CA10291

Pure Sine Wave Inverter System

YOHAKO

USER MANUAL

JAPAN TECHNOLOGY

Esteemed 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

1.Product Features

● Double CPU intelligent control technology, excellent performance;
● The electricity grid mode/ battery mode could be set, application flexible;
● Charge current/battery type could be set, convenient and practical;
● Intelligent fan control, save 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

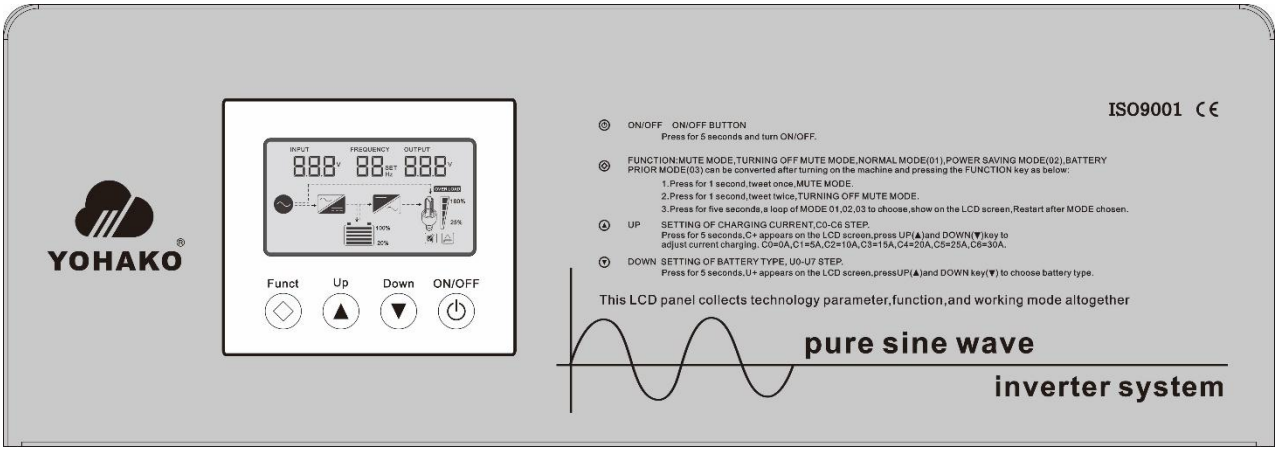
1.1 Open the package, inspect product accessories, including:1 host,1 pcs user manual.
1.2 Inspect whether the machine have been damaged during the transport or not, If it have some damage, don't start the machine, contact the logistics company and dealer.

<2> Installation、Storage Notes

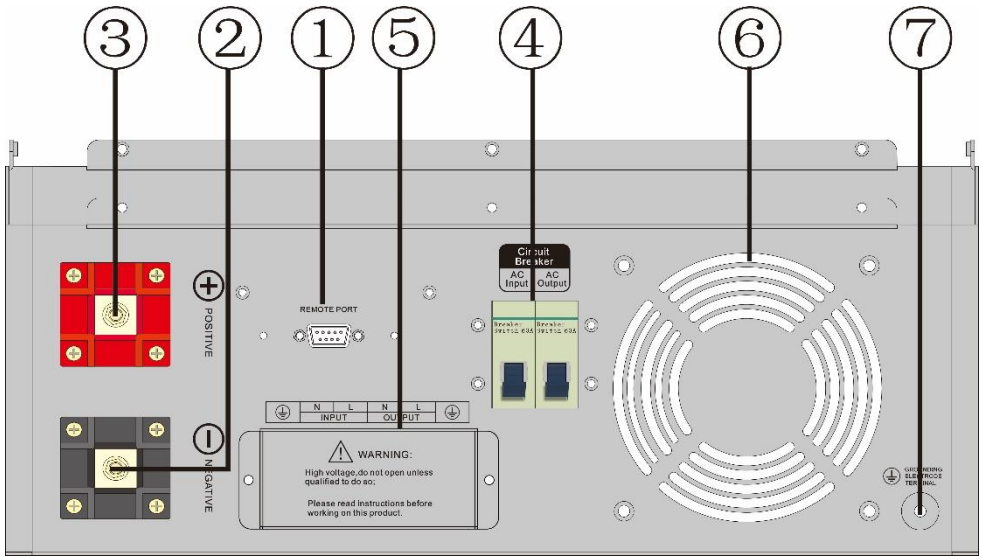
2.1 The product installation should be operated by professionals，or assisted by dealer.
2.2 If it needs to transport machine, please take proper protection measures; move the machine from low temperature environment to high temperature environment，may appear droplet, please keep it dry and ensure safety.
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 When the machine will not be used for long term, it needs closing the battery switch on back panel.

3.Equipment appearance graphical representation guide

（1）Equipment appearance view



（2）Side view of 3.5KVA appearance



Explanation:

①--RS232 communication interface

②--battery negative input terminal

③--battery positive input terminal

④--AC input/output circuit breaker

⑤--AC input/output terminal station

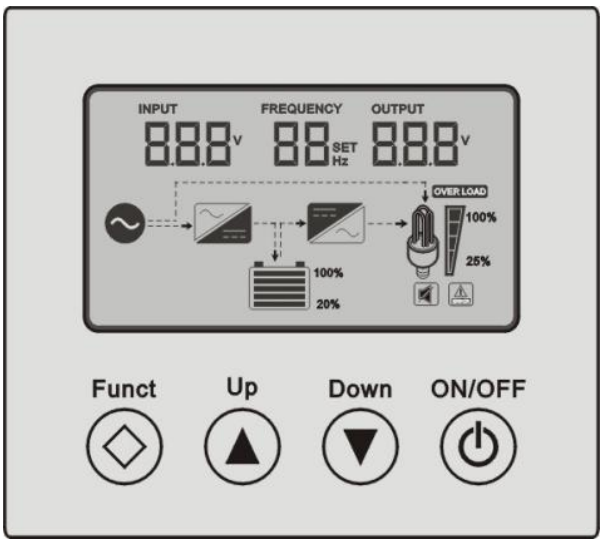
⑥--Fan

⑦--ground terminal

4.Operating instructions

1.1 Panel LCD display graphical representation instruction

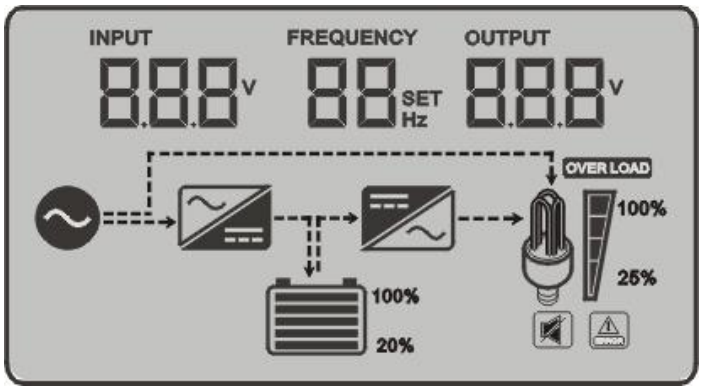
LCD display and function keys interface can display the equipment working status, such as: input/output voltage, frequency, grid mode, inverter mode, battery capacity, load capacity, alarm warning etc.



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/ multiply key	Enter into charge current setting with long press; increment with short press.
▼	Function key / Reducing key	Enter into battery mode setting with long press; decrement with short press.
⏻	ON/OFF	Single bond ON/OFF control.

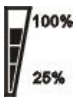
1.3 LCD display instruction



(1) The panel displays the description

Equipment parameter instruction		
LCD display	**Function instruction**	
INPUT 888 V	AC input voltage parameter	
FREQUENCY 88 Hz	AC output frequency parameter	
OUTPUT 888 V	AC output voltage parameter	
88 SET	Equipment working mode selection	
	Grid priority mode	Battery priority mode
	01 SET	03 SET

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

Load icon instruction				
LCD display	Function instruction			
	Output overload reminder			
	0%～25%	25%～50%	50%～75%	75%～100%
				

<table>
<tr><th colspan="3">Working mode icon instruction</th></tr>
<tr><th>LCD display</th><th colspan="2">Function instruction</th></tr>
<tr><td>  </td><td colspan="2">Grid input icon</td></tr>
<tr><td>  </td><td colspan="2">AC-DC icon</td></tr>
<tr><td>  </td><td colspan="2">DC-AC icon</td></tr>
<tr><th colspan="3">Buzzing icon instruction</th></tr>
<tr><td rowspan="2">  </td><td>Lighten</td><td>Prohibit buzzer tweet</td></tr>
<tr><td>dark</td><td>Start buzzer tweet</td></tr>
<tr><th colspan="3">Fault/abnormal icon instruction</th></tr>
<tr><td> 
</td><td colspan="2">Fault/Abnormal reminder</td></tr>
</table>

（2）Panel key/LCD setting instruction

<table>
<tr><th colspan="2">Function key</th><th colspan="7">Operating instructions</th></tr>
<tr><td rowspan="4">  </td><td>Mute key</td><td colspan="7">Long press for 1 second, buzzing 1 time, start mute state; Long press for 1 second again, buzzing 2 times, close mute stage;</td></tr>
<tr><td rowspan="3">Function-key</td><td colspan="7">Long press for 5s, 01,03 mode can be recurrent selection, it will take effect after restarting；</td></tr>
<tr><td colspan="3">Grid priority mode</td><td colspan="4">Battery priority mode</td></tr>
<tr><td colspan="3">01 SET</td><td colspan="4">03 SET</td></tr>
<tr><td rowspan="3">  </td><td rowspan="3">Function-key</td><td colspan="7">Long press for 5s，LCD panel 88 SET will display relative charge current regulation C+, press ▲ increase charge current，press ▼ decrease charge current;</td></tr>
<tr><td>C0</td><td>C1</td><td>C2</td><td>C3</td><td>C4</td><td>C5</td><td>C6</td></tr>
<tr><td>0A</td><td>5A</td><td>10A</td><td>15A</td><td>20A</td><td>25A</td><td>30A</td></tr>
<tr><td rowspan="10">  </td><td rowspan="10">Function-key</td><td colspan="7">Long press for 5s，LCD panel 88 SET will display relative charge voltage regulation U+, press ▲ increase charge voltage，press ▼ decrease charge voltage;</td></tr>
<tr><td>U0</td><td colspan="4">Gel U.S.A</td><td colspan="2">13.7V</td></tr>
<tr><td>U1</td><td colspan="4">A.G.M.1</td><td colspan="2">13.4V</td></tr>
<tr><td>U2</td><td colspan="4">A.G.M.2</td><td colspan="2">13.7V</td></tr>
<tr><td>U3</td><td colspan="4">Sealed lead Acid</td><td colspan="2">13.6V</td></tr>
<tr><td>U4</td><td colspan="4">Gel European</td><td colspan="2">13.8V</td></tr>
<tr><td>U5</td><td colspan="4">Open lead acid</td><td colspan="2">13.8V</td></tr>
<tr><td>U6</td><td colspan="4">Calcuim(open)</td><td colspan="2">13.6V</td></tr>
<tr><td>U7</td><td colspan="6">De sulphation cycle 15.5 for 4 hrs</td></tr>
<tr><td rowspan="2">  </td><td rowspan="2">ON/ OFF key</td><td>Starting up</td><td colspan="6">Long press for 2s, buzzing 1 time, equipment start output;</td></tr>
<tr><td>Power off</td><td colspan="6">Long press for 2s, Long press for 2,after internal relay energized, the equipment power off output;</td></tr>
</table>

（3）Working mode instruction

Icon	Working mode	Running state
	The grid preferred mode	After starting the inverter and the electricity input working well, inverter supply power to loads via the grid bypass regulated, and charge battery; When the grid happened abnormal such as overvoltage, low-voltage, massive distortion etc, inverter can supply high quality power via inner modules to loads.
	Battery preferred mode	With the grid working well and battery be charged fully, the grid works standby, inverter supply power from battery to loads. When battery power drops too low to supply power, inverter supply power to loads via the grid bypass regulated but not charge battery. This mode is designed for new energy power system such as wind or solar power system.

（4）**Error code and solution**

Error code	Faulty	Solution
E01	Over current 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 applicances loaded.
E03	Applicance 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	----------
E 10	Undervoltage of battery	Check the system voltage of inverter and use same data for the battery pack.

（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:

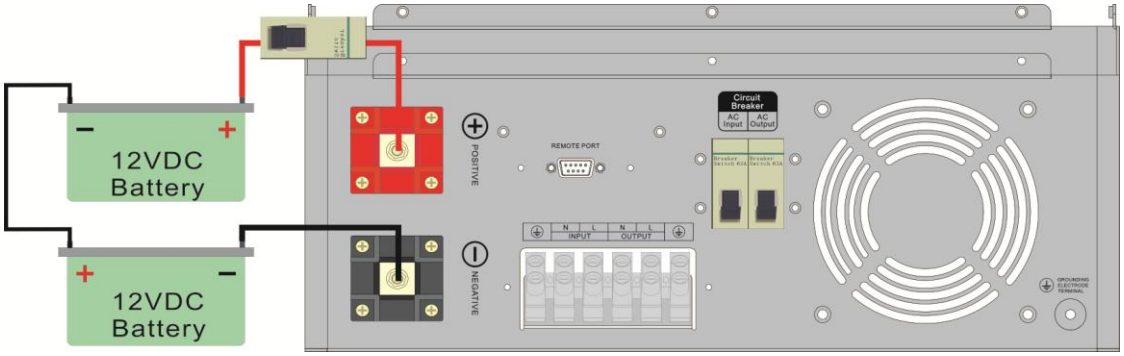
1,Start up electric generator and after it running stable, make electric generator output power supply be connected into the equipment input terminal, then make sure the equipment output is no-load, then start up the equipment.

2,After the equipment starting, then connect load one by one.

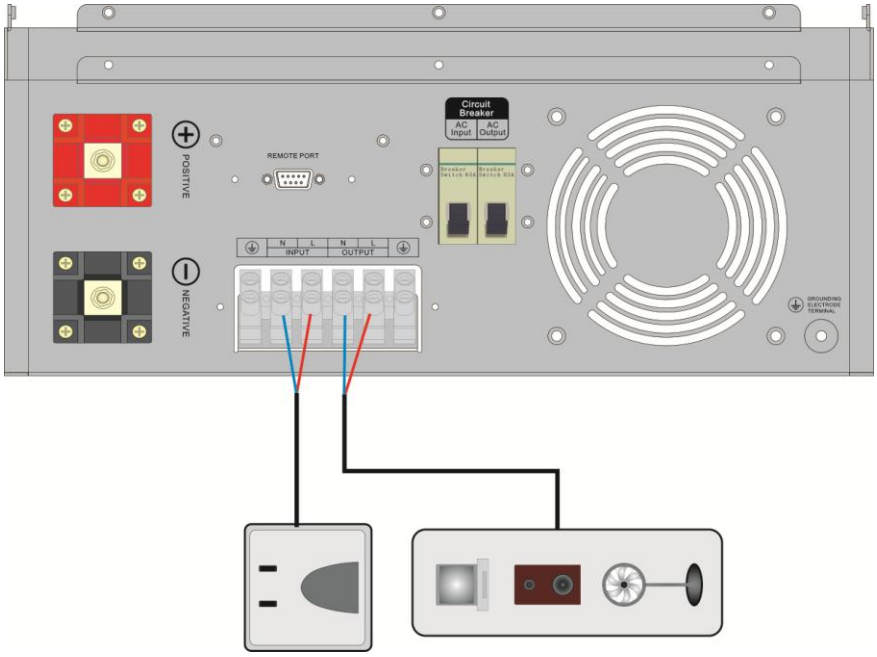
3,We suggest electric generator capacity should be 2~3 times of this equipment.

5. Equipment wiring graphical representation guide

（1）24V battery connection diagram



（2）3.5KVA system connection diagram



（3）Circuit breaker specification suggestion table

Type:FT	Battery Voltage	Current of breaker	Recommended cable diameter
1.5KVA（1KW）	12VDC	>83A	16mm^2
2.5KVA(2KW)	12VDC	>167A	35mm^2
	24VDC	>83A	16mm^2
3.5KVA(3KW)	12VDC	>250A	50mm^2
	24VDC	>125A	35mm^2
5KVA(4KW)	24VDC	>167A	35mm^2
	48VDC	>84A	16mm^2
6.25KVA(5KW)	24VDC	>209A	50mm^2
	48VDC	>105A	25mm^2
7.5KVA（6KW）	48VDC	>125A	35mm^2
10KVA(8KW)	48VDC	>167A	35mm^2
15KVA(10KW)	48VDC	>209A	50mm^2

6.Care and Maintenance

1. This series products only need rarely care, battery only need keeping charging so that can get expected lifetime. When connect with the grid, no matter the equipment on and off, it should be charge battery and provide overcharge/over discharge protection function.

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. When the equipment has been used normally, the battery need charging/discharging every 4~6 month, charging after it discharge untill the equipment power off and charging time can’t less than 12 hours. At high temperature area, the battery need charging/discharging every 2 month, and charging time can’t less than 12 hours.

4. 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, watches. Use a screwdriver with insulated handle, don't put the tool, or other metal on the battery.

5. 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。

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!

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.).

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℃ fan fast, below 42℃ fan slow	Normal

8.Technology Parameter sheet

Model number: FT-		3.5KVA
Rated power		2.5KW
Battery	Rated voltage	24VDC
	Charge current	30A（default）-C0-C6 can be set
	Battery type	U0-U7 can be set
Input	Voltage range	170-275VAC
	Frequency	45-65Hz
Output	Voltage range	220VAC；± 5% (Inverter mode)
	Frequency	50/60Hz；± 1% (Inverter mode)
	Output wave	Pure sine wave
	Switching time	＜10ms(traditional load)
	Efficiency	＞85%（80% Resistance load）
	Overload	110-120%/30S；＞160%/300ms；
	Protection	Battery over voltage/low voltage, overload, short circuit protection, oevertemperature 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)		416*306*198
Package size: L*W*H（mm）		516*345*262

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

9. Load suggestion table

Loads chart of power inverter			
Rated power of inverter	**Loads**	**Quantity**	**Loads power**
3.5KVA	HP Air-condition 800W	1	2.5KW
	Television 200W	1	
	Sound equipment 100W	1	
	Electric Fan 150W	2	
	Light Bulb 10W	15	
	Refrigerator 200W	1	
	Washing Machine 250W	1	
	Other equipment 500W	1	