

# DIMENSIONS™

DC to AC Power Inverter  
Pure Sine Wave Output  
**Owner's Manual**



**Models:**

12/1800N  
12/2400N  
12/3000N  
12/3600N



**Models:**

12/800N  
12/1200N  
12/1500N



**Sensata**  
Technologies

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## INTRODUCTION

Thank you for purchasing a Dimensions™ inverter from Sensata Technologies®! We think that you will find this product to be extremely reliable and easy to use.

Please read this manual completely before installing or operating the unit.

### Contact Us

Sensata Technologies can be reached by phone or email if you need assistance with this product.

Phone: 1-800-553-6418 or 1-651-653-7000

Fax: 1-888-439-3565 or 1-651-653-7600

E-mail: [inverterinfo@sensata.com](mailto:inverterinfo@sensata.com)

Website: <http://magnum-dimensions.com/>

## Important Safety Information

Read this manual before installation. This manual contains important instructions pertaining to safety, installation, and operation.

Save this manual and keep it in a safe place.

Sensata Technologies is an ISO 9001:2015 Registered Company.

Sensata uses the following special notices to help prevent injury and/or damage to equipment:

### Safety Symbols

- ▲ DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
- ▲ WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- ▲ CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION is used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE is used to notify of installation, operation, or maintenance information that is important but not hazard related.

### Safety Listing



Power Inverter, E100666

## Inverter Safety Instructions

- ▲ **WARNING:** Power inverters produce hazardous voltages. To avoid risk of harm or fire, the unit must be properly installed.
- ▲ **WARNING:** There are no user serviceable parts inside. Do not remove the cover.
- ▲ **WARNING:** Power inverters should not be mounted in a location that may be exposed to rain or spray.
- ▲ **WARNING:** Power inverters should not be installed in a zero-clearance enclosure.
- ▲ **WARNING:** Damage to the power inverter will occur if correct polarity is not observed when installing the inverter's DC input cables.
- ▲ **WARNING:** Damage to the power inverter will occur if an external AC power source is applied to the inverter's AC hardwire output.
- ▲ **WARNING:** Power inverters contain a circuit breaker and capacitor that may produce a spark upon connection or during normal operation. Do not mount in a confined battery or gas compartment
- ▲ **WARNING:** Be sure the power inverter is turned off and AC power is disconnected when batteries are being connected, disconnected, serviced, and replaced or personal injury and/or damage to the inverter could result.
- ▲ **WARNING:** Working near lead-acid batteries is dangerous. There is a risk of acid exposure.

## Battery Safety Instructions

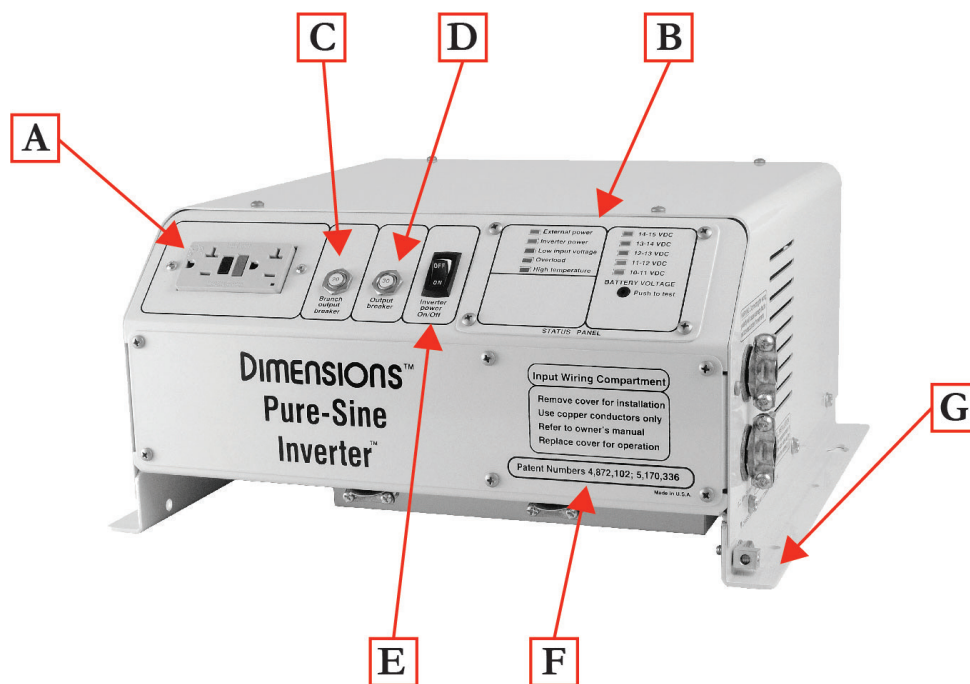
- ▲ **WARNING:** Batteries generate explosive gases during operation.
- ▲ **WARNING:** There is risk of high current discharge from shorting a battery that can cause fire and explosion. Use insulated tools during installation.
- ▲ **WARNING:** Remove all rings, watches, jewelry, or other conductive items before working near the batteries.
- ▲ **WARNING:** Inspect the batteries at least once a year for cracks, leaks, or swelling.
- ▲ **WARNING:** Dispose of the batteries according to local regulations. Do not incinerate batteries; there is risk of explosion.
- ▲ **WARNING:** A fuse must be installed between the battery and the inverter to protect against shorted cables.

## Specifications

Models	12/800N	12/1200N	12/1500N	12/1800N	12/2400N	12/3000N	12/3600N
<b>Output Power (Watts Cont.)</b>	800	1200	1500	1800	2400	3000	3600
<b>Output Current (Amps AC)</b>	Up to 7	Up to 10	Up to 12.5	Up to 15	Up to 20	Up to 25	Up to 30
<b>Peak Output (Amps DC)</b>	12	21	24	44	91	91	136
<b>Input Current (Amps DC)</b>	Up to 80	Up to 120	Up to 150	Up to 180	Up to 240	Up to 300	Up to 360
<b>Input Voltage (Volts DC)</b>	10.5 to 20						
<b>Output Voltage (Pure Sine)</b>	120 VAC $\pm$ 5%						
<b>Output Frequency</b>	60 Hz $\pm$ 0.05%						
<b>Output Wave Form</b>	Pure Sine Wave, <5%						
<b>Efficiency</b>	Up to 88%						
<b>Operating Temp</b>	0°F to 140° F (-20°C to 60° C)						
<b>Dimensions (in inches) (LxWxH)</b>	15 x 8.2 x 7.5			15 x 16 x 7.5			15 x 17 x 10
<b>Weight (lbs.)</b>	25	29	29	42	56	58	80

Table 1 Specifications

# Components



Introduction

Figure 1

- A. GFCI
- B. Status LED
- C. AC Input Breaker
- D. Output Breaker
- E. Local “On/Off” Switch
- F. Input Wiring Access Cover
- G. Bonding Lug

## Design Features

- **Unit Protection:** Automatic inverter short circuit/overload protection, automatic over temperature shutdown, and AC output circuit breaker.
- **Battery Protection:** Automatic low battery shutdown at 10.5 VDC with an in-rush delay.
- **Status LED:** This LED will show inverter operation mode and troubleshooting information. See the table in the troubleshooting section at the rear of the manual for further operation mode descriptions.
- **GFCI:** Provides 120 VAC output. Only replace with an approved GFCI. Includes GFCI receptacle protection.
- **Enclosed AC and DC cable connections**
- **Microprocessor controlled**
- **High performance construction and cooling methods**
- **Enclosed AC and DC cable connections**
- **Remote On/Off switch hookup**
- **Battery voltage indicator with push-to-test**



# INSTALLATION

## Mount Inverter

### Installation Tools

- Wire Termination Crimper
- Cable Ties
- Drill
- #2 Phillips Screw Driver (with a magnetic end)
- Slotted Screw Driver
- Tape Measure
- Wire Cutters
- Needle Nose Pliers
- Wire strippers

### Inverter Mounting Recommendations

NOTE: The inverter mounting location should provide adequate ventilation and clearance to maintain room temperature during operation. At least 1/2" of clearance is required on all sides except the bottom.

1. Locate a suitable, secure mounting surface as close to the batteries as possible without being in the same compartment.
2. Mount the inverter using four each 1/4-20 steel bolts, flat and lock washers, and nuts. The length of the bolts should be equal to the thickness of the mounting surface plus 3/4".

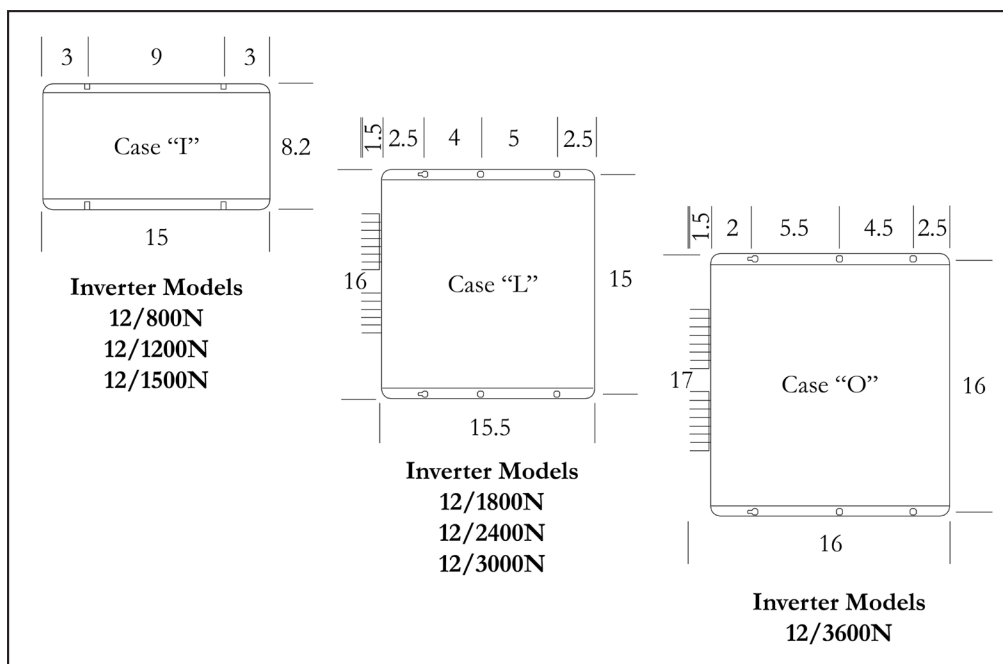


Figure 2 Mounting for All Models (Inches)

Installation

## DC Wire Gauge & Fusing

▲ **WARNING:** Damage to the power inverter will occur if correct polarity is not observed when installing the inverter's DC input cables.

### Inverter Cable

Wiring should meet all local codes and standards and be performed by qualified personnel such as a licensed electrician.

An inverter cable kit (a positive cable, negative cable, and proper fuse) is needed to connect the inverter to a battery bank. An inverter cable kit designed to SAE guidelines can be purchased directly from Sensata – call for options. An 8 AWG cable is also required to connect the inverter's bonding lug to ground.

**Min. Cable and Max. Fusing Guide at 5% Voltage Drop at Full Output**

Inverter Model	Full Load (ADC)	Inverter to Battery Est. Cable Length in Feet		
		1 to 10 feet @ 25°C (77°F)	11 to 15 feet @ 25°C (77°F)	16 to 20 feet @ 25°C (77°F)
12/800N	80	4 AWG, 150 A Fuse	4 AWG, 150 A Fuse	2 AWG, 150 A Fuse
12/1200N	120	4 AWG, 200 A Fuse	2 AWG, 200 A Fuse	1 AWG, 200 A Fuse
12/1500N	150	2 AWG, 200 A Fuse	1 AWG, 200 A Fuse	1/0 AWG, 200 A Fuse
12/1800N	180	2 AWG, 300 A Fuse	1/0 AWG, 300 A Fuse	2/0 AWG, 300 A Fuse
12/2400 N	240	1/0 AWG, 400 A Fuse	2/0 AWG, 400 A Fuse	4/0 AWG, 400 A Fuse
12/3000N	300	2/0 AWG, 500 A Fuse	4/0 AWG, 500 A Fuse	4/0 AWG, 500 A Fuse
12/3600N	360	4/0 AWG, 600 A Fuse	4/0 AWG, 600 A Fuse	Not Recommended

**Table 2 Cable Sizing**

NOTE: Using a smaller cable may cause a low battery or high temperature fault.

## DC Wire Gauge & Fusing Continued

### Make an Inverter Cable Kit

1. Use a stranded copper cables in all cases.

NOTE: The inverter cable length and the size of the inverter will determine the cable gauge and the size fuse to use. The maximum inverter cable recommended is 20 ft., and it must be fused within 18 in. from the positive (+) terminal of the battery. Keep the cable lengths between the battery and inverter as short as possible.

2. Use SGX cross-linked polyurethane insulation type that complies with the high temperature insulation requirements (125°C.) of SAE J-1127 and vehicle manufacturer requirements.
3. For higher than normal temperature applications or large motor loads and other applications with high surge currents, use cable gauge 1 to 2 sizes larger than recommended in Table 1.
4. UL requires that a line fuse be installed within 18 inches of the battery. Use only Bussmann ANN type fuses to 500 A and Bussmann ANL for 600 A.

### Typical Cable Connection Procedure

NOTE: Refer to Figures 3 and 4 for a typical DC wiring diagram. See Table 2 for proper cable sizes.

1. Remove the in-line fuses from the fuse holders for cable installation.
2. Connect the inverter's bonding lug to ground or vehicle chassis.
3. Connect the "inverter cable" set to the appropriate DC input lugs.
4. Connect the ring terminated ends of the "inverter cable" set directly to the appropriate battery post.
5. Connect the load side of the remote "On/Off" switch to the hookup lead cable extending from the inverter and the fused side to the positive post of the battery.
6. Install the in-line fuses removed in step 1 back into the fuse holders. A typical one-time spark will occur when this final connection is made.

# Typical DC Cable Connections for 12/800N, 12/1200N, and 12/1500N

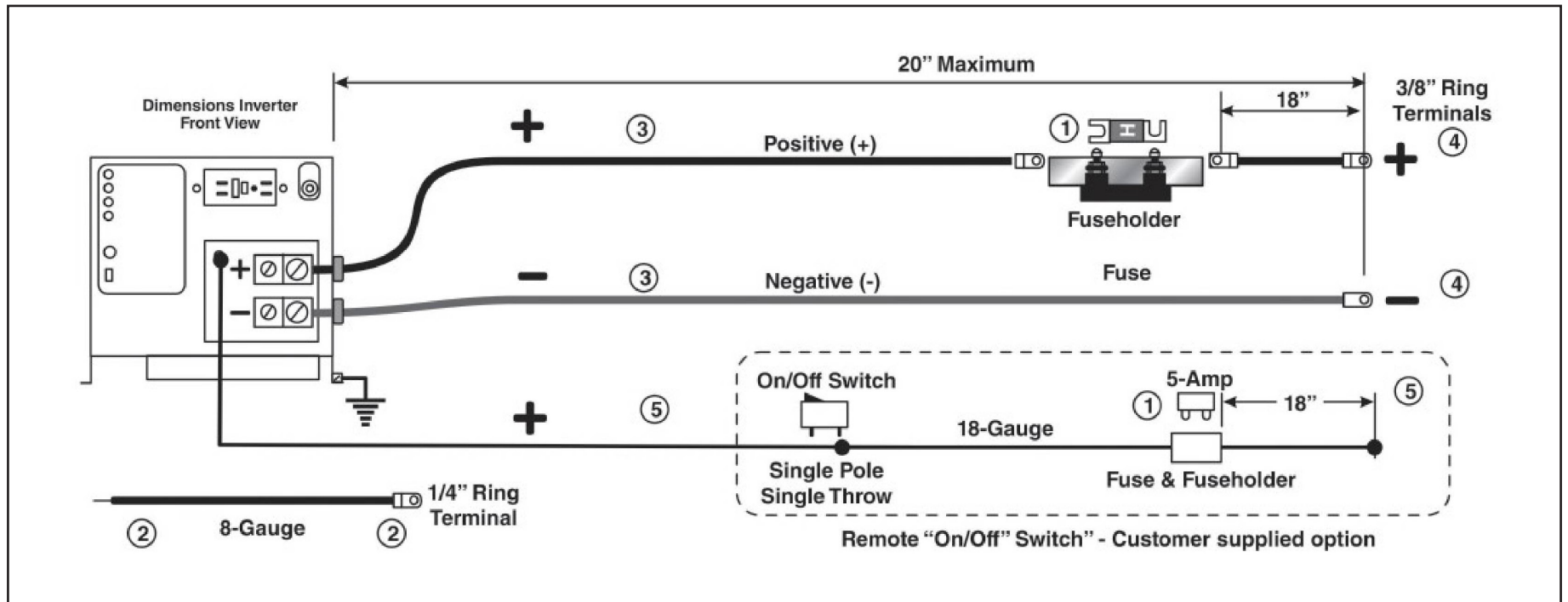


Figure 3

# Typical DC Cable Connections for 12/1800N, 12/2400N, 12/3000N and 12/3600N

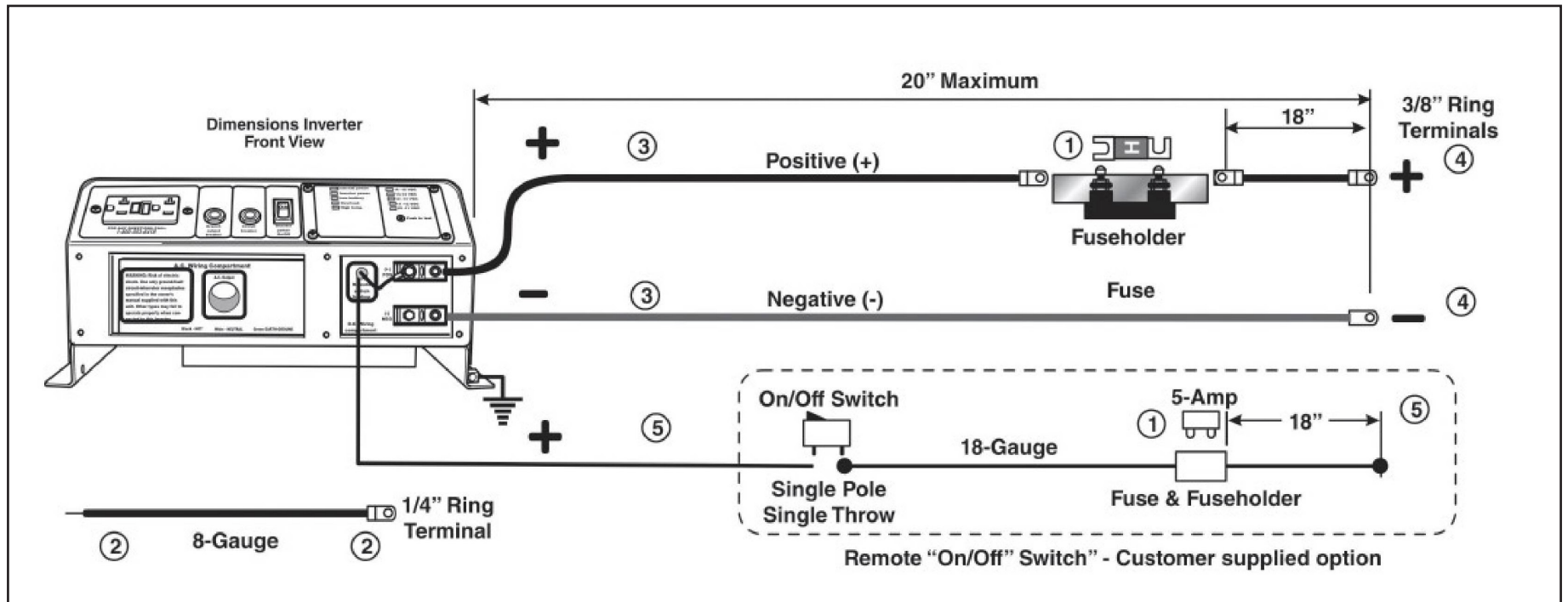


Figure 4

# Wiring Diagram for 12/800N, 12/1200N, and 12/1500N

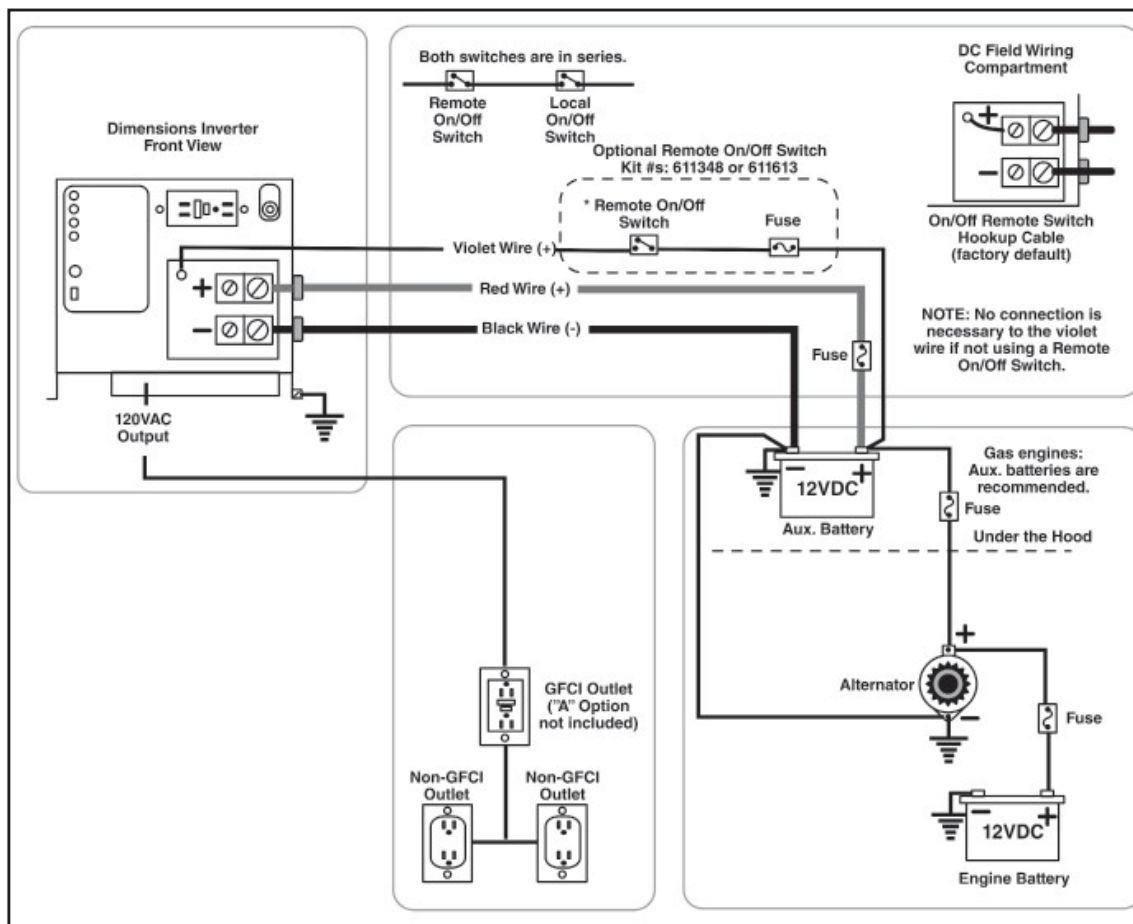
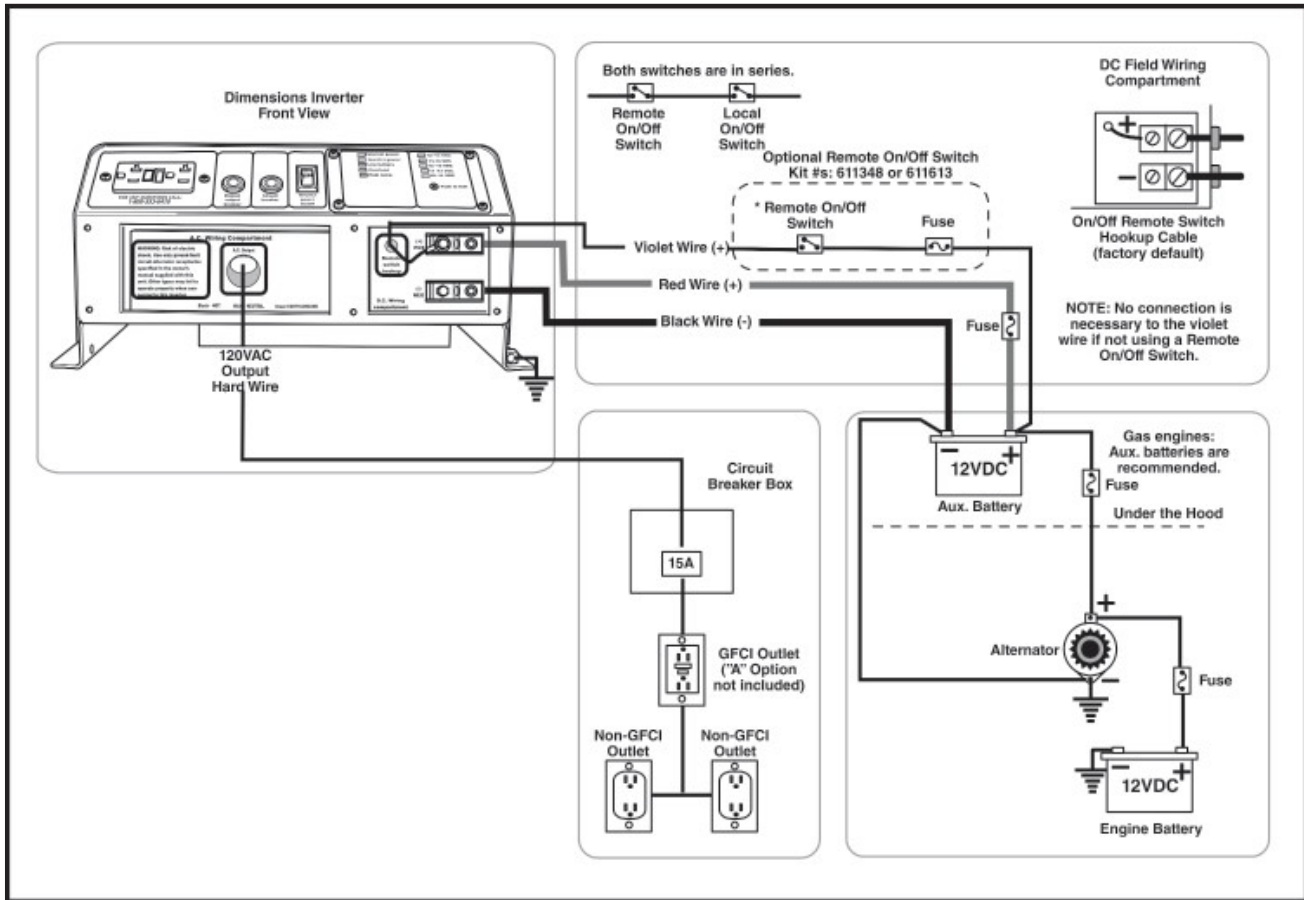


Figure 5

Installation

# Wiring Diagram for 12/1800N, 12/2400N, 12/3000N and 12/3600N



Installation

Figure 6

## Remote Inverter “On/Off” Switch

### Install Remote Inverter “On/Off” Switch – Customer Supplied

An optional remote switch with an integral LED can be purchased and used to control the inverter. Route the cable to the inverter and plug into the connector on the back.

1. Mount the remote switch in a convenient location.
2. Use an 18 AWG wire and a single pole single throw switch hookup lead extending from the inverter.
3. Wire from the remaining connection on the remote switch to the battery positive (+) terminal.
4. Install a 5 A in-line fuse in series within 10 inches from the positive (+) terminal of the battery.



## OPERATION

Once the inverter has been fully installed, wired, and DC power has been applied, the inverter is ready to turn on. The status LED beneath the AC wiring box on the left side of the inverter shows the current state of the inverter.

### Inverter Power Mode

Usage: Any 120 VAC, 60 Hz single phase product within the inverter's power rating.

The inverter front status LED will be green while the inverter is on. The AC power produced by the inverter comes from the energy stored in the battery bank through an electronic inversion process. A transformer, a Metal Oxide Silicon Field Effect Transistors (MOSFET), a filter capacitor, and a microprocessor are used to generate clean AC power.

The inverter will operate at DC input voltages ranging from 10.5 to 20 volts. Above 20 volts, the inverter may stop operating due to input voltage being out of range. The inverter can tolerate up to 24 VDC for 5 minutes. Durations longer than 5 minutes will result in a shut down. Input voltages above 24 VDC will result in an immediate shutdown. The inverter will restart when the input voltage drops below 16 VDC. When the input voltage drops to 10.5 volts, the inverter will stop operating due to a low battery condition. When the lead-acid battery bank voltage drops to 10.5 volts, the battery is fully discharged.

### Turn the Inverter On

The local "On/Off" switch located on front or the remote "On/Off" switch can be used to control the inverter. Both the local and remote switch are configured in series. To control the inverter remotely, set the local "On/Off" switch to on.

# TROUBLESHOOTING

**⚠ WARNING: Do not remove chassis cover. No user-serviceable parts inside.** Call or email customer service for free consultation during business hours (7:30 am - 5:30 pm C.S.T).

Phone: 1-800-553-6418 or 1-651-653-7000  
 Fax: 1-888-439-3565 or 1-651-653-7600

E-mail: [inverterinfo@sensata.com](mailto:inverterinfo@sensata.com)  
 Website: <http://magnum-dimensions.com/>

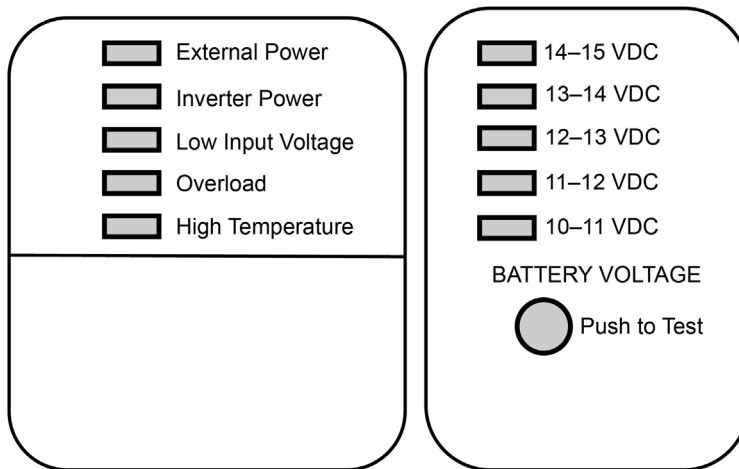


Figure #

## Troubleshooting Guide

1. Plug a 100 watt light bulb into the inverter's AC outlet.
2. Switch on the remote On/Off switch (if available).
3. Turn the inverter's local "On/Off" for 5 seconds before switching it back on. If the work light turns on, the inverter works.

No LED	Check if the in-line fuse which is located within 18" from the battery's positive post is installed or open.	
	Check if DC connections are tight and clean.	
Test light is off	Check if the switches are on. Check if any of the wires connected to the remote switches are loose or disconnected.	
"Inverter Power" LED is on	Check if the GFCI is tripped. Reset if necessary by cycling power.	If GFCI is set, disconnect all loads and connect a test light. If the test light is off, replace the GFCI or return the inverter for service.
	For hardwired connections, remove the DC input voltage and inspect the AC hardwire connections.	
Test light is off	Check if the AC output circuit breaker is tripped.	
"Low Input Voltage" LED is on	The use of a battery isolator is not recommended due to excessive voltage drop across isolator terminals.	
	Battery voltage must be above the low battery threshold (10.5 VDC measured at the inverter) for the inverter to be on.	
	Check for proper DC wire AWG (see DC Wire Gauge & Fusing section.)	
"Overload" LED is on	Unplug all loads and reset the inverter. To reset, turn the unit off and wait for 30 seconds to turn on again.	If the overload condition clears, check for short circuits or check load size versus inverter output wattage size.
	If the overload persists, possible failed inverter.	
"High Temperature" light is on	Allow the unit to cool down, the high temp fault should self-correct	
	Verify that all vent openings are clear of obstruction.	
	Reduce ambient temperature and/or load.	

Table #

## APPENDIX

### Accessories & Replacement Parts

Part Number	Item Description
	Fuse 150 A, ANN-150
430010	Fuse 200 A, ANN-200
430011	Fuse 250 A, ANN-250
430012	Fuse 300 A, ANN-300
430054	Fuse 350 A, ANN-350
430019	Fuse 400 A, ANN-400
430020	Fuse 500 A, ANN-500
430067	Fuse 600 A, ANN-600

Table #

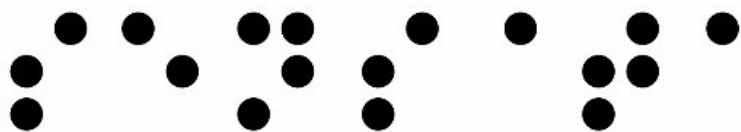
GFCI MFG	Catalog No.
Leviton	411-N7899-X# (for #, I=Ivory, W=White) 7899-# (for #, I=Ivory, W=White)

Table #

### Inverter Model Options

Options	Description
A	AC terminals protected by GFCI
R	Remote only, local switch inactive

Table #



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# Sensata

**Technologies**

Form #122187 Revision C  
XXXX Manual

The World Depends on Sensors and Controls