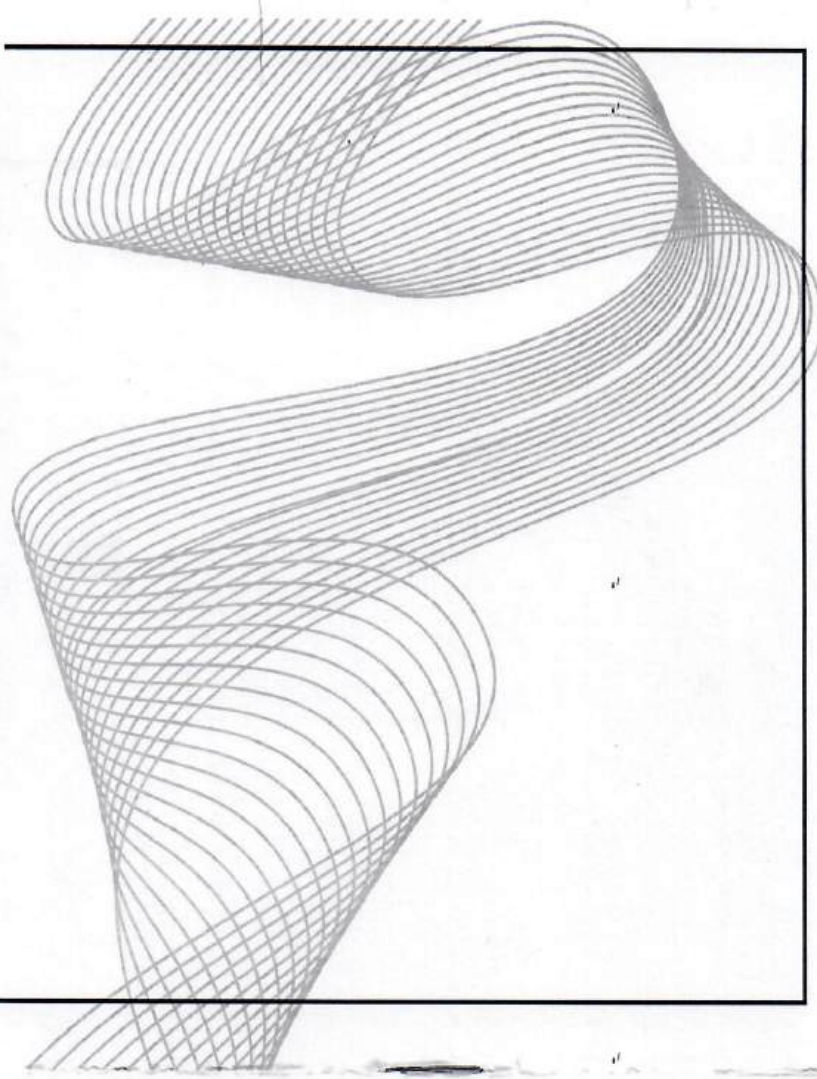


USER MANUAL

1-6KW

Pure Sine Wave Combined Inverter Chargers



614-BD010-01

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Warning : Do not open unit high internal voltage! Please read these instructions before use!

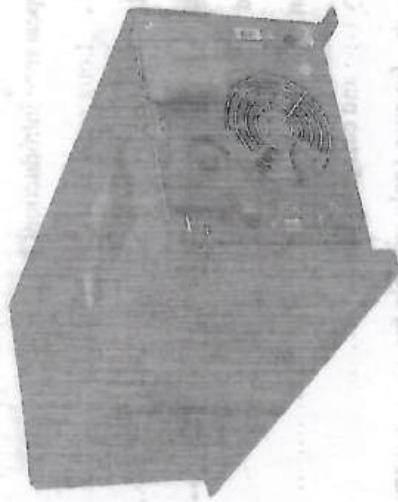
1、 The product introduction

According to the structure is divided into long square ,square two types.

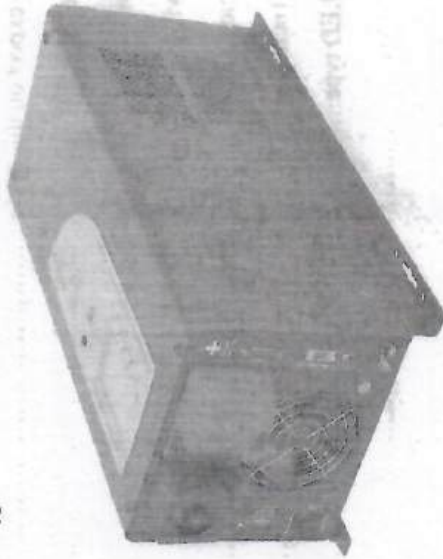
1.1 The long square

Long square according to the display is divided into the LED and LCD.

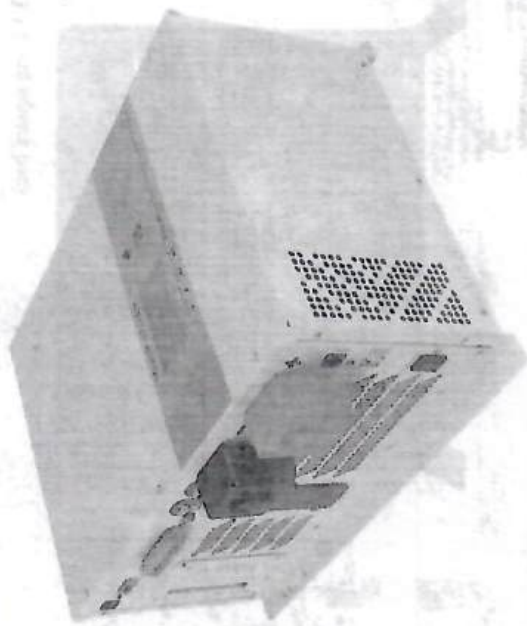
1.1.1 The LED type



1.1.2 The LCD type

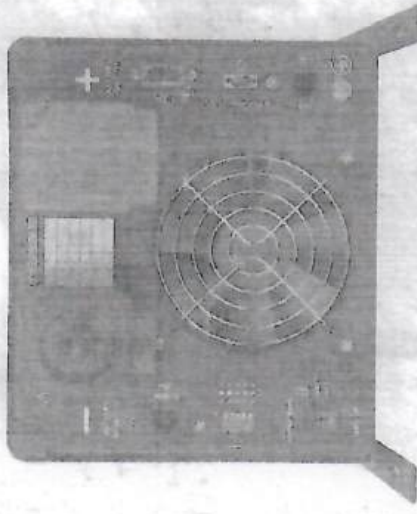


1.2 The square



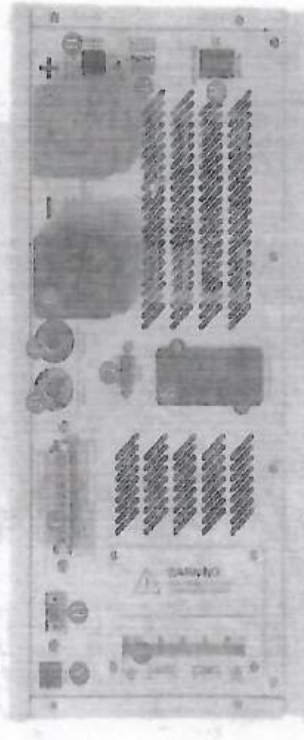
1.3 Appearance introduction (back)

1.3.1 Long square back



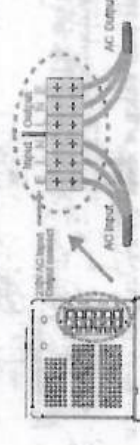
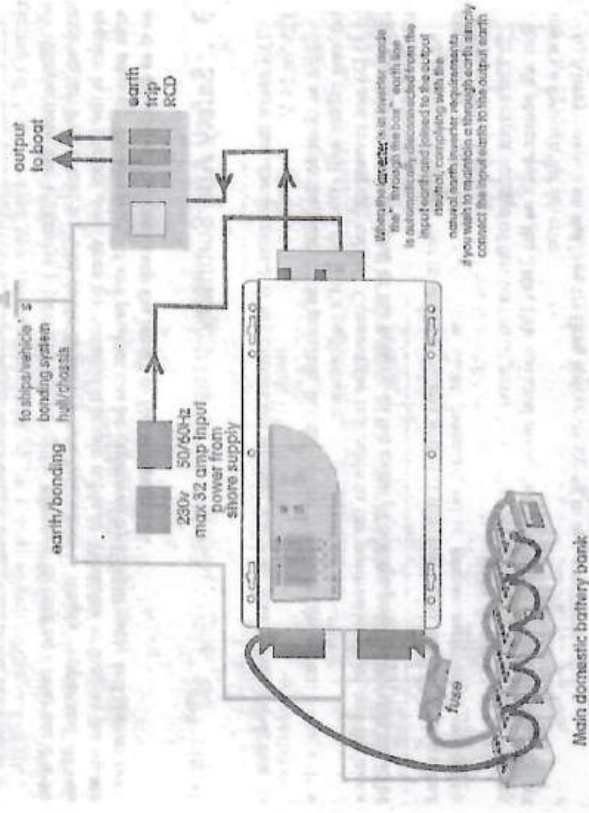
- A Negative DC Terminal
- B Positive DC Terminal
- C Remote Port
- D RS232
- E DIP Switch
- F DC Fan
- G Auto GEN START
- H ON/OFF Switch
- I BTS
- J Grounding Terminal

1.3.2 square back



- A BTS
- B Auto GEN START
- C Dry Contact
- D Inverter Output Protect
- E Charger Input Protect
- F Negative DC Terminal
- G Positive DC Terminal
- H Remote Port
- I AC Terminal
- J RS232
- K Intelligent slot
- L DIP Switch
- M ON/OFF Switch

2 、 Basic wiring for the UPS Inverter



WHAT CABLE TO USE in mm sq:

A charger or inverter	cable run distance 0-1.5m	cable run distance 1.5-4.0m	Watt
125-180A	50 m m²	70 m m²	2000Watt
180-330A	70 m m²	90 m m²	3000Watt

Please note that if there is a problem obtaining for example 90 mm sq cable, use 2 x 50 mm sq. or 3 x 35mm sq. One cable is always best but, cable is simply copper and all you require is the copper ,so it does notmatter if it is one cable or 10 cables as long as the square area adds up .Performance of any product can be improved by thicker cable and shorter runs, so if in doubt round up and keep the length as short as possible.

3 、 Safety And Summary

- 1) Ensure that the inverter has the correct d/c voltage for your boat or vehicle system is 12V or 24 V.
- 2) Fit as close to the batteries as possible. the shorter the d/c cables the better. Voltage drop on long cables will effect the unit's performance..
- 3) Do not reverse the cables! Connect the red cable to the positive terminal and the black cable to the negative terminal of the battery. In the event of reverse polarity the unit could be totally destroyed.
- 4) Always use the inverter in an environment which is well ventilated, not exposed to direct sunlight or a heat source, away from water, moisture, oil or grease, away from any highly inflammable substance, out of reach of children.
- 5) The output voltage of this unit must never be on your AC system at the same time as any other a/c source such as the 230/110V external mains line or a generator. All external power must go through the Inverter.
- 6) Always switch on the Inverter first, before plugging in any appliance.
- 7) Under new electrical legislation only professional electricians should install this product. Ensure the fitting instructions are fully understood before fitting this product.

4 、 Installation

- 1) Position the unit as close to the main battery bank as possible.
- 2) Position in a cool, dry & well ventilated space.
- 3) Orientation of the unit is not critical.
- 4) Either purchase the standard cable set from which is about 1.5 metres, or if using your own cable ,use the cable size chart provided on the installation drawing to ensure you have thick enough cable for the d/c leads. In the event of not being able to get the size requested (it cab be hard to get thick cable) then simply add multiple length of thinner cable, i.e. if you cannot get 90mm cable then use 3x 35mm cable, at the end of the day its just copper we need.
- 5) Fit a fuse suitable for the job, again look at the installation drawing, have a full range of high current fuses in the GANLR range of gold fuse products, ranging from 100-500 amps. on the d/c side.
- 6) Connect the cables from the batteries to the fuse then to the unit, this way if there is a fault at the unit the fuse is already in place and this will be safe. In the event of a isolation switch being used, please ensure the rating of the switch can handle the power of the unit.
- 7) Ensure the unit is switched off during installation.
- 8) On the a/c side ensure the shore power (all external a/c sources) are totally disconnected, connect the output from the inverter to suitable Residual Current Breaker (R.C.D. for earth protection) and current over load trips. Fuse the a/c input side depending on through power requirements, the max through power is 30 amps, so fuse at 40A (allowing also for charger consumption) if you intend to use the full through power for standard 13-16 amps throughput

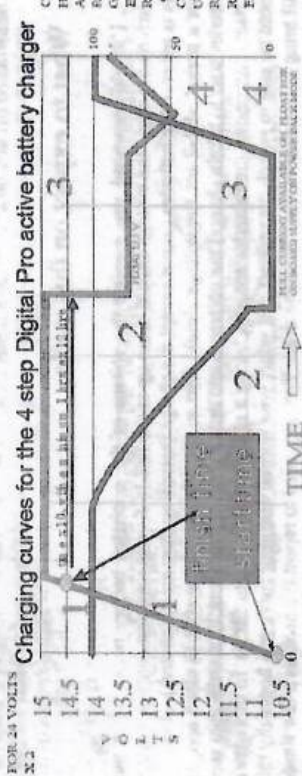
then a 20A fuse would be appropriate.
9) Recommend Multi core tri rated a/c cable, if used on a boat or vehicle, as this is much safer where vibration is likely. Only use single solid household a/c cable if the product is being used as a power source for a house or platform free of vibration.

10) Before attempting to switch on the unit, please ensure you have selected the correct battery type on the small battery type selector switch on the front of the main box. rotate the switch to your battery type. The Progressive charge control software will automatically adjust for battery bank size and state.

Batter Type Selector, for 24 v x voltages by 2

4 step digital controlled progressive charge		
Switch setting	Boost (*2.24V; *4.48V)	Float
0	to be used	
1	GEL USA	14.0
2	AGMI	14.4
3	AGM2	14.6
4	sealedlead acid	14.4
5	GEL EURO	14.4
6	open lead acid	14.8
7	calcium	15.1
8	de sulphation	15.5 (4 hrs then off)
9	to be used	

Charging curves for the 4 step Digital Pro active battery charger



5. The battery type and charge voltage

Some battery types may look confusing such as gel usa and gel euro, AGM usa and AGMeuro. If you find this confusion then join the club, we have had the different voltage curves supplied to us by different companies from the U.S.A. and Europe for what we seem the same product, however it's not our call, we simply supply the options, if in doubt call your battery supplier and ask which charge voltage they want you to use for their battery type, and select the closest to it. If totally confused then use the lower voltage setting until you have had a higher voltage setting confirmed to you by whoever supplied the batteries to you.

The de-sulphation cycle on switch position 8 is marked in red because this is a very dangerous setting if you do not know what you are doing. Before even attempting to use this cycle you must clearly understand what it does and when and how you would use it.

What causes sulphation? This can be occur with infrequent use of the batteries, or if the batteries have been left discharged so low that they will not accept a charge. This cycle is a very high voltage charge cycle designed to try to break down the sulphate 'crust' that is preventing the plates taking a charge and thus allow the plates to clean up and so accept charge once again.

6. How to use this function (only suitable for open lead acid batteries)

- 1) Ensure the battery bank is totally isolated from anything else on the boat or vehicle; the high voltage applied by this setting could destroy all your electronics and other electrical equipment still connected (hence all these instructions are in red, this is a very expensive mistake).
- 2) Make sure the battery compartment is very well ventilated and battery caps are removed.
- 3) Switch the battery type selector switch to the correct position, then switch the a/c power on.
- 4) Because this is such a dangerous setting there is a 4 hr time out period build into the software, however on a very large battery bank this may not be enough and the unit may need to be switched off and on again to do another cycle.

7. What to expect on this cycle

I would recommend you monitor the voltage of the sulphated battery bank. When you switch on the cycle the voltage should shoot up to the full 15.5 volts very fast (within minutes) this is because the batteries cannot accept the charge (assuming they are sulphated). However, over a period of 1-2 hrs the voltage should start to drop (as the plates start to clean and the batteries start to take a charge) the voltage could drop way down to about 12.5 volts then start to rise. This shows the batteries are now taking a charge and starting to fill up. In this case it would be safe to switch the unit off and select your normal charging curve and hopefully this will bring your batteries back from the dead. You may need to repeat the process a few times. Please note this is a professional guess tool, which most times helps, but its not magic, so expect the worst and hope for the best.

Never leave a system unattended when on this mode. If the battery temperature reaches above 50 deg c (ie if the batteries are almost to hot to touch) then stop the process).

8. Remote control

Before operation, to ensure that the host power supply is disconnected, the host front

panel can also be used as a remote control, remove the main box panel screw, be careful with the switch panel and disconnect the continuous host continuous slot.

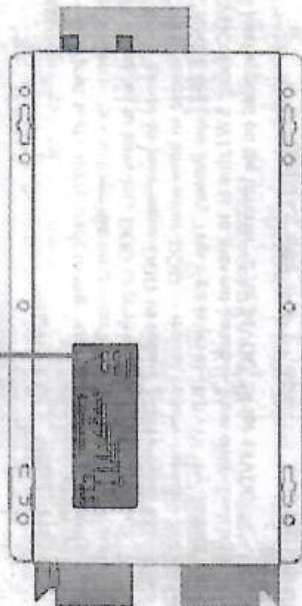
Using the remote control host replication is partially filled with the host.

Using a remote control line reconnection host panel

Remote control installation

Twist off panel screw,

Disconnects the machine behind of cables



9. Operation and what to expect

1) After the unit is installed, using the panel on the front of the unit, and with the shore power (230 /110 VAC) still disconnected, switch the unit on. The leds will cycle through there test routine, then the unit should go into inverter mode and 230/110 v should be produced on the output a/c terminals (provided the batteries are over 11 volts).

2) If the above is ok, then connect the shore power to feed 230/110V into the INVERTER, after a shortwhile, the inverter should go off line, and feed the shore power through the inverter. Changeover is about 20 milli secs (so fast that you should not be able to notice it) and the battery charger should come on-line and go through it's charge sequence ending, after 1-10 hrs, with float voltage.

10. DIP Switches

On the DC end of inverter, there are 5 DIP switches which enable users to customize the performance of the device.

LED:

Switch NO	Switch Function	Position: 0	Position: 1
SW1	Low Battery Trip Volt	10.5VDC *2 for 24VDC, *4 for 48VDC	10VDC
SW2(230V)	AC Input Range	184-254VAC	154-264VAC(40Hz+)
SW2(120V)	AC Input Range	100-135VAC	90-135VAC(40Hz+)
SW3	Load Sensing Cycle	3 seconds	30 seconds
SW4	Frequency selectiv	50Hz	60Hz
SW5	Battery/AC Priority	Utility Priority	Battery Priority

LCD:

Switch NO	Switch Function	Position: 0	Position: 1
SW1	Low Battery Trip Volt	10.5VDC *2 for 24VDC, *4 for 48VDC	10VDC
SW2(230V)	AC Input Range	184-253VAC	150-264VAC(40Hz+)
SW2(120V)	AC Input Range	100-135VAC	90-135VAC(40Hz+)
SW3	Battery/AC Priority	Utility Priority	Battery Priority

Low Battery Trip Volt:

Deep discharge of the lead acid battery leads to high losses in capacity and early aging. In different applications, different low voltage disconnection level is preferred. For example, for solar application, user intended to have less DOD to prolong the battery cycle life. While for mobile application, users intend to have more DOD to reduce battery cycle life. While for mobile application, users intend to have more DOD to reduce battery capacity and on board weight. For 12VDC model, the Low Battery Trip Volt is set at 10.0VDC by default. It can be customized to 10.5VDC using SW1, this is to prevent batteries from over-discharging while there is only a small load applied on the inverter. *2 for 24VDC, *4 for 48VDC

AC Input Range:

There are different acceptable AC input ranges for different kinds of loads. For some relatively sensitive electronic devices, a narrow input range of 184-253VAC (100-135V for 120VAC model) is required to protect them. While for some resistive loads which work in a wide voltage range, the input AC range can be customized to 154-253VAC (90-135V for 120VAC model), this helps to power loads with the most AC input power without frequent switches to the battery bank. In order to make the inverter accept dirty power from a generator, when the SW2 is switched to position "1", the inverter will bypass an AC input with a wider voltage and frequency (40Hz plus for 50Hz/60Hz). Accordingly, the AC charger will also work in a wider frequency range (43Hz plus for 50Hz/60Hz). This will avoid frequent switches between battery and generator. But some sensitive loads will suffer from the low quality power. The pros and cons should be clearly realized.

Load Sensing Cycle:

The inverter is factory defaulted to detect load for 250ms every 30 seconds. This cycle can be customized to 3 seconds through the SW3 on DIP switch.

Frequency selective:

Display output frequency, can set 50Hz, 60Hz through the SW4 on DIP switch.

AC/Battery Priority:

Our inverter is designed AC priority by default. This means, when AC input is present, the battery will be charged first, and the inverter will transfer the input AC to power the load. Only when the AC input is stable for a continuous period of 15 days will the inverter start a battery inverting cycle to protect the battery. After 1 normal charging cycle ac throughput will be restored. For more info, pls refer to our manual at AC Charging Section. The AC Priority and Battery Priority switch is SW5. When you choose battery priority, the inverter will invert from battery despite the AC input. Only when the battery voltage reaches the low voltage alarm point (10.5Vdc for 12Vdc, 21Vdc for 24Vdc, 42Vdc for 48Vdc) will the inverter transfer to AC Input, charge battery, and switch back to battery when the battery is fully charged. This function is mainly for wind/solar systems using utility power as back up. The AC/Battery Priority function can be activated by sliding the switch even when the inverter is in operation.

Note: In battery priority mode, when qualified AC inputs for the first time, the inverter will only go into battery priority mode after a cycle of bulk charging and absorb charging is finished. The inverter will not go into float charging mode.

11、 Common Faults

11.1、 Technical specification

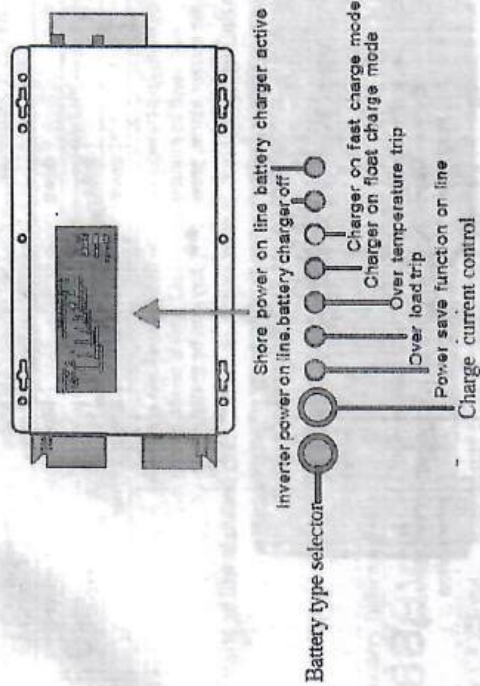
General specification	UPS Inverter
Input Wave form	Pure sine wave
Nominal voltage	110VAC
Low voltage trip	80V±4% 115V±4% 230VAC
Minimum engage	90V ±4% 184V±4%/164V±4%
High voltage trip	130V±4% 254V±4%/264V±4%
High voltage re engage	125V±4% 244V±4%/254V±4%
Max input a/c voltage	140VAC
Nominal input frequency	50Hz or 60Hz (auto detect)
Low freq trip	47Hz for 50Hz, 57Hz for 60Hz
High freq trip	55Hz for 50Hz, 65Hz for 60Hz
Output wave form	(on bypass mode) same as input
Overload protection	Circuit breaker
Short circuit protection	Circuit breaker
Transfer switch rating	30 amp or 40 amp
Efficiency on line transfer mode	95%+
Line transfer time	10ms
Bypass without battery connected	yes
Max by pass current	30 amp or 40 amp
Bypass over load current	35 amp or 45 amp (Alarm)
Inverter Specification / output	
Output wave form	Pure sine wave
Output continuous power watts	1000W 2000W 3000W 4000W 5000W 6000W
Power factor	0.9-1.0
Nominal output voltage rms	230V
Output voltage regulation	±10%/rms
Output frequency	50hz +/- 0.3hz or 60hz +/- 0.3hz
Nominal efficiency	>80%
Short circuit protection	yes
Nominal input voltage	12, 24 or 48 v depending on model
Minimum start voltage	10 v for 12 v model, 20v for 24 v model, 40v for 48v model
Low battery alarm	10.5v for 12 v model, 21v for 24 v model, 42v for 48v model
Low battery trip	10 v for 12 v model, 20v for 24 v model, 40v for 48v model
High voltage alarm	16 for 12v model, 32 v for 24 v model, 64v for 48v model
Charger Mode specification	
Input voltage range	194-253 vac

Output voltage	dependent on battery type			
Charge current	35/70A			
Battery initial voltage for start up	0-15.7v for 12v(* 2 for 24v ; * 4 for 48v)			
Over charge protection shutdown	15.7v for 12v(* 2 for 24v ; * 4 for 48v)			
Charger curves (4 stage constant current)Battery types				
4 step digital controlled progressive charge				
Battery type	charge v	float v		
GEL USA	14.0	13.7		
AGMI	14.4	13.4		
AGM2	14.6	13.7		
Sealed Lead Acid	14.4	13.6		
GEL EURO	14.4	13.8		
Open Lead acid	14.8	13.3		
Calcium	15.1	13.6		
De-sulphation	15.5 for 4 hrs			
Remote control	Front control panel removable			
Size: in mm	model	Long square		square
	1-3K W	334*595*320mm		515*405*280mm
	4-6K W	334*770*320mm		695*405*280mm
Net Weight	1000	2000	3000	4000
	16kg	20kg	25kg	35kg
			5000	6000
			38kg	40kg

11.2、LED type:

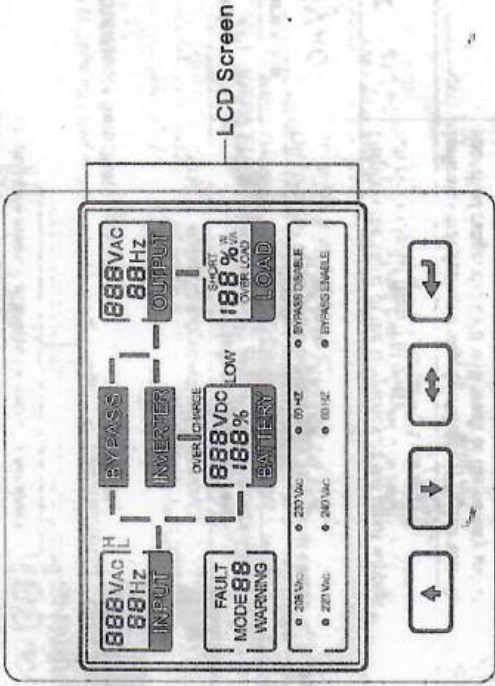
There are numerous faults which the unit can detect and transmit the fault to you by the use of l.e.d.s and alarm on the unit itself. The remote control gives a little help but the real fault finding can only take place at the unit. Please see the fault finding chart over the page for full information.

show running pattern:



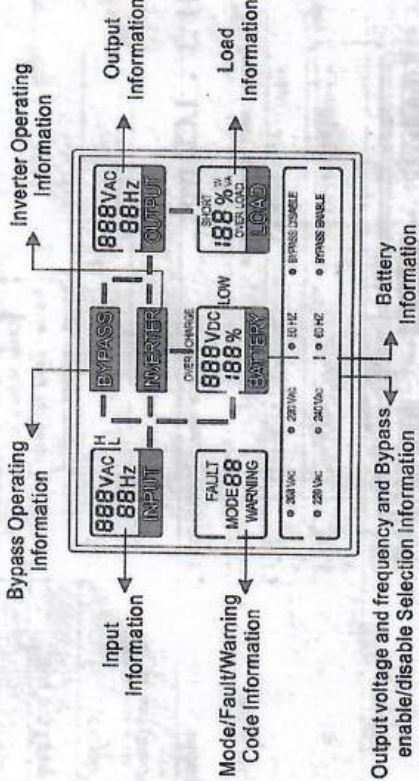
11.3 、LCD type

(1) Front Panel Specifications



Switch	Function	Description
↑	up	Move up to pre-select
↓	down	Move down to pre-select
←→	left&right	Move left&right to pre-select
↵	enter	Select&Enter

Note: 1. When the buzzer alarm, press **↵** key can be muted.
2. When the display backlight in enter saving, press **↵** key backlight will be bright.

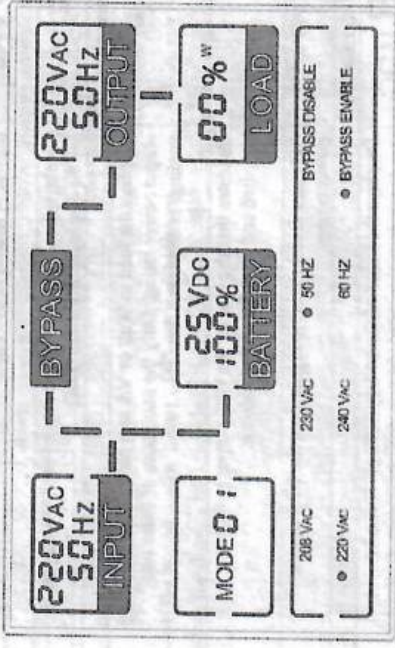


Display	Information or Data
Input Information	
888VAC	Displays the value of the input supply voltage. It can be displayed from 0 to 999Vac.
88Hz	Displays the value of the frequency of the input supply. It can be displayed from 0 to 99Hz.
H	Indicates that the input supply voltage is higher than the specified range, the UPS will work in the battery mode.
L	Indicates that the input supply voltage is lower than the specified range, the UPS will work in the battery mode.

Output Information	
888VAC	Displays the value of the UPS output voltage. It can be displayed from 0 to 999Vac.
88Hz	Displays the value of the frequency of the UPS output. It can be displayed from 0 to 99Hz.
Load Information	
188 % VA	Displays the load in Watt or VA as a percent of the UPS' output power rating. Only the maximum of these two readings is displayed from 0 to 199%.
SHORT	Indicates that the load or the UPS output is short-circuited and the UPS will shutdown.
OVER LOAD	Indicates that the load is higher than the UPS output power rating.
Battery Information	
888VDC	Displays the value of the battery voltage. It can be displayed from 0 to 999Vdc.
188 %	Displays the battery stored capacitance in percent. It can be displayed from 0 to 199%.
OVER CHARGE	Indicates that the battery is over charged, the UPS will be switched to battery mode.
LOW	Indicates that the battery voltage is low, the UPS will shutdown soon.
Mode/Fault/Warning code Information	
FAULT MODE 88 WARNING	Displays the operating mode, the fault code and the warning codes of the UPS. For the meaning of these codes refer to page 13.
Inverter operating Information	
INVERTER	Indicates that the inverter is running.
Bypass operating Information	
BYPASS	Indicates that the bypass circuit is running.
Output voltage and frequency and Bypass disable/enable selection Information	
203 VAC 230 VAC 220 VAC	indicates the value of the desired UPS output voltage. One of these four values can be selected when the UPS is in the No-output or in the Bypass mode.
50 Hz 60 Hz	Indicates the value of the desired UPS output frequency. One of these two values can be selected when the UPS is in the No-output or in the Bypass mode.
BYPASS DISABLE BYPASS ENABLE	Not used

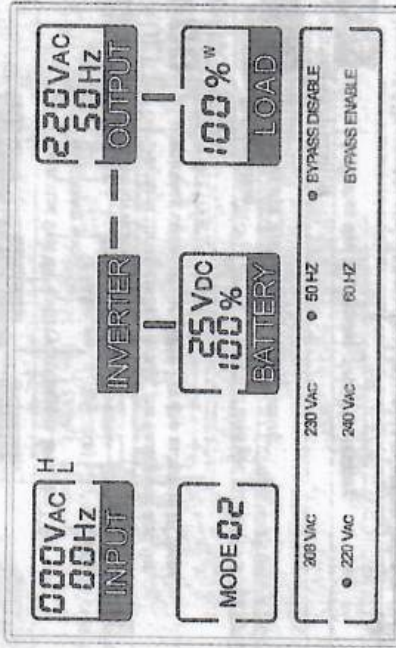
(2) Line Mode

The LCD display in Line mode is shown in the following diagram:



(3) Battery mode

The LCD display in Battery mode is shown in the following diagram:



(4) Warning mode

The LCD display in warning mode is shown in the following diagram:



The different codes could be displayed on the LCD screen corresponding to their own

Warning modes:

Code	Warning
10	Battery Low Voltage
11	Battery High Voltage
12	Over Load
13	Over Temperature
14	Over Charge

(5) Fault mode

The LCD display in fault is shown in the following diagram:



The different codes could be displayed on the LCD screen corresponding to their own

Fault modes:

Code	Fault	Code	Fault
1	Fan locked fault	6	No feedback fault
2	Over load fault	7	Half short circuit fault
3	Short Circuit fault	8	Charge fault
4	Over temperature fault	9	Over voltage fault
5	Battery Trouble		