

General specification

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:	135v ± 4%	263v ± 4%
High voltage re engage:	127v ± 4%	253v ± 4%
Max input AC voltage:	150VAC	270VAC
Nominal input frequency:	50Hz or 60Hz (auto detect)	
Low freq trip:	47 Hz for 50 Hz, 57Hz for 60 Hz	
High freq trip:	55 Hz for 50 Hz, 65 Hz for 60 Hz	
Output wave form:	(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:	10 ms typical	
Bypass without battery connected:	Yes	
Max bypass 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 or quasi sine wave	
Output continuous power watts:	1000 2000 3000 4000 5000 6000	
Output continuous power VA:	1000 2000 3000 4000 5000 6000	
Power factor:	0.9-1.0	
Nominal output voltage rms:	120Vac(L-N), 230Vac(L-N), 120Vac(N-H)/ 230Vac(H-H)	
Output voltage regulation:	+/- 10% rms	
Output frequency:	50Hz ± 0.3Hz or 60Hz ± 0.3Hz	
Nominal efficiency:	>88%	
Surge ratings:	3000 6000 9000 12000 15000 18000	
Short circuit protection:	Yes, fault after 10 secs	

Inverter specification / input			
Nominal input voltage:	12v	24v	48v
Minimum start voltage:	10v	20v	40v
Low battery alarm:	10.5v	21v	42v
Low battery trip:	10v	20v	40v
High voltage alarm:	16v	32v	64v
Power saver:	Below 25 watts when enabled		
Power saver:	Same switched on/off on remote		

Charger mode specification	
Input voltage range:	95-127VAC 194-253VAC/ 164-253 VAC(W)
Output voltage:	Dependent on battery type
Charge current:	35A / 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: (*2 for 24v; * 4 for 48v)	

1-6 bat. type selector for ups mode	7-9 bat. trip selectors for solar inv. mode	
Position	Fast V	Float V
0:Not used		
1:Gel U.S.A	14.0	13.7
2:A.G.M.1	14.1	13.4
3:A.G.M.2	14.6	13.7
4:Sealed lead acid	14.4	13.6
5:Gel european	14.4	13.8
6:Open lead acid	14.8	13.8

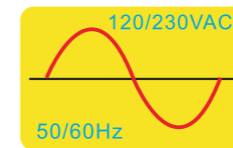
Remote control / RS232 / USB	Yes. Optional
Size: in mm	1000 Model: 443*222*179mm ³ 2000/3000 Model: 507*258*179mm ³ 4000Model: 540*348*196mm ³
Weight:	5000/6000 Model: 595*348*196mm ³ 1000 2000 3000 4000 5000 6000 13kg 17kg 26kg 31kg 36kg 38kg

Ordering Information

Typical part number	PS W7	-S	-20	-12	-E	00
1.Basic Series	PS W7 = Combined Inverter & Charger					
2.Waveform	S = Pure Sinewave Q = Quasi Sinewave					
3.Power Rating	10 = 1000W 20 = 2000W 30 = 3000W 40 = 4000W 50 = 5000W 60 = 6000W					
4.Battery Voltage	12 = 12VDC 24 = 24VDC 48 = 48VDC					
5.AC Voltage	E = 230VAC NC = 120VAC					
6. Suffixe	00 = Standard model 01 = Customer model					

PowerStar W7

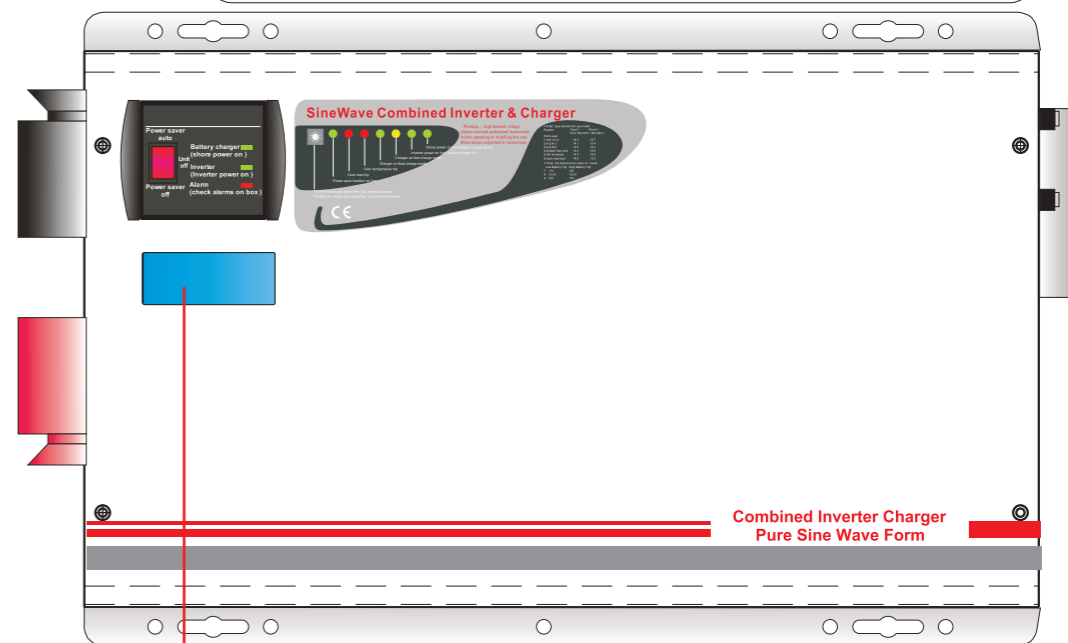
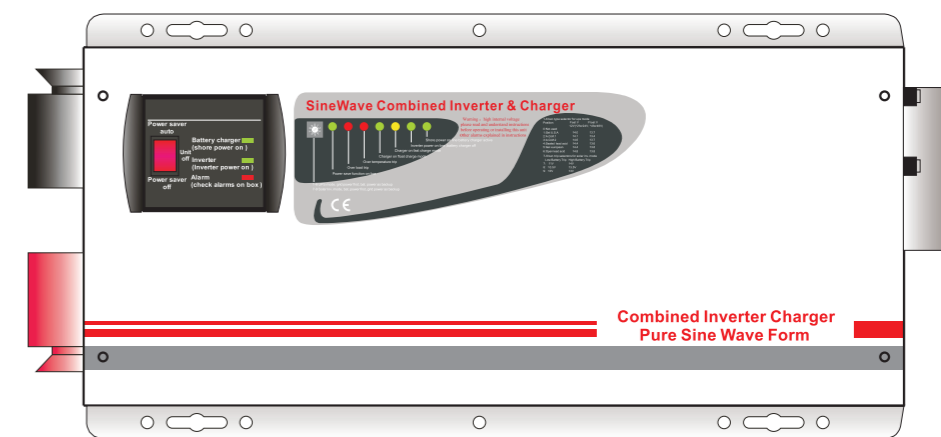
Product Information Guide



1000W 4000W
2000W 5000W
3000W 6000W

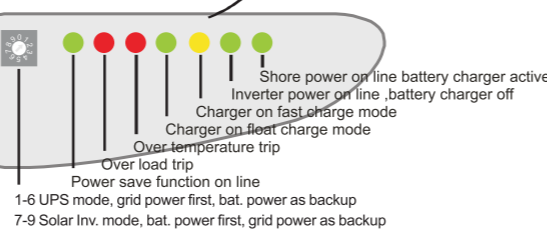
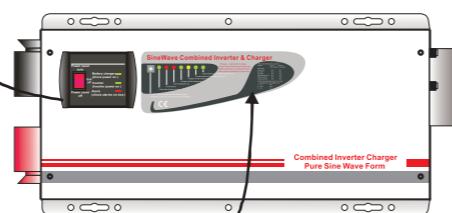
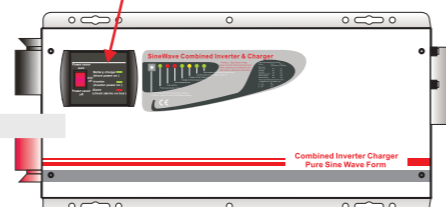
Continuous power with P.F.C charger

SineWave Combined Inverter & Charger



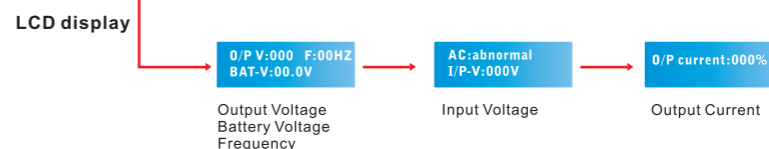
Remote control installation

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



Indication & fault finding chart

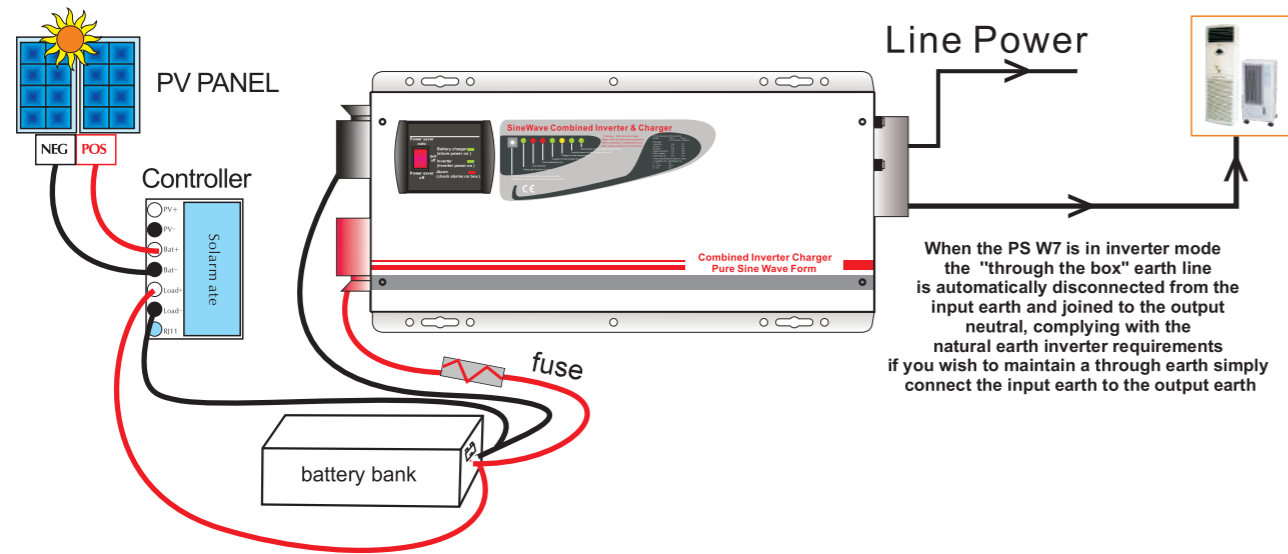
Status	Function	L.E.D.s on main unit						L.E.D.s on remote	
Charge function	Constant current charge	●	●	●	●	●	●	on	on
	Constant voltage charge				flash			on	on
	Float				on			on	on
	Standby							on	on
Inverter mode	Inverter on							on	on
	Power saver on	on							
Alarms	Battery low voltage							on	on
	Battery high voltage							on	on
	Over load (Inverter mode)	on						on	on
	Over temp (inverter mode)	on						on	on
	Over temp (line mode)	on	on	on	on	on	on	on	on
	Over charge	on	on	on	on	on	on	on	on
Fault mode	Fan lock							beep continuous	
	Battery high v							beep continuous	on
	Inverter mode overload	on						beep continuous	
	Over temperature	on						beep continuous	
	Back voltage							flash	flash



Models:1012 2012 2024 3012 3024 4024 5024 6024
1012E 2012E 3012E 2024E 3024E 4024E 5024E
6024E 4048E 5048E 6048E



Basic wiring for the Power Star W7 Series



How to select UPS Mode and Solar Inverter Mode

The PS W7 is OFF Grid type Grid Hybrid Solar Power Inverter, When you use PV panel to charge battery, you will need External Solar Charge controller too. Please select UPS Mode or Solar Inverter Mode by the selector on Panel.

UPS Mode

The 1-6 position is for UPS Mode. Grid Power (AC) First, Battery Power (Solar Power) as Backup. Turn the selector to select Position 1-6; you can select the different charge voltage for different battery. Under UPS Mode, when Grid Power ON, the PS W7 will work under AC mode (Line Mode) and charge battery by Grid Power together with solar power, the PS W7 output is from Grid Power by PS W7 Bypass. When Grid Power OFF, the PS W7 will transfer to Battery mode (Inverter mode).

Solar Inverter Mode

The 7-9 position is for Solar Inverter Mode. Solar Power (Battery power) First, Grid Power as backup. Turn the selector to select 7-9; you can select the different battery trip point. Under Solar Inverter Mode, when battery Energy is enough, the PS W7 only work under inverter Mode (Battery mode) even Grid Power is ON. When battery voltage is lower than Low Battery trip voltage, the PS W7 will transfer to AC mode (Line Mode), the Grid power will recharge battery together with Solar Power. When Battery was recharged over the high voltage trip voltage, the PS W7 will transfer back to inverter Mode (Battery mode) again.

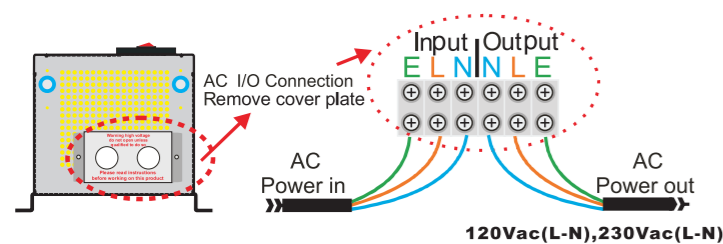
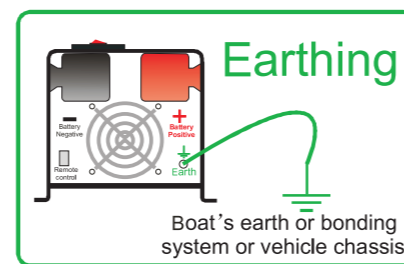
ATTENTION:

- On the sticker the voltage is for 12VDC mode, for the 24VDC 48VDC, it's multiple.
- Not to adjust the position frequently
- Better to change positions while PS W7 switch off.

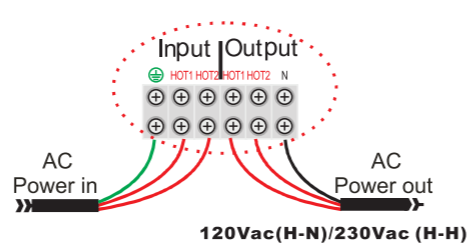
WHAT CABLE TO USE in mm²:

A charger or inverter	cable run distance 0 - 1.5m	cable run distance 1.5 - 4.0m
125-180 A	50 mm ²	70 mm ²
180-330 A	70 mm ²	90 mm ²

Please note that if there is a problem obtaining for example 90 mm² cable, use 2* 50 mm² , or 3*35 mm². One cable is always best but, cable is simply copper and all you require is the copper, so it does not matter 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



I/P: L+N=230V, O/P: L+N=230V or
I/P: HOT1+HOT2=230V, O/P: HOT1+HOT2=230V
(HOT1=HOT2=120V, not to input E wire again while Your E and N are same one wire)



I/P: HOT1+HOT2=230V, O/P: HOT1+HOT2=230V
HOT1+N=120V, HOT2+N=120V
(HOT1=HOT2=120V, not to input E wire again while Your E and N are same one wire)

Check list

- 1) Ensure that the inverter has the correct DC voltage for your boat or vehicle system. ie 12v or 24v/48v.
- 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 PS W7.
- 6) Always switch on the PS W7 first, before plugging in any appliance.
- 7) Under new electrical legistion only professional electricians should install this product.

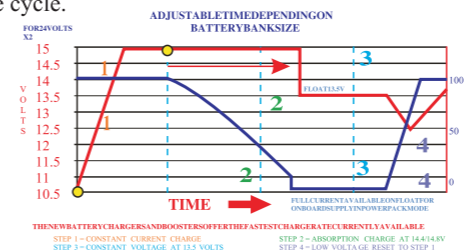
Ensure the fitting instructions are fully understood before fitting this product.

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 we 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 DC 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 90mm² cable then use 3* 35mm² 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, We have a full range of high current fuses in the GANLR range of gold fuse products , ranging from 100-500 AmPs. 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 Line power (all external AC 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 AC 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) 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 type. The Progressive charge control software will automatically adjust for battery bank size and state

ChargeStageTransitionDefinitions

- 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_{boost}
- Boost CV Stage: Start a Ttimer; the charger will keep the boost voltage in Boost CV mode until the Ttimer has run out. Then drop the voltage down to the float voltage. The timer has a 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 10 days, 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 your 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.

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 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. 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 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.

Fill the hole on the main unit using the blank replica of the remote control unit.

Using the remote cable supplied then re-connect 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 Line power (120/230VAC) still disconnected, switch the unit on. The leds will cycle through there 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 Line power to feed 120/230V into the PS W7, after a short while, the inverter should go off line, and feed the Line 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.

Common Faults:

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.