

ISO 9001:2000 Certified Company



Dimensions

DC to AC Power Inverters

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

Including Options: A, B1, D, R, T, T1

OWNERS MANUAL FOR DIMENSIONS INVERTERS

Model 12/1800N

Model 12/2400N

Model 12/3000N

Model 12/3600N

Including Options: A, B1, D, R, T

Table of Contents

	<u>Page</u>
1. General	2
2. Description	2
3. Installation	3
4. Start Up/Operation. . .	5
5. Troubleshooting.	6
6. Installation Figure 1 . .	7

1. GENERAL

1.01 Dimensions inverters have been designed and manufactured for many user applications and long life. They utilize patented 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

Inverter Rating

<u>Inverter</u>	<u>Input</u>		<u>Output</u>	
<u>Model</u>	(VDC)	(ADC)	(VAC)	(Watts)
12/1800N	12.6	Up to 180	120	1800
12/2400N	12.6	Up to 240	120	2400
12/3000N	12.6	Up to 300	120	3000
12/3600N	12.6	Up to 360	120	3600

2.01 The inverter converts 12 VDC to 120 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, 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 is temperature compensated.

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 the inverter's circuit breaker or fuse (if needed) 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

Model	Distance(feet)		
	1-10	11-15	16-20
12/1800N	2 ga	1 ga	1/0 ga
12/2400N	1/0 ga	2/0 ga	3/0 ga
12/3000N	2/0 ga	3/0 ga	4/0 ga
12/3600N	4/0 ga	4/0 ga	N/R
Fuse: 250A 300A 350A 400A 450A 500-600A			
WGA: 2 1 1/0 2/0 3/0 4/0			

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.

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.

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. Extension cable is available if necessary.

3.06.03 If the "R" option is not included, connect a single pole single throw "On/Off" switch using an 18-gauge wire to the "Remote Switch Hookup" violet wire lead located in the DC field wiring compartment. Disconnect the violet wire from the battery positive input terminal and connect it to the load side of the remote switch. The line side of the switch must be connected to a +12VDC. Install a 5 Amp in-line fuse within 18" from the +12VDC source. 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 NOTE: A remote switch, if installed, will operate **only if** the local On/Off switch on the face of the inverter is turned "On". You may use several switches or relays in parallel in lieu of one remote switch.

3.07 Remote Temperature Sense ("B1" option)

3.07.1 A gray 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 charger temperature compensation circuitry.

3.07.2 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.

3.08.3 The output is also presented behind the wiring compartment panel using direct hardwire wire leads. The black wire is 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.

3.08.4 The hardwire A.C. output is not ground fault circuit interrupt, (GFCI) protected unless the inverter has option "A". GFCI outlets should be installed at all appropriate locations per NEC 551. The GFCI outlet should be Hubbell GFR5352XX (20A) or GFR5252XX (15A).

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

3.09 120/240 VAC Dual Output (D Option)

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.

3.10 120 VAC Input (T, T1, B1 options)

3.10.1 120 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 black wire is 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 (50 amp. for T1 option).

3.10.3 When external 120 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 input.

3.10.4 Units having the "B1" option require a separate 120 VAC, 20 amp input circuit. The "T" or "T1" option circuit activates the internal transfer switch supplying utility or generator power to the inverter's output loads, and turns "Off" the inverter. The "B1" option input circuit activates the battery charger. Both the transfer switch input and the battery charger input must be connected to the same phase AC power source.

Charger Rating

Model	Input 120VAC, 60Hz	Output
12/1800N	Up to 15 Amp AC	85 Amp DC
12/3000N	Up to 20 Amp AC	105 Amp DC

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 If the unit has the "B1" option, there are two switches on the right side that should be adjusted.

4.03 The switch labeled "Battery Type" should be set to the correct setting based on the composition of the batteries attached to the inverter. Use the following table to determine the correct setting.

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 put through 5 charge cycles with the switch set one position lower (to the right) than desired. Example: Start a used vented-lead acid battery on the "C" setting.

4.04 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

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

5. TROUBLESHOOTING

5.01 Dimensions offers free phone consultation concerning installation or troubleshooting. Call the Customer Service Department at:

1-800-553-6418 or 1-651-653-7000.

fax: 1-651-653-7600

e-mail: inverterinfo@sensata.net

5.02 If the inverter fails to operate correctly, 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. +12 VDC **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° C (104° F). Verify that the inverter is not in a closed compartment and that the fan is not blocked.

5.03 For units having the B1 option, when the battery charger fails to operate correctly check the inverter troubleshooting procedure in 5.02, verify that the remote temperature sense probe is installed correctly on the battery, then observe the

front panel lights:

a) The External power light should be lit, the Power supply or the Battery charger light should be lit. If not, verify that the external power circuit is providing 120 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 battery(s) during the 12 hour charge cycle. One or more of the following conditions can cause this condition.

1) Verify that the two switch settings ("BATTERY TYPE" and "BATTERY BANK SIZE") are correctly set.

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

3) The battery's voltage dropped below 12.6 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.

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 1, 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.

