Sensata Technologies

121501B

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ISO 9001:2008 Certified Company

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Dimensions
DC to AC Power Inverters

OWNERS MANUAL for Models:

24/5600DN

Including Options: B1, C, R, T

Form 121501

OWNERS MANUAL
FOR DIMENSIONS INVERTERS

Model 24/5600DN

Including Options: B1, C, R, T

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1. GENERAL

1.01 Dimensions inverters have been designed and manufactured for many user applications and long life. They utilize engineered construction methods and high technology electronic parts and circuitry.

1.02 *CAUTION:* Inverters produce hazardous voltages, to avoid risk of harm or fire the unit must be properly installed. There are no user serviceable parts inside, do not remove the cover.

CAUTION: The inverter should not be mounted in a location that may be exposed to rain or spray.

CAUTION: The inverter should not be installed in a zero clearance enclosure.

CAUTION: Damage to the inverter will occur if correct polarity is not observed when installing the DC input cables.

CAUTION: Damage to the inverter will occur if an external AC power source is applied to the inverter's AC output or its hardwire output.

CAUTION: The inverter contains a circuit breaker and capacitor that may produce a spark. Do not mount in a confined battery or gas compartment.

CAUTION: Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during operation. There is a risk of acid exposure. There is also a risk of high current discharge from shorting the battery that can cause fire and explosion.

CAUTION: Be sure the inverter and, if used, the external AC input circuit breaker or fuse are turned"OFF" during installation.

2. DESCRIPTION

2.01 The inverter converts 24 VDC to 120/240 VAC, 60 HZ, having a pure sine wave form.

2.02 The inverter has internal protection against output short circuit, output overload and high temperature conditions. Also, there is a thermally controlled cooling fan.

2.03 The inverter is designed to operate any 120 VAC, 240 VAC, or 120/240 VAC 60 HZ single phase appliance, equipment or tool within its power ratings.

2.04 The battery charger ("B1" option) has sophisticated, patented recharge detection circuitry to ensure complete battery charging. It is fully automatic and regulated, and will charge at the rate listed.

Inverter Rating

Inverter	Input		Output	
Model	(VDC)	(ADC)	(VAC)	(Watts)
24/5600	25.2	280	120/240	5600

3. INSTALLATION

3.01 The following instructions should be thoroughly read and understood before installation.

3.02 *CAUTION:* Inverters produce hazardous voltages, to avoid risk of harm or fire the unit must be properly installed.

CAUTION: Damage to the inverter will occur if correct polarity is not observed when installing the DC input cables.

CAUTION: Damage to the inverter will occur if

an external AC power source is applied to the inverter's AC outlet or its hardwire output.

CAUTION: Be sure both the inverter and the external AC circuit breaker or fuse are turned "OFF" during installation.

NOTE: All wiring must follow the National Electric Code, Provincial or other codes in effect at the time of installation, regardless of suggestions in this manual. All wires should be copper conductors.

3.03 Mounting

3.03.1 Locate a suitable, secure vertical or horizontal mounting surface as close to the battery as possible without being in the same air tight compartment. The maximum recommended distance between the mounting location and the battery is 20 feet.

CAUTION: If mounting the inverter on a vertical surface, mount with the front control panel pointing down.

3.03.2 The 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.

3.03.3 Secure the unit with 1/4 inch screws or bolts in the mounting slots on the flanges of the chassis.

3.04 Chassis Bonding Lug - FIG. 1

3.04.1 Connect a #8 gauge or greater copper wire between the bonding lug on the inverter and the earth grounding system or the vehicle chassis.

3.05 Battery Cabling - FIG. 1

3.05.1 *CAUTION:* Assure that hydrogen gas does not accumulate near the battery by keeping the area well ventilated. A spark may result when connecting the final battery wiring due to the initial charging of the internal input capacitor.

3.05.2 Use stranded copper wire between the battery and inverter as indicated. A line fuse must be installed between the battery and the inverter. U.L. requires that the fuse be within 18 inches of the battery.

DC Input Wire Lengths (maximum) and Fusing Guide

	Distance(feet)			
Model	1-10	11-15	16-20	Fuse
24/5600	3/0 ga	3/0 ga	4/0 ga	500-600A

3.05.3 NOTE: Using smaller input cable or longer length will greatly degrade the inverter peak performance.

IMPORTANT NOTE FOR VEHICLE INSTALLATION: Do not use the vehicle chassis as the negative return in place of a return cable. Use the same size cable as the positive connection and run directly to the battery/alternator.

3.05.4 Install the wires at the battery, inverter and then fuse holder. Make sure that good, clean connections are made. Use care not to touch the positive and negative wires together. This will result in a violent spark and could result in exploding batteries and fire.

3.05.5 The battery input terminals are located in the wiring compartment. A mounting spark may result when connecting the battery wire, due to an initial charging of the internal input capacitor.

3.05.6 *CAUTION:* Connecting the inverter incorrectly to the battery will cause damage that is not covered under warranty.

3.06 Remote Switch for Inverter Operation - Fig. 1

3.06.1 All material used for the remote switch should be U.L. listed and installed per low voltage, Class 2, wiring code. The remote switch hookup can not provide additional current to operate an indicating lamp.

3.06.2 If the "R" option is included, then connect the cable from the remote panel/status lights with the mating connector extending from the inverter. Extention cable is available if necessary.

3.06.3 If the "R" option is not included, a

remote switch may be connected to the violet wire marked "Remote Switch Hookup" in the wiring compartment. The violet wire is connected to the load terminal of the switch. Connect the line terminal of the remote switch to fused, +24 VDC. The cable clamp strain relief should be used to secure the field wires.

3.06.4 The switch should be mounted at a convenient location in a listed outlet box with approved strain relief.

3.06.5 If the remote switch is not used, the inverter can be turned “Off” or “On” with the switch on the inverter.

3.07 Remote Temperature Sense ("B1" option)

3.07.1 ***CAUTION:*** Failure to connect the remote temperature sense probe correctly will result in high output voltage that will cause improper battery charging.

3.07.2 A 10 foot long cable with temperature sense probe is provided with the unit. This allows the unit to know the exact battery temperature for correct operation of the temperature compensated circuitry. This changes the output voltage as required by the battery at a given temperature.

3.07.3 Install the probe end on a NEGATIVE battery terminal post.

3.08 120 VAC Output

3.08.1 *CAUTION:* Do not connect another source of AC power directly to the output of the inverter. This will result in damage to the inverter that is not covered under warranty!

3.08.2 The 120 VAC output of the inverter is provided at the GFCI receptacle outlet on the inverter, (not with the "C" option).

3.09 120/240 VAC Dual Output

3.09.1 The output is presented behind the wiring compartment panel for direct hardwire wire leads. The two black wires are hot, the white wire is neutral and the green wire is ground. The cable strain relief should be used to secure the field wires.

3.09.2 GFCI outlets should be installed at all appropriate locations per NEC 551. The GFCI outlet should be Hubbell GFR5352XX (20A) or GFR5252XX (15A).

3.09.3 The remote AC outlets should be mounted at a convenient location in a listed outlet box with approved strain relief.

3.10 120/240 VAC Input (T option)

3.10.1 120/240 VAC 60HZ power from the electric utility or generator can be connected to the inverter with hardwire connections at the "AC Input" wire leads provided in the hardwire compartment. The two black wires are hot, the white wire is neutral and the green wire is ground. The cable clamp strain relief should be used to secure the field wires.

3.10.2 The input circuit should have 30 amp circuit protection from the distribution panel.

3.10.3 If provided with the “T” option, when external 120/240 VAC is supplied, the internal transfer switch is automatically activated, the inverter is turned “Off”, and the inverter’s loads will operate from external AC.

3.11 Battery Charger (B1 Option) 240 VAC, 60Hz Input

3.11.1 Units having the "B1" option require a separate 240 VAC, 30 amp input circuit. This activates the battery charger and also turns the inverter "off".

3.11.2 This circuit is connected to the inverter with hardwire connections at the "AC Input - Battery Charger" in the hardwire compartment. The black wires are hot, the white wire is neutral, and the green wire is ground.

3.11.3 ***NOTE:*** This circuit must be the same phase and fed from the same source as the transfer input circuit.

3.11.4 ***NOTE:*** Both the battery charger input circuit and the transfer circuit must be powered for the battery charger to operate.

3.11.5 The battery charger input voltage of 240 VAC should have 30 amp circuit protection from the distribution panel.

Battery Charger Rating

Inverter Model	Input (Amps AC @ 240VAC)	Output Amps DC
24/5600	Up to 30	Up to 150

4. START UP / OPERATION

4.01 The battery charger will operate anytime that there is external AC power and the battery is not 100% charged. The status lights will indicate that there is external power and the battery's condition.

4.02 The switch on the right side of the unit must be set for the correct type of battery attached to the unit as shown in the Battery Type Selection Table.

BATTERY TYPE SELECTION

SETTING	BATTERY TYPE
A	Vented Nickel-Cadium 10 cells
B	Vented Lead-Acid (Antimony) Flooded Electrolyte
C	Sealed Lead-Acid Absorbed or Vented Nickel-Cadium 9 cell
D	Sealed Lead-Acid Gelled

NOTE: Used batteries should be operated one setting below the setting determined from the Battery Type Selection Table for 5 charge cycles. Example: Operate a used Vented Nickel-Cadium 10 cell on setting B initially instead of A.

4.03 To operate the inverter, turn the switch to "ON". Assure that the output breakers are reset. If the remote switch is used, the inverter is turned "On" or "Off" by the remote switch.

4.04 Models having the "C" option have an adjustment on the right side of the inverter marked "Power Conservation Adjustment". The factory setting for the adjustment potentiometer (located inside the slot on the right side) is with it's arrow pointing at 6 o'clock (pointing down), which gives a co-inverter to main inverter switchover setting of 50 watts. Switch on or plug in all "always on" AC loads. The red light appearing through the slot should be off, indicating an "always on" load of less than 50 watts and no adjustment is needed. The red light on indicates an adjustment is needed. Adjust the potentiometer 1/4 turn clockwise to the 9 o'clock position. Wait 10 seconds for the light to go off, if it doesn't, turn the potentoimeter fully clockwise. Wait 10 more seconds, if the light still doesn't go off, the "always on" load is greater than 80 watts and the main inverter will be on all the time.

4.05 The switch labeled "Battery Size" should be set to the correct setting based on the total amp hour capacity of the batteries attached to the inverter. Use the following table to determine correct setting.

BATTERY CAPACITY SELECTOR

SETTING	AMP HOUR CAPACITY
A	Over 600
B	600 - 400
C	400 - 200
D	Less than 200

5. TROUBLESHOOTING

5.01 Sensata offers free phone consultation concerning installation or troubleshooting. Call the Customer Service Department at:
1-800-553-6418 or 651-653-7000
fax: 1-651-653-7600
e-mail: inverterinfo@sensata.com

5.02 If the inverter fails to operate, use the following troubleshooting procedure.

5.02.1 Connect a 100 watt light bulb to the inverter output.

5.02.2 Make sure that the inverter is turned "On", and the circuit breakers are reset.

5.02.3 Check the connection to the remote switch, if used. +24VDC input **must** be present at the violet wire for the unit to operate. If not, check any fuses in the remote switch circuit.

5.02.4 Observe the fault indicating lights on the front of the inverter.

a) The Low input voltage light indicates a low battery condition. Switch the inverter "Off" for 5 seconds, then "On" again. The light coming on again indicates a fault in the battery wiring, battery capacity and voltage or the line fuse.

b) The Overload light indicates an output wiring short circuit or a load that is too large for the power rating of the inverter. Switch the inverter "Off", remove the short circuit or excessive load from the output, then switch the inverter back "On".

c) The High temperature light indicates the inverter has overheated. The unit will automatically turn back on when it has cooled to 40^0 C. Verify that the inverter is not in a closed compartment and that the fan is not blocked.

5.03 When the battery charger fails to operate correctly check the inverter troubleshooting procedure in 5.02, assure that the remote temperature probe is installed correctly, then observe the front panel lights:

a) The external power light should be lit, if not, verify that the external power circuit is providing 120/ 240 VAC, 60HZ power to the unit. Check all external power wiring and external circuit breakers or fuses.

b) The green Timer Complete light indicates the unit's battery charger was unable to completely charge the batteries during the 12 hour charge cycle. One or more of the following conditions can cause this condition.

1) The charger was unable to detect the 80% charge level point during the 12 hour cycle due to a defective battery.

2) The battery's voltage dropped below 25.2 volts while the charger was attempting to detect the 80% charge level. A battery with a shorted cell or incorrect acid density can cause this condition.

3) The batteries have more Ampere Hours of capacity than the charger can recharge in one 12 hour cycle.

BATTERY CHARGER CAPACITIES

24/5600	1000AH

4) More than 20 Amps of DC load current was drawn directly from the batteries during the charge cycle.

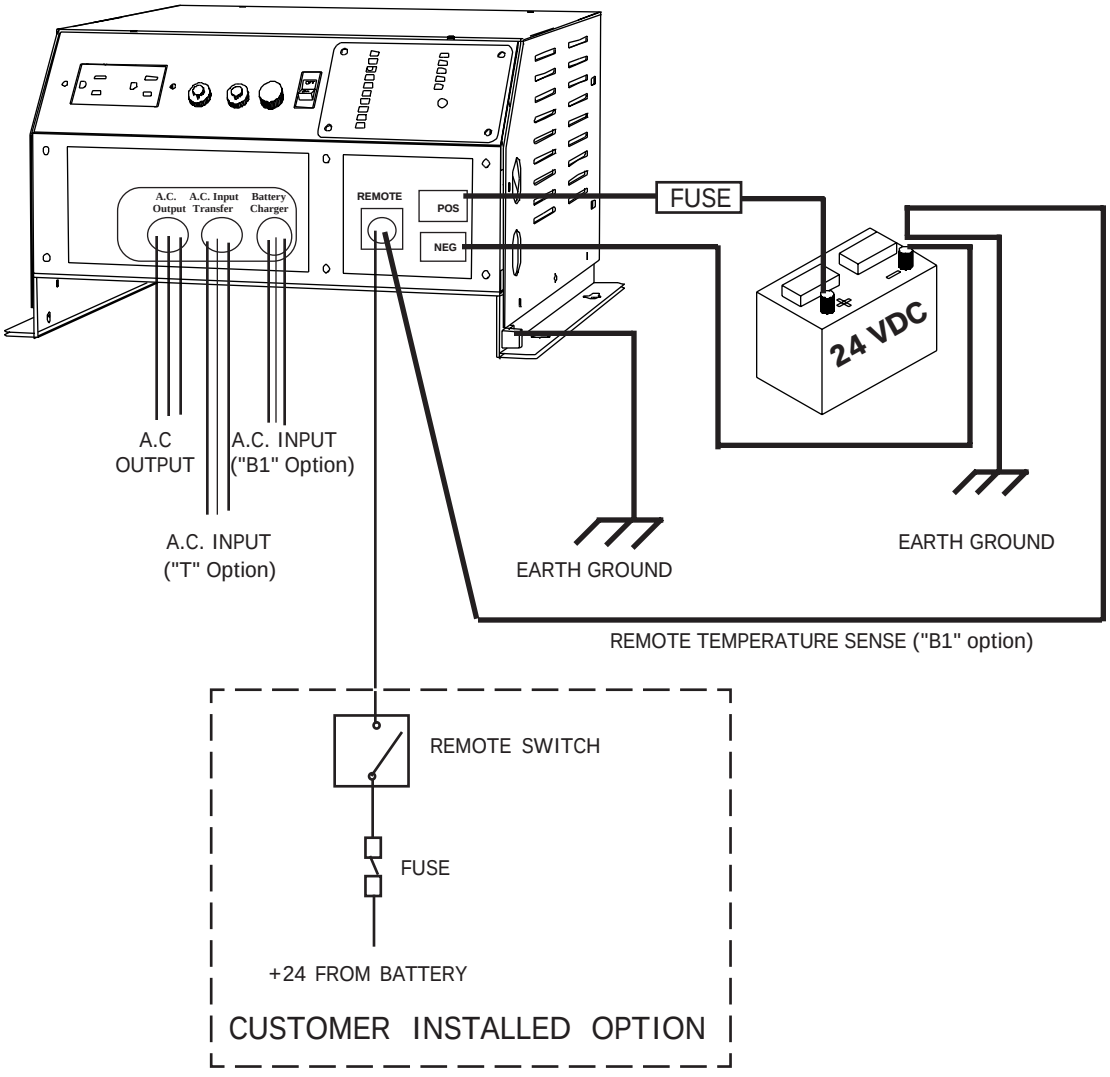
5) AC power loss (brown out) in the external AC input that limited the amount of AC power available to the battery charger.

5.04 A new charge cycle may correct the Timer Complete condition if the cause seems to be conditions 3, 4, or 5. The new charge cycle can be started by disconnecting both external AC inputs for 5 seconds then reconnecting them.

5.05 Call Airpax Dimensions, Inc. for technical assistance and/or a Return Authorization Number if the above steps are completed and the inverter or battery charger will not operate satisfactorily.

FIG. 1 INSTALLATION WIRING

WARNING: CONNECTING THE BATTERY WITH THE WRONG POLARITY TO THE INVERTER WILL CAUSE DAMAGE THAT IS NOT COVERED UNDER THE WARRANTY.



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, 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 Dimensions discretion based on the condition of the product.

• Customer must be in good standing with Sensata.

• 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 / 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.

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, 4467 White Bear Parkway, St. Paul, MN 55110, 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 ASSUMES NO LIABILITY IN CONNECTION WITH THE INSTALLATION OR USE OF THE PRODUCT, EXCEPT AS STATED IN THIS LIMITED WARRANTY. DIMENSIONS WILL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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