Series Sine-Wave Inverter
System Manual

12/220-XXXX

24/220-XXXX

48/220-XXXX

110/220-XXXX

220/220-XXXX

Table of Contents

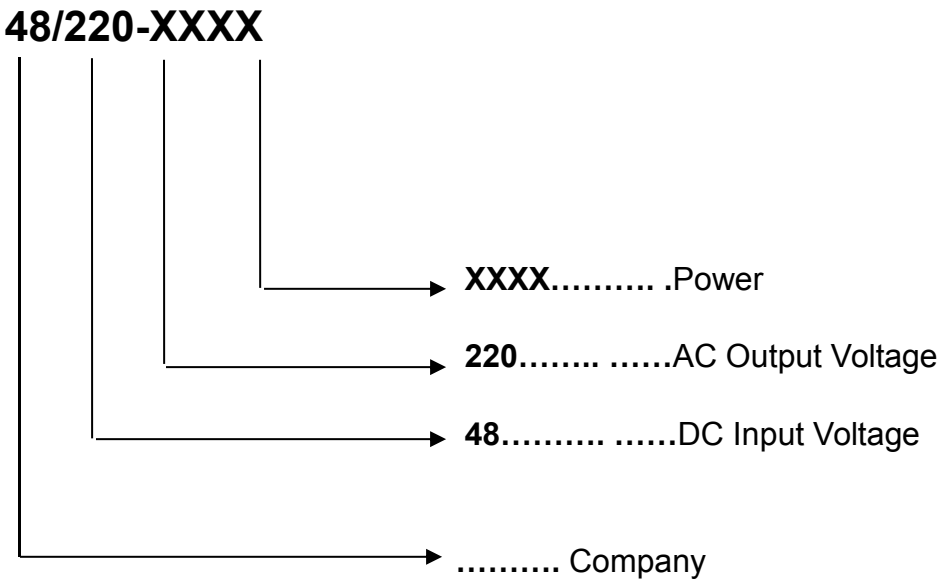
IMPORTANT SAFETY NOTES

- Please keep this manual for future use.
- Please read this manual carefully at the first time, and install, operation and maintain as per
    - ◆ the manual instructions.
- AC input voltage of the series is 220V/50Hz, DC input voltage 12VDC/24VDC/48VDC/110VDC/220VDC, please connect as per the instructions, avoiding the possible damage.
- Please turn off the inverter and disconnected all cables before moving.
- For avoiding the damage and hurt to people and inverter, please don't open cover by yourself.
- Do not use it with overload which can affect inverter life.
- Please put the inverter in the dry place, at least 10cm away from the wall.
- Protecting from direct sunlight, rain and moisture.
- Please put it far away from fire and high temperature.
- Please do not put things on the top of inverter.
- Please contact dealer or manufacturer service center for any problem, do not open the cover avoiding any further damage and risk.

Warning:

The product can be affected by the radio under certain circumstances, further protection equipment is needed.

1. Series Model Notes:



2. Series Model Table

Chart1: Series Table

	12 Series	24 Series	48 Series	110 Series	220 Series
500VA	12/220-500	24/220-500	48/220-500	110/220-500	220/220-500
1000VA	12/220-1000	24/220-1000	48/220-1000	110/220-1000	220/220-1000
2000VA	/	24/220-2000	48/220-2000	110/220-2000	220/220-2000
3000VA	/	24/220-3000	48/220-3000	110/220-3000	220/220-3000
4000VA	/	/	48/220-4000	110/220-4000	220/220-4000
5000VA	/	/	48/220-5000	110/220-5000	220/220-5000
6000VA	/	/	48/220-6000	110/220-6000	220/220-6000

3. Series Functions

With the development of information and network technology, the new generation DC-AC power supply, sine-wave inverter, are widely used in telecom, mobile, air field, banking, office, industry, hospitals, military and research fields. By using battery as DC input, and sine-wave AC output after inverter, the output voltage and frequency of Sine-wave inverter are very steady and can work continuously, avoiding the problems of power break, voltage unsteady, noise and lightning invasion. With the sine-wave inverter can guarantee the utility and equipment reliable work and system safety.

Sine-wave Inverter is a kind of DC-AC power supply, the output wave is pure sine-wave by SPWM technology, with the features of fast reaction, low wave distortion, output voltage and frequency steady. This inverter is also equipped with the protections of over DC input, low voltage, over AC output, overload, circuit shortage and internal over heat, these can guarantee good performance, working reliability and other technical specifications.

Sine-Wave inverter is designed based on center control system to meet the power supply requirements of computer and other terminals, mainly applying for:

- Various managing equipment of digital communication system, including terminal, monitor and cashier equipment.
- Server, intelligent platform of information network system, power system and instrument.
- Suitable for system which has DC power mainly and require AC power system.

Features of Inverter:

a) With micro-CPU control, Series inverter is an intelligence model product, good designing and reliability are the advantages.
b) series inverter is adopting SPWM technology, with the output of stabilized voltage and frequency, pure sine-wave.
c) series inverter has good compatibility, builtn by-pass switch, high overload feature for reliable and continuous power supply.
d) series inverter can be AC power type and DC power type:
AC power type means the city power supply is priority when the city power is normal, when city power is off, inverter comes into work state.
DC power type means the inverter power supply is priority when the city power is normal, when inverter is power off, city power comes into work state automatically.
e) With the excellent designing, series inverter can be auto switched to bypass on the running state, it's easy to maintain and replace the battery without effecting load power supply.

f) In case there is battery voltage high/low or overload, the overload warning shutdown output, when battery voltage recovers normal, battery voltage

recovers; power supply outpuft will auto recovers in 50 seconds after overload off. This function is very suitable for the communication station in which there is no person on duty.

g) series inverter can support network communication system, power working state can be monitored by the supervision software.

h) series inverter provides with two dry connectors which can be used for DC input fault checking and AC output problem warning.

Figure1: Inverter Function Diagram

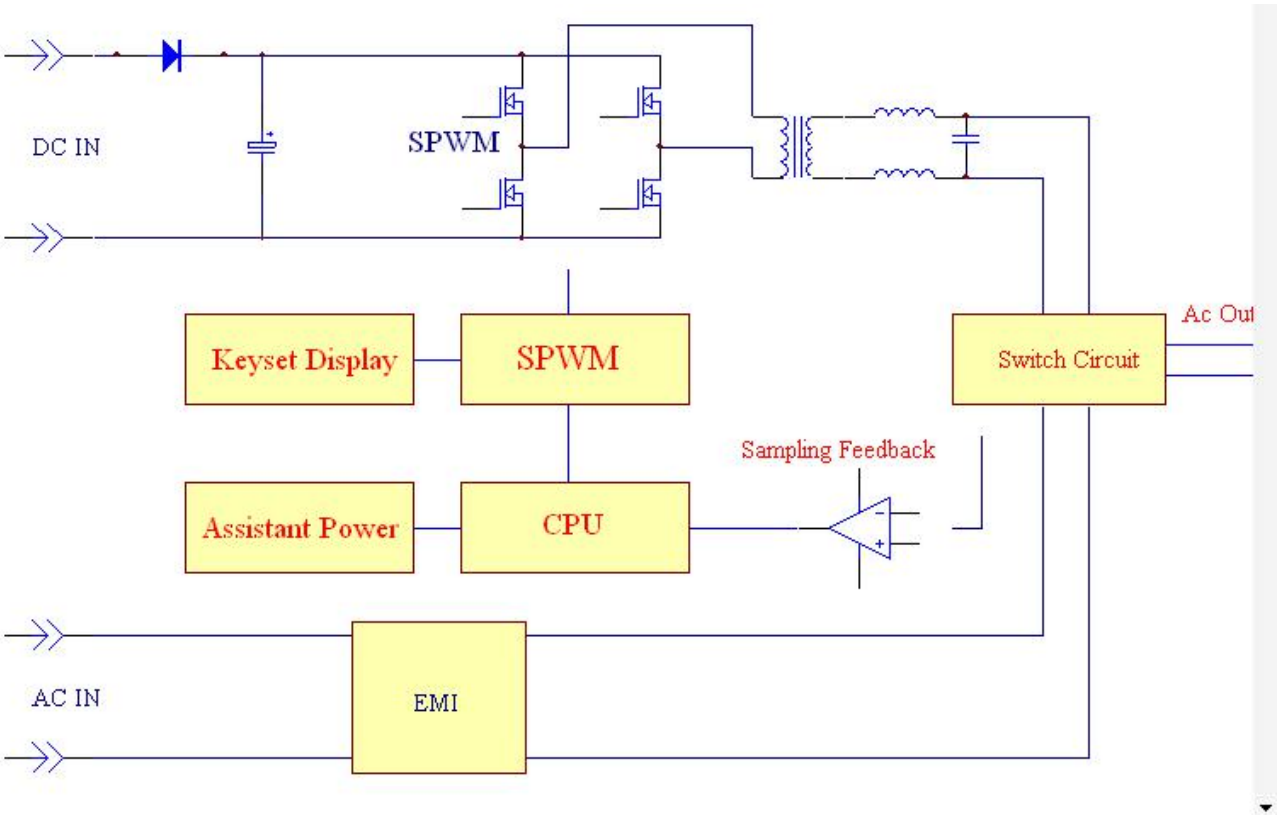


Chart2: Series Model INPUT Voltage, Current, Efficiency(+/-0.5~1V)

	12 Series		24 Series		48 Series		110 Series		220 Series	
Input volt （Vdc）	12V		24V		48V		110V		220V	
Input range of DC （Vdc）	Normal Volt 9.8V—14.5V		Normal Volt 20V—30V		Normal Volt 40V—59V		Normal Volt 88V—132V		Normal Volt 192V—270V	
	Start Volt 11V—13V		Start Volt 22V—28V		Start Volt 45.5V—57V		Start Volt 101V—127V		Start Volt 207V—260V	
Input Current （A）	500VA	40	500VA	20	500VA	9.8	500VA	4.3	500VA	2.2
	1000VA	76	1000VA	38	1000VA	19	1000VA	8.3	1000VA	4.2
			1500VA	57	1500VA	28.5	1500VA	12.5	1500VA	6.3
			2000VA	76	2000VA	38	2000VA	16.6	2000VA	8.3
					3000VA	57	3000VA	24.9	3000VA	12.4

4. Series Model Technical Specifications

Chart3: Series Model Technical Specifications

Technical Sspecifications		500VA	1000VA	2000VA	3000VA	4000VA	5000VA	6000VA
DC INPUT	Input Voltage（Vdc）	See chart2						
	Input current（A）	See chart3						
	Input range of Voltage（Vdc）	See chart3						
	Reverse Noise Current	≤10%						
AC Bypass	Bypass Volt（Vac）	265V-175V(±10V)						
	Input Current（A）	2.3	4.6	9.1	13.6	18.1	23	27.3
	Transfer Time（ms）	≤5ms						
AC OUTPUT	Rated Capacity（VA）	500VA	1000VA	2000VA	3000VA	4000VA	5000VA	6000VA
	Output Power（W）	400W	800W	1600W	2400W	3200W	3500W	4200W
	Voltage and Frequency	220Vac,50HZ						
	Output Current（A）	1.8	3.6	7.2	10.8	14.5	16	19.1
	Voltage Precision（V）	220±1.5%						
	Frequency Precision（Hz）	50±0.1%						
	Output	Pure Sine Wave						
	Wave Distortion（THD）（Resistant Load）	≤3%						
	Dynamic Reaction Time（Load 0←→100%）	5%						
	Power Factor（PF）	0.8/0.7/0.6						
	Overload	120%, 30 sec						
	Inversion Efficiency（80% Resistant Load）	≥85%						
	Transfer Time（ms）	≤5ms						
ENVIRONMENT	Isolation（IN/OUT）	1500Vac，1minute						
	Noise（1m）	≤40dB						
	Temperature	-25℃~+50℃						
	Humidity	0~90%						
	Sea Level（m）	≤2000						
SHOW	LCD	See VII						
	LED	line、inverter、battery、Output Load						
MECHANICAL	Desk Type（D×W×H）（mm）	See Chart6						
	19 Inch Rack Type（D×W×H）（mm）	See Chart6						
	Weight（Kg）	See Chart6						
Protection Function		Input Low/High Voltage；Output Overload/Shortage；Connecting Protection						

5. Series Model Use Method

- **Installation**
  1. Open the package and check accessories (1-pc AC Input Cable and 1 Manual)
  2. Choose a clean and ventilation area.
  3. Make sure DC voltage and battery voltage are inverter required.
  4. Check the power Positive and Negative line.
  5. Connecting Positive Cable with the terminal DC48V**"+"** on the back panel，and negative Cable with the **"-".**
  6. Connecting AC input **L/N/G** with AC Input terminals **L/N/G**.(AC Ground must be connected into ground area)
  7. Connecting load cables with AC output terminals **L/N/G**.

- **Start**
  a) Make sure that input DC and AC output cables are right connected.
  b) Turn on DC input switch.
  c) Put the start switch on"I"，inverter comes into the state of selfnspection, showing inverter is on.

Notes: Selfnspection------Before the output is delivered, the inverter will check the related parts and system state. When the all meters of inverter is in normal, the inverter will be in working status of power supply and inversion. This checking takes about 10 seconds, indication LED lights from left to right two times during this period.

- **Shutdown**

Put the start switch on"O"， all LED light and becomes dark, inverter is shutdown.

6. Series Maintenance Information

- **Figures**

Power ON/OFF button--  （SWITCH）

"Mains output"indicator,green 

"Inversion output"indicator, blue 

"Battery failure"indicator, red 

"Load failure"indicator, red 

Up key 

Down key 

Returen key 

Enter key 

Chart4: LED Lights and Indication

Status / Item		Output Status	Out Type	Mains (Green)	Inversion (Blue)	Battery (yellow)	Load (Red)	Buzzer
1	Power on Self Test	Yes(mains)	Mains	Light	Light	Light	Light	1 beep/ second
		No(no mains)	Inversion					mute after 3 beep
2	Self Test Battery Fault	Yes(mains)	Mains	Dark	Light	Blink	Dark	Blew
		No(no mains)	No					
3	Mains Normal	Yes	Mains	Light	Dark	Dark	Dark	No
4	Mains Abnormal	Yes	Inversion	Dark	Light	Dark	Blink	1beep/3 second
5	Inversion normal	Yes	Inversion	Dark	Light	Dark	Dark	No
6	DC power work Low voltage	Yes(Lower than power on voltage)	Inversion	Dark	Blink	Dark	Dark	1beep/3 second
7	DC power on Low voltage	No(Lower than power on voltage)	No	Blink	Blink	Blink	Blink	1beep/3 second
8	DC power input High voltage	Yes(mains)	Mains	Light	Dark	Dark	Dark	No
		No(no mains)	No	Dark	Dark	Light	Dark	1 beep/ second
9	Inversion Output Abnormal(output voltage over high/over low)	Yes(mains)	Mains	Dark	Blink	Blink	Dark	Blew
		No(no mains)	No					
10	Mains Overload alarm	Shutdown after 3 minutes	No	Light	Dark	Dark	Light	1 beep/ second
11	Inversion Overload alarm	Shutdown after 30 seconds	No	Dark	Light	Dark	Light	1 beep/ second
12	Shut off overload	Recovery after 1 minute	No	Dark	Dark	Blink	Light	Blew
13	Shut off short-circuit	No	No	Light	Light	Blink	Light	Blew
14	Inversion wave abnormal	Yes(mains)	Mains	Blink	Blink	Blink	Dark	Blew
		No(no mains)	No					
15	Disconnect DC power	Yes(mains)	Mains	Light	Dark	Dark	Dark	1beep/3 second

Note : Individual indicator combination and alarm information is not inconsistent with the actual test , does not affect the device performance . (Consult manufacturer technical person).
Explain: "→" said the LED lights up arrow order; " Note " to Table II

Table 5: Inverter common fault analysis table

Fault type	Failure phenomenon	Failure Analysis	Failure point judgment	Troubleshooting	Remark
Power on failure	Can't power on	DC positive and negative reversed	Check the DC input positive and negative pole before wiring, high potential pick connect with + pole, low potential pick connect with - pole.	Re-correct wiring after confirm positive and negative.	
		DC power on low voltage	Use a multimeter to test DC voltage of two terminals, confirm whether voltage is higher than power on point voltage.	When battery charging voltage reach the power on point voltage, then power on.	
Working fault	After working a while, inverter no output	Inverter low voltage or high-voltage or overload protection	Disconnect the load -without lo test to see whether it can work whether each point voltage is normal .	Consult manufacturer's technician	
Mains switch failure	No switch	Mains voltage low voltage or over voltage	Use a multimeter to test inverter's AC input terminals to see whether the voltage is in the range of working.	Waiting mains voltage stability, then switch	
		Inverter low voltage shutdown protection	Inverter low voltage shutdown, then connect to mains, no switch	Switch after inverter work	
Output failure	No output	Inverter protection	High voltage, low voltage, high temperature, over load etc	Consult manufacturer	
		Output fuse bad	Unscrew the fuse holder to see whether the fuse is bad.	Replace	New style LCD inverter has fuse

Remark: When testing, combine this table with indicator table to judge.

7. series LCD display panel description

1.Menu display order（List down key as example）

Below is the main menu display content:

DC InputVoltage ⟶ AC Line Voltage ⟶ AC Line Frequency ⟶ Inverter State

Output Voltage ⟶ Ooutput Current ⟶ Output Frequency ⟶ Output Power

Load Rate ⟶ Parameter DIVting

2) DC InputVoltage: means DC input voltage.
3) AC Line Voltage: means mains input voltage（±2V）
4) AC Line Frequency: means mains input frequency.
5) Inverter State:means inverter working mode.
6) Output Voltage: means inverter output voltage.
7) Ooutput Curren: means inverter output current.
8) Output Frequency: means inverter output frequency 50HZ（±0.1HZ）
9) Output Power: means inverter output power.
10) Load Rate: means load percentage.
11) Parameter DIVting: Parameter DIVtings (press the Enter key to enter the DIVup menu)
12) Screensavers: display company name.

2. LCD screen can be cycle switch with up and down key. When standby, press up key, first shows:

Parameter DIVting ⟶ Load Rate ⟶ So on

3. Following is parameter DIVting menu display content:

Language ⟶ Main Supply ⟶ Local Address ⟶ AC Alarm ⟶ Chack Bit

Baud Rate ⟶ LED Backlight ⟶ Version

- Language: means choose language（**Press Enter key to select Chinese or English**）。
- Main Supply:means which power priority
- Local Address: means inverter address
- AC Alarm:means no mains alarm**(Select open, buzzer will alarm in case of no mains)** .
- Chack Bit: means the parity bit.
- Baud Rate: means communication baud rate **(Select open self- identification baud rate)**
- LED Backlight: means LED backlit Time
- Version: means software version information.

4. LCD screen can be cycle switch with up and down key. When enter into parameter DIVting, press up key first shows:

Version ⟶ LED Backlight ⟶ So on

5.When in column of LCD menu(except language and parameter DIVting), press Enter key OK , can find the current machine failures.

Then press Enter key OK , can turn off the buzzer sound.