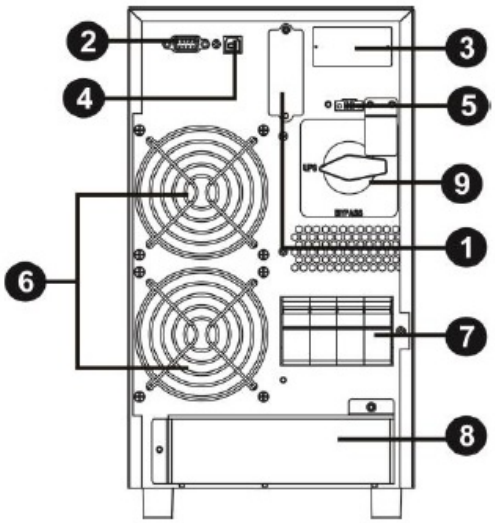


Diagram 4: 3/1 15KL/20KL Rear Panel

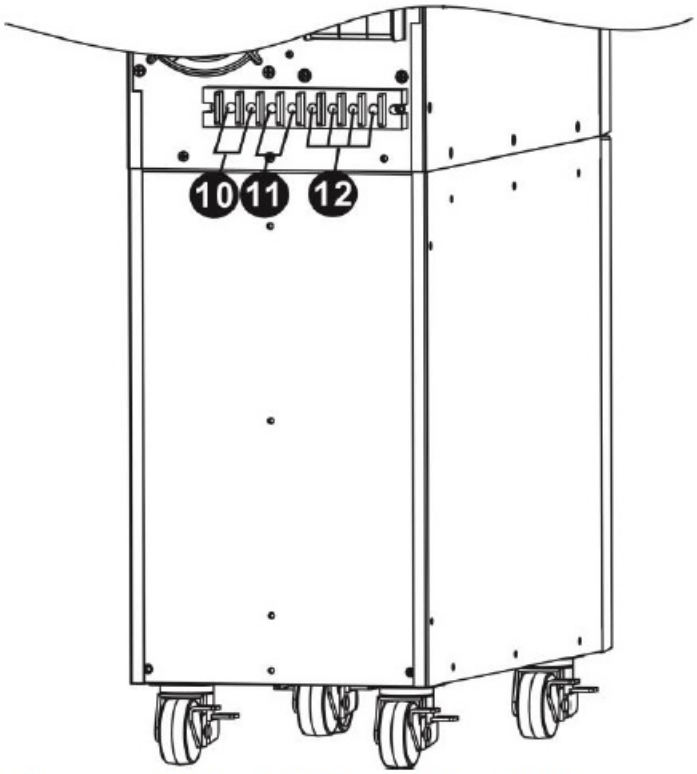


Diagram 5: Input/Output Terminal

1. External battery connector
2. RS-232 communication port
3. Intelligent slot
4. USB communication
5. Emergency power off function connector (EPO connector)
6. Cooling fan
7. Input circuit breaker
8. Input/Output terminal (Refer to Diagram 4 / 6 for the details)
9. Maintenance bypass switch (option)
10. Output terminal
11. Grounding terminal
12. Utility input terminal

UPS Installation

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

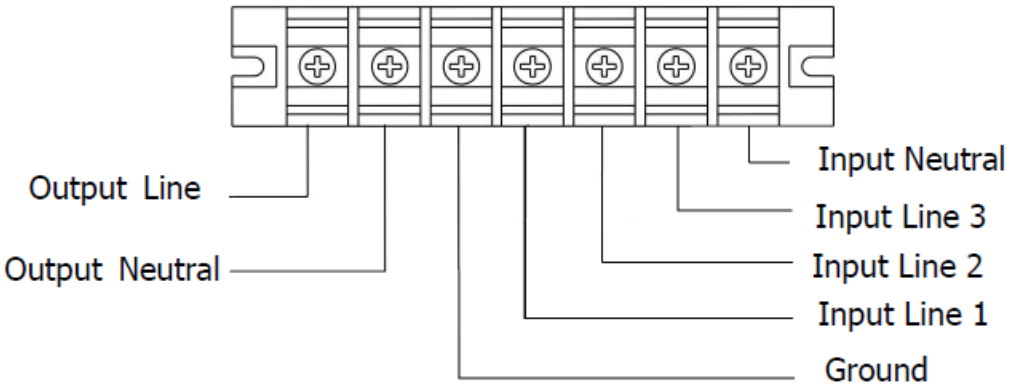
1. Make sure the mains wire and breakers in the building comply with the standard of rated capacity of UPS to avoid the hazards of electric shock or fire.

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

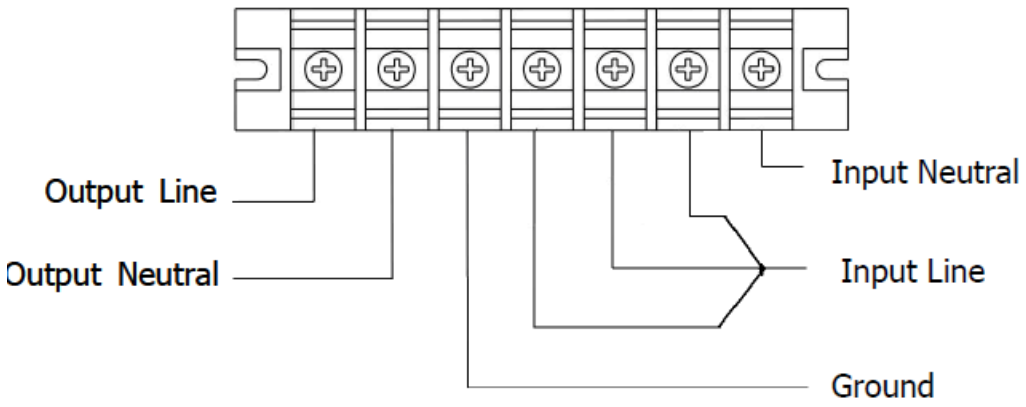
Model	Wiring spec (AWG)			
	Input	Output	Battery	Ground
3/1 10K	8	8		8
3/1 10KL	8	8	8	8
3/1 15K	6	6		6
3/1 15KL	6	6	6	6
3/1 20K	6	6		6
3/1 20KL	6	6	6	6

- **NOTE 1:** It is recommended to use suitable wire in the above table or thicker for safety and efficiency.
- **NOTE 2:** The selections for the color of wires should be followed by the local electrical laws and regulations.

5. Remove the terminal block cover on the rear panel of the UPS. Then connect the wires according to the following terminal block diagrams: (Connect the earth wire first when making a wire connection. Disconnect the earth wire last when making a wire disconnection!)
   This UPS can be configured for two different applications. Please refer to below wiring diagrams.



Terminal Block wiring diagram for three-phase input



Terminal Block wiring diagram for single-phase input

- NOTE 1: Make sure that the wires are connected tightly to 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.

- NOTE 3: This UPS is equipped with a phase auto-adapt function for input. This function allows UPS to adapt the input phase sequence automatically. Therefore, this UPS can accept either three-phase or single-phase input power.
- Please refer to the above wiring diagrams for the connection. However, it never accepts two-phase input power.

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

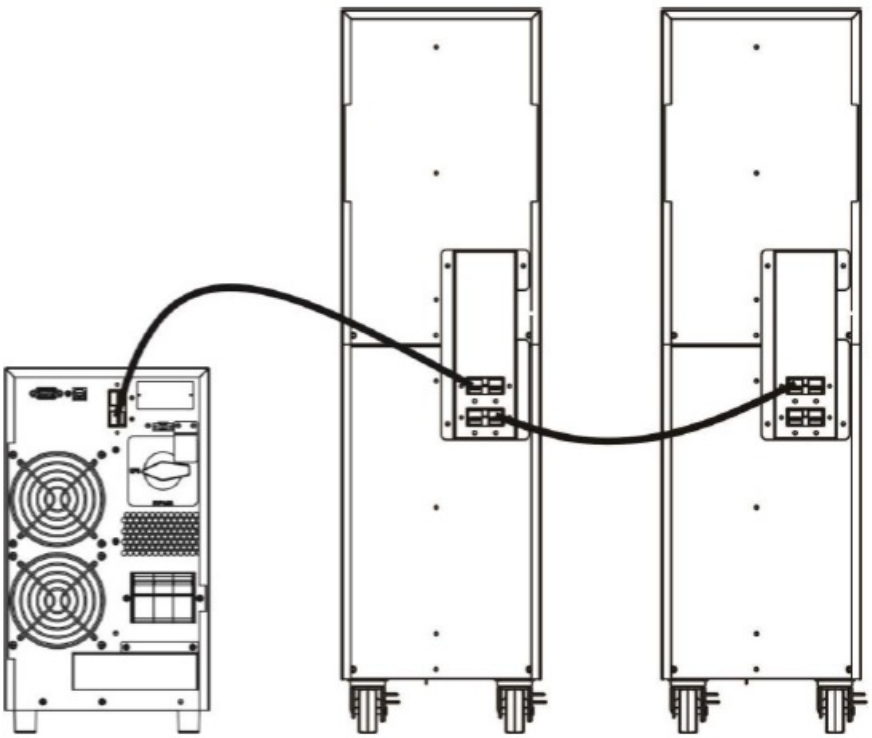
Warning: (Only for standard model)

- Make sure the UPS is not turned on before installation. The UPS should not be turned on during the 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 voltage and numbers may be different. If you connect them, 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 an external battery pack is installed. If not, please install it carefully. Switch off the battery breaker before installation.

Warning:

- For a standard external battery pack, there is one DC breaker to disconnect the battery pack and the UPS. But for other branded external battery packs, 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 the “OFF” position and then install the battery pack.



- Pay high attention to the polarity marking on the external battery terminal block, and make sure the correct battery polarity is connected. A 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 the wire should be checked carefully.
- Make sure the utility input & output wiring is correct. The current spec, color, position, connection, and conductance reliability of the wire should be checked carefully. Make sure the L/N terminal is correct, not reverse or short-circuited.

Software Installation
For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown.

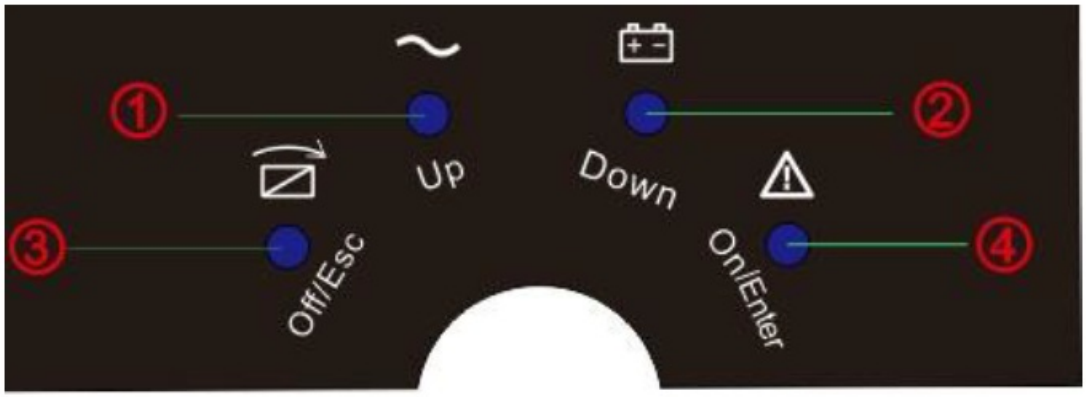
Operations

Button Operation

Button	Function
ON/Enter Button	Ø Turn on the UPS: Press and hold the button more than 1s to turn on the UPS. Ø Enter Key: Press this button to confirm the selection in the settings menu.
OFF/ESC Button	Ø Turn off the UPS: Press and hold the button more than 2s to turn off the UPS. Ø Esc key: Press this button to return to the last menu in the settings menu.
Test/Up Button	Ø Battery test: Press and hold the button more than 1s to test the battery while in AC mode, or CVCF mode. Ø UP key: Press this button to display the next selection in the settings menu.
Mute/Down Button	Ø Mute the alarm: Press and hold the button more than 1s to mute the buzzer. Please refer to section 3-4-8 “Mute the buzzer” for details. Ø Down key: Press this button to display the previous selection in the settings menu.
Test/Up + Mute/Down Button	Ø Press and hold the two buttons simultaneously for more than 1s to enter/escape the setting menu.

CVCF mode means converter mode.

LED Indicators and LCD Panel



① Inverter LED Ⓒ Battery LED ③Bypass LED ④Alarm LED

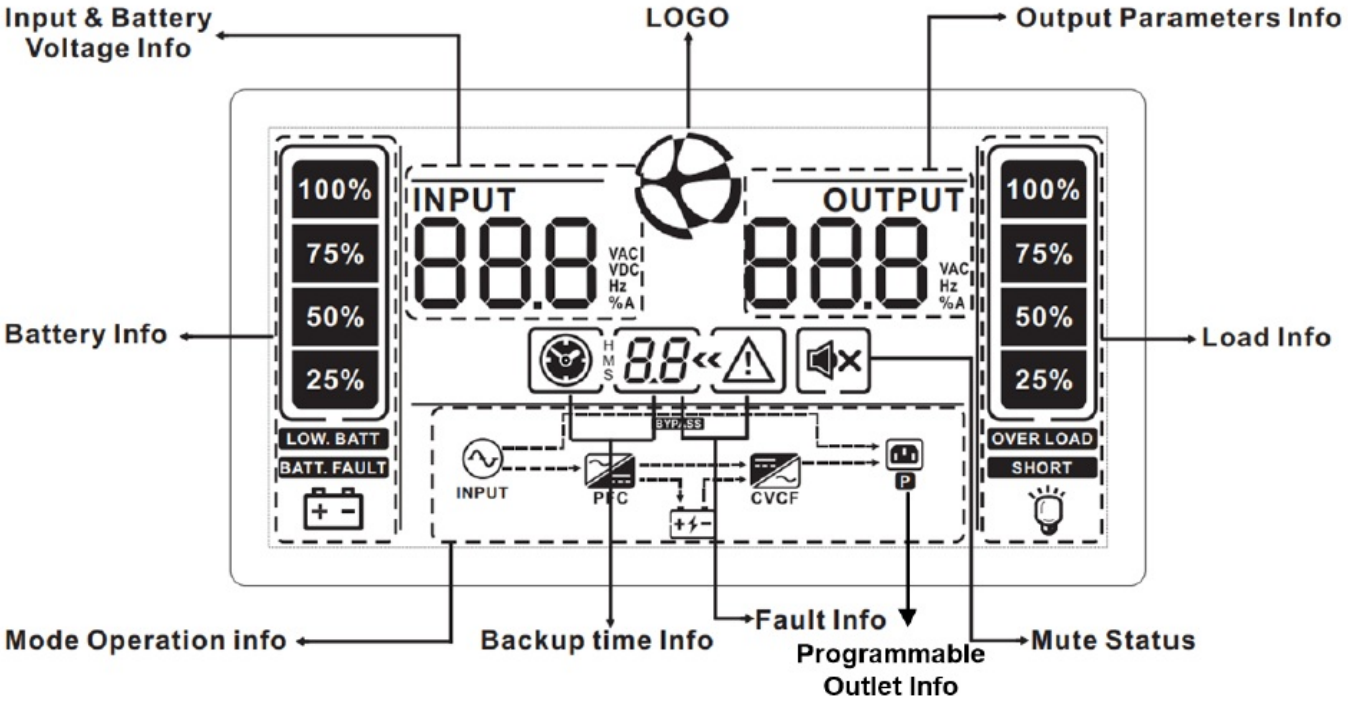
LED Indicators:

There are 4 LEDs on the front panel to show the UPS working status:

Mode / LED	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.

LCD Panel



Display	Function
Remaining backup time information	
	Indicates the remaining backup time in pie chart.
H M S 88	Indicates the remaining backup time in numbers. H: hours, M: minute, S: second
Fault information	
	Indicates that the warning and fault occurs.
88	Indicates the warning and fault codes, and the codes are listed in details in section 3-8/3-9.
Mute operation	
	Indicates that the UPS alarm is disabled.
Output & Battery voltage information	
OUTPUT 888 VAC Hz %A	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency
Load information	
100% 75% 50% 25%	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.
Programmable outlets information	
P	Indicates that programmable management outlets are working.
Mode operation information	

INPUT	Indicates the UPS connects to the mains.
	Indicates the battery is working.
BYPASS	Indicates the bypass circuit is working.
	Indicates the Converter circuit is working.
PFC	Indicates that the PFC is enabled.
	Indicates the Inverter circuit is working.
CVCF	Indicates that the CVCF is enabled.
	Indicates the output is working.
Battery information	
100% 75% 50% 25%	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	
INPUT 88.8 VAC VDC Hz %A	Indicates the input voltage or frequency or battery voltage. Vac: Input voltage, Vdc: battery voltage, Hz: input frequency

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		
Overcharge		
EPO enable		
Fan failure/Over temperature		
Charger failure		
Overload 3 times in 30min		
Input phase dislocation		
Input voltage unbalanced		
Input Phase Losing		
Fault		
Bus start failure	Beeping continuously	Yes
Bus over		
Bus under		
Bus unbalance		
Inverter soft start failure		
High Inverter voltage		
Low Inverter voltage		
Inverter output short-circuited		
Battery SCR short-circuited		

Over Temperature		
Overload		

UPS Operation

1. Turn on the UPS with the utility power supply (in AC mode)
    1. After the power supply is connected correctly, set the breaker of the battery pack at the “ON” position (the step is only available for the long-run model). Then, set the input breaker to the “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 the 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 the 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 AC mode. If the utility power is abnormal, the UPS will operate in Battery mode without interruption.

       NOTE: When the UPS is running out of battery, it will shut down automatically at Battery mode. When the utility power is restored, the UPS will auto-restart in AC mode.
2. **Turn on the UPS without a utility power supply (in Battery mode)**
    1. Make sure that the breaker of the battery pack is at the “ON” position (only for the 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 Battery mode.
3. **Connect devices to UPS**

   Before the UPS is turned on, you can connect devices to the UPS.
    1. Switch on the devices one by one and it will display the total load level in the 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 load is too big.
    3. If the UPS is overloaded, the buzzer will beep twice every second.
    4. When the UPS is overloaded, 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 the 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 an 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 the bypass function is disabled or the input power is not within the bypass acceptable range, it will cut off output directly.
4. **Charge the batteries**
    1. After the UPS is connected to the utility power, the charger will charge the batteries automatically except in Battery mode or during battery self-test.
    2. It’s suggested to charge batteries at least 10 hours before use. Otherwise, the backup time may be shorter than the expected time.
    3. Make sure the battery numbers setting on the control board (Please refer to section 3-4-12 for detailed setting) is consistent to the real connection.
    4. The charging current can be changed from 1A/2A/4A via LCD or software. Please make sure that the charging current is suitable to the battery specification.
5. **Battery mode operation**
    1. When the UPS is in Battery mode, the buzzer will beep according to different battery capacities. 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 a 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 the 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 temperatures and load types.
5. When setting the backup time limit for 16.5 hours (default value from LCD panel), after maximum discharging of 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 3-6 LCD setting section)

6. **Turn off the UPS with the utility power supply in AC mode**
    1. Turn off the inverter of the UPS by pressing the “OFF” button for at least 2s, 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 sockets and 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 a risk of power loss for connected devices.
    2. In Bypass mode, the 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 completely off.
7. **Turn off the UPS without a utility power supply in Battery mode**
    1. Turn off the UPS by pressing the “OFF” button for at least 2s, 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.
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 sections 3-3 for the details.
9. **Operation in warning status**
    1. When the Fault LED flashes and the buzzer beeps once every second, it means that there are some problems with the UPS operation. Users can get the fault code from the LCD panel. Please check the troubleshooting table in Chapter 4 for details.
    2. Some warning alarms can’t be muted unless the error is fixed. Please refer to sections 3-3 for the details.
10. **Operation in Fault mode**
    1. When the 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 the display panel. Please check the troubleshooting 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 cases, please cut off the connection from the utility, external battery, and output immediately to avoid more risk or danger.

11. **Operation in maintenance mode**

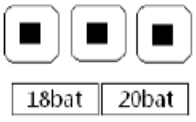
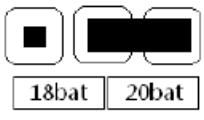
    This operation is only available for professional or qualified technicians.

    When the UPS needs repair or maintenance and the load can't be cut off in this case, please operate the UPS in maintenance mode.

    1. First, remove the cover of the maintenance bypass switch on the rear panel. Then, the UPS automatically stops and enters bypass mode.
    2. Turn the maintenance switch to the "BYPASS" position.
    3. Turn off the input breaker. Now, you may start to maintain the UPS.
    4. After the maintenance is complete, please turn on the input breaker.
    5. Turn the maintenance switch to the "UPS" position.
    6. Put the cover back to its original position.
    7. Restart the UPS.

12. **Change battery numbers**

    1. This operation is only available for professional or qualified technicians.
    2. Turn off the UPS. If the load can't be cut off, you should remove the cover of the maintenance bypass switch on the rear panel and turn the maintenance switch to the "BPS" position first.
    3. Switch off the input breaker and the battery breaker.
    4. Remove the cabinet cover, and then modify the jumpers (CN1) on the control board to set the battery numbers as the following table:

Battery numbers	16 batteries	20 batteries
CNTL Board CN1		

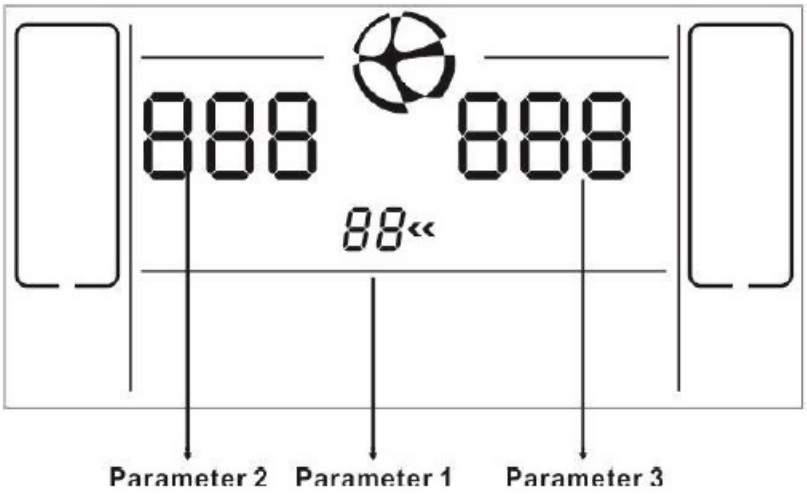
    Note:  =connect with jumper;  =no jumper.

    5. Modify the battery pack according to the setting number carefully. After completing it, put the cover back, and switch on the battery breaker.
    6. Switch on the input breaker and the UPS will enter Bypass mode. If the UPS is in maintenance Bypass mode, switch the maintenance switch to the "UPS" position and then turn on the UPS.

Abbreviation Meaning in LCD Display

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
HS.H	HSH	HOST UPS of hot standby function
RES	rES	Reserved

LCD Setting



- There are three parameters to set up the UPS. Refer to the following diagram.
- Parameter 1: It's for program alternatives. Refer to the 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 the "Up" or "Down" button to change the programs or parameters.

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					
06	Reserved					
07	Reserved					
08	Bypass mode setting	Y	Y			
09	Maximum battery discharging time setting	Y	Y	Y	Y	Y
10	Reserved					
11	Reserved					
12	Hot standby function enable/disable	Y	Y	Y	Y	Y
13	Battery voltage calibration	Y	Y	Y	Y	Y
14	Reserved					
15	Inverter voltage Calibration		Y	Y	Y	
16	Floating charging voltage adjustment	Y	Y	Y	Y	Y
17	Constant charging voltage adjustment	Y	Y	Y	Y	Y
18	Maximum charging current setting	Y	Y	Y	Y	Y
19	Battery capacity and group 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.

1. Output voltage

Interface	Setting
	**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(Default) **230:** Presents output voltage is 230Vac **240:** Presents output voltage is 240Vac

2. Output frequency

Interface	Setting

60 Hz, CVCF mode  50 Hz, Normal mode  ATO  	**Parameter 2: Output Frequency** Setting the output frequency. You may choose the following three options in parameter 2: **50.0Hz:** The output frequency is set to 50.0Hz. **60.0Hz:** The output frequency is set for 60.0Hz. **ATO:** If selected, the 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 the default setting. **Parameter 3: Frequency mode** Setting output frequency at CVCF mode or non-CVCF mode. You may choose the 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 the 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 the setting in parameter 2. If 50 Hz is selected in parameter 2, UPS will transfer to battery mode when the input frequency is not within 46~54 Hz. If 60Hz is selected in parameter 2, UPS will transfer to battery mode when the input frequency is not within 56~64 Hz. *If Parameter 2 is ATO, the Parameter 3 will show the current frequency.

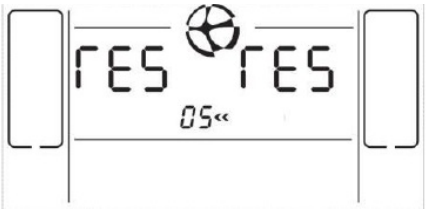
3. Voltage range for bypass

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

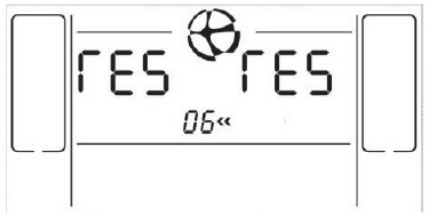
4. Frequency range for bypass

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

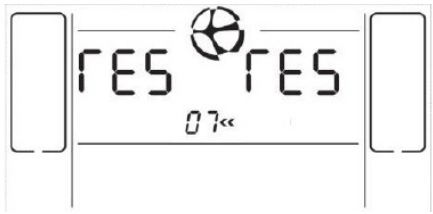
5. Reserved

Interface	Setting
	**reserved**

6. Reserved

Interface	Setting
	**reserved**

7. Reserved

Interface	Setting
	**reserved**

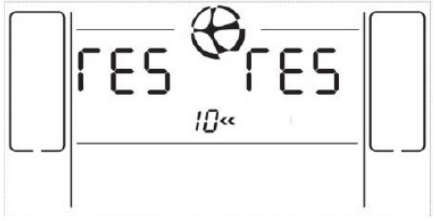
8. Bypass mode setting

Interface	Setting
	**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 runnin g in Bypass mode under any situations. **Parameter 3:** **ENA**: Bypass enabled. When selected, Bypass mode is activated. **D IS**: Bypass disabled. When selected, automatic bypass is acceptable , but manual bypass is not allowed. Manual bypass means users ma nually operate UPS for Bypass mode. For example, pressing the OF F button in AC mode to turn into Bypass mode.

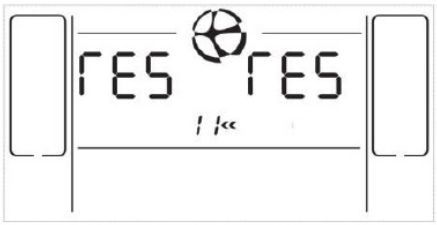
9. Maximum battery discharging time setting

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

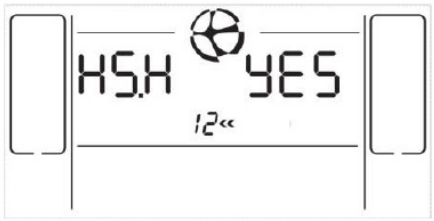
10. Reserved

Interface	Setting
	**reserved**

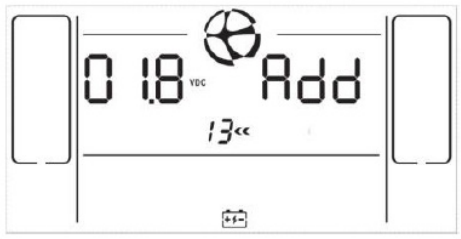
11. Reserved

Interface	Setting
	**reserved**

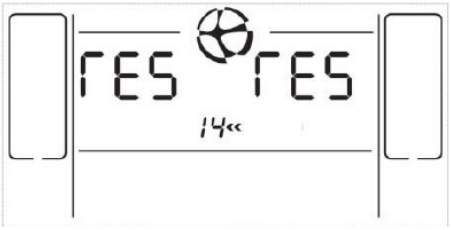
12. Hot standby function enable/disable

Interface	Setting
	**Parameter 2:** **HS.H:** Enable or disable the Hot standby function. You may choose t he following two options in **Parameter 3:** **YES:** Hot standby function is enabled. It means that the current UPS i s set to host of the hot standby function, and it will restart after AC rec overy even without the battery connected. **NO:** Hot standby function is disabled. The UPS is running at normal mode and can’t restart without a battery

13. Battery voltage calibration

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

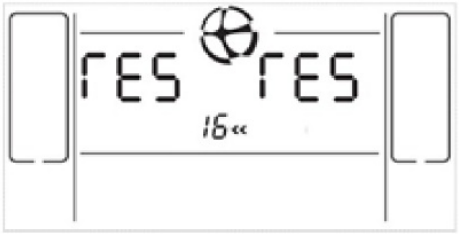
14. Reserved

Interface	Setting
	**reserved**

15. Inverter voltage calibration

Interface	Setting
	**Parameter 2:** you may choose **Add** or **Sub** to calibrate inverter volt age **Parameter 3:** The voltage setting range is from 0V to 6.4V. The defa ult value is 0V.

16. Reserved

Interface	Setting
	**Reserved**

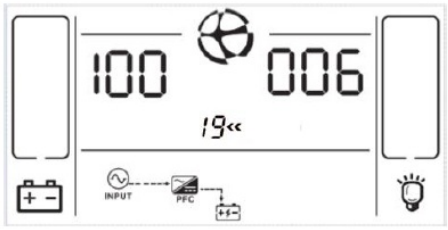
17. Reserved

Interface	Setting
	**Reserved**

18. Maximum charging current setting

Interface	Setting
	**Parameter 3:** The maximum charging current could be adjusted. The default value is 4A for the long run model and 1A for the standar d model. The available options are 1A, 2A and 4A.

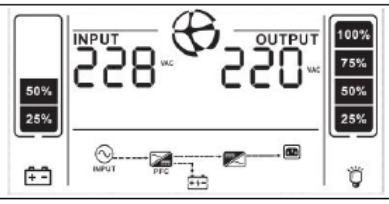
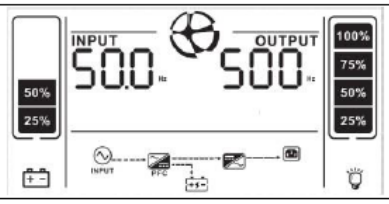
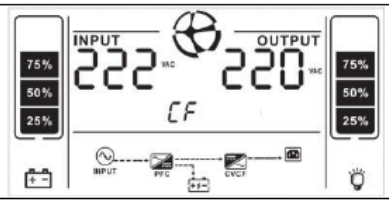
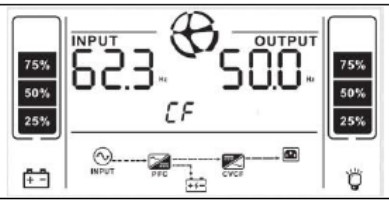
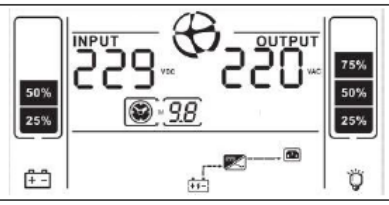
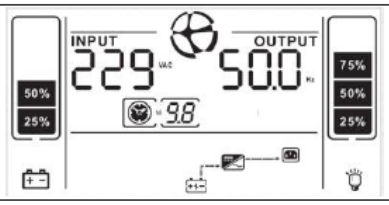
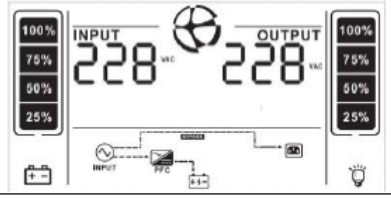
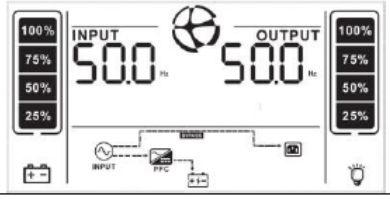
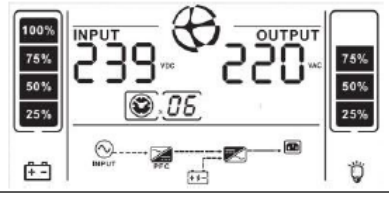
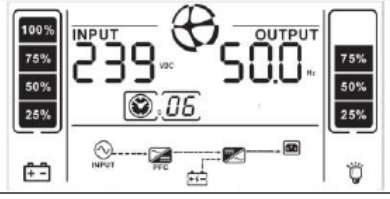
19. Battery capacity and group setting

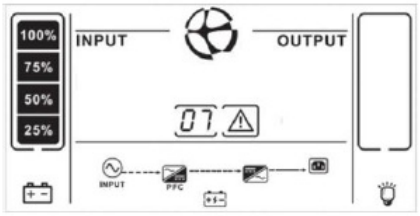
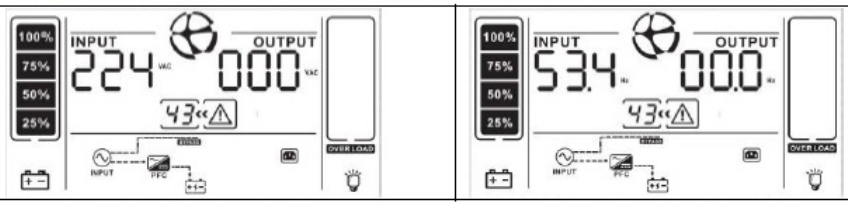
Interface	Setting
	**Parameter 2:** Set the battery capacity such as 7AH, 9AH, 10AH, 12AH, 17AH, 26AH, 40AH, 65AH, 100AH and so on. The default value is 9AH. **Parameter 3:** Set battery group range from 1 to 6. The default value is 1 group. These parameters are for the battery backup time calculation.

20. Backup time calibration

Interface	Setting
	**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 the multiplier factor is 1.0 and the setting range is from 0.5 to 2.

Operating Mode/Status Description

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.
	LCD display	 
Battery Test	Description	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.
	LCD display	 
Warning status	Description	When the UPS has warning happened and it can work normally, LCD panel will display warning codes. Most can display three warning code and each number represent a warning condition, can from the form of warning instructions (3-9) to know what kind of situation.

	LCD display	
Fault status	Description	When UPS has fault happened, it will display fault codes in LCD panel.
	LCD display	

Fault 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	Inverter relay short circuited	24	None

Warning Indicator

Warning	Icon (flashing)	Alarm	Warning Code
Battery unconnected	⚠ BATT. FAULT	Beeping every second	01
Input Phase Losing	⚠	Beeping every second	02
Input phase dislocation	⚠	Beeping every second	04
Over charge	⚠ 100% 75% 50% 25%	Beeping every second	07
Battery low	⚠ LOW. BATT	Beeping every second	08
Overload	⚠ OVER LOAD	Beeping twice every second	09
EPO enable	⚠ EP	Beeping every second	0b
Over temperature	⚠	Beeping every second	0d
Charger failure	⚠	Beeping every second	0E
Overload 3 times in 30min	⚠	Beeping every second	33
Cover of maintain switch is open.	⚠	Beeping every second	3A
Input voltage unbalanced	⚠	Beeping every second	3C

Trouble Shooting

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 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.

Storage and Maintenance

Storage

Before storing, charge the UPS for at least 7 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery under 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 capacitors such as BUS capacitors.
- Only persons who 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.
- When replacing the batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause a battery explosion. The batteries must be rightly deposed according to local regulations.
- Do not open or destroy batteries. Escaping electrolytes can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage to avoid fire hazards.
- Do not disassemble the UPS system.

Specifications

MODEL		**3/1 10K(L)**	**3/1 15K(L)**	**3/1 20K(L)**
CAPACITY*		10000 VA / 9000 W	15000 VA / 13500 W	20000 VA / 18000 W
INPUT				
Voltage Range	Low Line Loss	110~ 176VAC ± 3 % at 50% Load; 176~ 200 VAC ± 3 % at 90% Load 200~ 276VAC ± 3 % at 100% Load 276~ 300 VAC ± 3 % at 90% Load		
	Low Line Come back	Low Line Loss Voltage + 10V		
	High Line Loss	300 VAC ± 3 %		
	High Line Com eback	High Line Loss Voltage – 10V		
Frequency Range		46Hz ~ 54 Hz @ 50Hz system		
Phase		Three phases with ground		
OUTPUT				
Output voltage		208/220/230/240VAC		

AC Voltage Regulation		± 1%		
Frequency Range (Synchronized Range)		46Hz ~ 54 Hz @ 50Hz system		
Frequency Range (Batt. Mode)		50 Hz ± 0.1 Hz or 60Hz ± 0.1Hz		
Overload	AC mode	100%~110%: 30min; 110%~130%: 5min; >130% : 1sec	100%~110%: 15 min; 110%~130%: 30 sec; >130% : 1sec	100%~110%: 5min; 110%~130%: 1sec; >130% : Immediately
	Battery mode	100%~110%: 3min; 110%~130%: 30sec; >130% : 1sec	100%~110%: 1min; 110%~130%: 5sec; >130% : Immediately	100%~110%: 1min; 110%~130%: 1sec; >130% : Immediately
Current Crest Ratio		3:1 max		
Harmonic Distortion		≦ 3 % THD (Linear Load) ≦ 5 % THD (Non-linear Load)		
Transfer Time	Line ⟷ Battery	0 ms		
	Inverter ⟷ Bypass	0 ms		
EFFICIENCY				
AC mode		> 91%		
Battery Mode		> 91%		
BATTERY				
Standard Model	Battery Type	12 V / 7 Ah	12 V / 9 Ah	12 V / 7 Ah
	Numbers	16 pcs / 20 pcs	16 pcs / 20 pcs	16 pcs x 2 strings (expandable to 40 pcs)
	Recharge Time	9 hours recovery to 90% capacity		
	Charging Current	Default: 1 A ± 10% Max.: 1A		
	Charging Voltage	218.4V ± 1% / 273 V ± 1%	218.4V ± 1% / 273 V ± 1%	218.4V ± 1% / 273 V ± 1%

Long-run Model	Type	12V, Battery capacity depending on applications					
	Numbers	16 pcs	20 pcs	16 pcs	20 pcs	16 pcs	20 pcs
	Charging Current	Default: 4 A ± 10% Max.: 1A, 2A, 4A(Adjustable)					
	Charging Voltage	218.4V ± 1%	273 V ± 1%	218.4V ± 1%	273 V ± 1%	218.4V ± 1%	273 V ± 1%
PHYSICAL							
Standard Model	Dimension,DXWXH(mm)	442 x 190 x 688				815 x 250 x 826	
	Net Weight (kgs)	66	76	67	78	125	
Long-run Model	Dimension, DXWXH(mm)	442 x 190 x 318				575 x 190 x 318	
	Net Weight (kgs)	15		16		18.95	
ENVIRONMENT							
Operation Temperature		0 ~ 50°C (The battery life cycle will be shortened when the temperature is above 25°C)					
Operation Humidity		<95 % and non-condensing					
Operation Altitude**		<1000m					
Acoustic Noise Level		Less than 60dB @ 1 Meter					
MANAGEMENT							
Smart RS-232 or USB		Supports Windows® 2000/2003/XP/Vista/2008/7/8, Linux and MAC					
Optional SNMP		Power management from SNMP manager and web browser					

- * Derate capacity to 60% of capacity in CVCF mode and to 90% when the output voltage is adjusted to 208VAC.
- **If the UPS is installed or used in a place where the altitude is above 1000m, the output power must be derated one percent per 100m.
- ***Product specifications are subject to change without further notice.

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- www.tuncmatik.com.

Documents / Resources

	**tuncmatik PLUS X9 3 Uninterruptible Power Supply** [pdf] User Manual 10kVA, 15kVA, 20kVA, PLUS X9 3 Uninterruptible Power Supply, PLUS X9 3, Uninterruptible Power Supply, Power Supply

References

- **User Manual**