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STORM CHASER

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BUILT IN THE USA



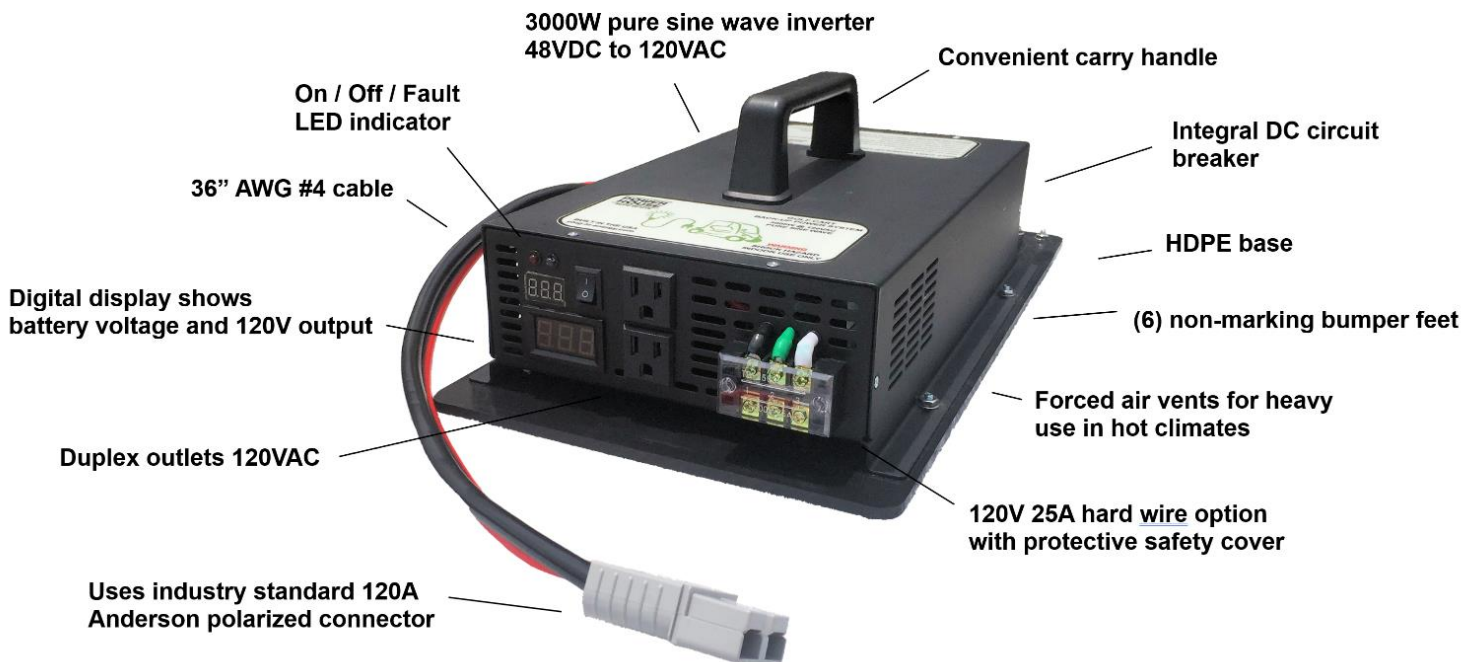
GOLF CART BACK-UP POWER SYSTEM
3000W @ 120VAC / PURE SINE WAVE

Product Manual

CE EMC RoHS FCC

AUTONOMOUS
POWER SOLUTIONS

Read this guide before installing or using the Storm Chaser and save it for future reference.



Please review this photo showing the Storm Chaser features and components

Quick Start: Power-Up Procedure

1. Make sure cart ignition is OFF.
2. Make sure 80A battery circuit breaker is OFF by pushing the blue button until the yellow flag extends.
3. Connect the Storm Chaser to the golf cart via the grey Anderson connector.
4. Turn circuit breaker ON with the yellow flag, there will be an audible click
5. Turn the Storm Chaser ON using the faceplate switch.
6. Confirm system status with faceplate display showing battery voltage and output voltage.
7. The Storm Chaser is now up and running. Appliances may be plugged directly into the inverter, or a power strip extension cord may be used.



Safety First

Incorrect installation or misuse of the Storm Chaser 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 Storm Chaser 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 Storm Chaser's AC outlets, fan, or vent openings.
- Do not expose the Storm Chaser to water, rain, snow.
- Do not, under any circumstances, connect the Storm Chaser to utility power AC distribution wiring.



WARNING! Heated surface.

- The Storm Chaser housing may become uncomfortably warm, reaching 140°F (60°C) under extended high power operation. Ensure there is always free air movement around the Storm Chaser, 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 Storm Chaser 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 Storm Chaser 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 Storm Chaser's AC outlets. The Storm Chaser will be damaged even if it is switched OFF.
- Do not expose the Storm Chaser 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 Storm Chaser will blow and may also cause permanent damage to the Storm Chaser.

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

Do not “stack” inverters or connect multiple Storm Chasers together!

The Storm Chaser is non stackable.

Do not connect multiple Storm Chasers together or to a common bus.

The output of the Storm Chaser CANNOT be synchronized to any other AC source.

Do not connect to a sub panel which is also connected to grid power.

Any AC source fed back to the Storm Chaser will ruin the inverter and possibly cause a fire or safety hazard.

Connection from Batteries to the DC Input Side

Sizing of Cables and Fuses

The AWG#4 cables provided with the Storm Chaser are rated for maximum Storm Chaser output.

The 80A circuit breaker is rated for momentary surges due to motor startup or other high current startups.

Do not overload. Do not use with equipment exceeding the Storm Chaser’s rated power. Better to use 80% of the rated power of the power inverter for longevity of the Storm Chaser.

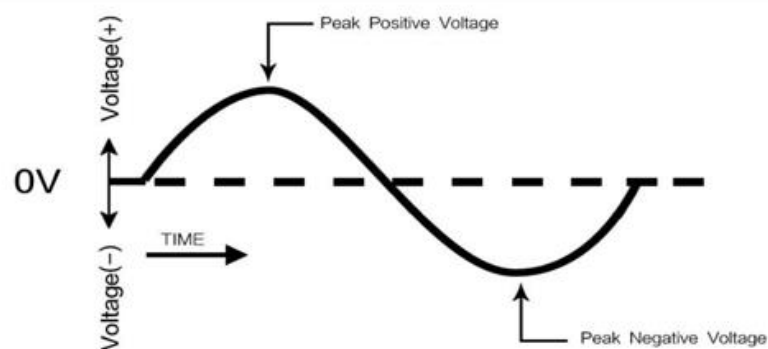
Product Introduction

The Storm Chaser 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 Storm Chaser output wave form is pure sine wave, well suited for sensitive electronics and energy efficient motors.

The Storm Chaser 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.

1. Storm Chaser Specifications

- 1.1 **Rated Continuous power:** 3000W
- 1.2 **Surge output power:** 6000W < 1 second
- 1.3 **Standby input power:** <30W
- 1.4 **DC Input Voltage :** 48V
- 1.5 **DC input voltage range:** 42~60VDC
- 1.6 **High battery shut down:** 61.5V
- 1.7 **AC output voltage (nominal):** 120VAC
- 1.8 **AC output frequency:** 60Hz +/- 2%
- 1.9 **AC output waveform:** Pure sine wave



- 1.10 **Conversion efficiency:** $\geq 85\%$
- 1.11 **Ambient operating temperature range:** 32°F-104°F/0°C-40°C
- 1.12 **Cooling method:** Intelligent temperature controlled internal fans

1.13 **Protection:** Input low voltage protection, Input high voltage protection, overload protection, temperature protection, short circuit protection, battery reverse protection.

1.14 **Packing:** The Storm Chaser is shipped fully assembled and ready to use.

NOTE: Spare fuses are for the replacement of the internal fuses, which open under a reverse polarity fault. Since the Anderson connector is polarity protected, we recommend an experienced technician connect it to the golf cart battery to prevent blowing the internal fuses.

Replacing the internal fuses requires disassembly of the Storm Chaser, we recommend consulting the factory before proceeding, Ph (844) 909-9095.

2. Status Indication:

2.1 Normal working indication: both DC and AC display on, blue LED on, red LED flashes on start-up, then turns OFF.

2.2 Abnormal input voltage indication:

Input low voltage alarm	Red LED ON, alarm ON
Input low voltage protection	Red LED ON, alarm ON, no AC output
Input high voltage protection	Red LED ON, no AC output

2.3 Abnormal output indication:

Output overload or short circuit protection	Red LED ON, no AC output
Short circuit protection	Short circuit protection only lasts for 2-3 seconds, alarm ON and red LED ON

2.4 Abnormal temperature indication: Red LED ON, no AC output

3. Insulation performance:

3.1 Dielectric voltage withstand:

Input end to the shell	1000VAC (50Hz 1min \cong 1.5mA)
Output end to the shell	1000VAC (50Hz 1min \cong 1.5mA)

3.2 Insulation resistance:

Input end to the shell	>20M Ω (1000VDC)
Output end to the shell	>20M Ω (1000VDC)

4. Storm Chaser Operation:

4.1 Working Environment: Indoor use only. Choose a cool, clean, dry and well-ventilated place. The Storm Chaser should be placed on a flat surface, preferably on the golf cart itself. Allow free access to the AC output terminals, and always allow free air circulation around the Storm Chaser during operation

4.2 DC Side Connection

4.2.1. Preventing DC input Under or Over Voltage: 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.

4.2.2 Do not use a solar panel or solar charge controller to connect to the Storm Chaser. Only connect the Storm Chaser with a well charged battery or battery bank with stable voltage.

4.2.3. Recommended Size of battery cables and fuses.

The Storm Chaser is furnished with dual AWG#4 cables, 36" long, from the factory. These cables may be connected directly to the golf cart battery, or a 25" AWG#4 extension cables can be used in order to move the Storm Chaser closer to the loads.

4.4 Storm Chaser Output Layout



1. The Storm Chaser display explained:

- a. The red LED flashes on start-up, remains OFF during normal operation
- b. The blue LED indicates normal operation
- c. The red LED indicates a fault

2. Input DC voltage display.

3. Output AC voltage display.

4. Socket type for AC output

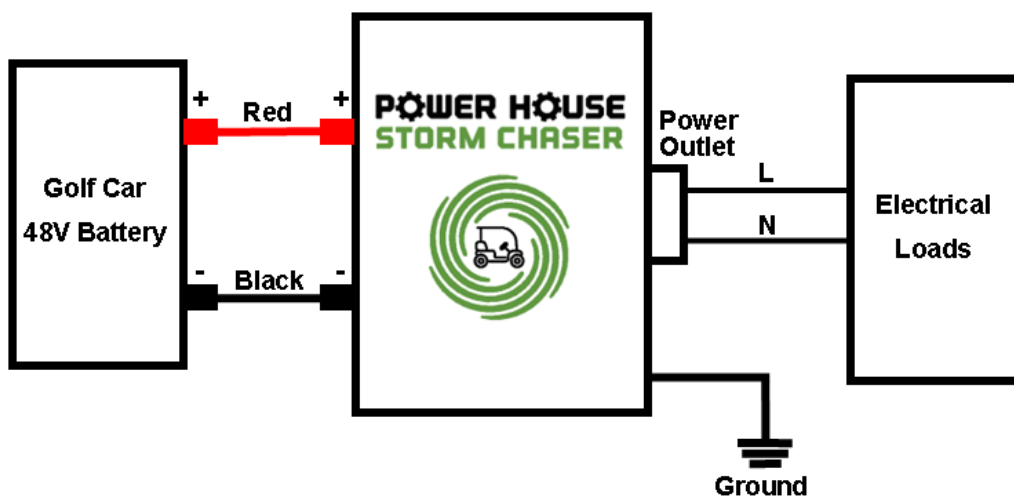
5. Hard wire terminal for AC output: black line for live, white line for neutral, green line for ground.

NOTE:

1. Do not connect the black wire with the green wire or the white wire with green one, equipment damage will occur.

2. NOTE: WARNING Keep the hard wire terminals covered at all times with the clear plastic cover. THIS IS A SHOCK HAZARD, failure to cover the terminals may result in injury or death!

4.5 Operation Instruction



For continuous operation, a maximum of 2100W, or 70% capacity is recommended.

4.6 AC Side Connection

Make sure the Storm Chaser power switch is in the OFF position.

Connect the Storm Chaser to the golf cart.

Turn the Storm Chaser ON

Connect the electric appliance to AC output socket of the Storm Chaser.

Turn the appliance ON

When finished, turn off the appliance first, then turn Storm Chaser power switch to "OFF" position.

4.7 Storm Chaser Load Reference:

Rated Continuous Power:

The Storm Chaser 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 Storm Chaser. The Storm Chaser 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 Storm Chaser 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.

4.8. Applicable 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.

5. Trouble Shooting: WARNING!

Do not open or disassemble the Storm Chaser without the manufacturer's permission. Attempting to service the unit yourself may cause the risk of electrical shock or fire.






Problems and Symptoms	Possible Cause	Solutions
Will not turn on	Battery damaged, or bad DC cable connection	Make sure battery is fully charged, check DC cables and terminations
No AC power output. Red LED always on	Output overload or short circuit	Decrease load, check AC cable. Remove load, check output
No AC power output. Red LED on	Low battery voltage or high battery voltage	Check battery voltage, charger battery, check DC circuit breaker
No AC power output. Red light on	Over temperature shut-down	Check if there is proper ventilation. Check if there are any objects or barriers blocking the vents or fans

6. FAQ, Frequently Asked Questions

6.1. How long can the Storm Chaser power up my appliances?

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

7. 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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