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BUILT IN THE USA



GOLF CART BACK-UP POWER SYSTEM
3000W @ 120VAC / PURE SINE WAVE

Product Manual

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Please record the Power House model and serial number in case you need to provide this information in the future. It is much easier to record this information now than try to gather it after the unit has been installed.

Order Number: _____

Model Number: _____

Serial Number: _____

Safety First

Incorrect installation or misuse of the Hurricane may result in danger to the user or hazardous conditions. We urge you to pay special attention to all CAUTION and WARNING statements.

CAUTION statements identify conditions or practices that may result in damage to other equipment.

WARNING statements identify conditions that may result in personal injury or loss of life.



WARNING! Shock hazard. Keep away from children.

- The Hurricane generates the same potentially lethal 120V AC power as a normal household wall outlet. Treat it with the same respect that you should have to any AC outlet.
- Do not insert foreign objects into the Hurricane's AC outlets, fan, or vent openings.
- Do not expose the Hurricane to water, rain, snow, indoor use only.
- Do not, under any circumstances, connect the Hurricane output to utility power AC distribution wiring.



WARNING! Heated surface.

- The Hurricane housing may become uncomfortably warm, reaching 140°F (60°C) under extended high power operation. Ensure there is always free air movement around the Hurricane, do not enclose or cover in any way. During operation, keep away from materials that may be affected by high temperatures.



WARNING! Explosion hazard.

- Do not use the Hurricane in the presence of flammable fumes or gases, such as in the bilge of a gasoline powered boat, or near propane tanks. Do not use the Hurricane in an enclosure containing "wet" lead acid batteries. These batteries, unlike sealed batteries, vent explosive hydrogen gas, which can be ignited by sparks from electrical connections.
- When working on electrical equipment, always ensure someone is nearby to help you in an emergency. It is recommended that the installation the golf cart Anderson connector be done by qualified personnel familiar with the golf cart battery pack.



CAUTION!

- Do not connect live AC power (City power/ Grid Electricity) to the Hurricane's AC outlets. The Hurricane will be damaged even if it is switched OFF.
- Do not expose the Hurricane to direct sunlight when operating, as overheating may occur.



CAUTION! SAFETY INSTRUCTIONS - INVERTER RELATED

Preventing Reverse Polarity on the DC Input Side

When making battery connections on the input side, make sure that the polarity of battery connections is correct (Connect the Positive of the battery to the Positive terminal of the unit and the Negative of the battery to the Negative terminal of the unit). If the input is connected in reverse polarity, DC fuse(s) inside the Hurricane will blow and may also cause permanent damage to the Hurricane. If this occurs consult the factory.

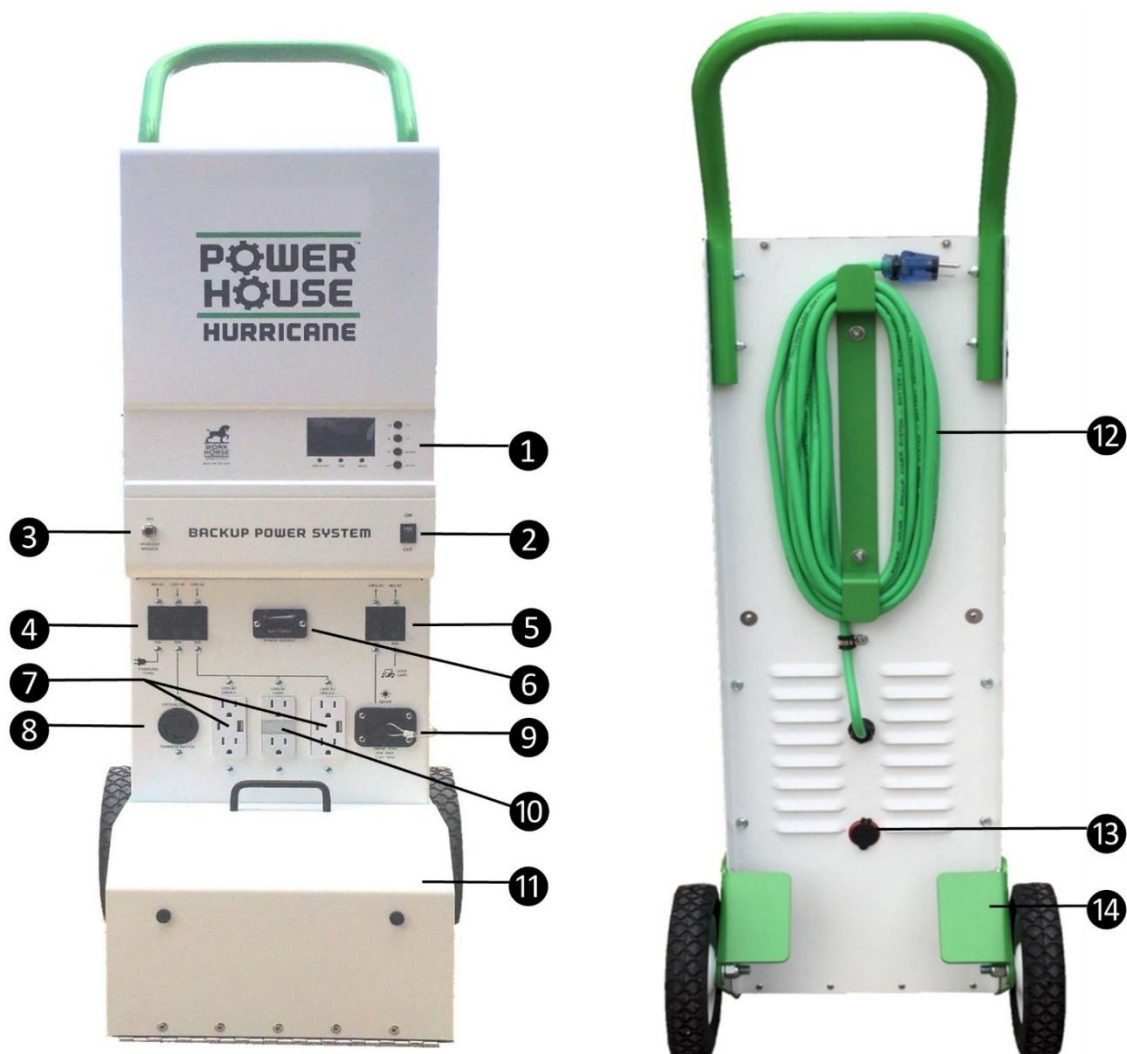
NOTE: Damage caused by reverse polarity is not covered by warranty!

The Hurricane is non stackable. Do not "stack" inverters or connect multiple Hurricanes together! Do not connect multiple Hurricanes together or to a common bus. The output of the Hurricane CANNOT be synchronized to any other AC source.

Do not connect to a sub panel which is also connected to grid power. A disconnect switch must be used.

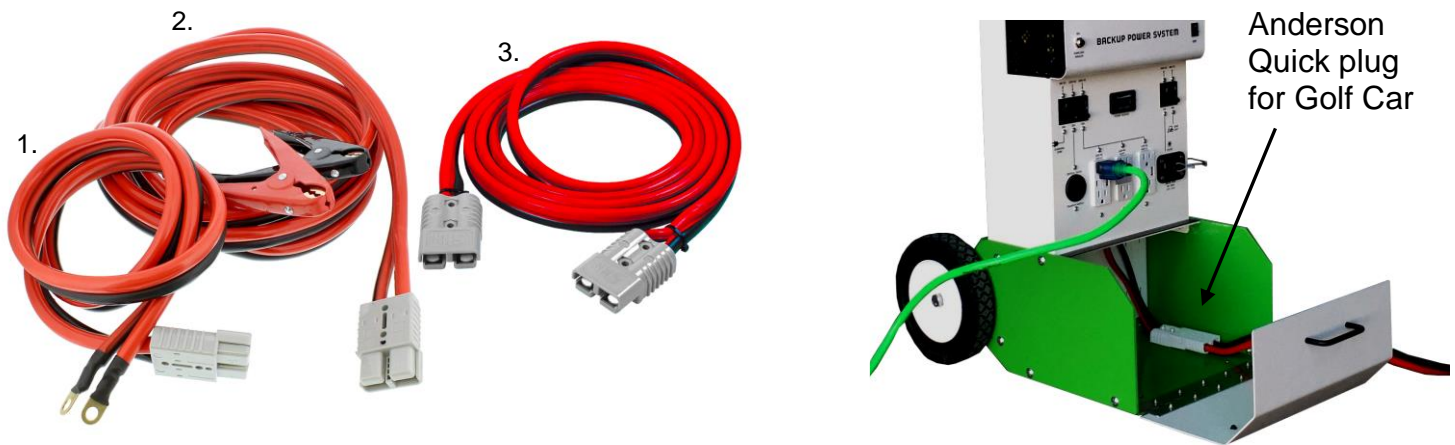
The AWG#4 cables provided with the Hurricane are rated for maximum Hurricane output. Do not use with equipment exceeding the Hurricane's rated power.

Features and Components



1	LCD with function buttons, status, charging and fault indicators.
2	ON/OFF power switch
3	AC secondary 40A circuit breaker
4	AC Breaker Group, charging cord, L14 loads, 120V outlets
5	DC Breaker Group, golf cart (battery input), solar input (not available on some models)
6	Battery capacity meter
7	120V outlets with USB A and C charging ports
8	L14 output receptacle
9	Anderson SB50 solar input
10	120V outlet with light
11	Cable storage compartment
12	AC charging cord
13	USB communications ports – Top USB for computer connection, bottom for Wi-Fi/GPRS
14	Foot pad for handling

Power House Plug-In Cable Kit

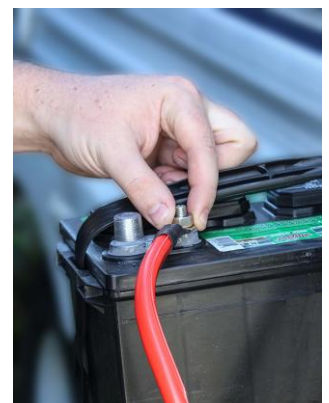


1. Permanent ring terminals to 120A Anderson quick plug.
2. Temporary emergency alligator clips to Anderson quick plug.
3. 120A Anderson to Anderson quick plug extension 25ft. (Optional)

For a quick temporary connection, you can use the alligator style battery clamps and either plug directly into the Power House or utilize the quick plug extension if a longer cable is required.



For a more permanent connection attach the ring terminal cable. The cable and Anderson quick plug can stay located in the Golf Cart battery storage compartment. The quick plug extension cable would be used to move the Hurricane up to 25 feet away if needed.



Quick Start: Power-Up Procedure

1. Make sure all breakers are in the OFF position
 2. Make sure one of the Power House battery cables is properly connected to the 48V battery bank
 3. Connect the Hurricane to the battery via the grey Anderson connector
 4. If line power is available and charging is desired, plug in the charging cord
 5. Turn breakers to the ON position
 6. Push the power switch to the ON position
 7. The outlets are now energized and ready for use
-

Product Introduction

The Hurricane transforms the 48V DC power from the golf cart battery to standard household 120V AC power for appliances. It utilizes advanced software, intelligent controls with time proven hardware. The Hurricane output wave form is pure sine wave, well suited for sensitive electronics and energy efficient motors.

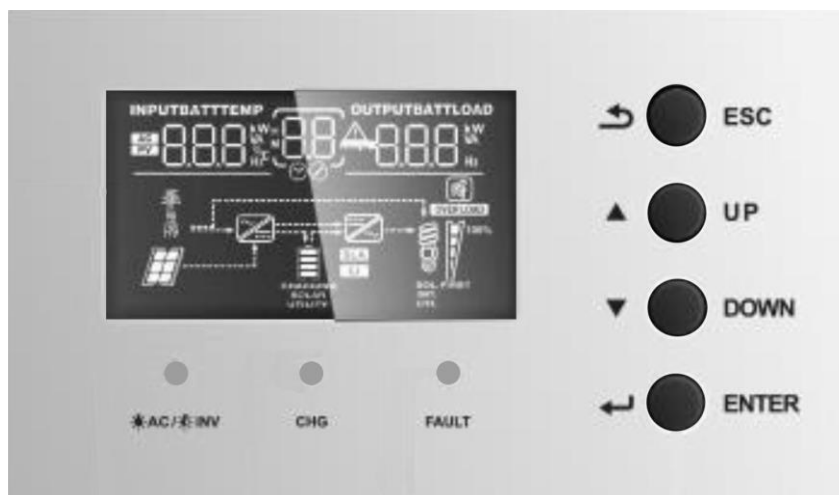
The Hurricane protects itself with the following features: overload protection, over-current protection, short circuit protection, battery reverse polarity protection, high temperature shut down, high or low battery input protection, with built-in fuse protection.

Working Environment: Indoor use only. Choose a cool, clean, dry and well-ventilated place. Allow free air circulation around the Hurricane during operation

Connect and use **ONLY** with 48VDC golf cart or battery banks. Do not attempt to use with 36V or 72V carts or vehicles. Stationary batteries can be lead acid, lithium or NiCd as long as the nominal battery voltage is 48VDC.

The Hurricane is furnished with dual AWG#4 cables from the factory. These cables may be connected directly to the golf cart battery, or a AWG#4 extension cables can be used in order to move the Hurricane closer to the loads.

The operation and display panel area includes three LED indicators, four function keys and LCD display.



LED Indicator Status		Operation	
☀️ AC / 🌙 INV	Green	Solid On	Output is powered by utility in AC mode
		Flashing	Output is powered by battery or PV in battery mode
☀️ CHG	Green	Solid On	Battery is fully charged
		Flashing	Battery is being charged
⚠️ FAULT	Red	Solid On	Fault occurs in the inverter
		Flashing	Warning condition occurs in the inverter

Button	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or to enter setting mode

Hurricane Specifications

Inverter

Battery voltage	48VDC
Output Waveform	Pure Sine Wave
Rated Power	3000VA/ 3000W Minimum
AC Voltage Input	120VAC ± 5% @ 50/60Hz
Surge Power	6000VA
Remote Monitoring	WiFi
Efficiency (Peak)	93%
Transfer Time	10 ms (For Personal Computers); 20 ms (For Home Appliances)

Solar Charger

Maximum PV Array Power	Maximum PV Array Power 4500W
MPPT Range @ Operating V	60~115 VDC
Maximum PV Array OCV	145 VDC
Max Solar Charge Current	80 A
Maximum Efficiency	98%
Standby Power Consumption	2W

AC Charger

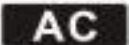









Maximum AC Charge Current	40 A
Frequency Range	60Hz
CV & Float Charge voltage	Adjustable 48.0V~58.4V





Operating Environment

Humidity	5% to 95% Relative Humidity(Non-condensing)
Operating Temperature	0°C - 55°C
Storage Temperature	-15°C - 60°C
















LCD Status Indicators:

Icon	Function Description
Input Information	
	Indicates the AC input.
	Indicates the PV input
	Indicate input AC voltage, input frequency, PV voltage, battery voltage and charger current.
Configuration Program and Fault Information	
	Indicates the setting programs.
	Indicates the warning and fault conditions.
 Warning Code: Flashing.  Error Code: Constantly On.	
	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.
Battery Information	
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.
	These two signs indicate the charge priority. SOLAR indicates solar first. UTILITY indicate utility first. SOLAR blinking indicates solar only; SOLAR and UTILITY both on indicates combined charging.






CC&CV Mode	Charge	Battery Voltage @ Load >50%	Battery Voltage @ 50%> Load > 20%	Battery Voltage @ Load < 20%	Icon
<48V		< 41.2V	< 43.6V	<44.8V	
48-50V		41.2-43.2V	43.6-45.6V	44.8-46.8V	
50-52V		43.2-45.2V	45.6-47.6V	46.8-48.8V	
>52V		> 45.2V	> 47.6V	>48.8V	

Load Information

	Indicates overload.			
	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.			
	0%~24%	25%~49%	50%~74%	75%~100%
				
Mode Operation Information				
	Indicates unit connects to the mains.			
	Indicates unit connects to the PV panel.			
	Indicates load is supplied by utility power.			
	Indicates the utility charger circuit is working.			
	Indicates the DC/AC inverter circuit is working.			
	These three signs indicate the output priority. SOL.FIRST indicates solar first. BAT.FIRST indicates battery first. UTI.FIRST indicates utility first.			
Mute Operation				
	Indicates unit audible alarm is disabled.			

Please see the table below to get an estimate of how long a typical golf cart battery will run typical loads. Please keep in mind these run times are affected by your golf cart battery capacity. Typically, lithium or older batteries will not have the storage capacity as a new set of lead acid batteries. Run times shown are using (8) T125 batteries, rated at 266Ah @ 100 hour, 12.7Kwh total storage capacity.

Typical Appliance Run Times

	Load	Watts	Hrs Day	Watt Hrs/Day	Typical Lithium Batteries 5kWh	Typical SLA/AGM Batteries 8.8kWh	Typical Wet Cell Batteries 12kWh
	20 cu ft. Fridge	175	8	1400	4 days	6 days	9 days
	Laptop Computer	75	8	600	8 days	15 days	20 days
	Desk Lamp	47	8	376	13 days	23 days	32 days
	Cell Phone	3	16	48	104 days	183 days	250 days
	Electric Fan	85	12	1020	5 days	9 days	12 days

Typical Appliance Run Times

	Load	Watts	Hrs Day	Watt Hrs/Day	Typical Lithium Batteries 5kWh	Typical SLA/AGM Batteries 8.8kWh	Typical Wet Cell Batteries 12kWh
	60" Television	200	8	1600	3 days	6 days	8 days
	CPAP Machine	40	8	320	16 days	28 days	38 days
	Coffee Maker	427	4	1708	3 days	5 days	7 days
	Microwave	900	1	900	6 days	10 days	13 days
	Breast Pump	25	2	50	100 days	176 days	240 days
	Electric Blanket	70	8	560	9 days	16 days	21 days
	Bottle Warmer	250	1	250	20 days	35 days	48 days
Realistic backup time with combined loads					2 days	4 days	5 days

Rated Continuous Power

The Hurricane has a maximum continuous output of 3000W, or 25A at 120VAC. Certain loads, such as electric motors may have a start-up current that exceeds the output of the Hurricane. The Hurricane is rated to power typical motor loads such as refrigerators and fans, but may struggle with high start-up loads such as well pumps, hydraulic motors, etc...

Surge Power Rating

During start up, certain loads require considerably higher surge of power for short duration (lasting from tens of milliseconds to few seconds) as compared to their Maximum Continuous Running Power Rating. The Hurricane continuous power should be higher than the surge power rating of these appliances. Some examples of such loads are given below:

Transformers (e.g. Isolation Transformers, Step-up / Step-down Transformers, Power Transformer in Microwave Oven etc.): At the moment when AC power is supplied to a transformer, the transformer draws very heavy surge of "Magnetization Inrush Current" for a few milliseconds that can reach up to 10 times the Maximum Continuous Rating of the Transformer.

Devices like Infrared Quartz Halogen Heaters (also used in Laser Printers)

Quartz Halogen Lights / Incandescent Light Bulbs using Tungsten heating elements:

Tungsten has a very high Positive Temperature Coefficient of Resistance i.e. it has lower resistance when cold and higher resistance when hot. As Tungsten heating element will be cold at the time of powering ON, its resistance will be low and hence, the device will draw very heavy surge of current with consequent very heavy surge of power with a value of up to 8 times the Maximum Continuous Running AC Power.

AC to DC Switched Mode Power Supplies (SMPS): This type of power supply is used as stand-alone power supply or as front end in all electronic devices powered from Utility/ Grid e.g. in

audio/video/ computing devices and battery chargers. When this power supply is switched ON, its internal input side capacitors start charging resulting in very high surge of Inrush Current for a few milliseconds. This surge of inrush current / power may reach up to 15 times the Continuous Maximum Running Power Rating. The surge of inrush current / power will, however, be limited by the Surge Power Rating of the AC source.

Typical AC appliances

Energy saving lamp, LED bulb, LED lamp, hair dryer, TV, Computer, washing machine, household fan, cooker, microwave oven, iron, soybean milk machine, juicer, blender, kitchen electronics, shaver, digital products, phone, printer, projector , audio, video, electric drill, hand tool, water pump, motor, packing machine ,refrigerator, etc.

LCD - PROGRAMMING

The Power House LCD allows users to virtually change all of its specs. It will enter setting mode if the ENTER button is held for 3 seconds. Press “UP” or “DOWN” button to select setting programs, and then press “ENTER” button to confirm the selection or ESC button to exit.

Program 01: Power Priority

01 UEI: Utility Priority (Default)

Utility will provide power to the loads as the first priority.

Solar and battery energy will provide power to the loads only when utility power is not available.

01 SOL: Solar Priority

Solar energy provides power to the loads as first priority.

If solar energy is insufficient, battery energy will be consumed.

Utility power will engage when one of below conditions happens:

Solar energy is not available

Battery voltage drops to either low-level warning voltage or the setting point in program 12 (Battery to Utility Transfer Voltage in “SOL Priority”).

Once the solar power is lost, the utility will have higher priority than battery. This mode can be regarded as “SUB”(Solar>Utility>Battery).

01 SBU: SBU Priority

As indicated by the abbreviation, the power priority comes as solar>battery>utility. Solar energy provides power as first priority.

If solar energy is insufficient, battery energy will be consumed.

Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12(Battery to Utility Transfer Voltage in “SBU Priority”).

When solar is gone in SBU mode, the power priority becomes battery>utility, battery priority is higher than utility priority.

Thus the inverter will cycle between setting 12 and 13. Users can to change to utility priority or solar priority to stop the cycle.

Program 02: Maximum Charging Current (PV + AC)

48V model: default 60A, 10A~120A Settable

(If Li is selected in program 5, this program can't be set up)

The MPPT charger will stop when charging is completed. To activate the charger, the battery voltage must drop at least 2 voltages below the lower value in program 19 and 20.

Program 03: AC Input Voltage Range

03 APL: Appliance Mode

In Appliance Mode, the acceptable AC input voltage range is 65~140VAC±5V.

03:UPS

In UPS Mode, the acceptable AC input voltage range: 95~140VAC±5V.

03: GEN

In Generator Mode, the acceptable AC input voltage range: 65~140VAC±5V . In this mode, the max charging current is 30A.

Note: When the inverter is connected to a generator, the generator should be no less than 10KVA.

Program 04: Power Saving Mode Enable/Disable

04: SdS

When the power saver mode is disabled, the inverter will output full voltage, and the idle power is about 50 watts.

04: SEN

If the power saver mode is enabled, the output of inverter will be off when connected load is low or not detected.

The threshold for load detection is 100W. The idle power in power saver mode is about 30 watts.

Program 05: Battery Type

05: AGN

AGM Battery (Default) : CV :56.4V, Float 54V.

05: FLd

Flood Battery: CV :58.4V, Float 56V.

05: USE

User-Defined

If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21. This setting works for GEL batteries etc.

05: US2

User-Defined 2

(Suitable for lithium battery without communicating with BMS)

If 'US2' is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21. In US2 mode, the program 19&20 should be set to the same value. If not, the inverter will only charge to the lower value. Compared with USE, the charger in US2 will immediately reduce charging current when preset voltage is reached. NOTE: The US2 will not optimally charge the lithium battery due to the lack of BMS communication. The battery capacity

icon bar doesn't reflect the actual battery capacity; it is converted from battery voltage. For more details, please refer to page 13.

When the inverter is in US2, it could not correctly display the accurate SOC of the lithium batteries. The displayed SOC is converted from battery voltage. The SOC will change only when the battery voltage changes big enough.

Due to the ripple current from the utility charger, when "US2" is set for charging lithium batteries, it is recommended to set the max utility charging current at 30% of the nominal charge current.

05: LI

Lithium

This setting only works when inverter communicates with lithium battery BMS built with the same protocol. The program is set to "LI", the LCD will show a hidden program of 36 about BMS protocol types.

There are many lithium battery BMS communication protocols, L01, L02 to L99.

When the battery type set as "LI", the maximum charge current can be modified by the user.

Note: When the communication fails, the inverter will cut off output.

RS485 communication protocol is L01 to L49.

The CAN communication protocol is L51 to L99.

Program 06: Automatic Overload Restart

06: LFd

Disabled.

06: LFE

When this feature is enabled, the inverter will attempt restart 3 times, if it still fails to start the load, it will transfer loads to AC input.

Program 07: Automatic OverTemp Restart

Program 08: AC Output Voltage

The AC output voltage between hot and neutral can be set to 100V, 110V and 120V.

Program 09: AC Output Frequency

The AC Output Frequency can be set to 50Hz or 60Hz.

Program 10: Number of 12V Batteries Connected In Series

The default value is 4. This program is only a reminder about the 12V battery quantity.

Program 11: Maximum Utility Charging Current

Model #	Default Value	Resetable Range
Hurricane	30A	0-40A

If Li is selected in program 5, this program can't be manually set up.

The solar charger has higher priority than the utility charger, if the max charging current and utility charger is set to the same value, the solar charger will still work.

If setting value in Program 02 is smaller than that in Program 11, the final charging current is set according to Program 02 for utility charger.

Program 12 Battery to Utility Transfer Voltage

The setting works when program 01 is in “SBU Priority” or “Solar Priority” Mode.

Model #	Default Value	Resettable Range
Hurricane	46V/50%	44V~51.2V/6%-95%

Program 13 Utility to Battery Transfer Voltage

The setting works when program 01 is in “SBU Priority” or “Solar Priority” Mode.

Model #	Default Value	Resettable Range
Hurricane	54V/95%	48V~58V/10%-100%

Program 14 Charge Power Source Priority

14:CSO

Solar Priority

Solar energy will charge battery as first priority.

Utility will charge battery only when solar energy is not available (lost).

14:CUt

Utility Priority

Utility will charge battery as first priority.

Solar energy will charge battery only when utility power is not available (lost).

14:SNU

Solar and Utility (Default)

Solar energy and utility will both charge battery.

14:OSO

Solar Only

Solar energy will be the only charger source no matter utility is available or not.

But when the battery voltage drops below the setting of 21(Low DC Cut-off Voltage), the utility power will be used to force a charging cycle to avoid battery over discharging. If this off grid solar inverter is working in DC to AC invert mode, only solar energy can charge the battery. Solar energy will charge battery if it's available and sufficient.

Program 15 Alarm On/Off Control

Program 16 Backlight On/Off Control

When off is set, the LCD will go dim after 60 seconds left unattended.

Program 17 Beeps once between AC and DC Transfer

Program 18 Overload Bypass

When enabled, the unit will transfer to line mode if overload occurs in battery mode.

Program 19 C.V. Charging Voltage

Model #	Default Value	Resettable Range
Hurricane	56.4V	48V~58.4V

If user-defined setting (USE/US2) is selected in program 5, this program can be set up

Program 20 Float Charging Voltage

Model #	Default Value	Resettable Range
Hurricane	54V	48V~58.4V

If user-defined setting (USE/US2) is selected in program 5, this program can be set up

Program 21 Low DC Cut-Off Voltage

Model #	Default Value	Resettable Range
Hurricane	42V/20%	40V~48V/5%-30%

The battery SOC will be displayed when BMS communication is established.

After User-defined (USE/US2) setting is selected in program 5, this program can be set up Low DC cut-off voltage will be fixed to setting value regardless of load percentage.

When low DC Cut-Off voltage is reached:

1. If battery is the only power source, inverter will shut down.
2. If PV energy and battery power are available, inverter will charge battery without AC output.
3. If PV energy, battery power and utility are all available, inverter will transfer to line mode and provide output power to loads and charge the battery at the same time.

When low battery voltage protection occurs and qualified PV or AC power inputs, the inverter will automatically charge and invert DC to AC when the battery voltage reach 54V (Or 10% more SOC than low battery cut off in Lithium mode).

To make it work, the power switch must remain in the original "ON" position.

The minimal voltage for the LCD to illuminate is 30Vdc.

Program 22 Solar Power Balance

When enabled, the solar input power will be automatically adjusted according to the load wattage. Max solar input power = Max battery charging power +Connected load power.

If disabled, the solar input power will be the same to the max battery charging power no matter how much loads are connected. The max battery charging power will be based on the setting current in program 2. (Max. solar power = Max. battery charging power)

Program 23 AC Output Mode

This setting is only available when the inverter is in standby mode (Switch off).

Power saving function will be automatically disabled when in parallel operation.

23:SIG

Single Unit Operation.

When unit operates separately and is not in parallel operation.

23:PAL

Parallel in Single Phase

When the units are used in parallel with single phase

23: 3P1/3P2/3P3

Split Phase: 2P0, 2P1, 2P2

Select "2P0" for the inverters connected to L1 phase;

If connect split phase 120V/208V, select "2P1" for inverters connected to L2 phase;

If connect split phase 120V/240V, select "2P2" for inverters connected to L2 phase

Do NOT connect share current cable between units on different phases.

Program 28 Address setting

Default 001. 001-255. Settable. It is for external solar charger expansion.

Program 36 Lithium BMS Protocol

Program 43 Battery Equalization

If “Flooded” or “User-Defined” is selected in program 05, this program can be set up. The Equalization is banned for AGM batteries.

Program 44 Battery Equalization Voltage

Model #	Default Value	Resettable Range
Hurricane	58.4V	48-58.4V

Program 45 Battery Equalized Time

Default 60min, 5min~900min Settable

Program 46 Battery Equalized Timeout

Default 120min, 5min~900min Settable

Program 47 Equalization Interval

Default 30 days, 1 day~90 days Settable

Program 48 Equalization Activated Immediately

If equalization function is enabled in program 23, this program can be set up. If “Enable” is selected in this program, it’s to activate battery equalization immediately and LCD main page will shows “Eq”.If “Disable” is selected, it will cancel equalization function until next activated equalization time arrives based on program 27 setting. At this time, “Eq” will not be shown in LCD main page.

Program #	Description	ICON
01 Power Priority	Utility Priority	01 UTI
01 Power Priority	Solar Priority	01 SOL
01 Power Priority	SBU Priority	01 SBU
02 Maximum Charging Current	Max PV+Utility Charging Current	02 80 ^A
03 AC Input Voltage Range	Appliance Mode (Default)	03 APL
03 AC Input Voltage Range	UPS Mode	03 UPS
03 AC Input Voltage Range	Generator mode	03 GEN
04: Power Saving Mode	Saving mode disable (Default)	04 SDS

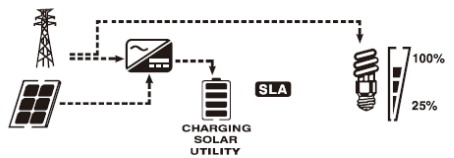
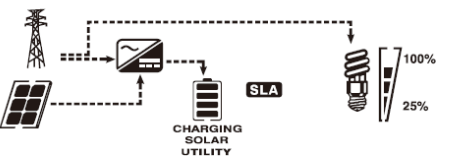
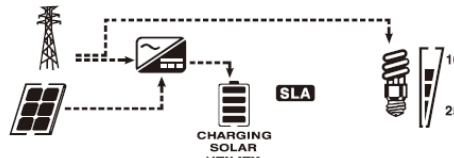
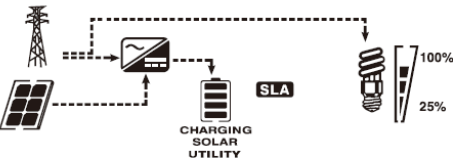
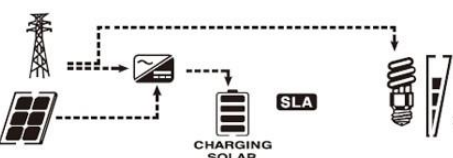
04: Power Saving Mode	Saving mode enable	04 SEN
05 Battery Type	AGM Battery (Default)	05 AGM
05 Battery Type	Flood Battery	05 FLD
05 Battery Type	User-Defined	05 USE
05 Battery Type	User-Defined 2	05 US2
05 Battery Type	Lithium	05 LI
06 Automatic Overload Restart	Restart Disable (Default)	06 LFD
06 Automatic Overload Restart	Restart Enable	06 LFE
07 Automatic OverTemp Restart	Restart Disable (Default)	07 tFd
07 Automatic OverTemp Restart	Restart Enable	07 tFE
08 AC Output Voltage	240V (Default)	08 240 ^v
09 AC Output Frequency	50Hz (Default)	09 50 ^{Hz}
10 Number of 12V Batteries Connected In Series	The default value is 4 for 48V model, and 2 for 24Vdc model.	^{BATT} 10 10 4
11 Maximum Utility Charging Current	10A to Max(default 30A)	11 30 ^A
12 Battery to Utility Transfer Voltage	Default 46.0V, 44.0V~51.2V resettable,	12 46.0 ^v
12 Battery to Utility Transfer Voltage	Lithium mode: default 40%, 5%~50% resettable	12 40 [%]
13 Utility to Battery Transfer Voltage	Default 54.0V, 48.0V~58.0V resettable,	13 54.0 ^v
13 Utility to Battery Transfer Voltage	Li mode: default 80%, 60%~100% resettable	13 80 [%]
14 Charger Power Source Priority	Solar Priority	14 CSD
14 Charger Power Source Priority	Utility Priority	14 CUT
14 Charger Power Source Priority	Solar and Utility (Default)	14 SNU
14 Charger Power Source Priority	Solar Only	14 OSO

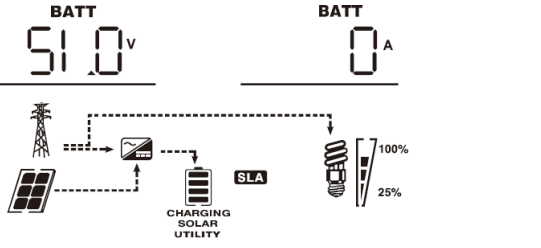
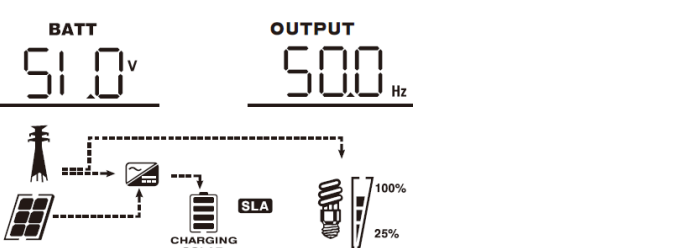
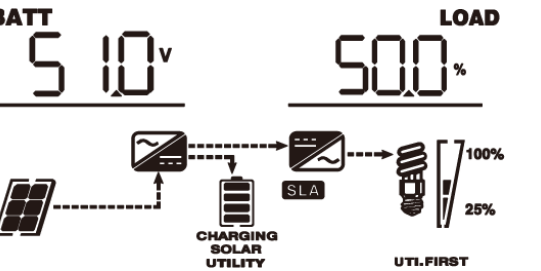
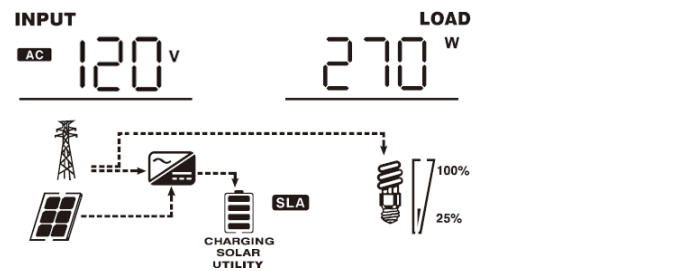
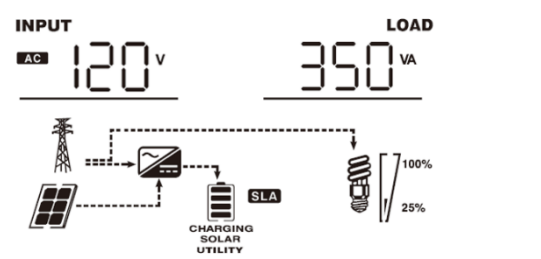
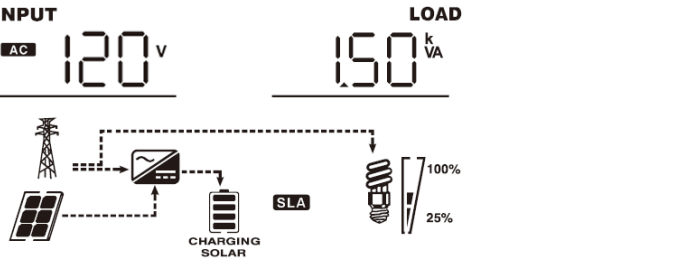
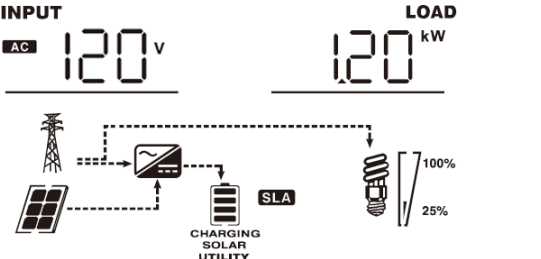
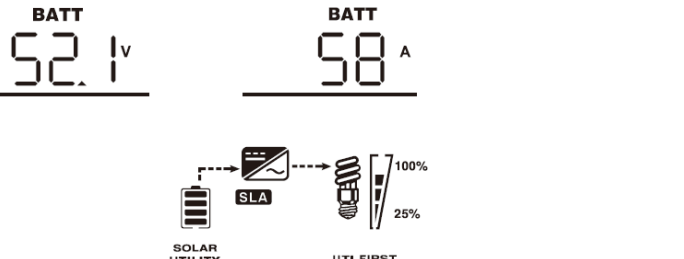
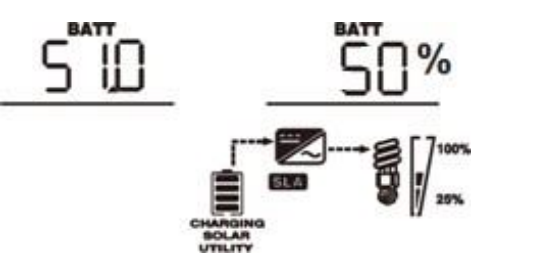
15 Alarm On/Off Control	Audible Alarm on (default)	15 b0N
15 Alarm On/Off Control	Audible Alarm off(Mute)	15 b0F
16 Backlight On/Off Control	Backlight on (default)	16 L0N
16 Backlight On/Off Control	Backlight off	16 L0F
17 Beeps once between AC and DC Transfer	Alarm on (default)	17 A0N
17 Beeps once between AC and DC Transfer	Alarm off	17 A0F
18 Overload Bypass	Bypass Disable (default)	18 bYd
18 Overload Bypass	Bypass enable	18 bYE
19 C.V. Charging Voltage	48V model: default 56.4V, 48.0V~58.4V Settable	CV 19 56.4 ^v
20 Float Charging Voltage		FLV 20 54.0 ^v
21 Low DC Cut-Off Voltage	Without BMS communication	COV 21 42.0 ^v
21 Low DC Cut-Off Voltage	With BMS communication	COV 21 20%
22 Solar Power Balance	Solar power balance enable (Default)	22 SbE
22 Solar Power Balance	Solar power balance disable:	22 Sbd
23 AC Output Mode	Single Unit Operation	23 ^{OUTPUT} S1 0
23 AC Output Mode	Parallel in Single Phase	23 ^{OUTPUT} PARL
23 AC Output Mode	Three phase: 3P1, 3P2, 3P2	23 ^{OUTPUT} 3P 1
23 AC Output Mode	Split phase: 2P0, 2P1, 2P2	23 ^{OUTPUT} 2P0
28 RS485 Communication Address	Default 001. 001-255 Settable. For external solar charger expansion.	ADT 28 1
36 Lithium BMS Protocol	Default L01	PtC 36 L0 1
43 Battery Equalization	Disabled (Default)	E9 43 ENA
43 Battery Equalization	Enable	E9 43 di S

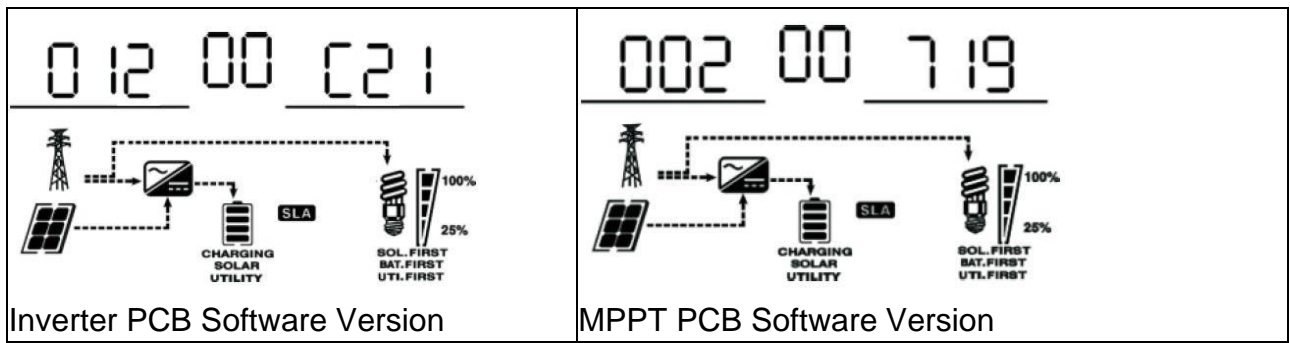
44 Battery Equalization Voltage	Default 58.4V, 48~60V settable	EQV 44 58.4
45 Battery Equalization Time	Setting range is from 5min to 900min. Increment of each click is 1min.	EQt 45 60
46 Battery Equalization Timeout	Setting range is from 5min to 900min. Increment of each click is 1 min.	EQO 46 120
47 Equalization Interval	Setting range is from 1 to 90 days. Increment of each click is 1 day.	EQI 47 30
48 Equalization Activated Immediately	Disabled (Default)	EQ 48 tON
48 Equalization Activated Immediately	Enable	EQ 48 tOF

LCD Display Setting

The LCD display information will be switched in turns by pressing “UP” or “DOWN” key. The selectable information is switched as below order: input voltage, input frequency, PV voltage, MPPT charging current, MPPT charging power, battery voltage, output voltage, output frequency, load percentage, load in VA, load in Watt, DC discharging current, main CPU Version and second MPPT CPU Version.

<p>INPUT AC 120v</p> <p>OUTPUT 120v</p>  <p>Input voltage/Output voltage (Default Screen)</p>	<p>INPUT AC 50.0 Hz</p> <p>OUTPUT 120v</p>  <p>Input frequency 50Hz</p>
<p>BATT AC PV 50 A</p> <p>OUTPUT 120v</p>  <p>Charging current</p>	<p>INPUT PV 60v</p> <p>OUTPUT 120v</p>  <p>PV voltage 60V</p>
	<p>BATT PV 500 W</p> <p>OUTPUT 120v</p>  <p>PV Charging power</p>


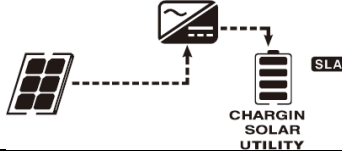
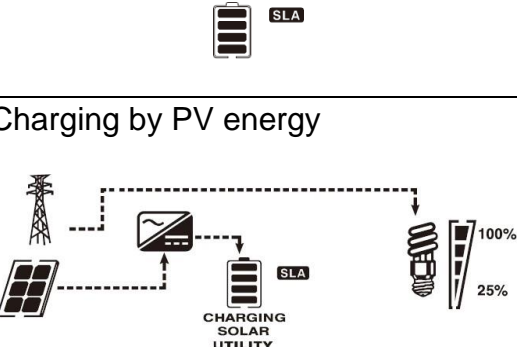
 <p>Battery voltage/ DC discharging current Battery voltage=51.0V, discharging current=0A</p>	 <p>Output frequency</p>
 <p>Load percentage</p>	 <p>Load in Watts</p>
<p>Load < 1kVA, displayed in xxx VA</p>	<p>Load \geq1KVA, displayed in x.x kVA.</p>
 <p>Load in VA</p>	 <p>Load in KVA</p>
 <p>Load in Watt (\geq1KW)</p>	 <p>DC discharging current</p>
 <p>Battery SOC Level</p>	



The LCD will display different inverter status when the up or down button is pressed. The last two pages of LCD show the software version of the inverter PCB and MPPT PCB. There are 8 digits. If the MPPT PCB is not activated, it will display 000-00-000.

Operating Mode Description

Operation mode	Description	LCD display
Standby mode / Power saving mode Note: *Standby mode: The inverter is not powered on but it can charge battery without AC output. *Power saving mode: When enabled, the output of inverter will be off when connected load is pretty low or not detected.	No output is supplied by the unit but it still can charge batteries.	Charging by utility and PV energy.
		Charging by utility.
		Charging by PV energy.
		No charging.
Fault mode Note:		Charging by utility and PV energy.

<p>*Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.</p>	<p>PV energy and utility can charge batteries.</p>	<p>Charging by utility.</p> 
		<p>Charging by PV energy.</p> 
<p>Line Mode</p>	<p>The unit will provide output power from the mains. It will also charge the battery at line mode.</p>	<p>No charging.</p> 

The inverter is built with automatic PV and utility power wakeup feature. When the power switch is in power off, and qualified PV input, the PV charger will be activated, and the rest part of the inverter will remain powered off. In this mode, the utility power can only illuminate the LCD, it can't charge batteries. When the inverter shuts off due to low battery voltage, and the switch is kept on "on" position, the inverter will use qualified utility power or PV power to charge batteries and wake up at "cold start voltage" to discharge the battery to provide AC output. If the inverter is set in SOL or SUB, the automatic wake up feature will charge battery close to "Utility to Battery switch" voltage, and then cut off utility charger, switch to DC to AC model.

Audible Alarm

The inverter also gives audible alarms when the following situations occur.

Warning	Buzzer beeps 0.5s every second.
Error	Long Beep. Beeps 0.5s every 1s for 10s, shut off, then long beep for 60 seconds.

FAN Operation

For Hurricane 3KW models, there are two DC fans. The DC fans will adjust the fan speed in a linear proportion according to load and charger wattage. It will slow down 1 minute after the triggering condition disappears. Allow at least 30CM of clearance around the inverter for air flow. Make sure that the air can circulate freely around the unit. Fan noise level <60db at a distance of 1 meter.

Maintenance & Troubleshooting

This troubleshooting guide contains information about how to troubleshoot possible error conditions while using the Power House System.


























If a failure occurs, the following chart is designed to help you quickly pinpoint the most common causes.




Indicator and Audable Alarm

Fault Code	Fault Event	Display Icon
01	Fan is locked	
02	Over temperature	
03	Battery voltage is too high	
04	Battery voltage is too low	
05	Output short circuited	
06	Output voltage is too high	
07	Overload time out	
08	Bus voltage is too high	
09	Bus soft start failed	
51	Over current or surge	
52	Bus voltage is too low	
53	Inverter soft start failed	
55	Over DC voltage in AC output	
56	Battery connection is open	
57	Current sensor failed	
58	Output voltage is too low	
60	Negative power fault	
80	CAN fault	
81	Host loss	

Warning Indicator

Warning Code and Event Audible Alarm Icon flashing

Warning Code	Warning Event	Audible Alarm	Flashing Icon
01	Fan is locked	Beep three times every second	
02	Over temperature	Beep once every second	
03	Battery is over-charged	Beep once every second	
04	Low battery	Beep once every second	
07	Overload	Beep once every 0.5 second	  
10	Output power derating	Beep twice every 3 seconds	
12	Solar charger stops due to low battery	Beep once every second	
13	Solar charger stops due to high PV voltage	Beep once every second	
14	Solar charger stops due to overload	Beep once every second	
15	Parallel input utility grid different	Beep once every second	
16	Parallel input phase error	Beep once every second	
17	Parallel output phase loss	Beep once every second	
20	BMS communication error	Beep once every second	
33	BMS communication loss	Beep once every second	
34	Cell over voltage	Beep once every second	
35	Cell under voltage	Beep once every second	
36	Total over voltage	Beep once every second	
37	Total under voltage	Beep once every second	
38	Discharge over current	Beep once every second	
39	Charge over current	Beep once every second	
40	Discharge over temperature	Beep once every second	
41	Charge over temperature	Beep once every second	
42	Mosfet over temperature	Beep once every second	

43	Battery over temperature	Beep once every second	
44	Battery under temperature	Beep once every second	
45	System shut down	Beep once every second	

Trouble Shooting

Problem	LCD/LED/Buzzer	Explanation	What to do
Unit shuts down automatically during startup process	LCD/LEDs and buzzer will be active for 3 seconds and then complete off	The battery voltage is too low (<1.91V/Cell)	1.Re-charge battery 2.Replace battery
No response after power on	No indication	1. The battery voltage is far too low (<1.4V/Cell) 2. Battery polarity is connected reversed	1. Check if batteries and the wiring are connected well 2. Re-charge battery 3. Replace battery
Mains exist but the unit works in battery mode	Input voltage is 0 on the LCD and green LED is flashing	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well
	Green LED is flashing	Insufficient quality of AC power (Shore or Generator)	1. Check if AC wires are too thin and/or too long 2. Check if generator (if applied) is working well or if input voltage range setting is correct (UPS→Appliance)
	Green LED is flashing	Set “Battery First” or “Solar First” as the priority of output source	Change output source priority to Utility first
When it's turned on, internal relay is switching on and off repeatedly	LCD display and LEDs are flashing	Battery is disconnected	Check if battery wires are connected well
Buzzer beeps continuously and red LED is on (Fault code)	Fault code 01	Fan fault	1. Check whether all fans are working properly 2. Replace the fan
	Fault code 02	Internal temperature of component is over 100°C	1. Check whether the air flow of the unit is blocked or whether the ambient temperature is too high 2. Check whether the thermistor plug is loose
	Buzzer beeps once every second, and red LED is flashing (Warning code)	Fault code 03	Battery is over-charged
The battery voltage is too high			Check if spec and quantity of batteries meet requirements
	Warning code 04	The battery voltage/SOC is too low	1.Measure battery voltage in DC input

			2.Check battery SOC in LCD when use Li battery 3.Recharge the battery
Fault code 05	Output short circuited		Check if wiring is connected well and remove abnormal load
Fault code 06/58	Output abnormal (Inverter voltage is over 150Vac or below 40Vac)		1.Reduce the connected load 2. Restart the unit, if the error happens again, please return to repair center
Fault code 07	The inverter is overloaded by 110%		Reduce the connected load by switching off some equipment
Fault code 08	Bus voltage is too high		1. If you connect to a lithium battery without communication, check whether the voltage points of the program 19 and 21 are too high for the lithium battery. 2. Restart the unit, if the error happens again, please return to repair center
Fault code 09/53/57	Internal components failed		Restart the unit, if the error happens again, please return to repair center
Warning code 15	The input status is different in parallel system		Check if AC input wires of all inverter are connected well
Warning code 16	Input phase is not correct		Change the input phase S and T wiring
Warning code 17	The output phase not correct in parallel		1. Make sure the parallel setting are the same system(single or parallel; 3P1,3P2,3P3). 2. Make sure all phase inverters are powered on
Warning code 20	Li battery can't communicate with the inverter		1.Check whether communication line is connected between inverter and battery. 2.Check whether BMS protocol type is the correct setting
Fault code 51	Over current or surge		Restart the unit, if the error happens again, please return to repair center
Fault code 52	Bus voltage is too low		
Fault code 55	Output voltage is unbalanced		
Fault code 56	Battery is not connected well or fuse is blown		If the battery is connected well, please return to repair center

	Fault code 60	Negative power fault	<ol style="list-style-type: none"> 1. Check whether the AC output connected to the grid input 2. Check whether Program 8 settings are the same for all parallel inverters 3. Check whether the current sharing cables are connected well in the same parallel phases 4. Check whether all neutral wires of all parallel units are connected together 5. If problem still exists, contact repair center
	Fault code 80	CAN fault	<ol style="list-style-type: none"> 1. Check whether the parallel communication cables are connected well. 2. Check whether Program 23 settings are right for the parallel system 3. If problem still exists, contact repair center
	Fault code 81	Host loss	

Warranty

One year warranty that commences from the date of purchase, covers:

- Any defect or failure due to materials or workmanship.
- The warranty does not cover any damage due to abuse, damage or operation outside the recommendations in this manual.
- Any unit covered under warranty will be repaired or replaced at the discretion of the distributor or manufacturer.



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