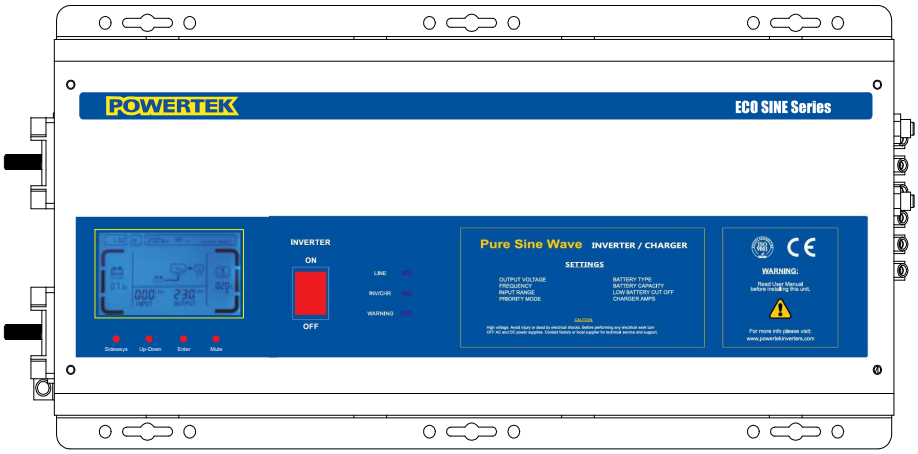
POWERTEK

Transformando energía en soluciones

USER MANUAL

ECO SINE Series

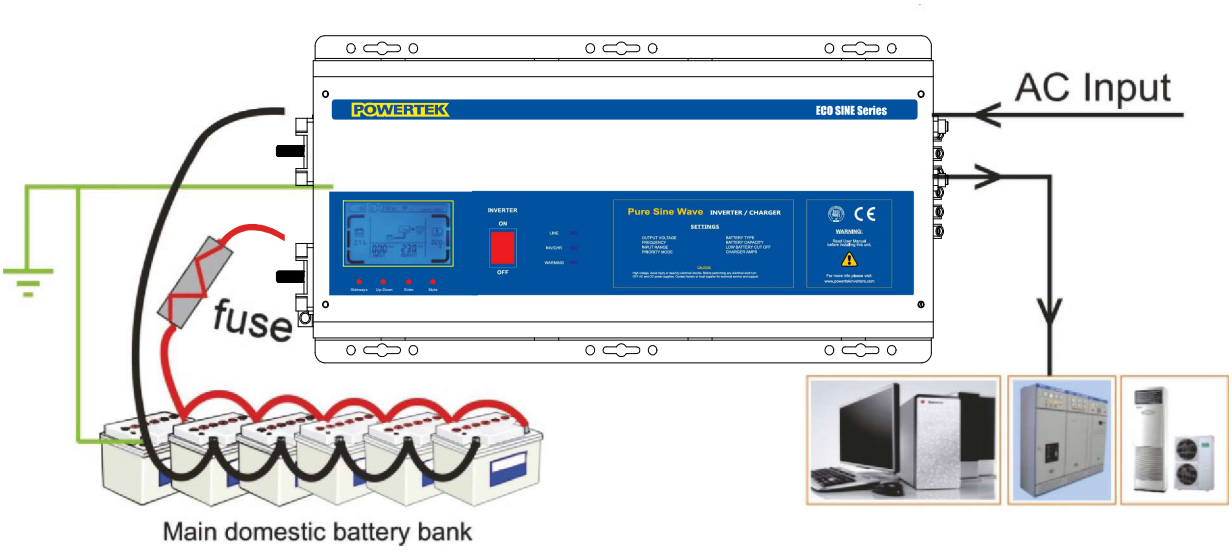


Models: ES-1200 / ES-1500 / ES-2500
ES-3500 / ES-4000 / ES-5000
ES-6000 / ES-7000 / ES-8000

www.powertekinverters.com

Basic wiring for ECO SINE Series

Warning: High voltage, do not open unless qualified to do so;
Please read instructions before working on this product.

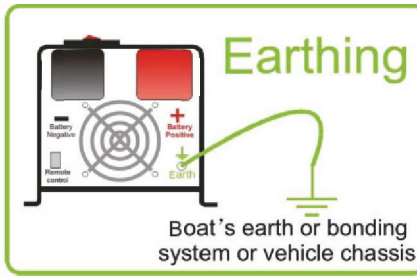


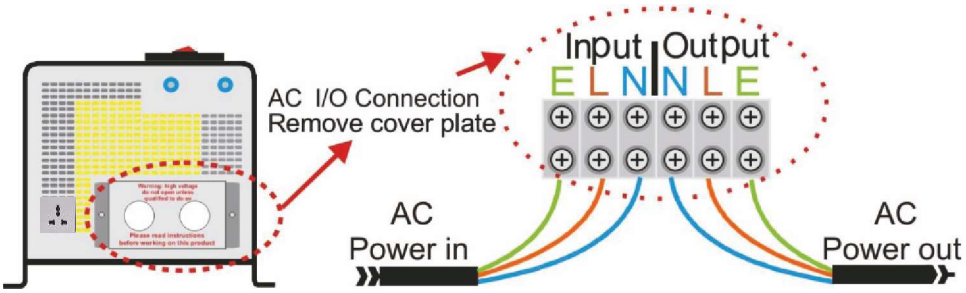
WHAT CABLE TO USE in mm²

A charger or inverter	Cable ryn distance 0-1.5m	Cable ryn distance1.5-4.0m
0-150A	25mm²	35mm²
150-200A	50mm²	70mm²
200-350A	70mm²	90mm²

Please note that if there is a problem obtaining, for example 90 mm² cable, use 2*50 mm², or 3*35 mm². To adopt one cable is always the best, cable is simply copper and all require ins the copper, so it does not matter if it is one cable for ten cables as long as the square areas adds up.
Performance of any products can be improved by thicker cable and shorter runs, so if just keep the length as short as possible.

natural earth inverter requirements
if you what to maintain a trough earth simply connect the input earth to the output earth.



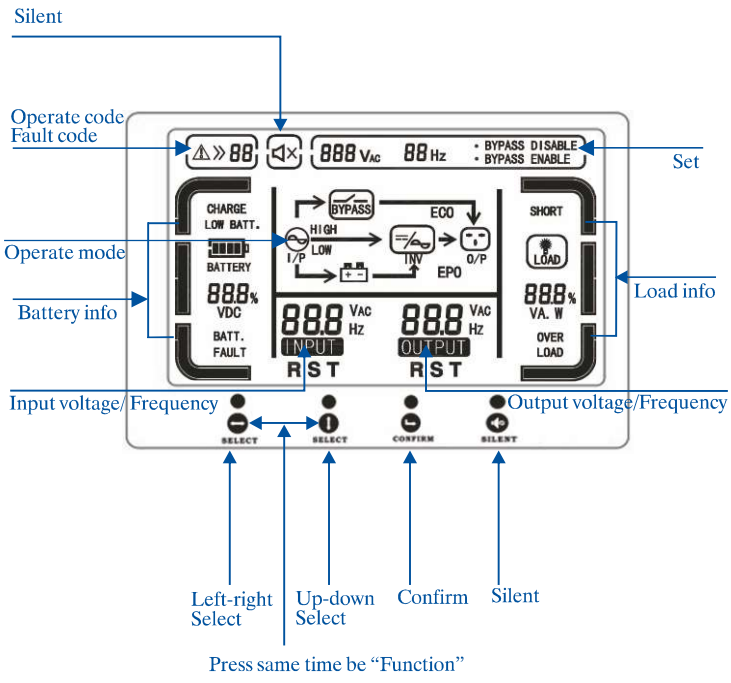


Operation

It is easy to operate the inverter, please according to below instructions.

● **Description of Panel**

1. Description of Panel



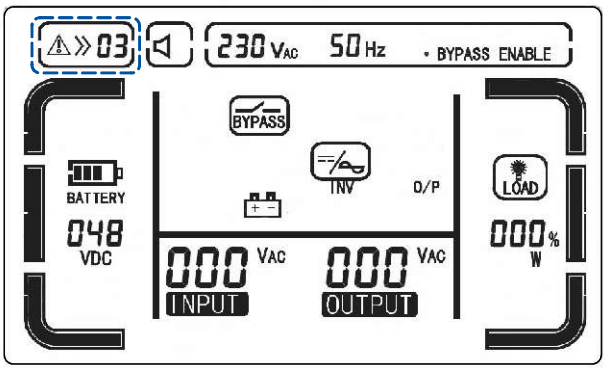
Keypress name	Function
Silent	Press it and hold over 3s,the inverter will be in silent mode, and press again over 3s, it will have sound again
Function	Press the two select buttons same time to enter into "function"mode,press over 2s,can set inverter specification
Left-right select	Only valid in "Function" mode,press over 1s,can change voltage and frequency choice
Up-down select	Only valid in "Function" mode,press over 1s, can change voltage and frequency choice
Confirm	Only valid in "Function" mode, press over 1s, can confirm new data.

2. Display meaning

Sign	Meaning
⚠	When inverter is faulty, this sign will appear, behind it is fault code. Fan Over temperature 01; Overload 02, same time OVERLOAD sign will flash every 1s; Output short circuit 03; Over temperature 04; Low Battery voltage 05; Input output reverse 06; semi-wave short circuit (unusual load) 07; Over charge 08; Battery Over voltage 09.
88	Mode display: 00 standby mode; 01 AC mode; 02 Invert mode; 03 Power saver mode.
	Silent mode in inverter mode, "X" means no sound.
888 VAC	Display output voltage, can set 220V, 230V, 240V.
88 Hz	Display output frequency, can set 50Hz, 60Hz. Autosense IF.
88.8% VDC	Display battery left capacity and battery voltage, will change to the other info in every 3s.
88.8 VAC Hz INPUT	Display AC input voltage and frequency, will change to the other info in every 3s.
88.8 VAC Hz OUTPUT	Display AC output voltage and frequency, will change to the other info in every 3s.
BYPASS	Bypass mode
HIGH LOW I/P	If show "HIGH" means AC input voltage high if show "LOW" means AC input voltage low. If AC is normal, will no show. If reverse L and N it will flash every 1s.
INV	Inverter mode
SHORT	Short circuit.
88.8% VA. W	Display load capacity: when VA value>W value, show VA value; when W value>VA value, show W value.
OVER LOAD	Overload, flash every 1s.
LOAD	Load.
CHARGE	Battery is charging.
LOW BATT.	Low battery voltage, flash every 1s.
BATTERY	Battery capacity

3.Fault Mode:

The upper left corner of the LCD shows the fault code and buzzer ringing.

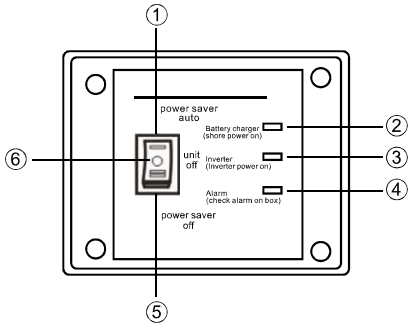


Fault code meaning

Fault code	Fault	Reason and Solution
01	Over temperature, fan fault (alarm light on)	Inverter operate temperature is very bad, insufficient ventilation and indoor temperature is very high. Close inverter and wait for 10minutes, after inverter cool, start again. If fan fault, please replace with new fan.
02	Overload (alarm light on)	Connecting load power is over than inverter rated power, if reduce load equipments quantity, inverter will back to work.
03	Output short circuit (alarm light on)	Close inverter, and disconnect all load equipments, inspect load equipments if any of them has fault or internal short circuit, then start inverter again. If still fault, please consult with manufacturer.
04	Over temperature (alarm light on)	Inverter operate temperature is very bad, insufficient ventilation and indoor temperature is very high. Close inverter and wait for 10minutes, after inverter cool, start again.
05	Low battery voltage (alarm light on)	Battery damage; Battery deep discharge, so need to charge again; Inverter charger problem, please consult with manufacturer to replace.
06	Reverse input and output	Connect input and output again in correct way.
07	Semi-wave short circuit (unusual load)	Connecting load power is over than inverter rated power, if reduce load equipments quantity, inverter will back to work.
08	Over charge	Charger damage, please consult with manufacturer for replace.
09	Battery over voltage	Check if battery bank dc voltage is corresponding to this inverter request dc voltage.

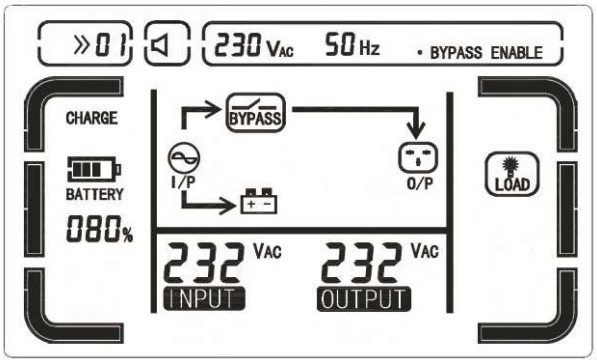
● **Operate**

1. Battery mode
   1) Power save mode: Press the "power saver auto" button; inverter will work in power save mode. (Only if connect with load, inverter will have output; if not connect with load, inverter will not have output).
   2) Invert mode: Press the "Power saver off" button, inverter has output and work in invert mode.
   3) AC mode: Connect with AC, AC indicators will light. Inverter will charge batteries and give ac output.
2. Close inverter: Press "Unit OFF" button, inverter will close and no output.

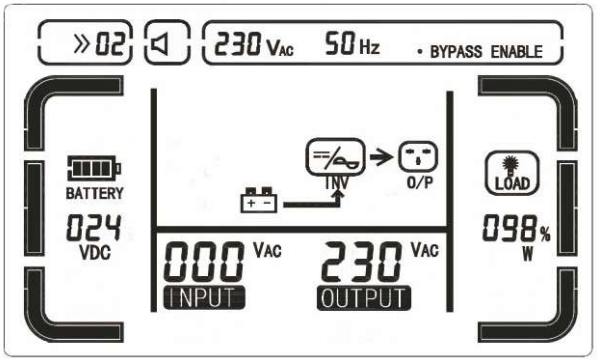


① Power save button ② Battery charge indicator
③ Invert indicator ④ Alarm indicator
⑤ Invert mode button ⑥ Close inverter button

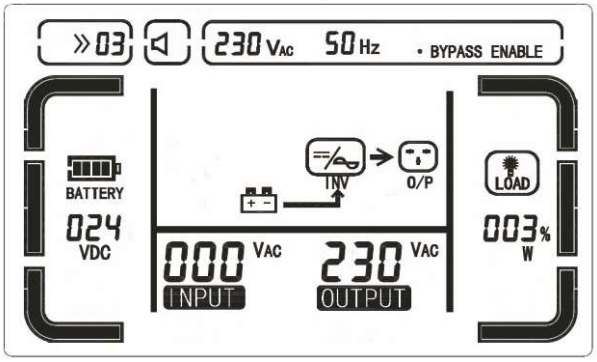
● **Operate mode**



AC mode 01



Battery inverter mode 02



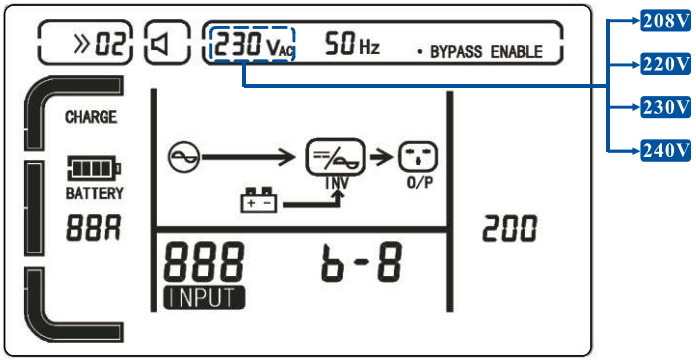
Power save mode 03
(at same time, "OUTPUT" and "O/P" signs flash)

Note: If connect with generator, please according to below procedures:

1. Start generator, after it has run in normal, please connect its output with inverter input (must confirm no load connect with inverter when connecting), then start inverter. After inverter start, connect with load.
2. The watt of generator is better to be twice of inverter watt.

Parameter setting

1.Output voltage Setting

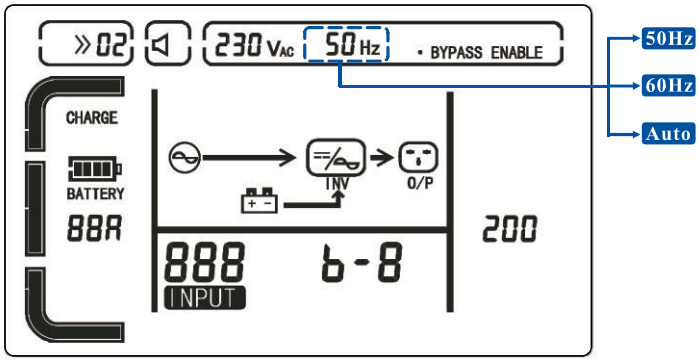


208Vac/220Vac/230Vac/240Vac four kinds of output voltage can be set.

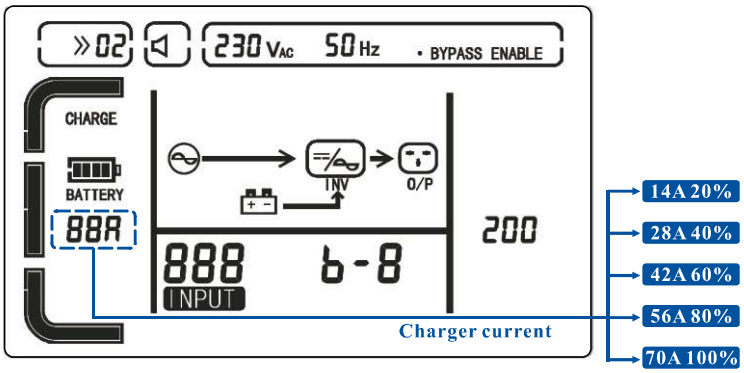
2.Output frequency Setting

The battery type and charge voltage recommendations are set out above For 24V unit x the above by

2. Some battery types may look confusing such as GEL USA and GEL EURO, AGM USA and AGM EURO. If you find this confusion then join the club, we have had the different voltage curves supplied to us by different companies form the U.S.A.



3.Charger current Setting



Maximum rated charge current can be divided into 5 defferent stages for adjustion.

20A charger can be adjusted into 4A/8A/12A/16A/20A.

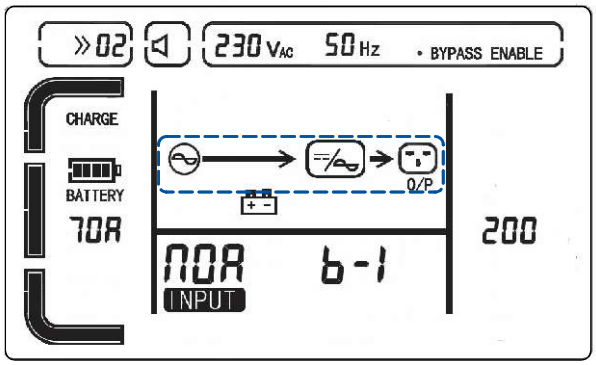
35A charger can be adjusted into 7A/14A/21A/28A/35A.

50A charger can be adjusted into 10A/20A/30A/40A/50A.

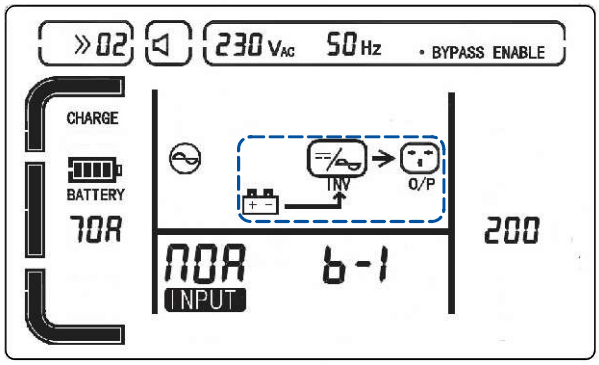
70A charger can be adjusted into 14A/28A/42A/56A/70A.

90A charger can be adjusted into 18A/36A/54A/72A/90A.

4.DC/AC mode priority selection

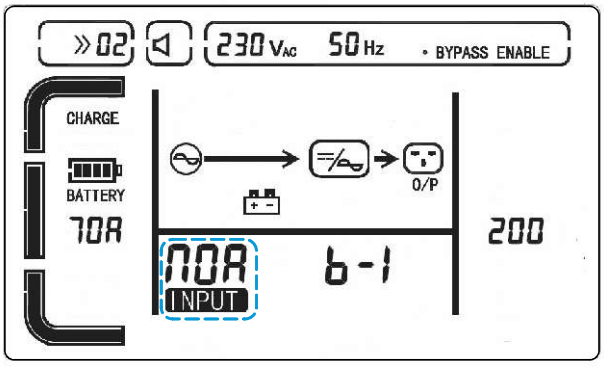


AC mode priority

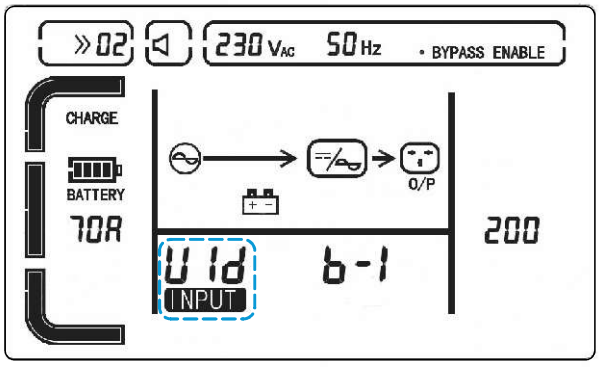


DC mode priority

5.Input voltage range

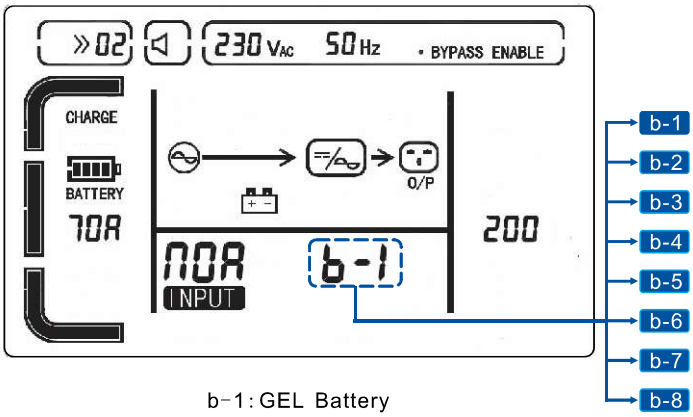


Narrow range mode

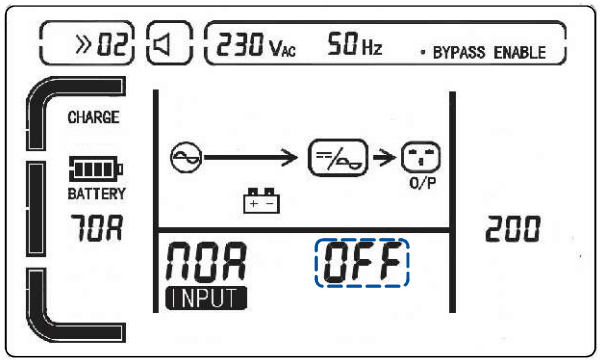


Wide range mode

6.Battery



b-1: GEL Battery

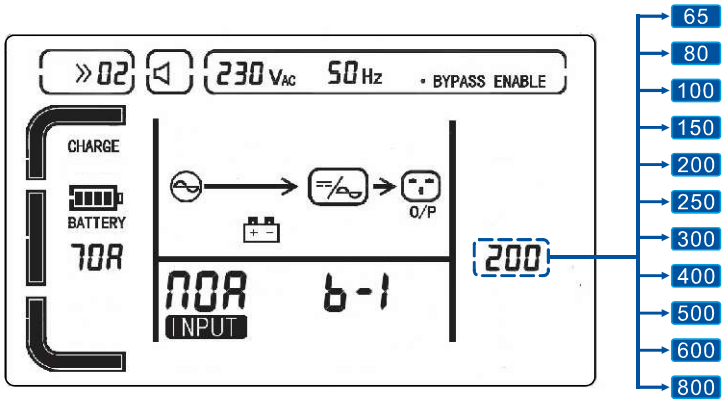


Charge off mode

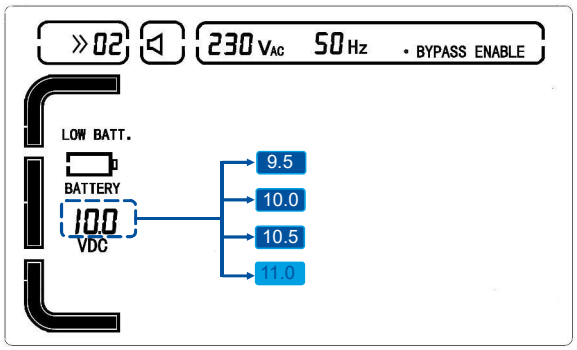
Battery type configuration parameter

LCD display	Battery Type	Fast V	Float V
b-1	AGM/GEL/LEAD ACID FLOODED	14.0	13.7(*2 for 24V; *4 for 48V)
b-2	LiFePO4 16S/8S/4S	57.6/28.8/14.4	56.8/28.4/14.2
b-3	LiFePO4 16S/8S/4S	56.3/28.2/14.1	55.5/27.8/13.9
b-4	LiFePO4 16S/8S/4S	55.2/27.6/13.8	54.4/27.2/13.6
b-5	LiFePO4 15S	54.0	53.3
b-6	LiFePO4 15S	52.8	52.1
b-7	LiFePO4 15S	51.8	51.0
b-8	De sulphation cycle	15.5	for 4 hrs (*2 for 24V; *4 for 48V)
OFF	Turn off the charger		

7. Battery capacity



8.Battery low voltage shutdown point



Battery capacity setting, select the battery capacity properly can make sure to display the right battery charging time and ensure that the battery is fully charged. If the battery capacity is not in the parameter, the close capacity is optional.

Capacity that is available in the LCD display as following :

65AH/80AH/100AH/150AH/200AH/250AH/300AH/400AH/500AH/600AH/800AH.

The factory default setting is 200AH.

Battery low voltage shutdown point

Battery low voltage shutdown point 9.5V/10.0V(default)/10.5V/11.0V.

Input Wave Form:	Sine wave (Utility or Generator)								
Nominal Voltage:	120VAC							230VAC	
Low Voltage Trip:	85V±4%							184V/154V±4%	
Low Voltage re engage:	95V±4%							194V/164V±4%	
High Voltage Trip:	140V±4%							263V±4%	
High Voltage re engage:	135V±4%							253V±4%	
Max Input AC Voltage:	150VAC							270VAC	
Nominal Input Frequency:	50Hz or 60Hz (Auto detect)								
Low freq trip:	40Hz for 50Hz 50Hz for 60Hz								
High freq trip:	55Hz for 50Hz, 65Hz for 60Hz								
Output wave form:	(Bypass mode) same as input								
Overload protection:	Circuit breaker								
Short circuit protection:	Circuit breaker								
Transfer switch rating:	30amp or 40amp								
Efficiency on line transfer mode:	95%								
Line transfer time:	10ms Typical								
Bypass without battery connected:	Yes								
Max bypass current:	30amp or 40amp								
Bypass over load current:	35amp or 45amp: Alarm								
Inverter Specification/output									
Output wave form:	Pure sine wave								
Output continuous power Watts:	1500	2500	3500	4000	5000	6000	7000	8000	
Power factor:	0.9−1.0								
Nominal output voltage rms:	120/230VAC								
Output voltage regulation:	±10% RMS								
Output frequency:	50Hz ± 0.3Hz or 60Hz ± 0.3Hz								
Nominal efficiency:	>85%								
Surge ratings:	3000	6000	9000	12000	15000	18000	21000	24000	
Short circuit protection:	Yes, fault after 10 secs								
Inverter Specification/input									
Nominal Input voltage:	12V	24V	48V	72V					
Minimum start voltage:	10V	20V	40V	60V					
Low battery alarm:	10.5V	21V	42V	63V					
Low battery trip:	10V	20V	40V	60V					
High voltage alarm:	16V	32V	64V	96V					
Power saver:	Below 25 watts when enabled								
Power saver:	Same switched on/off on remote								
Charger Mode specification									
Input voltage range:	85-140VAC or 184-263VAC								
Output voltage:	Dependent on battery type								
Charger current:	15A/20A/35A/50A/70A/90A								
Battery initial voltage for start up:	10-15.7v for 12v(*2 for 24v,*4 for 48v,*6 for 72v)								
Over charge protection shutdown:	15.7v for 12v(*2 for 24v,*4 for 48v,*6 for 72v)								
Charger curve(4 stage constant current)Battery types									
4 step digital controlled progressive charge									
Battery type:	**Fast V**	**Float V (*2 for 24v,*4 for 48v,*6 for 72v)**							
b-1:AGM/GEL	14.0	13.7 (*2 for 24V,*4 for 48V)							
b-2:LiFePO4 16S/8S/4S	57.6/28.8/14.4	56.8/28.4/14.2							
b-3:LiFePO4 16S/8S/4S	56.3/28.2/14.1	55.5/27.8/13.9							
b-4:LiFePO4 16S/8S/4S	55.2/27.6/13.8	54.4/27.2/13.6							
b-5:LiFePO4 15S	54.0	53.3							
b-6:LiFePO4 15S	52.8	52.1							
b-7:LiFePO4 15S	51.8	51.0							
b-8:De sulphation cycle	15.5	for 4 hrs (*2 for 24V;*4 for 48V)							
Remote control/RS232/USB	Yes. Optional								
Size: in mm	1000-3000W Model:460*220*190mm								
	4000-6000W Model:650*220*190mm								
	7000-8000W Model:650*240*190mm								
Weight:	1200W	1500W	2500W	3500W	4000W	5000W	6000W	7000W	8000W
	15kg	16kg	20kg	25.5kg	36kg	39.5kg	48kg	53.5kg	59kg

Product specifications are subject to change without further notice.