



Sensata
Technologies



SSI-12HF7N
SSI-12HF10N
SSI-12HF15N
Owner's Manual
Form 122180

SSI Series Owner's Manual

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1. Important Safety Instructions



WARNING!

Before using the inverter, please read and save these safety instructions.

1-1. General Safety Precautions

- 1-1-1. Do not expose the inverter to rain, snow, spray, or dust. To reduce the risk of hazard, do not cover or obstruct the ventilation openings. Do not install the inverter in a zero-clearance compartment. Overheating may result.
- 1-1-2. To avoid a risk of fire or electrical shock, make sure that existing wiring is in good electrical condition and not undersized. Do not operate the inverter with damaged or substandard wiring.
- 1-1-3. There are some components in the inverter that can cause arcs and sparks. To prevent fire or explosion, do not put batteries, flammable materials, or anything that should be ignition-protected around the inverter.

1-2. Battery Safety Precautions

- 1-2-1. If battery acid contacts skin or clothing, you need to wash with soap and water immediately. If battery acid contacts your eyes, you need to wash it out with cold running water for at least 20 minutes and get medical attention immediately.
- 1-2-2. Never smoke, make a spark or create a flame in the vicinity of the battery or the engine.
- 1-2-3. Do not drop a metal tool on the battery. The resulting spark or short-circuit of this act may result in an explosion, spark or fire.
- 1-2-4. Remove personal metal items such as rings, bracelets, necklaces, and watches when operating with lead-acid batteries. Failure to do so may result in a spark or short circuit event, which can result in very high temperatures that can melt the metal items and potentially cause serious bodily harm.

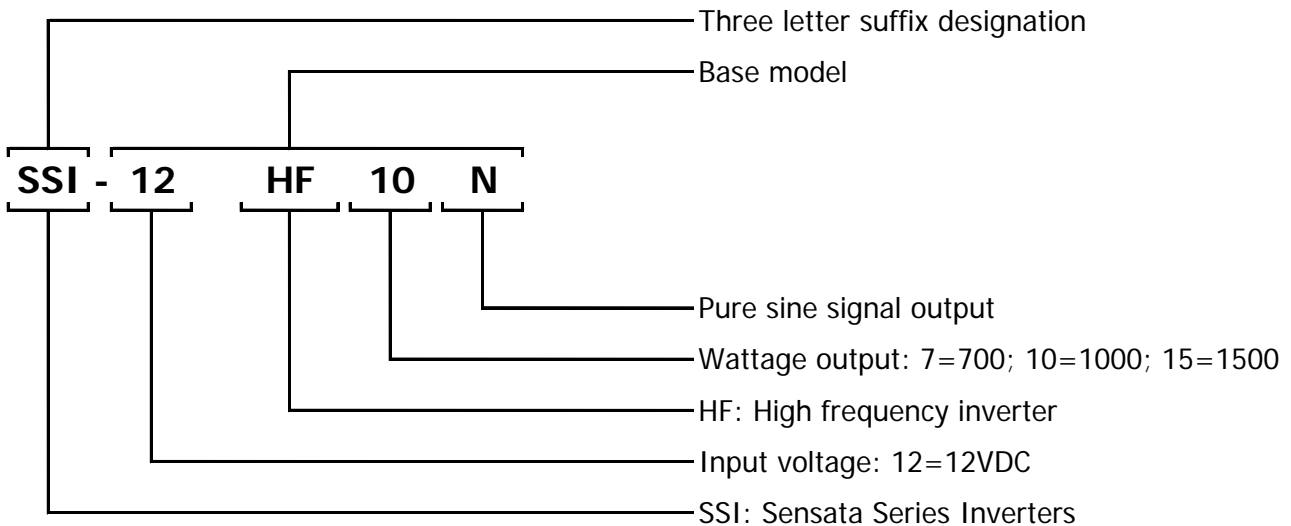
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2. Introduction

2-1 Features

- Pure sine output wave with advanced microprocessor control.
- GFCI (Ground Fault Circuit Interrupter) / NEMA5-15R receptacle.
- Optional remote control status panel with power ON/OFF button.
- Output frequency 50/60 Hz switch selectable.
- Load control cooling fan.
- LED indication for input, output level & failure status.
- Reverse Polarity (Fuse), under voltage and over voltage protection.
- Output short circuit, overload, over temperature protection.
- Automatic low battery shutdown at 10.2 VDC (with in-rush delay)
- Approvals: UL/CUL Listed and FCC Class A approved.

Nomenclature



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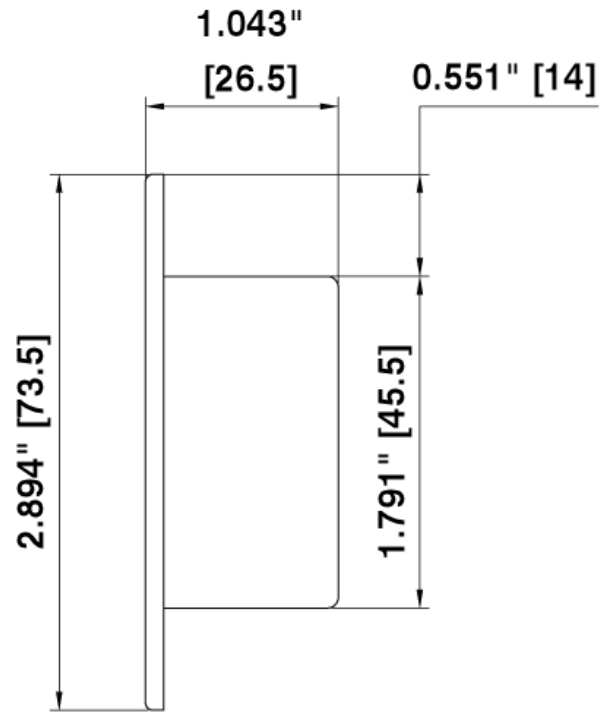
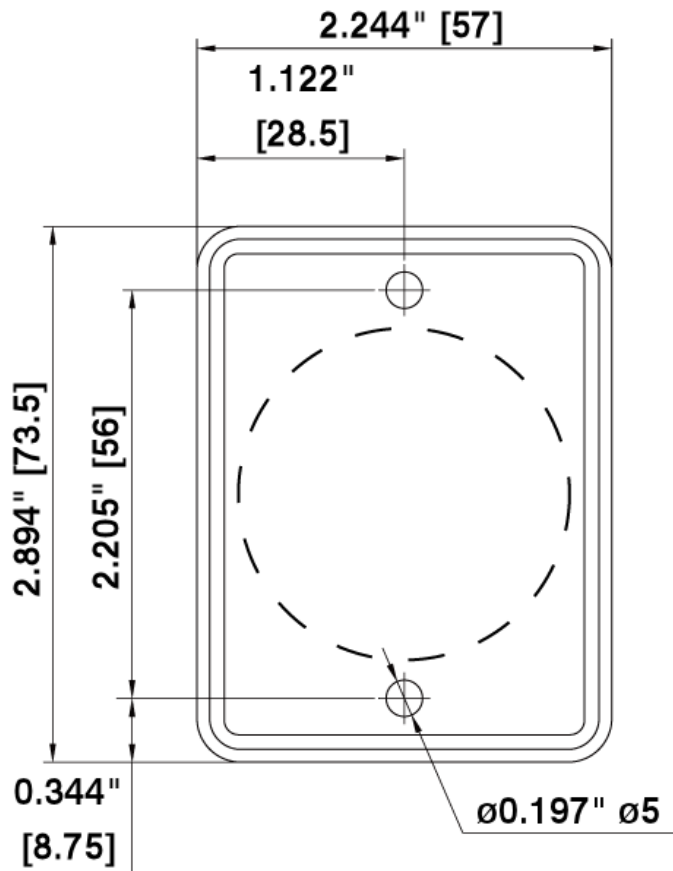
2-2 Specifications

Specifications	Inverter Model		
	SSI-12HF7N	SSI-12HF10N	SSI-12HF15N
Continuous Output Power	700 Watts	1000 Watts	1500 Watts
Maximum Output Power	770 Watts	1100 Watts	1650 Watts
Surge Rating (Max.)	1400 Watts	2000 Watts	3000 Watts
Input Voltage	12VDC		
Input Current	80A DC	128A DC	171A DC
Output Voltage	120VAC +/- 5%		
Frequency (Switch Selectable)	50/60Hz +/- 0.05%		
Output Waveform	Pure Sine Wave (THD <3%)		
Efficiency (full load) Max*.	89%	89%	88%
No Load Current Draw (Max.)	1.25A	1.43A	1.45A
Stand-By Current Draw (Max.)	0.25A	0.25A	0.28A
Input Voltage Regulation (VDC)	10.5 to 16		
Input Level Indicator	Red / Orange / Green (LED)		
Load Level Indicator			
Failure Indicator	Red LED		
Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over/Under Input Voltage and Over Temperature		
Remote Control	SSI-R8 Panel (Optional)		
Approvals * EMC	UL/CUL * FCC Class A		
Operating Temperature Range	32° to 104°F (0° to 40° C)		
Storage Temperature Range	-22° to 158°F (-30° to 70° C)		
Cooling	Loading Controlled Cooling Fan		
Dimensions (L x W x H)	12.16 x 7.36 x 3.14 inch 308.9 x 187.0 x 79.8 mm	15.21 x 7.83 x 3.76 inch 386.4 x 199 x 95.6 mm	16.39 x 7.83 x 3.76 inch 416.4 x 199 x 95.6 mm
Weight	6 lbs / 2.7 kg	10 lbs. / 4.5 kg	11.8 lbs / 5.4 kg
Warranty	2 Years		

* **Note:** The specifications are subject to change without notice.

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2-3 Mechanical Drawings

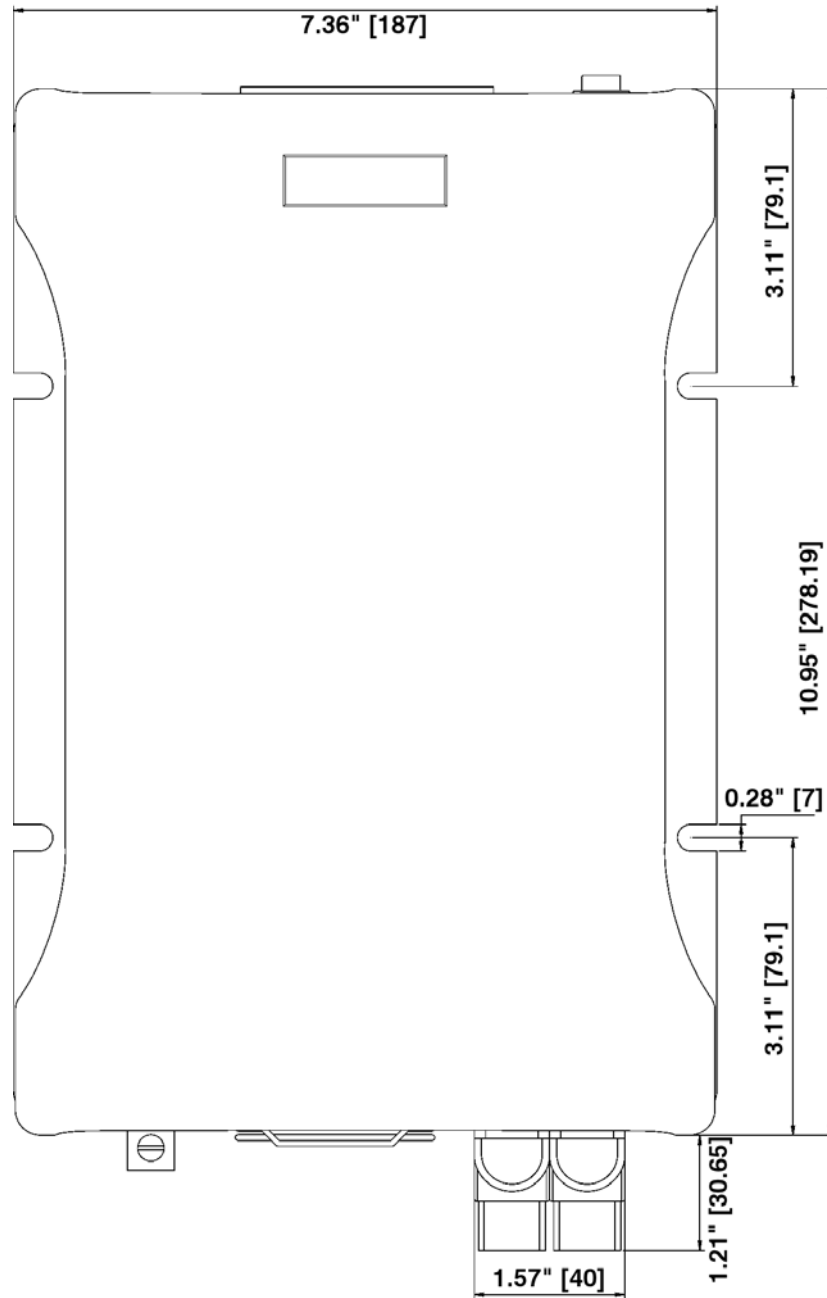


Unit: inch [mm]

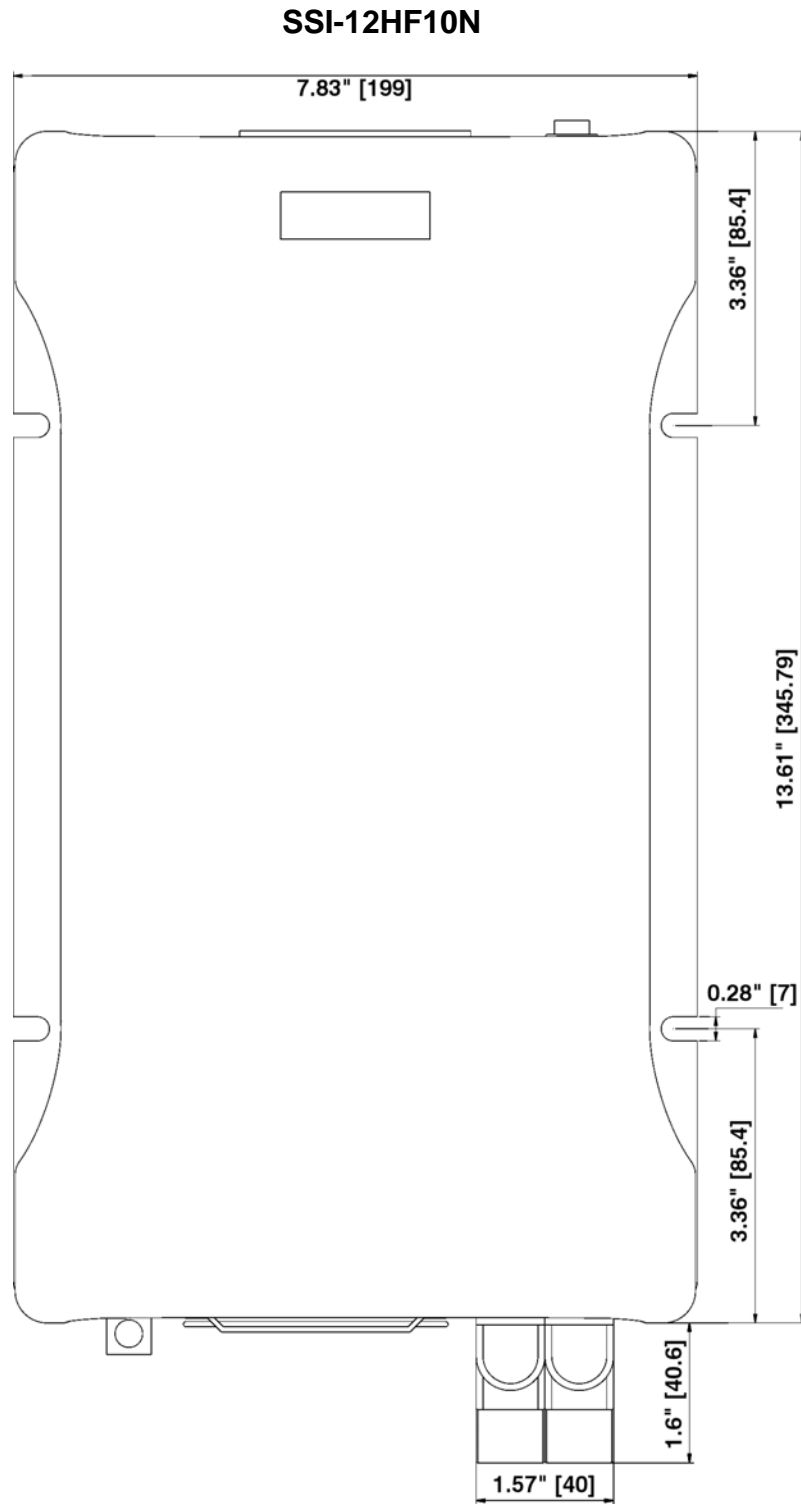
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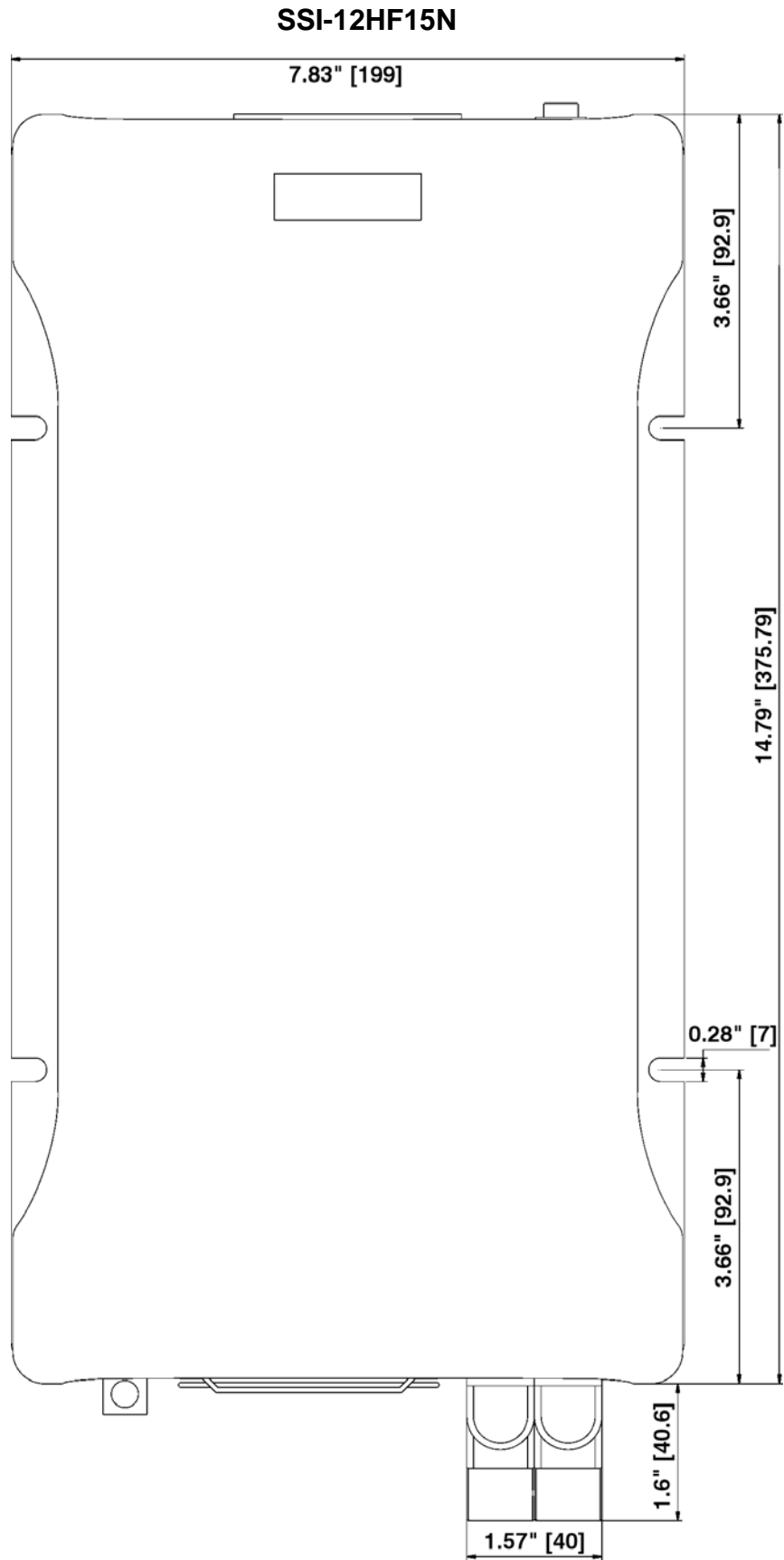
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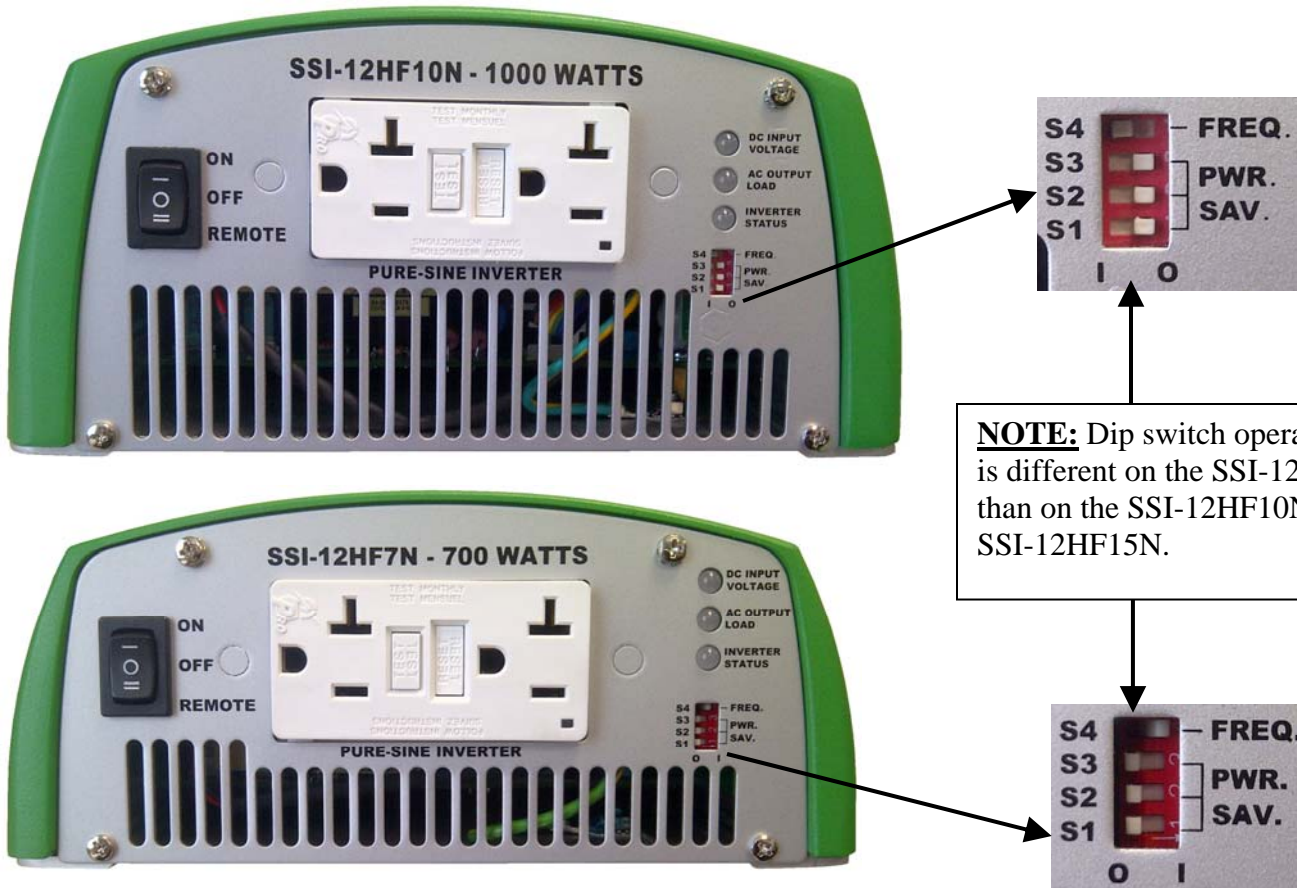
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3. Locating Controls and Ports

3-1. Front Views



NOTE: Dip switch operation is different on the SSI-12HF7N than on the SSI-12HF10N and SSI-12HF15N.

- (1) *Ventilation Openings:*
Allows airflow passing to cool down the inside electronics.
- (2) *Frequency & Power Saver Indicator:*
Output frequency dip switches settings:

Output Frequency	Dip Switch - S4
50 Hz	OFF (0)
60 Hz	ON (1)

NOTE: Default frequency setting is 60Hz for USA usage.

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Power saving dip switches setting:

Power saving mode is adjustable and set by the DIP switches, S1, S2 and S3 on the front panel. Please note that the GFCI cannot be re-set if the inverter is in the Power Save mode.

Example:

With the watt setting at 20W, it will take a minimum 20 watt load for the inverter to operate properly; A load less than 20 watts will cause the inverter to enter into the power saving mode.

Load Wattage	Dip Switches Setting		
	S1	S2	S3
DISABLE	OFF (0)	OFF (0)	OFF (0)
20W	ON (1)	OFF (0)	OFF (0)
40W	OFF (0)	ON (1)	OFF (0)
55W	ON (1)	ON (1)	OFF (0)
75W	OFF (0)	OFF (0)	ON (1)
95W	ON (1)	OFF (0)	ON (1)
115W	OFF (0)	ON (1)	ON (1)
135W	ON (1)	ON (1)	ON (1)

Note: The GFCI cannot be re-set if the inverter is in the Power Save mode

Note: Dip switch operation is different on the SSI-12HF7N than on the SSI-12HF10N and SSI-12HF15N. See pictures on page 10.

(3) Inverter Status:

Green LED	LED Signal	Status
Solid	—————	Power OK
Slow Blink	— — — —	Power Saving
Red LED	LED Signal	Status
Fast Blink	-----	Over Voltage Protection
Slow Blink	— — — —	Under Voltage Protection
Intermittent Blink	-- -- --	Over Temperature Protection
Solid	—————	Over Load Protection

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DC Input (VDC)					Over Temperature Protection			
Over Voltage		Under Voltage Alarm	Under Voltage		INTERIOR		HEAT SINK	
Shut-down	Restart		Shut-down	Restart	Shut-down	Restart	Shut-down	Restart
16.3	15.3	11.0	10.2	12.7	70°C	45°C	90°C	60°C

(4) AC Output Load (Watts):

LED Status	DARK	GREEN	ORANGE	RED	RED BLINK
SSI-12HF7N	0 ~ 150W	151 ~ 362W	363 ~ 622W	623 ~ 754W	Over 754W
SSI-12HF10N	0 ~ 216W	217 ~ 520W	521 ~ 885W	886 ~ 1075W	Over 1075W
SSI-12HF15N	0 ~ 285W	286 ~ 730W	731 ~ 1290W	1291 ~ 1563W	Over 1563W

(5) DC Input Voltage:

LED Status	12 VDC
RED Slow Blink	10.3 ~ 10.6
RED	10.6 ~ 11.0
ORANGE	11.0 ~ 12.1
GREEN	12.1 ~ 14.2
ORANGE Blink	14.2 ~ 16.0
OVER RED Blink	16.0

(6) GFCI Outlet:

AC output power

(7) On/Off & Remote Switch:

Before installing the inverter, ensure the main switch is set to "OFF". Before using the remote unit, ensure the main switch is set to "REMOTE".

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3-2 Rear View



(1) *Chassis Ground:*

Use wire # 8 AWG to connect Chassis ground with vehicle chassis.



WARNING!

Operating the inverter without proper ground connection may cause an electrical hazard.

(2) *DC Input Terminals:*

Connect DC input terminal to 12VDC battery or other power source. Check for appropriate polarity **POS (+)** and **NEG (-)** before connecting battery cables.



WARNING!

Reverse polarity connection may damage the inverters internal fusing.

(3) *Fan Ventilation:*

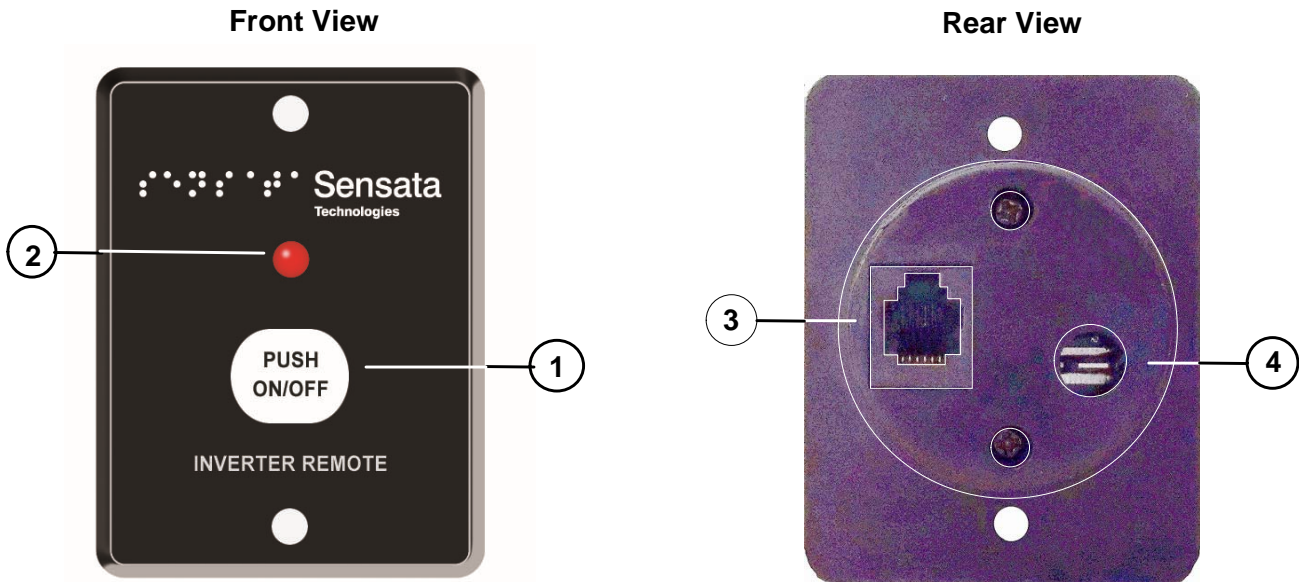
Be sure to keep it a distance (at least 1 inch) from its surroundings.

(4) *Remote Port:*

The SSI series inverter is compatible with remote control panel SSI-R8. Before using the remote unit, you need to ensure the main switch is in the "REMOTE" position and the input voltage of the power inverter is the same the remote panel.

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3-3 Remote Status Panel – Optional “SSI-R8” (part Number 245032)



- (1) *Push On/Off button:*
Turns the inverter ON/OFF when the main On/Off switch is set to “Remote”
- (2) *LED indication:*
Inverter status

Red LED	LED Signal	Status
Solid	—————	Inverting
Blinking Fast	-----	Ignition Control
Blinking Slow	- - - -	Ignition Lockout

- (3) *Remote status panel connection port:*
Connects the remote status panel to the inverter module through the RJ-11 flat cable
- (4) *Auxiliary +12V connector:* Ignition Control and Ignition Lockout

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3.3.1 User's Guide for the SSI-R8 Remote Controller

a. Features:

- Remote ON/OFF inverter operation
- Ignition Control and Ignition Lockout information display

b. Specification:

- Input Voltage Range: 10.5 – 16Vdc By Inverter
- Operating Temperature Range : 0 – 40 °C
- Storage Temperature Range : - 30 °C - 70 °C
- Stand-By Current Draw : < 40mA
- Applicable Models : 700, 1000 & 1500 watt models

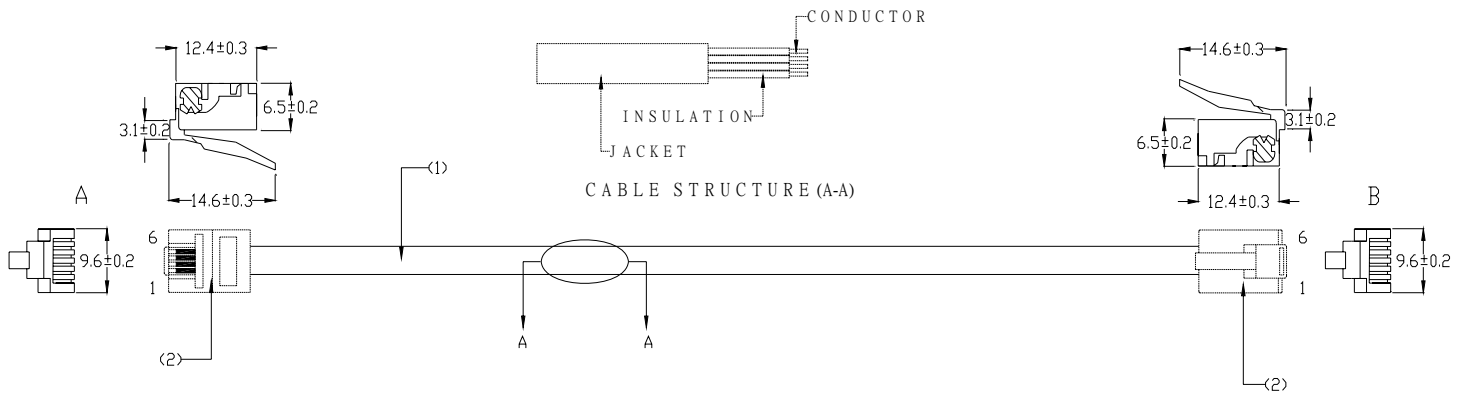
c. Introduction:

- This is a simple ON / OFF remote control.
- Steady red LED light indicates the Inverter is ON.
- Fast flashing red LED light indicates that it is in Ignition Control selection status.
- Slow flashing red LED light indicates that it is in Ignition Lockout selection status.
- The wire JP1 is placed inside the remote controller and it is to indicate either Ignition Control Function or the Ignition Lockout Function. Remove the two screws to change the jumper position.
- JP1 jumper "Open" – **Ignition Control Function (Default position of the jumper)**
- JP1 jumper "Short" – **Ignition Lockout Function**
- Please note that the default mode for JP1 is OPEN.
- The wire must go with a 12 Volt 0.5A fuse with proper sizes.
- Connect the wire RJ-11 to the remote port in front of the panel.

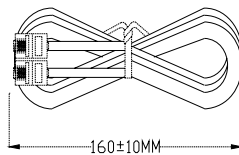
d. Ignition Control Function – The Ignition Control Function is to turn the Inverter ON when the auxiliary input wiring is connected to the Ign/ACC wiring and 12 Volts is applied by having the ignition key turned to the "On" or "ACC" position.

e. Ignition Lockout Function – The Ignition lockout function is to turn the Inverter OFF when the auxiliary input wiring is connected to the Ign/ACC wiring and 12 Volts is applied by having the ignition key turned to the "On" or "ACC" position.

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A	COLOR	B
6	NC	6
5	YELLOW	5
4	GREEN	4
3	RED	3
2	BLACK	2
1	NC	1



WARNING!
DO NOT use standard telephone cable.

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4. Installation

4-1. *General Installation Recommendations*

The power inverter should be installed in an environment that meets the following requirements:

- (a) Do not allow water to drip on or enter into the inverter.
- (b) Ambient air temperature should be between 0° to 40° C (32° to 104° F) , the cooler the better.
- (c) Do not install the inverter in a battery compartment or other areas where flammable fumes may exist, such as fuel storage areas or engine compartments. These gases are very corrosive, and prolonged exposure will damage the inverter.
- (d) Keep the inverter a distance (as least 1 inch) away from surrounding things. Ensure the ventilation shafts on the front and rear of the unit are not obstructed.
- (e) Do not install the inverter in a dusty environment. The dust can be inhaled into the unit when the cooling fan is working.
- (f) Avoid excessive cable lengths. Use the recommended wire lengths and sizes (see section 3-5). Do not mount the inverter where it will be exposed to the gases produced by the battery.



WARNING!

Shock hazard; before proceeding further, carefully check that the inverter is NOT connected to any batteries, and that all wiring is disconnected from any electrical sources. Do not connect the output terminals of the inverter to an incoming AC source.

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4-2. DC Wiring Connections

- 4-2-1 Follow this procedure to connect the battery cables to the DC input terminals of the inverter. The cables should be as short as possible (less than 20 feet / 3 meters ideally) and large enough to handle the required current in accordance with the electrical codes or regulations applicable to the installation.
- (a) Cables that are not an adequate gauge (too narrow) or too long will deteriorate inverter performance such as poor surge capability and frequent low-input voltage warnings and shutdowns.
 - (b) These low input voltage warnings are due to DC voltage drop across the cables from the inverter to the batteries.
 - (c) The longer and narrower the cables, the greater the voltage drop. Increasing DC cable size helps improve the situation.
 - (d) Sensata Technologies recommends the following cables for optimum inverter performance:

Model #	Wire AWG 1-10'	Wire AWG 11-15'	Wire AWG 16-20'	Inline Fuse or Circuit Breakers
SSI-12HF7N	# 6	# 4	# 2	Up to 80 amps
SSI-12HF10N	# 4	# 2	# 1	Up to 150 amps
SSI-12HF15N	# 2	# 1	# 1/0	Up to 200 amps

- 4-2-2 Connect the cables to the power input terminals on the rear panel of the inverter. The red terminal represents positive **POS.** [+] and black terminal represents negative **NEG.** [–]. Insert the cables into the terminals and tighten the screw to clamp the wires securely.

Sensata Technologies recommends using only high quality (SGX) insulated copper wire and keep the cable length short, a maximum of 20 feet.

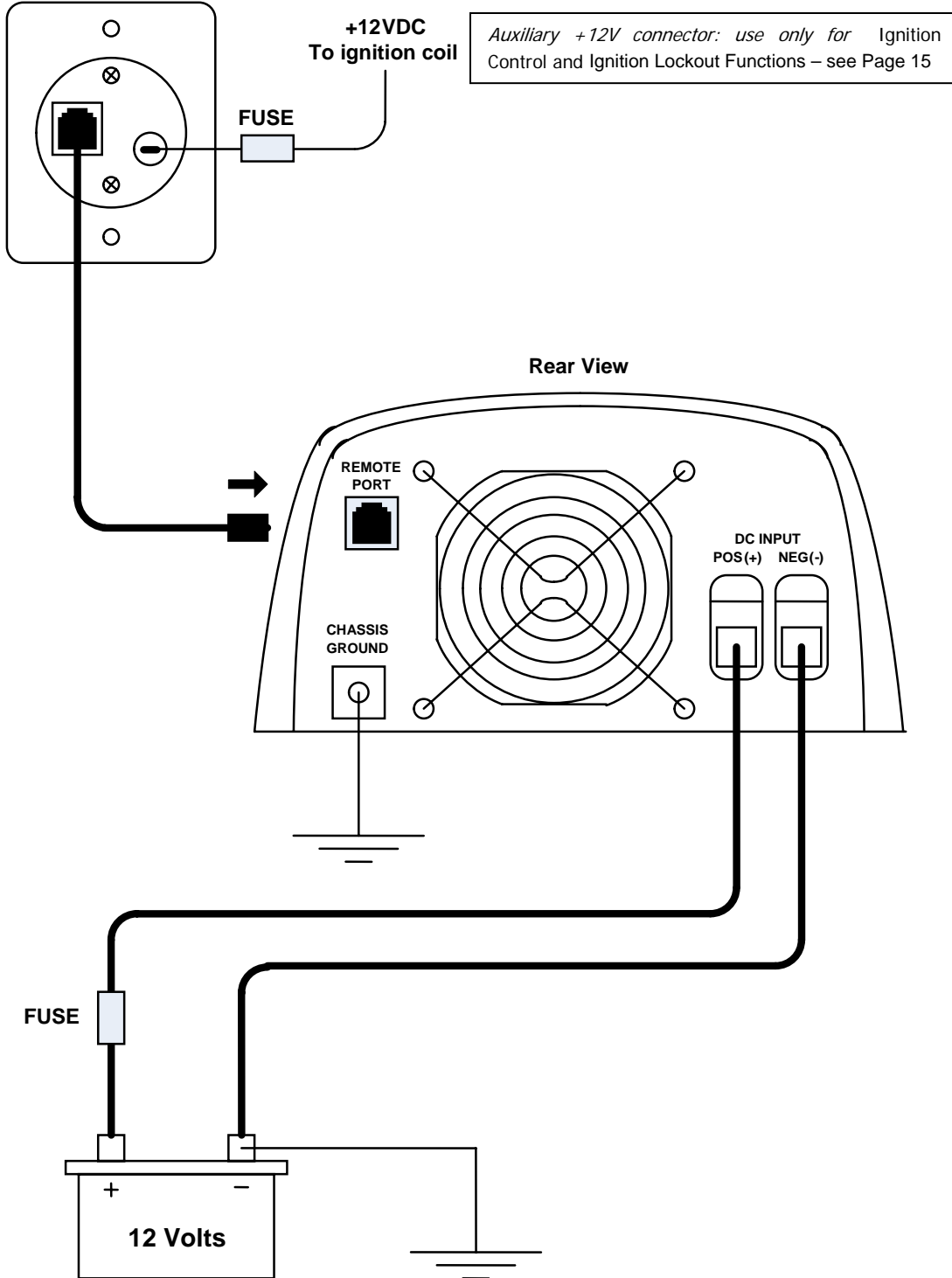
Ensure all the DC connections are tight (torque to 9 ~ 10 ft-lbs, 11.7 ~ 13 Nm). Loose connections may cause overheat and fire.

The installation of a fuse must be on a positive cable. Failure to place a fuse on “+” cables running between the inverter and battery may cause damage to the inverter and will void warranty.

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4-3. Wiring Diagram

Remote Panel SSI-R8 (Optional)
(Rear View)



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4-4. AC Safety Grounding

The AC output ground wire should go to the grounding point for your loads (for example, a distribution panel ground bus).

3-6-1. The neutral conductor of the AC output circuit of the inverter is automatically connected to the safety ground during inverter operation. This conforms to National Electrical Code requirements that separately derived from AC sources (such as inverters and generators) which have their neutral conductors tied to ground in the same way as the neutral conductors from the utility tied to ground at the AC breaker panel.

4-5. Inverter Operation

To operate the power inverter, use the ON / OFF switch on the front panel to turn the power ON. The power inverter is now ready to deliver AC power to your loads. If there are several loads in use, turn them on separately after the inverter is "ON" in order to prevent over voltage protection (OVP) resulting from the surge power.

3-7-1. Set the power switch to "ON" position and the buzzer will send out "beep" sound. Then the inverter will perform a self-diagnostic, and the LED indicators will also appear various colors. Finally the buzzer will "beep" again and the Input Level and Status LED indicators will turn to "green" in color, then the inverter starts to work successfully.

3-7-2. Set the power switch to the OFF position, and then the inverter stops and all the lights go off.

3-7-3. Set the power inverter switch to ON position and turn the test load ON. The inverter should supply power to the load. If you plan to accurately measure the true output R.M.S. voltage of the inverter, a meter such as FLUKE 87 or better, or any Multi-Meter marked as "True RMS" must be used.

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Troubleshooting



WARNING!

Do not open or disassemble the inverter. Attempting to service the unit yourself may cause the risk of electrical shock or fire.

Problems / Symptoms	Possible Cause	Solutions
There is no AC power output, and the status indicator LED is :		
a. RED, blinking fast	Over input voltage (OVP)	Battery voltage at the inverter is too high. Check the input voltage, reduce the input voltage, or turn off the vehicle's engine/alternator.
b. RED, blinking slowly	Low input voltage (UVP)	Battery voltage too low. Possible low battery, also check all DC wiring connections at battery, fuse, negative cable, and inverter input.
c. RED, blinking intermittently	Over Temperature (OTP)	Improve ventilation, make sure inverter vents are not obstructed, or lower ambient temperature.
d. RED, solid ON	Short circuit, overload or wiring error (OLP)	Check AC wiring for short circuit, unplug or reduce the load on the inverter.
e. Green, blinking	Power save mode	Inverter set for power save mode, load on inverter must exceed the power save mode DIP switch settings. GFCI cannot be re-set if inverter is set to the power save mode.

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Maintenance

To keep your inverter operating properly, there is very little maintenance required. You should clean the exterior periodically with a damp cloth to prevent accumulation of dust and dirt; please note to have the inverter turned OFF and not to allow excessive moisture enter the inverter. At the same time, check connections and tighten the screws on the DC input terminals if necessary.

Warranty

Sensata Technologies guarantees this product against defects in materials and workmanship for a period of 24 months from the date of purchase and will repair or replace any defective power inverters if directly returned to us with postage pre-paid. Please call Sensata technical support for an RMA number (800-553-6418)

Please note that Sensata Technologies is only responsible for ensuring our products are operational before delivering. This warranty will be considered void if the unit has been misused, altered, or accidentally damaged. Sensata Technologies is not liable for anything that occurs as a result of the user's fault.

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Notes:

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