DIMENSIONS®

DC to AC Power Inverters

Pure Sine Wave Output

Owner's Manual

MODELS:

12WA7N

12WA10N

Sensata Technologies

Sensata Technologies

TABLE OF CONTENTS

1. SAFETY INSTRUCTIONS

IMPORTANT: Read this manual before installation, it contains important safety, installation, and operating instructions. Save this manual and keep it in a safe place.

Sensata Technologies is an ISO 9001:2008 Registered Company

1.1 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. Do not mount in a confined battery or gas compartment.
- **Warning:** Be sure the Power Inverter is turned OFF during installation.

1.2 Battery Safety Information:

- **Warning:** Working in the vicinity of lead-acid batteries is dangerous. There is a risk of acid exposure.
- **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 once a year for cracks, leaks or swelling.
- **Warning:** Dispose of the batteries according to local regulations. Do not incinerate batteries; risk of explosion exists.

2. TECHNICAL SPECIFICATIONS

INVERTER MODEL	12WA7N	12WA10
Dimensions - LxWxH (Inches):	10.5 x 12 x 4	
Efficiency:	Up to 88%	
Input Current (Amps DC):	Up to 70	Up to 100
Input Voltage (Volts DC):	11 to 14	
Operating Temperature:	-4°C to 40°C (20°F to 104°F)	
Output Current (Amps AC):	Up to 5.8	Up to 8.3
Output Frequency (Hz):	60 ± .05%	
Output Power (Watts):	700	1000
Output Voltage (Volts AC):	120 ± 5%	
Output Waveform:	Pure sine with < 5% THD	
Peak Output (Amps AC):	11	16
Weight (Lbs):	25	26

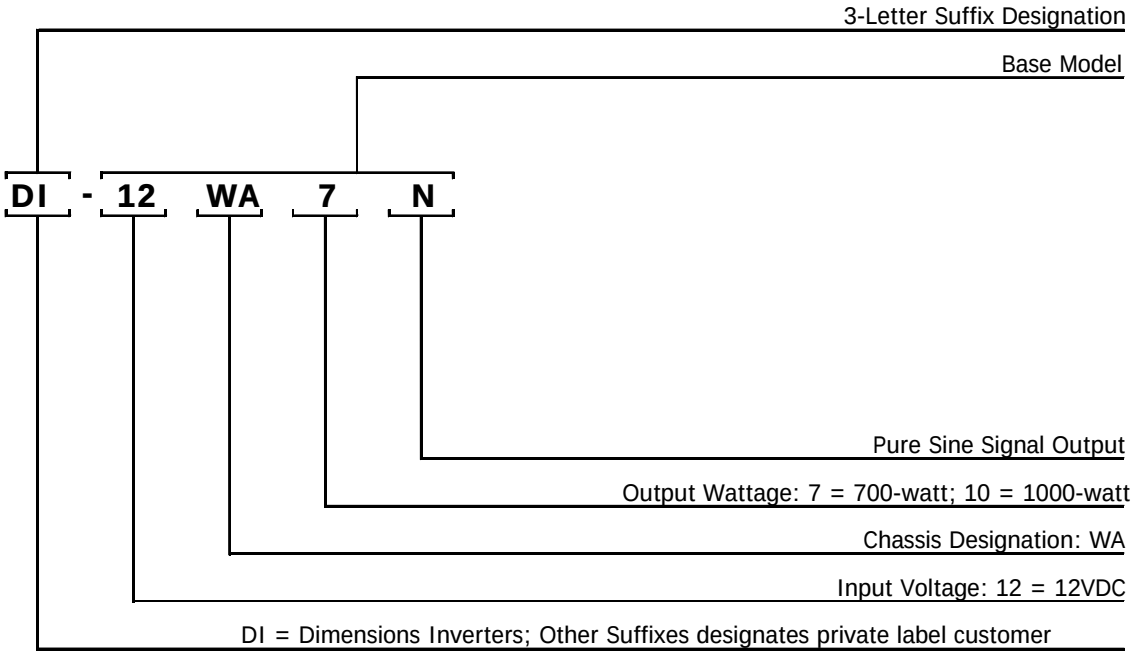
2.1 Other Design Features: Patented construction and cooling methods with thermally controlled cooling fan, local GFCI outlet protection, and Remote "On/Off" switch hookup.

2.2 Unit Protection: Automatic electronic short circuit/overload protection, Automatic over temperature shutdown and Output circuit breakers.

2.3 Battery Protection: Automatic low battery shutdown at 10.5VDC (with in-rush delay.)

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

3. NOMENCLATURE



4. PHYSICAL DESCRIPTION

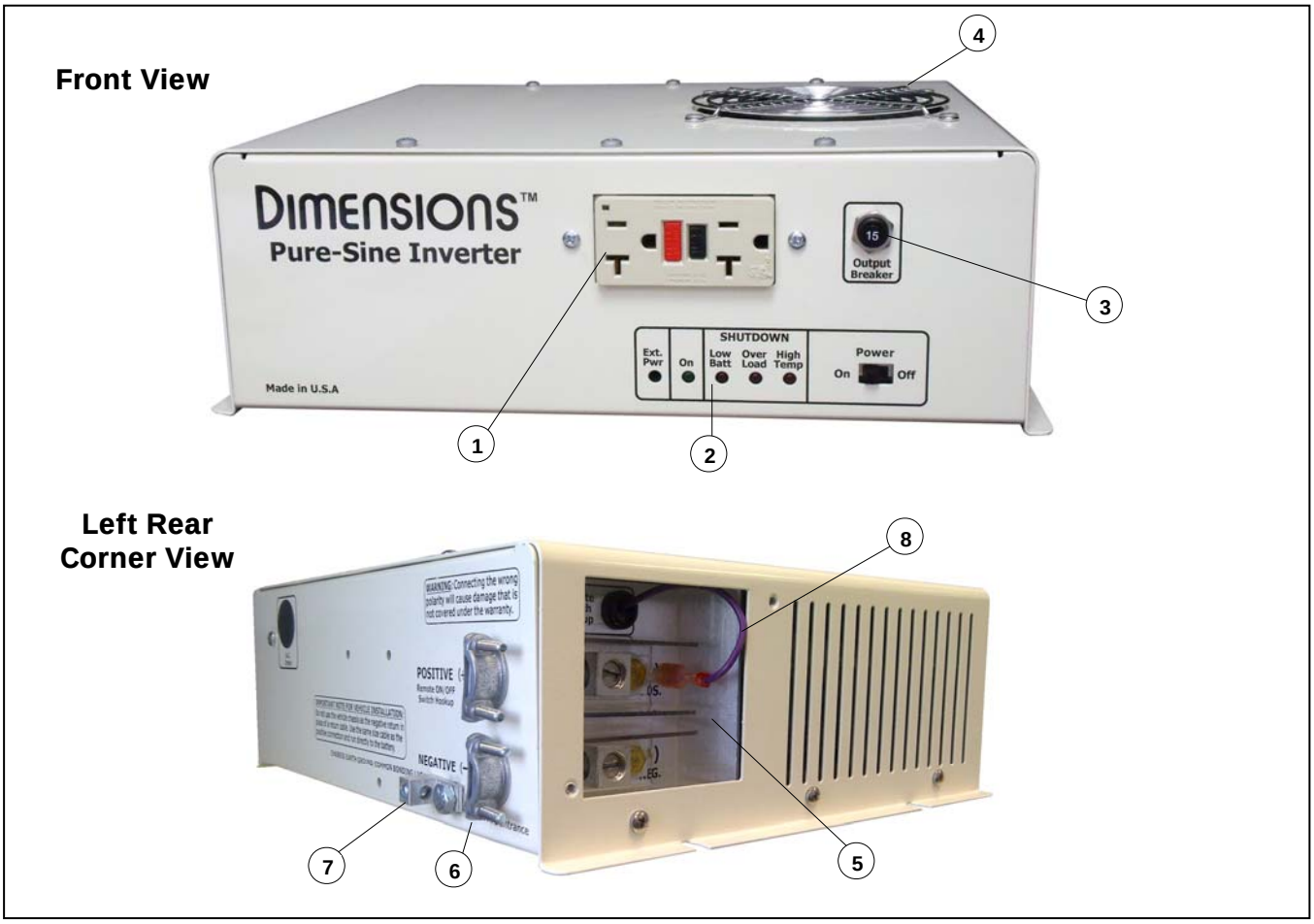


FIGURE 1: Inverter physical description

(1) GFCI Outlets: 120VAC Output.

(2) LED Status Control Panel: Provides inverter status (See figure 2 on page 7)

(3) Output Breaker: Trips to protect the inverter's internal circuitry from shorted AC loads or overload situations.

(4) Cooling Fan: Thermally-controlled fan triggers only when necessary to cool down inside electronics.

(5) DC Field Wiring Compartment: Provides access to the Positive (+) & Negative (-) DC input lugs.

(6) DC input Openings Positive (+) & Negative (-): Allows the DC input cables to reach the DC lugs inside the field wiring compartment.

(7) Bonding Lug: Connects to the ground system.

(8) Remote ON/OFF: Wire through a remote On/Off switch, fuse, and then to the positive side of the battery. Allows for remote control of the inverter.

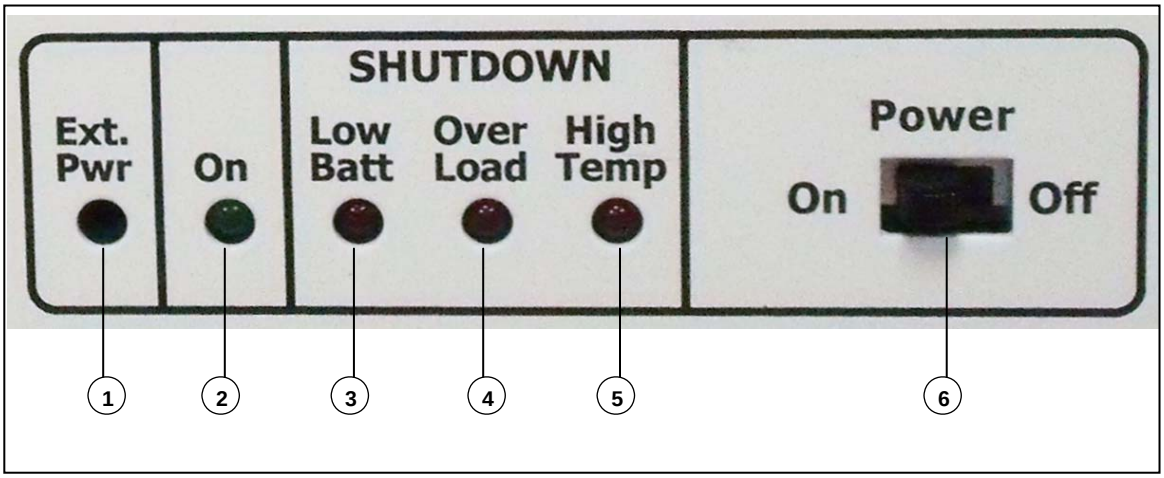


FIGURE 2: Control Panel Description

(1) **External power:** The Green LED indicates that there is an external AC power line applied to the inverter AC input (early models only.)

(2) **Inverter power "On":** The Green LED indicates that the inverter is operating from batteries in inverter mode.

(3) **Low battery:** The Red LED indicates that the inverter is in a low battery voltage condition and will shutdown.

(4) **Overload:** The Red LED indicates that the inverter is in an overload condition and will shutdown.

(5) **High Temperature:** The Red LED indicates that the inverter is operating on a high temperature condition and will shutdown.

(6) **Local On/Off Switch:** Switches the inverter ON/OFF.

5. MOUNTING THE INVERTER

***Note:* Before mounting the inverter system, read the safety instruction section on page 3.**

5.1 Tools for Installation: The following tools are needed for inverter installation: Crimper, Cable ties, Cutter, Drill, # 2 Phillips Screw driver, Tape measure, Wire cutters, Wire Strippers.

5.2 Mounting Recommendations:

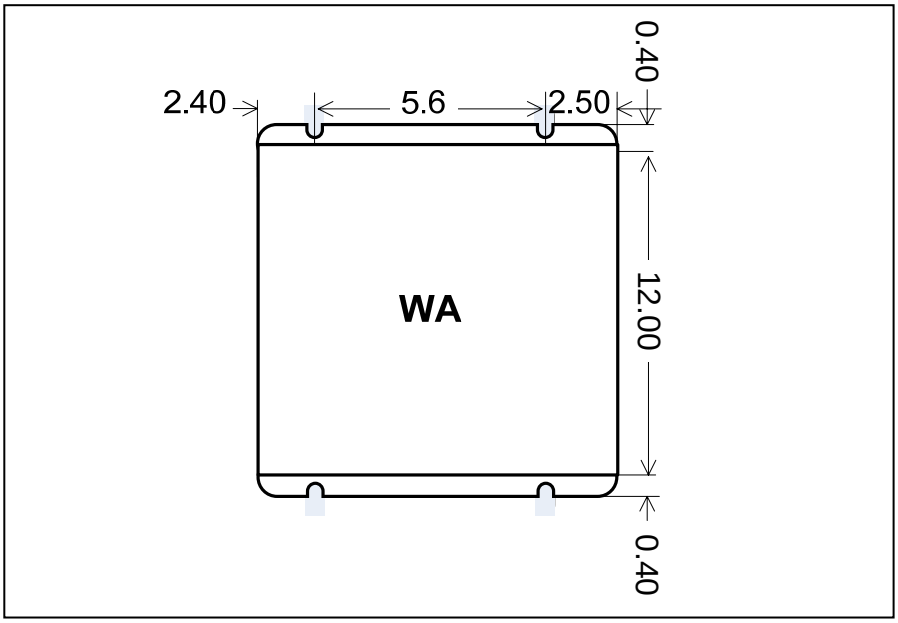


FIGURE 3: Inverter mounting footprints (dimensions are in inches)

***Note:* The inverter mounting location should provide adequate ventilation and clearance to maintain room temperature during operation. At least 1/2 inch of clearance is required on all sides.**

1 Locate a suitable, secure vertical or horizontal mounting surface as close to the batteries as possible without being in the same airtight compartment.
2 If mounting the inverter on a vertical surface, it is recommended that the front control panel be pointing down whenever possible.
3 Locate the mounting holes on the chassis flanges and fasten them using ¼ inch diameter screws to secure the inverter.

6. DC WIRE GAUGE & FUSING

6.1 Inverter Cable: An “inverter cable” kit (positive cable, negative cable and proper fuse) is needed to connect the inverter to a battery bank. An 8-gauge cable is also needed to connect the inverter’s bonding lug to ground.

The inverter cable length and the size of the inverter will determine the cable gauge and the fuse size to use. The maximum inverter cable recommended is 20-ft; it must be fused within 18-in from the positive (+) terminal of the battery.

Cross reference the inverter model, and the estimated cable length in Table I to determine proper cable gauge, and fuse size. The inverter cable kit can be purchased directly from factory. See the accessories section on this manual.

Table I: Cable and Fusing Guide at 5% Voltage Drop at Full Output

Inverter Model	Full Load (Amps DC)	Inverter to Battery Estimated Cable Length in Feet		
		1' to 10'	11' to 15'	16' to 20'
12WA7N	70	6-gauge, 150A fuse	4-gauge, 200A fuse	2-gauge, 250A fuse
12WA10N	100	4-gauge, 200A fuse	2-gauge, 250A fuse	1/0-gauge, 350A fuse

Warning:* *Proper cable gauge must be used to prevent excessive voltage drop at the inverter DC input.

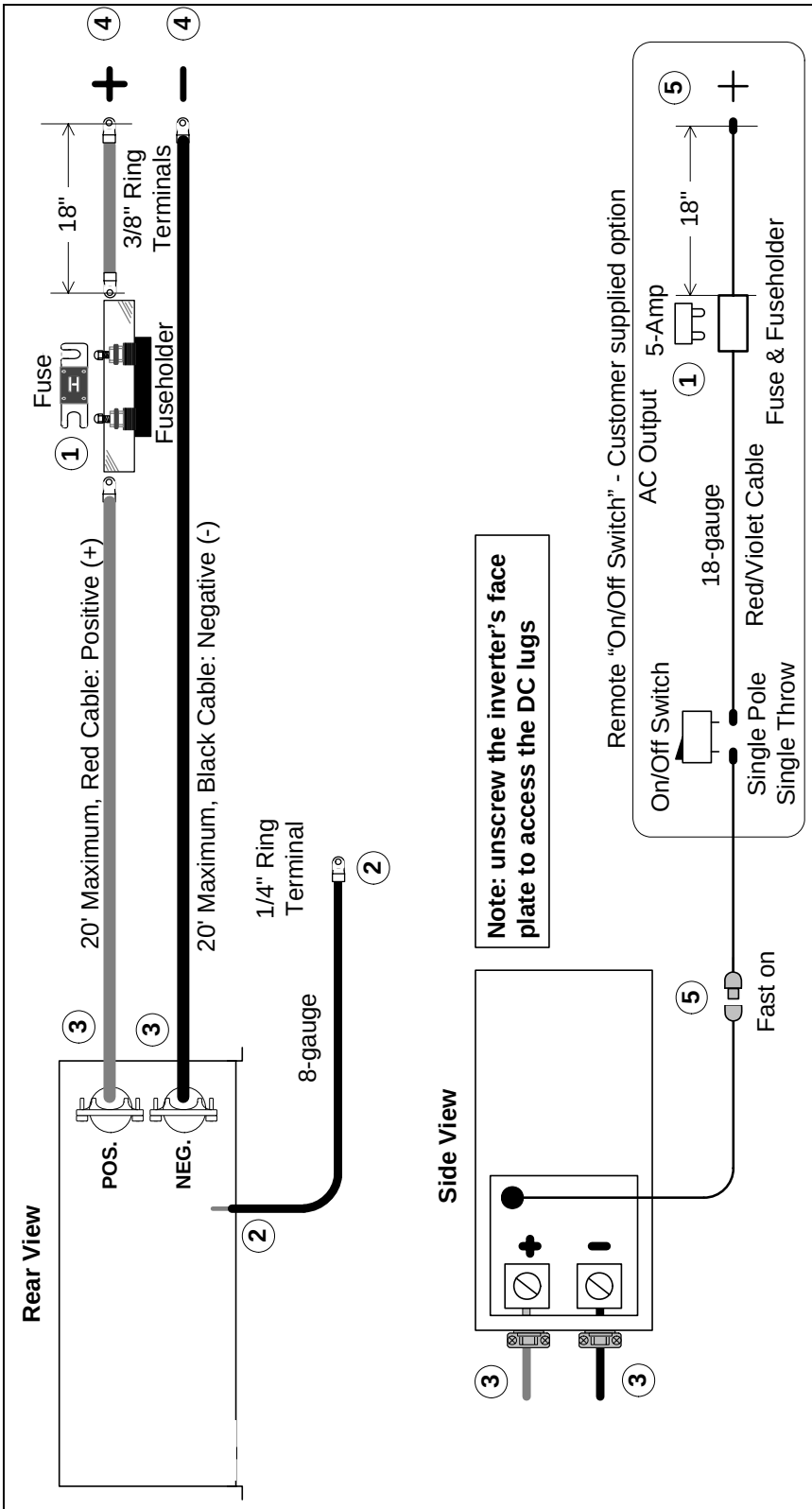
6.2 Cable Recommendations: To furnish an “inverter cable” kit, follow below recommendations:

1 Use stranded copper cables in all cases.
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 Cable gauge recommendations are minimum. 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 on table I above.
4 Keep the cable lengths between battery and inverter as short as possible.
5 Use Bussmann fuse type ANN or ANL and fuseblock # 3576. See the accessories section on this manual.

7. REMOTE “ON/OFF” SWITCH

An optional customer supplied remote “On/Off switch” can be connected to the remote On/Off switch hookup lead located in the DC field wiring compartment. Use an 18-gauge cable, single pole single throw switch and a 5-Amp in-line fuse installed within 18-in from the positive (+) terminal of the battery.

8. DC INPUT WIRING DIAGRAM



Cable Connection Procedure

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. Tight the strain relief to hold the cables in place.
4) Connect the ring terminated ends of the "inverter cable" set directly to the appropriate battery post.
   Make sure the battery polarity is observed.
5) Connect the load side of the "remote On/Off" switch to the cable lead 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) in the fuse-holders. A typical one time spark will occur when this final connection is made. Plug the flat cable to the back of the remote panel for inverter operation.

FIGURE 4: Inverter Cable Assembly and Remote On/Off Switch Assembly Kit

9. OVERALL WIRING DIAGRAM

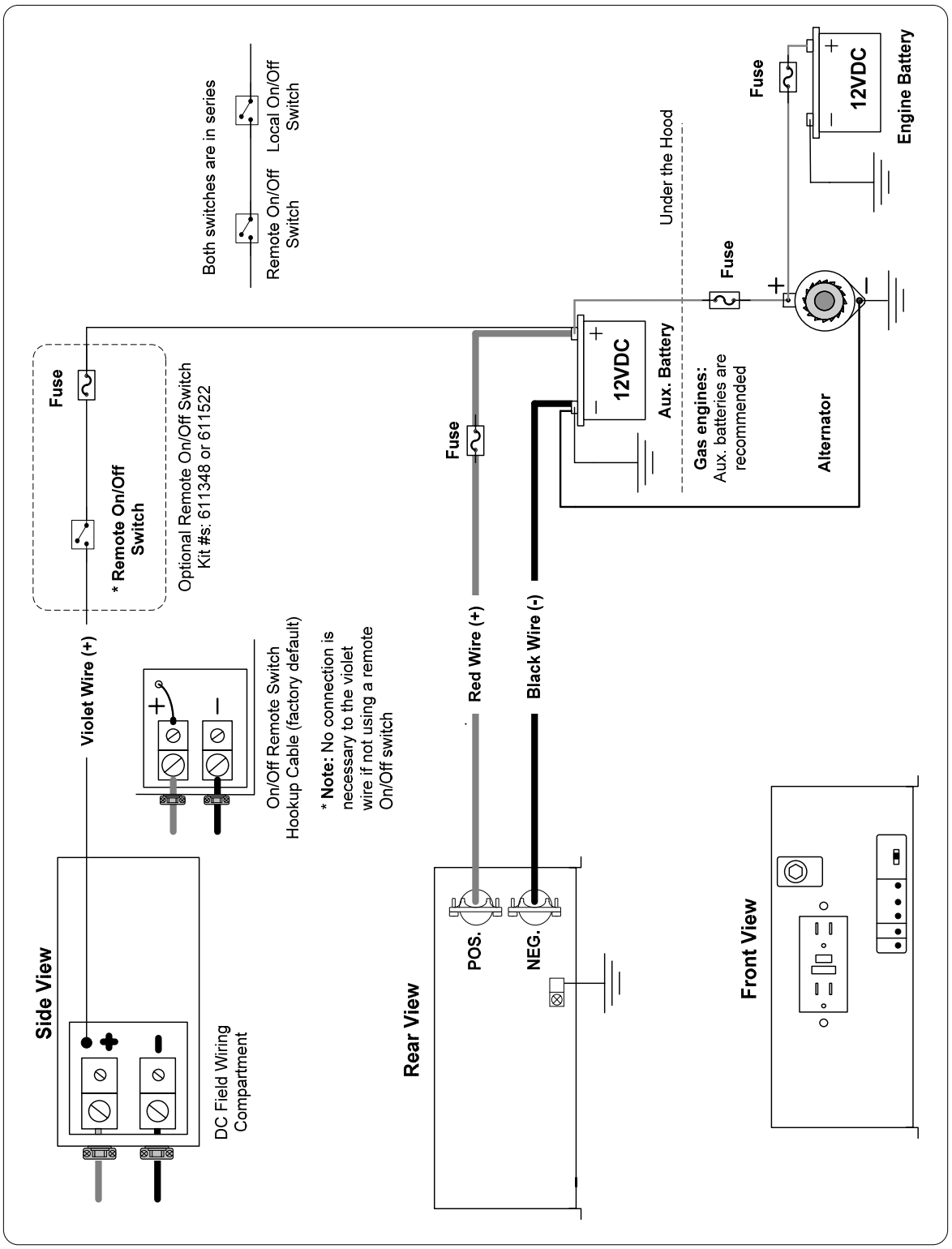


FIGURE 5: Typical AC & DC wiring diagram – Auxiliary battery configuration

10. THEORY OF OPERATION

The “Local On/Off Switch” located on front, or the “Remote On/Off Switch” if used controls the inverter. Both the Local and “Remote On/Off” switches are configured in series. To control the inverter remotely set the “Local On/Off switch” to ON.

Inverter Power Mode: The green LED “On” will come on. The AC power produced by the inverter comes from the energy stored in the battery bank through a sophisticated electronic inversion process. A transformer, a Metal Oxide Silicon Field Effect Transistors (MOSFET), a filter capacitor and a 16-bit, 16 MHz microprocessor control are used to generate clean useful AC power.

***Note:* The signal output waveform produced by the inverter when in “inverter mode” is pure sinusoidal. It has a total harmonic distortion of less than 5%.**

11. TROUBLESHOOTING

Call or e-mail customer service for free consultation during business hours (central time) at: 1-800-553-6418; 1-651-653-7000; fax: 1-888-439-3565; 1-651-653-7600
e-mail: inverterinfo@sensata.com; http://dimensions.sensata.com

1) **No AC output power:**
   1.1) No LEDs on:
   - Check in-line fuse which is located within 18" from the battery's positive post.
   - DC connections to be tight and clean.
   - Battery voltage to be above 9 VDC.
   - Bypass or disconnect remote On/Off switch if used.

   1.2) Green LED "Inverter Power" on: Disconnect all loads and connect a test light to the GFCI output outlet (make sure all breakers are reset)
   - If test light is on: Check your AC connections and loads.
   - If test light is off: Possible bad GFCI or transfer relay

   1.3) Green LED "External Power" on: Repeat 1.2 steps above.
2) **Red LED "Low Battery" on:** The use of battery isolator is not recommended due to excessive voltage drop across terminals
   - Battery voltage to be above 10.5 when vehicle's engine is OFF, and above 13 VDC when it is ON.
   - Check for proper DC wire gage (see wire gauge & fusing section)
3) **Red LED "Overload" on:** Unplug all loads, and reset the inverter On/Off:
   - If the overload condition persist, possible bad inverter.
   - Overload conditions clears, check for short circuits or check load size versus inverter output wattage size.
4) **Red LED "High Temp." on:** Let the inverter to cool down to 40°C (104°F)

12. ACCESSORIES

ADI Part Number	Item Description
430011	Fuse 100A, ANN-250
430052	Fuse 150A, ANN-150
430054	Fuse 350A, ANN-350
430010	Fuse 200A, ANN-200
431021	Fuse holder with cover
611096	Inverter cable assembly 10ft, 4-gauge, 200A fuse and fuse holder
611089	Inverter cable assembly 15ft, 4-gauge, 200A fuse and fuse holder
611103	Inverter cable assembly 10ft, 6-gauge, 150A fuse and fuse holder
611034	Inverter cable assembly 15ft, 2-gauge, 250A fuse and fuse holder
611022	Inverter cable assembly 20ft, 2-gauge, 250A fuse and fuse holder
611100	Inverter cable assembly 20ft, 1/0-gauge, 350A fuse and fuse holder
611348	Remote lighted rocker switch kit with fuse and 14ft 18-gauge cable (dash mount)
611522	Remote switch panel kit with fuse and 14ft 18-gauge cable (electrical box mount)
140004	Battery box single group 31
250018	Ventilation assembly (battery box) 42in long

13. APPENDIX

Battery Specifications Chart

Group Number	Voltage Volts DC	Capacity Amp-Hour	Dimensions in inches			Weight LBS
			L	W	H	
GC2	6	220	10 3/8	7 3/16	10 5/8	70
L16	6	350	11 3/4	7 1/8	16 3/4	125
27/31	12	95	13	6 13/16	9 7/16	70
4D	12	180	20 3/4	8 3/4	9 7/8	140
8D	12	225	20 3/4	11 1/8	9 7/8	170

Note: ***The use of deep-cycle batteries is strongly recommended on inverter applications; deep discharge cycles typical with inverter applications can shorten the life of other type of batteries.***

Sensata Technologies
Power Controls White Bear
4467 White Bear Pkwy,
St. Paul, MN 55110-7626
Tel: 800-553-6418
Fax: 651-653-7600
inverterinfo@sensata.com
http://dimensions.sensata.com

Limited Warranty Terms & Conditions

SHIPPING TERMS: F.O.B. St. Paul Minnesota. Freight prepaid and billed, subject to prior credit approval.

MINIMUM ORDER: $50.00 Net Price

LOSS OR DAMAGE: Loss or damage in transit are the responsibility of the carrier. Any claim should be filed with the delivering transport company. Invoice, Bill of Lading and Delivery receipt with damage noted therein must accompany any claims for freight damage. Claims for shortage and lost shipments must be made in writing to Sensata Technologies, Power Controls White Bear, St. Paul, MN within 10 days of date of shipment. Claims not reported within this time frame will not be honored.

PRICES: Prices are subject to change without notice. All orders are subject to acceptance at the factory. We reserve the right to invoice prices in effect at time of shipment.

TERMS: Net 30 days with approved credit, credit card or C.O.D.

RETURN GOODS POLICY:
• No returned materials will be accepted without an accompanying Returned Materials Authorization Number (RMA) from the factory.
• Credit will be issued for returned goods to the original purchaser within 60 days of purchase, provided the inverter is returned to Sensata unused and not mounted. The amount of credit will be issued at Sensata's discretion based on the condition of the product.
• Customer must be in good standing with Sensata Technologies.
• Inverters that are discontinued, high-voltage (over 24vdc), special-order or used are excluded and will not be eligible for credit. Non-inverter items such as cable assemblies, fuses and fuse holders, will not be eligible for credit
• Support components supplied by Sensata vendors will be covered under that manufacturer's credit return policy.
• Customer pays return freight.

PLEASE SHIP AUTHORIZED RETURNS TO:
Sensata Technologies | Power Controls White Bear | 4467 White Bear Parkway | St. Paul, MN 55110
Return Freight Prepaid

LIMITED WARRANTY:
Sensata Technologies extends the following warranty to the original purchaser of those goods subject to the qualifications indicated. Sensata warrants to the original purchaser for use that the goods or any component thereof manufactured by Sensata will be free from defects in workmanship from the date of purchase for the period listed on the product label, provided such goods are installed, maintained and used in accordance with Sensata and the original manufacturer's written instructions. Damages caused by the misuse, undue care or obvious wear through use will not be covered by this warranty.

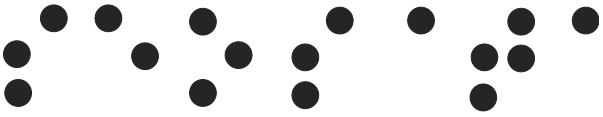
Components not manufactured by Sensata, but used within the assembly provided by Sensata, are subject to the warranty period as specified by the individual manufacturer of said component, provided such goods are installed, maintained and used in accordance with Sensata and the manufacturer's written instructions.

Sensata's sole liability and the Purchaser's sole remedy for a failure of goods under this limited warranty and for any and all claims arising out of the purchase and use of the goods, shall be limited to the repair or replacement of the goods that do not conform to this warranty.

To obtain repair or replacement service under the limited warranty, the purchaser must contact the factory for a Return Material Authorization (RMA). Once obtained, send the Return Material Authorization Number along with the defective part or goods to:
Sensata Technologies, Power Controls White Bear, 4467 White Bear Parkway, St. Paul, MN 55110. Return Freight Prepaid.
THERE ARE NO EXPRESS WARRANTIES COVERING THESE GOODS OTHER THAN AS SET FORTH ABOVE. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO ONE YEAR FROM DATE OF PURCHASE.

SENSATA TECHNOLOGIES ASSUMES NO LIABILITY IN CONNECTION WITH THE INSTALLATION OR USE OF THE PRODUCT, EXCEPT AS STATED IN THIS LIMITED WARRANTY. SENSATA TECHNOLOGIES WILL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

WARNING: **LIMITATIONS ON USE:** DIMENSIONS® brand products are not intended for use in connection with Life Support Systems and for Avionic use. Sensata Technologies makes no warranty or representation in connection with their products for such uses.



Sensata
Technologies

4467 White Bear Parkway
St. Paul, MN 55110
Phone: 651-653-7000, 800-553-6418
Fax: 651-653-7600, 888-439-3565
inverterinfo@sensata.com
www.dimensions.sensata.com

Form # 122175 03/25/2013

Printed in U.S.A.