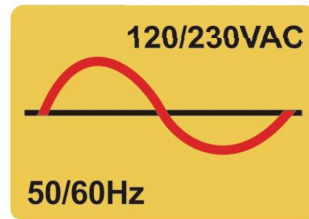


# HI Series (II)

## Product Information Guide



1000W	3000W
1500W	4000W
2000W	5000W
2500W	6000W

Continuous power  
with P.F.C charger

## Sine Wave Combined Inverter & Charger



**Models:** HIZW1000-12-C(II), HIZW1000-24-C(II), HIZW1000-48-C(II), HIZW1500-12-C(II), HIZW1500-24-C(II), HIZW1500-48-C(II), HIZW2000-12-C(II), HIZW2000-24-C(II), HIZW2000-48-C(II), HIZW2500-12-C(II), HIZW2500-24-C(II), HIZW2500-48-C(II), HIZW3000-12-C(II), HIZW3000-24-C(II), HIZW3000-48-C(II), HIZW4000-24-C(II), HIZW4000-48-C(II), HIZW5000-24-C(II), HIZW5000-48-C(II), HIZW6000-24-C(II), HIZW6000-48-C(II)  
 HIZWS1000-12-C(II), HIZWS1000-24-C(II), HIZWS1000-48-C(II), HIZWS1500-12-C(II), HIZWS1500-24-C(II), HIZWS1500-48-C(II), HIZWS2000-12-C(II), HIZWS2000-24-C(II), HIZWS2000-48-C(II), HIZWS2500-12-C(II), HIZWS2500-24-C(II), HIZWS2500-48-C(II), HIZWS3000-12-C(II), HIZWS3000-24-C(II), HIZWS3000-48-C(II), HIZWS4000-24-C(II), HIZWS4000-48-C(II), HIZWS5000-24-C(II), HIZWS5000-48-C(II), HIZWS6000-24-C(II), HIZWS6000-48-C(II)

# Combined Inverter & Charger

## Basic wiring for HI Series (II) Series

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

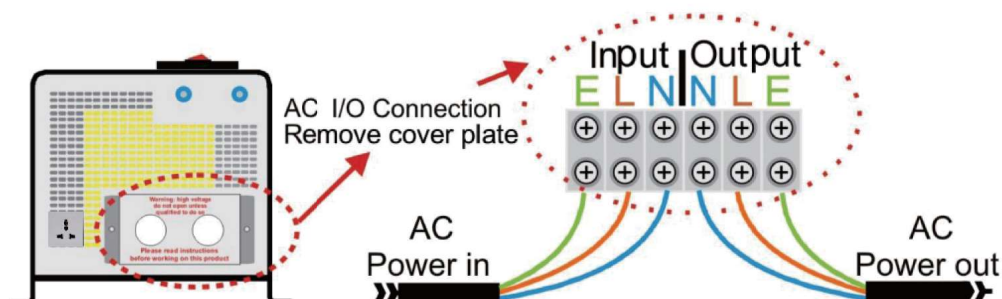
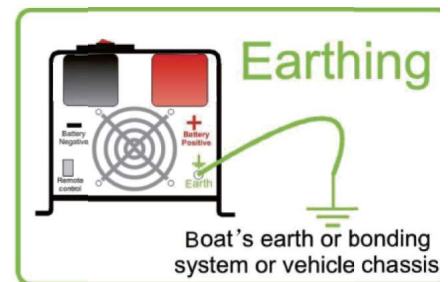


### WHAT CABLE TO USE in mm<sup>2</sup>

A charger or inverter	Cable ryn distance 0-1.5m	Cable ryn distance 1.5-4.0m
0-150A	25mm <sup>2</sup>	35mm <sup>2</sup>
150-200A	50mm <sup>2</sup>	70mm <sup>2</sup>
200-350A	70mm <sup>2</sup>	90mm <sup>2</sup>

Please note that if there is a problem obtaining, for example 90 mm<sup>2</sup> cable, use 2\*50 mm<sup>2</sup>, or 3\*35 mm<sup>2</sup>. 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.



## Check list

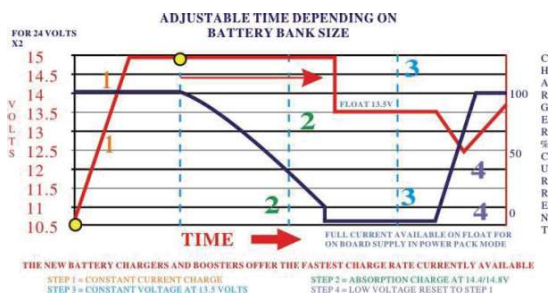
- 1) Ensure that the inverter has the correct DC voltage for your boat or vehicle system. ie 12 or 24V/48V/72V.
- 2) Fit as close to the batteries as possible, the shorter the DC cables the better. Voltage drop on long cables will effect the unit's performance.
- 3) Do not reverse the cables! Connect 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 from children.
- 5) The output voltage of this unit must never be on your AC system at the same time as any other AC source such as the 230V external mains line or a generator. All external power must go through the Power Star LW.
- 6) Always switch on the Power Star LW, before plugging in any appliance.
- 7) Under new electrical legation only professional electrocutions should install the product. Ensure the fitting instructions are fully understood before fitting this product.

## 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 Dealer which is about 1.5 meters, 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 DC leads. In the event of not being able to get the size requested (it can be hard to get thick cable) then simply add multiple length of thinner cable, i.e. if you cannot get 90 mm<sup>2</sup> cable then use 3\*35 mm<sup>2</sup> cable.
- 5) Fit a fuse suitable for the job, again look at the installation drawing. We have a full range of high current fuses in the GANLR range of gold fuse products, ranging from 100-500 Amp. on the DC 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 AC side ensure the shore power (all external AC sources) are totally disconnected, connect the output from the inverter to suitable Residual Current Breaker (R.C.D for the earth protection) and current over load trips Fuse the AC input side depending on through power requirements, the max through power is 30Amp Ps, so fuse at 40A (allowing also for charger consumption) if you intend to use the full through power for standard 1316 amps throughput then a 20A fuse would be appropriate.
- 9) We recommend Multi core tri rated AC cable, if used on a boat or vehicle, as this is much safer where vibration is likely. Only use single solid household AC 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 types. The progressive charge control software will automatically adjusted for battery bank size and state

## Charge Stage Transition Definitions

- Boost CC Stage: If AC input is applied, the charger will run at full current in CC mode until the charger reaches the boost voltage.
- Software timer will measure the time from AC start until the battery charger reaches 0.3V below the boost voltage, then take this time as  $T_0$  and  $T_0 * 10 = T_1$ .
- Boost CV Stage: Start a  $T_1$  Timer; the charger will keep the boost voltage in Boost CV mode until the  $T_1$  Timer has run out. The drop the voltage down to the float voltage. The timer has minimum time of 1 hour and a maximum time of 12 hours.
- Float Stage: In float mode, the voltage will stay at the float voltage.
- If the AC is reconnected or the battery voltage drops below 12Vdc/24Vdc, the charger will reset the cycle above.
- If the charge maintains the float state for 10days, the charger will reset the cycle.



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 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 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 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.

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 dangerous mistake.)
- 2) Make sure the battery compartment is very well ventilated and battery caps are removed.
- 3) Switch the battery type selector to the correct position, then switch the AC 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.
- 5) 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 15.5volts 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 charge) the voltage could drop way down to about 12.5 volts then start to rise. These 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 50deg c (ie. If the batteries are almost too hot to touch) then stop the process).

## Install remote control.

Isolate the unit before attempting this so there are no high voltages. The local control panel on the front of the unit can also be used as a remote control, reveal the screws holding the panel onto the main box, carefully remove the panel and disconnect it from the connection socket behind the unit. Using the remote cable supplied then reconnect the panel to the unit

## 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 (120/230VAC) still disconnected, switch the unit on. The leds will cycle through the test routine, then the unit should go into inverter mode and 120/230V should be produced on the output AC terminals (provided the batteries are over 11 volts).
- 2) If the above is ok, then connect the shore power to feed 120/130V into the PS LW, after a short while, the inverter should go off line, and feed the shore power through the inverter. Changeover is about 20 milliseconds (so fast that you should not be able to notice it) and the battery charger should come online and go through it's charge sequence ending, after 110hrs, with float voltage.

## Common Faults:

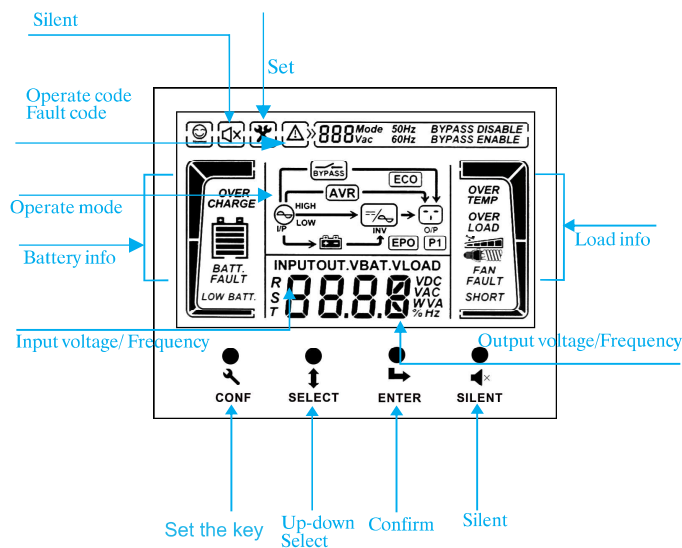
There are numerous faults which the unit can detect and transmit the fault to you by the use of LCD display and alarm on the unit itself. The remote control gives a little help but the real fault finding can only take place at the unit. Please see the fault finding chart over the page for full information.

## 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.
ENTER	In settings mode, press this button to confirm the set item.
SELECT	Press this key to view parameters on the screen, such as input and output voltages, and battery voltages. In settings mode, select different Settings.
CONF	Long press this button for 3 seconds, the unit enters the setting mode, which can set the output voltage, frequency, battery information and so on.
CONF+SELECT	Long press two buttons for 2 seconds, the inverter restores factory Settings.

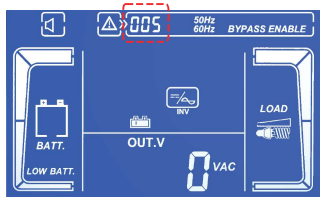
#### 2. Display meaning

Sign	Meaning
	When the inverter is malfunctioning, this flag will appear followed by the fault code. Fan temperature too high 01; Overload 02, while OVERLOAD flag flashes every 1s; Output short 03; Temperature too high 04; Battery voltage too low 05; Input and output reverse 06; Half wave short (abnormal load) 07; Overcharge 08; Battery voltage too high 09.
	Hold down CONF for three seconds to go to the setting screen.
	Silent mode in inverter mode, "X" means no sound.
<b>888</b> Mode Vac	Display output voltage, can set 208V, 220V, 230V, 240V.
<b>50Hz</b> <b>60Hz</b>	Display output frequency, can set 50Hz, 60Hz. autosensing IF.
<b>8888</b> VDC VAC WVA %HZ	Display input, output, battery voltage and load, by pressing "SELECT" button display switch.
<b>AVR</b>	Displaying this indicates entering AVR mode.
	Battery capacity
<b>BYPASS</b>	Bypass mode
<b>HIGH</b> <b>LOW</b> I/P	If "HIGH" is displayed, it means the AC input voltage is high, if "LOW" is displayed, it means the AC input voltage is low. If AC is normal, it will not be displayed. If reversing N, it will flash once every 1 second.
	Inverter mode.
	Load.
<b>OVER TEMP</b>	Display load capacity: when VA value > W value, show VA value; when W value > VA value, show W value.
<b>OVER LOAD</b>	Overload, flash every 1s.
<b>SHORT</b>	Short circuit.
<b>OVER CHARGE</b>	Battery is charging.
<b>LOW BATT.</b>	Low battery voltage, flash every 1s.
<b>BATT. FAULT</b>	Battery fault, flash every 1s.
<b>FAN FAULT</b>	Fan fault, flash every 1s.

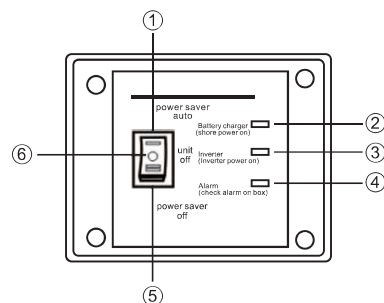


### 3. Fault Mode

The upper left corner of the LCD shows the fault code and buzzer ringing. As shown in the figure below, the inverter is faulty.



Inverter fault display screen



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

#### Fault code meaning

Fault code	Fault	Reason and Solution
001	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.
002	Overload (alarm light on)	Connecting load power is over than inverter rated power, if reduce load equipments quantity, inverter will back to work.
003	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.
004	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.
005	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.
006	Reverse input and output	Connect input and output again in correct way.
007	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.
008	Over charge	Charger damage, please consult with manufacturer for replace.
009	Battery over voltage	Check if battery bank dc voltage is corresponding to this inverter request dc voltage.

#### ● Operate mode



AC mode 01



Battery inverter mode 02



Power save mode 03

#### ● 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.

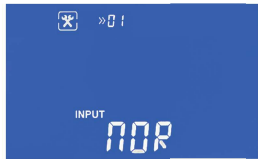
**Note:** If connect with generator, please according to below procedures:

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.

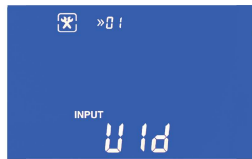
## Parameter setting

In the power-on state, long press the "CONF" button for 3 seconds to enter the setting mode, short press the "CONF" button to select different setting items, and continue to press the SELECT button to select different sub-items in the setting. After setting, press the "ENTER" button to confirm and save. Note that the setting involves the modification of the inverter voltage and frequency, and the inverter needs to be restarted to take effect. The specific setting items are as follows:

### 1.Input voltage range



Normal input range

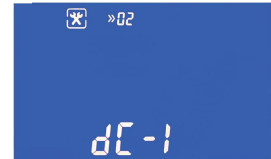


Wide input range

### 2.DC/AC mode priority selection



AC priority mode



DC priority mode

### 3.Output voltage Setting



Set 208V output



Set 220V output



Set 230V output



Set 240V output

### 4.Output frequency Setting



Set the output to 50Hz

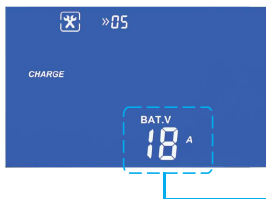


Set the output frequency adaptive



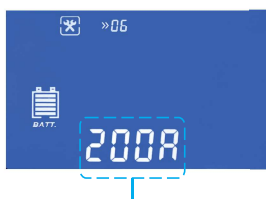
Set the output to 60Hz

### 5.Charger current Setting



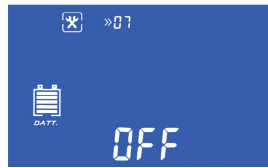
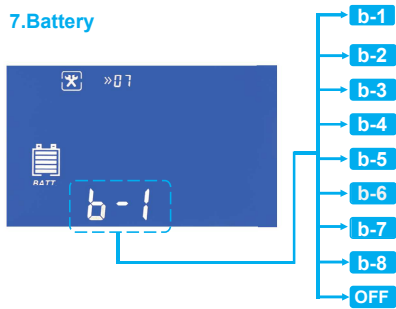
- 18 Maximum rated charge current can be divided into 5 different stages for adjustment.
- 36 20A charger can be adjusted into 4A/8A/12A/16A/20A.
- 54 35A charger can be adjusted into 7A/14A/21A/28A/35A.
- 72 50A charger can be adjusted into 10A/20A/30A/40A/50A.
- 90 70A charger can be adjusted into 14A/28A/42A/56A/70A.
- 90A charger can be adjusted into 18A/36A/54A/72A/90A.

### 6.Battery capacity



- 65 Battery capacity setting, selecting the correct battery capacity ensures that the correct battery charge time is displayed and that the battery is fully charged. If the battery capacity is not in the parameters, close to the capacity is optional.
- 80 Capacity that is available in the LCD display as following:
- 100 65AH/80AH/100AH/150AH/200AH/250AH/300AH/400AH/500AH/600AH/800AH.
- 150 The factory default setting is 200AH.
- 200
- 250
- 300
- 400
- 500
- 600
- 800

### 7. Battery



The battery type is set to OFF, which means it stops charging.

### Battery type configuration parameter

LCD display	Battery Type	Fast V	Float V
b-1	AGM	14.0	13.7(*2 for 24V,*4 for 48V)
b-2	LiFeP04 16S/8S/4S	57.6/28.8/14.4	56.8/28.4/14.2
b-3	LiFeP04 16S/8S/4S	56.3/28.2/14.1	55.5/27.8/13.9
b-4	LiFeP04 16S/8S/4S	55.2/27.6/13.8	54.4/27.2/13.6
b-5	LiFeP04 15S	54.0	53.3
b-6	LiFeP04 15S	52.8	52.1
b-7	LiFeP04 15S	51.8	51.0
b-8	De sulphation cycle	15.5	For 4hrs
OFF	Turn off the charger		

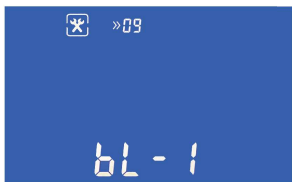
### 8. Battery low voltage shutdown point setting



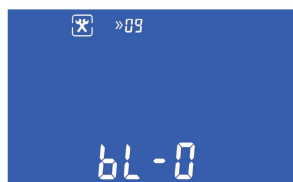
- 9.5
- 10.0
- 10.5
- 11.0
- 11.5

Battery voltage shutdown point, you can set different gears; coefficient default is 10.0 V. According to different battery needs, set the appropriate battery low voltage shutdown point with you; if you choose 16 series lithium battery or 15 series lithium battery, the shutdown point can be set higher, according to the specific requirements of the battery to adapt to modify.

### 9. LCD backlight setting



LCD backlight is steady on



LCD backlit screen

**General specification**

**Power star LW/LWS(I)**

<b>Input Wave Form:</b>	Sine wave (Utility or Generator)		
<b>Nominal Voltage:</b>	120VAC	230VAC	
<b>Low Voltage Trip:</b>	85V±4%	184V/154V±4%	
<b>Low Voltage re engage:</b>	95V±4%	194V/164V±4%	
<b>High Voltage Trip:</b>	140V±4%	263V±4%	
<b>High Voltage re engage:</b>	135V±4%	253V±4%	
<b>Max Input AC Voltage:</b>	150VAC	270VAC	
<b>Nominal Input Frequency:</b>	50Hz or 60Hz (Auto detect)		
<b>Low freq trip:</b>	40Hz for 50Hz	50Hz for 60Hz	
<b>High freq trip:</b>	55Hz for 50Hz, 65Hz for 60Hz		
<b>Output wave form:</b>	(Bypass mode) same as input		
<b>Overload protection:</b>	Circuit breaker		
<b>Short circuit protection:</b>	Circuit breaker		
<b>Transfer switch rating:</b>	30amp or 40amp		
<b>Efficiency on line transfer mode:</b>	95%		
<b>Line transfer time:</b>	10ms Typical		
<b>Bypass without battery connected:</b>	Yes		
<b>Max bypass current:</b>	30amp or 40amp		
<b>Bypass over load current:</b>	35amp or 45amp: Alarm		
<b>Inverter Specification/output</b>			
<b>Output wave form:</b>	Pure sine wave		
<b>Output continuous power Watts:</b>	1000	2000	3000 4000 5000 6000
<b>Power factor:</b>	0.9-1.0		
<b>Nominal output voltage rms:</b>	120/230VAC		
<b>Output voltage regulation:</b>	± 10% RMS		
<b>Output frequency:</b>	50Hz ± 0.3Hz or 60Hz ± 0.3Hz		
<b>Nominal efficiency:</b>	>85%		
<b>Surge ratings:</b>	3000	6000	9000 12000 15000 18000 21000 24000
<b>Short circuit protection:</b>	Yes, fault after 10 secs		
<b>Inverter Specification/input</b>			
<b>Nominal Input voltage:</b>	12V	24V	48V
<b>Minimum start voltage:</b>	10V	20V	40V
<b>Low battery alarm:</b>	10.5V	21V	42V
<b>Low battery trip:</b>	10V	20V	40V
<b>High voltage alarm:</b>	16V	32V	64V
<b>Power saver:</b>	Below 25 watts when enabled		
<b>Power saver:</b>	Same switched on/off on remote		
<b>Charger Mode specification</b>			
<b>Input voltage range:</b>	85-140VAC or 184-263VAC		
<b>Output voltage:</b>	Dependent on battery type		
<b>Charger current:</b>	15A/20A/35A/50A/70A/90A		
<b>Battery initial voltage for start up:</b>	10-15.7v for 12v(*2 for 24v,*4 for 48v,*6 for 72v)		
<b>Over charge protection shutdown:</b>	15.7v for 12v(*2 for 24v,*4 for 48v,*6 for 72v)		
<b>Charger curve(4 stage constant current)Battery types</b>			
<b>4 step digital controlled progressive charge</b>			
<b>Battery type:</b>	Fast V	Float V	
AGM	14.0	13.7 (*2 for 24V, *4 for 48V)	
LiFeP04 16S/8S/4S	57.6/28.8/14.4	56.8/28.4/14.2	
LiFeP04 16S/8S/4S	56.3/28.2/14.1	55.5/27.8/13.9	
LiFeP04 16S/8S/4S	55.2/27.6/13.8	54.4/27.2/13.6	
LiFeP04 15S	54.0	53.3	
LiFeP04 15S	52.8	52.1	
LiFeP04 15S	51.8	51.0	
Desulphation	15.5	For 4hrs	
<b>Remote control/RS232/USB</b>	Yes. Optional		
<b>Size: in mm</b>	1000-3000W Model:460*220*190mm 4000-6000W Model:650*220*190mm		
<b>Weight:</b>	1000W 16kg	1500W 18kg	2000W 20kg 25.5kg 3000W 36kg 4000W 39.5kg 5000W 48kg 6000W

**Ordering Information**

**Typical part number** ▶ LW - 1000 - E - 12 - C

- 1. Basis series**  
Low frequency pure sine wave Inverter & Charger
- 2. Power Rating**  
1000=1000W 2000=2000W 3000=3000W  
4000=4000W 5000=5000W 6000=6000W
- 3. AC Voltage**  
E=120VAC NC=230VAC
- 4. Battery Voltage**  
12=12VDC 24=24VDC 48=48VDC
- 5. Display**  
C=LCD Display NC=LED Display

**Typical part number** ▶ LWS - 1000 - E - 12 - C

- 1. Basis series**  
Low frequency pure sine wave Inverter & Charger
- 2. Power Rating**  
1000=1000W 2000=2000W 3000=3000W  
4000=4000W 5000=5000W 6000=6000W
- 3. AC Voltage**  
E=120VAC NC=230VAC
- 4. Battery Voltage**  
12=12VDC 24=24VDC 48=48VDC
- 5. Display**  
C=LCD Display NC=LED Display

Product specifications are subject to change without further notice.

**Remote control installation**

Remove 4 screws holding this panel and disconnect the cable behind it



**Remark:**

HI series can be powered on without battery connection. After the AC power is switched on, it can be powered on with mains power.