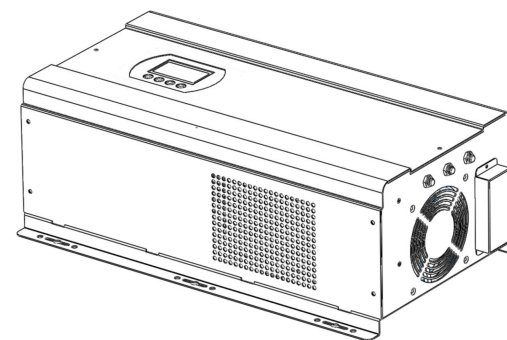


# User Manual



**FT series 3KW-6KW**

## Error code and solution

Error code	Faulty	Solution
E01	Overcurrent of MOSFETS board	Kindly contact sales if still having this issue after restarting
E02	Output short circuit	Check whether it's overloaded seriously or short circuit inside appliances loaded
E03	Appliance Overloaded	Check whether it's overloaded, and remove some loads not important
E04	Inner Over-temperature	Check whether fan is working well or the air dust for cooling be blocked
E05	Overvoltage of battery	Check whether battery connection and configuration correct
E06	Battery's voltage is lower than shutdown voltage	Make sure battery be fully charged, or replace new battery
E07	Reverse connected cables between transformer with heatsink on power board	Fix the two cables after they are interchanged
E08	Start Protection when low output voltage	Kindly contact sales if still having this issue after restarting
E09	Reserved	-----
E10	Undervoltage of battery	Check the system voltage of inverter and use same data for the battery pack.

## 8 Technology Parameter

Type: FT-		3KW	4KW	5KW	6KW
Rated power		3000W	4000W	5000W	6000W
Battery	Rated voltage	24VDC/48VDC		48VDC/96VDC	
	Charge current	MAX 25A			
Input	Voltage（HOT1-HOT2）	170-275VAC			
	Frequency	45-65Hz			
Output	Voltage/Power （HOT1-HOT2）	240VAC/ 3KW	240VAC/ 4KW	240VAC/ 5KW	240VAC/ 6KW
	Voltage/Power（N-HOT1）	120VAC/ 1.5KW	120VAC/ 2KW	120VAC/ 2.5KW	120VAC/ 3KW
	Voltage/Power（N-HOT2）	120VAC/ 1.5KW	120VAC/ 2KW	120VAC/ 2.5KW	120VAC/ 3KW
	Frequency	50/60Hz±1%( Inverter mode)			
	Output wave	Pure sine wave			
	Switching time	<10ms( typical load)			
	Efficiency	>85%（80% Resistance load）			
	Overload	110-120%/30S; >160%/300ms;			
	Protection	Battery overvoltage/lowvoltage, overload, short circuit protection, overtemperature protection, etc.			
Operating ambient temperature		0-40℃			
Storage ambient temperature		-15 - +50℃			
Operating/Storage ambient		0-90% No condensation			
Machine Size: L*W*H (mm)		563*307*189			
Package size: L*W*H（mm）		640*370*240			

Note: Our company has the right of changing this user manual without any information

## Dear Customers

It's very grateful to you for trusting our company and selecting our products!

Before using this product, please read carefully this user manual, including installation, using, failure investigation and other important information and suggestion, we also suggest you keep this manual well!

## Catalogue

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## 1 Product Features

- Double CPU intelligent control technology, excellent performance
- The grid mode/energy-saving mode/battery mode could be set, application flexible
- Intelligent fan control, safe and reliable
- Pure sine wave AC output, and be adapt to all kinds of loads;
- LCD display equipment parameter in real-time, operation status be clear at a glance
- Output overload, short circuit protection, various of automatic protection and alarm warning;

## 2 Installation、Storage instruction

### (1) Unpacking Inspection

1.1 Open the package, inspect product accessories, including:1 host,1 piece user manual

1.2 Inspect whether the machine have been damaged during the transport or not, If it have some damage, don't start the machine, contact the logistics company and dealer.

### (2) Installation、Storage Notes

2.1 The product installation should be operated by professionals, or assisted by dealer.

2.2 If it needs to transport machine, please take proper protection measures; move the machine from low temperature environment to high temperature environment, may appear droplet, please keep it dry and ensure safety.

2.3 Don't let the machine exposure in damp, inflammable and explosive or large accumulation of dust environment. Don't cover and block vents, please preset above 10cm air circulation clearance so that having a good cooling.

2.4 It is battery switch must be shut down when the equipment is not connected with the grid and not being used

-1-

## 7 Judgment and treatment for simple faults

**Warning :High voltage inside the device! Do not open it by yourself, or try to do maintenance, so as not to be in danger!**

Fault	Possible causes	solution
The grid occasional	Strong out of restoration fuse holder	Press again the strong out part
Time degradation of Machine with loads	Battery undercharge	Make sure battery be full of charging normally
	Machine connect load overcharge	Move away non-key loads
	Battery burn-in and can't charge enough power	Please contact with CSR and get battery need changing module
The machine can't be started	The grid input line or battery input line is in bad connect	Check and reconnection
Starting up alarm	Low battery	Make sure battery be full of charge normally
	Overload	Move away non-key loads
Buzzer for 2s, pause 1s	Internal over-temperature	Check fan and hear dissipation whether be blocked
Fan sometimes fast, sometimes slow	Internal temperature above 45°C fan fast, below 42°C fan slow	Normal

When you contact with engineers, please provide the following information: machine model/problem date/complete description of the problem(including indicator status, battery specification, all of the connection etc)

## 6 Care and Maintenance

(1) This series products only need rarely care, battery only need keeping charging so that can get expected lifetime.

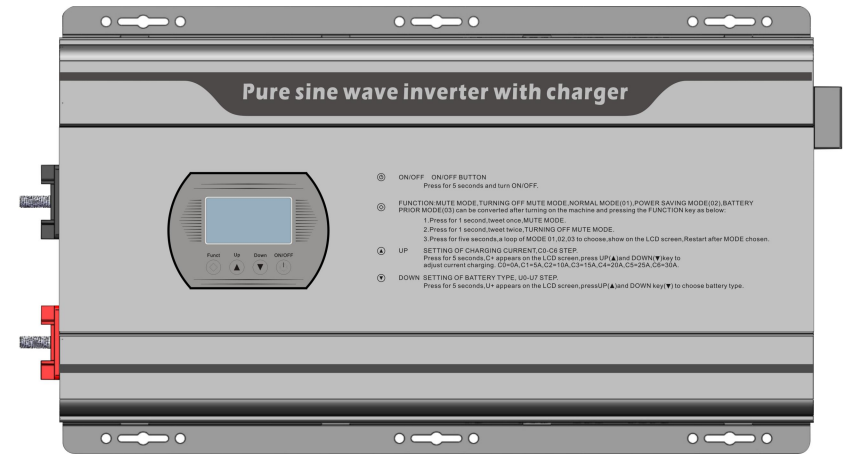
(2) If the equipment will not be used for long-term, we suggest it should be charged 1 time every 4~6 month. Usually, the battery can be used for 3~5 years, if it has some problem, then the battery should be changed as soon as possible. When changing battery, it must be operated by professional and obey battery supplier indicate.

(3) Before changing the battery, it must be closed equipment and break away from the grid, close the battery switch. Take off the metal objects such as rings.

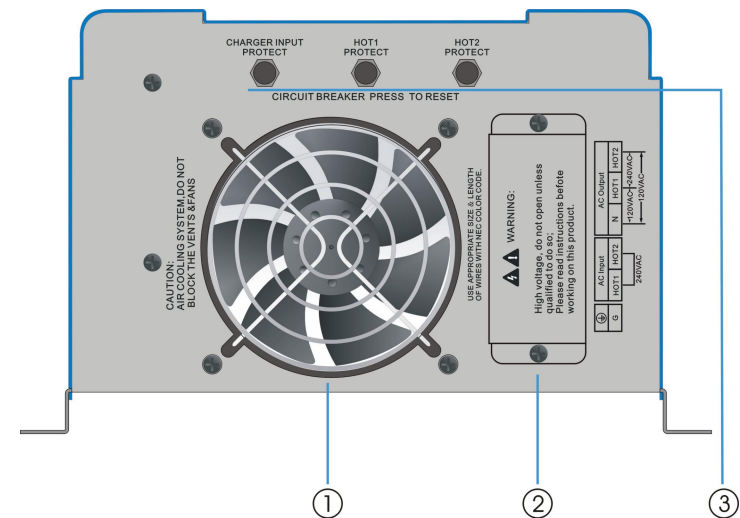
(4) Connect the battery line, tiny spark in joint belongs to the normal phenomenon, and will not cause harm to the personal safety and equipment. Never connect the battery positive and negative into short or the reverse.

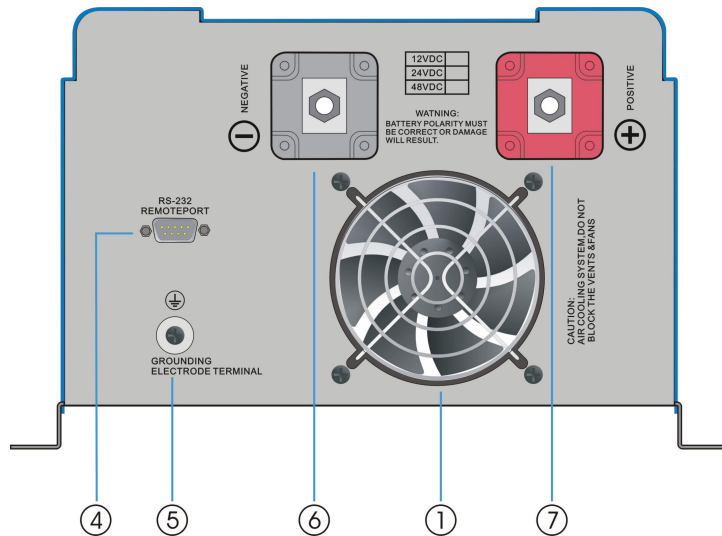
## 3 Equipment appearance graphical representation guide

### (1) Equipment appearance view



### (2) 3K/4K/5K/6K view of equipment appearance





### (3) Guide

- ①-- Fan
- ②-- AC input/output terminal
- ③-- AC input/output fuse holder
- ④-- RS232 communication interface(optional function)
- ⑤-- Earth terminal
- ⑥-- Battery terminal negative input terminal
- ⑦-- Battery terminal positive terminal

### (5) Audible alarm reminder instruction

Equipment running normal	Buzzing prohibit	Buzzer is no tweet under default state
	Buzzer starts	Buzzer tweet 4 times every 15s, indicate the equipment operated under battery inverter state
Battery high voltage alarm	Buzzer tweets 4 times per second, alarms high voltage	
Battery low voltage alarm	Buzzer tweets 2 times per second, alarms low voltage	
Overtemperature alarm	Buzzer alarm 2 seconds pause 1 second	

### (6) Electric generator connection announcements

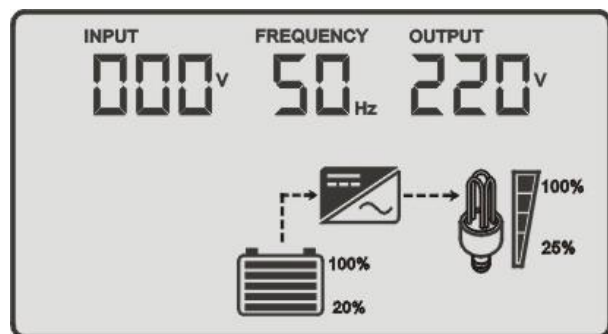
If connect electric generator, it needs operating as below:

6.1 Start up electric generator and after it running stable, make electric generator output power supply be connected into the equipment input terminal, make sure the equipment output is no-load, then start up the equipment.

6.2 After the equipment starting, then connect load one by one

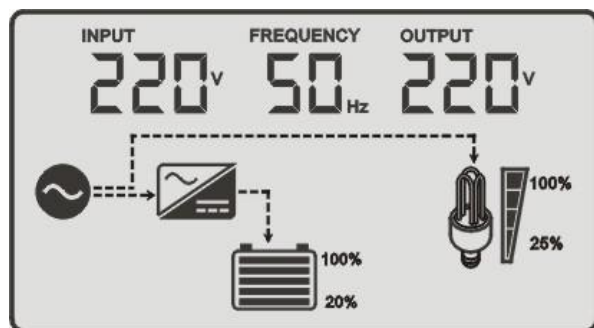
6.3 We suggest electric generator capacity should be 2~3 times of this equipment

#### (4) Working mode state



(Battery working status)

When the grid input abnormal or under battery preferred mode, supply power to load by battery storage power convert to AC power via inverter

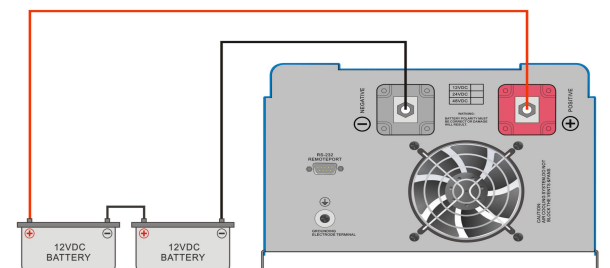


(The grid working status)

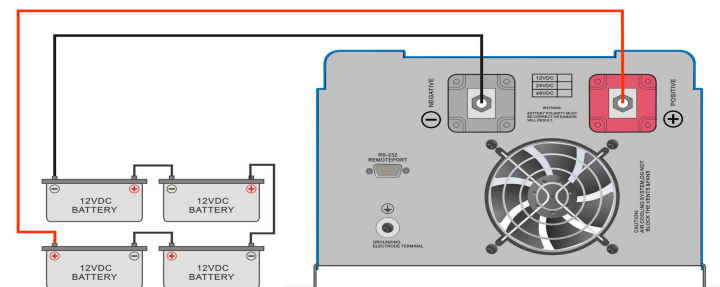
When the grid input normal or under battery preferred(but low battery), supply power to load after the grid regulated voltage via inverter bypass mode.

#### 4 Equipment wiring diagram

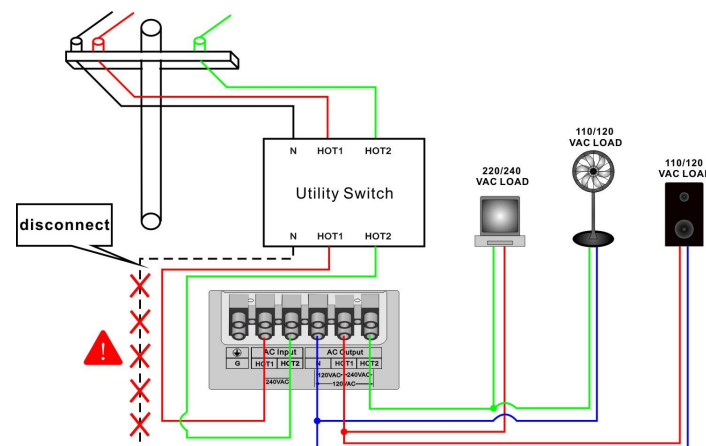
##### (1) 24VDC series battery wiring diagram



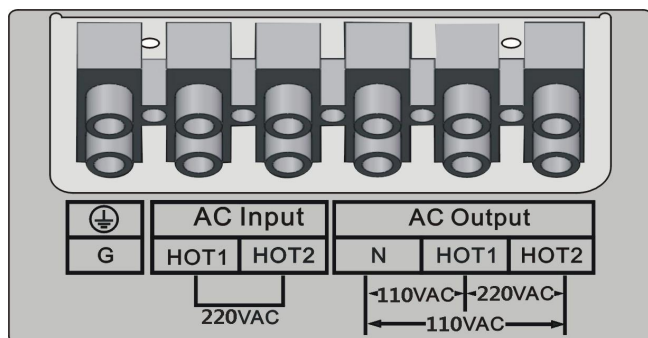
##### (2) 48VDC series battery wiring diagram (It is 8 pieces 12VDC battery connected in series of 96VDC series battery connection)



##### (3) Input/output wiring diagram



#### (4) Connection notes of output load



**The connection between the load of 120VAC and 240VAC must follow the connection as below:**





- 4.1 the load of 120VAC shall be firstly connected to **N-HOT1** terminas. The load power shall be half of the rated power of inverter with load detecti on function and loads powered percentage display;
  - 4.2 while **N-HOT2** terminal is connected with the load of 120VAC, Itspower shall not exceed half of the rated power of inverter. The output terminal has no load detection function and load percentage display;
  - 4.3 the load of 240VAC is connected to the **HOT1-HOT2** terminal The load power is the rated power of inverter with load detection function and load percentage display;
- If not necessary, it is recommended that the **N-HOT2** terminals should not be connected to the load of 120VAC. If the load needs to be connected, it should strictly control the load power and not exceed half of the rated power. At this point, the **HOT1-HOT2** terminal can not connect to the load of 240VAC;

#### (3) Working mode instruction

Icon	Working mode	Running state
	The grid priority mode	Mains priority mode, after the device starts and the grid input under normal operation, the equipment through the grid bypass regulator to supply power to the load, at the same time power battery; When the grid is having too high/low/serious distortion or other abnormal , equipment will make battery energy through internal module transfer into high quality electricity and supply power to load.
	Battery priority mode	Battery priority mode operation, in the case of normal mains power input, when the battery is sufficient, mains power is just waiting for standby state, The equipment converts the battery energy through the internal modules to provide high-quality power to the load. When the battery power drops to the low voltage threshold, the device automatically stabilizes the voltage through the mains bypass to provide power to the load, but does not charge the battery. This model is mainly designed for new energy power generation system (such as solar power generation system).



## (2) Panel key/LCD setting instruction

Function key		Operating instructions	
	Mute key	Long press for 1 second, buzzing 1 time, start mute state; Long press for 1 second again, buzzing 2 times, close mute stage;	
	Functi-on key	Long press for 5s, 01 ,03 mode can be recurrent selection, it will take effect after restarting;	
		Grid priority mode	Battery priority mode
			
	ON/ OFF key	Starting up	Long press for 2s, buzzing 1 time, equipment start output
		Power off	Long press for 2s, Long press for 2,after internal relay energized, the equipment power off output

## (5) Direction for using of wire diameter

Direction for using of battery, AC input/output wire diameter: (Compute depends on 1mm<sup>2</sup> copper core with 4-5A current)

$$\text{Battery wire diameter} = \frac{\text{Rated power(W)}}{\text{Rated battery(V)} \times 5\text{A/mm}^2}$$

$$\text{AC wire diameter} = \frac{\text{Rated power(W)}}{\text{Rated AC voltage(V)} \times 5\text{A/mm}^2}$$

For example: Wire diameter of 5000W/48Vdc/220Vac as below:

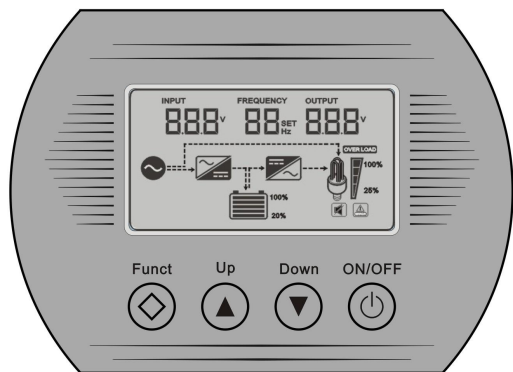
$$\text{Battery wire diameter} = \frac{1000\text{W}}{24\text{V} \times 5\text{A/mm}^2} \approx 10(\text{mm}^2)$$

$$\text{AC wire diameter} = \frac{1000\text{W}}{220\text{V} \times 5\text{A/mm}^2} \approx 1(\text{mm}^2)$$

## 5 Operating instructions

### (1) Panel LCD display graphical representation instruction

1.1 LCD display and function keys interface can display the equipment working status, such as: input/output voltage, frequency, grid mode, inverter mode, battery capacity, load capacity, alarm warning etc.



### 1.2 Instruction of keys

Function keys		Instruction
	Mute/ function key	Sound attenuation with short press; enter into equipment working mode with long press
	Function key/ up key	Under the settings interface, press short to turn the page or increment
	Function key / down key	Under the settings interface, press short to turn the page or reduce
	ON/OFF	Single bond ON/OFF control

Battery parameter	Description	Default Values	Adjustable range
BAT 1 b01	Charge voltage	13.8V	13.8V±1.5
BAT 2 b02	Inverter recovery voltage	13.5V	13.5V±1.5
BAT 3 b03	Low voltage alarm	10.5V	10.5V±1.5
BAT 4 b04	Low voltage shutdown	10.0V	10.0V±1.5
BAT 5 b05	The capacity shows 0% voltage	10.0V	10.0V±1.5
BAT 6 b06	The capacity shows 100% voltage	12.0V	12.0V±1.5
BAT 7 b07	Factory reset	See "Factory Reset" instructions	

**3、Factory reset:** Select “b07” parameter, press and hold the “Funct” key for more than 5 seconds, the “FSR” icon flashing. Press and hold the “Funct” key for more than 5 seconds to return to battery parameter setting “①” interface, the battery voltage parameters have been restored to factory defaults

**4、Restart the device:** Press and hold the “ON/OFF” key for more than 1 second to shutdown and save the data, and then press and hold the “ON/OFF” key for more than 1 second again to start the device.

**Caution:** Setting parameter are defined based on a single battery. For example: if the "low voltage alarm" value of 24VDC device is set to 10.5VDC, then the "low voltage alarm" value of the device is  $10.5 * 2 = 21.0\text{VDC}$

Introductions:

- ① --Battery parameter setting
- ② --Battery voltage setting
- ③ --Press and hold the “Up” and “Down” keys at the same time, and then power on to enter the battery parameter setting “①”.
- ④ --In the battery parameter setting“① ”interface, press and hold the “Funct” key for more than 5 seconds to enter the battery voltage“② ”.
- ⑤ --In the battery voltage setting“② ”interface, press and hold the “Funct” key for more than 5 seconds to return to the battery parameter setting“① ”.

■ Operating step:

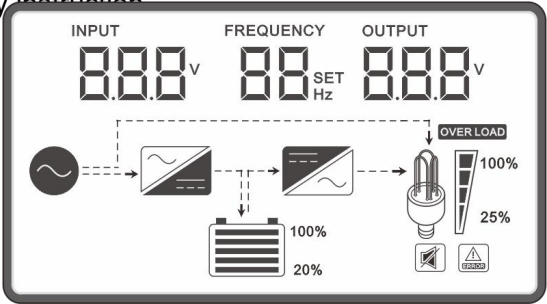
1、**Enter battery parameter setting:** Connect the battery, press and hold the “Up” and “Down” keys and then press the “ON/OFF” key for more than 1 second at the same time to start the device, and enter the battery parameter setting “①”.













2、**Battery parameter setting instruction:**






2.1 In the battery parameter setting “①” interface, press “Up” or “Down” key to select the battery parameter to be modified, the battery icon flashing. Press and hold the “Funct” key again for more than 5 seconds to enter the battery voltage setting “②” interface, battery voltage iron flashing.






2.2 Press "Up" or "Down" key to adjust the voltage value, the increment is ±0.1, after the setting is completed, press and hold the "Funct" key again for more than 5 seconds, the modification will take effect and return to the battery parameter setting "① " interface.

1.3 LCD display instruction



Equipment parameter instruction				
LCD display	Function instruction			
INPUT  V	AC input voltage parameter			
FREQUENCY  Hz	AC output frequency parameter			
OUTPUT  V	AC output voltage parameter			
 SET	Equipment working mode selection			
	Grid priority mode		Battery priority mode	
	 SET		 SET	
Load icon instruction				
LCD display	Function instruction			
	Output overload reminder			
 100% 25%	0%~25%	25%~50%	50%~75%	75%~100%
				

Battery icon instruction		
LCD display	Status	Battery voltage values/12V; *A (pcs)
	Twinkle	< 10.5V; *A
	Lighten	10.5~11.2V; *A
	Lighten	11.2~11.6V; *A
	Lighten	11.6~12.1V; *A
	Lighten	12.1~12.5V; *A
	Lighten	> 12.5V; *A

Working mode icon instruction		
LCD display	Function instruction	
	Grid input icon	
	AC-DC icon	
	DC-AC icon	
Buzzing icon instruction		
	Lighten	Prohibit buzzer tweet
	dark	Start buzzer tweet
Fault/abnormal icon instruction		
	Fault/Abnormal reminder	

# ■ Operation setting diagram:

