



MAXX SST™
COMPACT POWER INVERTER
INSTRUCTION MANUAL



Catalog Number VEC054D

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SAVE THIS MANUAL FOR FUTURE REFERENCE.

Cat. # VEC054D
September 2007

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⚠ GENERAL SAFETY WARNINGS AND INSTRUCTIONS FOR ALL APPLIANCES

READ ALL INSTRUCTIONS

⚠ **WARNING:** Read all instructions before operating product. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.

- **AVOID DANGEROUS ENVIRONMENTS** Don't use appliances in damp or wet locations. Don't use appliances in the rain.
- **KEEP CHILDREN AWAY.** All visitors should be kept at a distance from work area.
- **STORE IDLE APPLIANCES INDOORS.** When not in use, appliances should be stored indoors in dry, and high or locked-up place – out of reach of children.
- **DON'T FORCE APPLIANCE.** It will do the job better and with less likelihood of a risk of injury at the rate for which it was designed.
- **USE RIGHT APPLIANCE.** Do not use the appliance for any job except that for which it is intended.
- **DRESS PROPERLY.** Do not wear loose clothing or jewelry. They can be caught in moving parts. Rubber gloves and substantial, non-skid footwear are recommended when working outdoors. Wear protective hair covering to contain long hair.
- **USE SAFETY GLASSES AND OTHER SAFETY EQUIPMENT.** Use safety goggles or safety glasses with side shields, complying with applicable safety standards and, when needed, a face shield. Also use face or dust mask if operation is dusty. This applies to all persons in the work area. Also use a hard hat, hearing protection, gloves, safety shoes and dust collection systems when specified or required. Safety glasses or the like are available at extra cost at your local dealer or Black & Decker Service Center.
- **DON'T ABUSE CORD.** Never carry appliance by cord or yank it to disconnect from receptacle. Keep cord from heat, oil, and sharp edges.
- **DON'T OVERREACH.** Keep proper footing and balance at all times.
- **DISCONNECT APPLIANCES.** Disconnect the appliance from the power supply when not in use, before servicing, and when changing accessories such as blades and the like.
- **AVOID UNINTENTIONAL STARTING.** Don't carry plugged-in appliance with finger on switch. Be sure switch is off when plugging in.
- **PROPER COOLING** is essential when operating the inverter. Do not place the unit near the vehicle's heat vent or in direct sunlight.
- **ELECTRICAL FAULT CIRCUIT INTERRUPTOR** protection should be provided on the circuits or outlets to be used. Receptacles are available having built in electrical fault circuit interruptor protection and may be used for this measure of safety.
- **USE OF ACCESSORIES AND ATTACHMENTS.** The use of any accessory or attachment not recommended for use with this appliance could be hazardous. Note: Refer to the accessory section of this manual for further details.
- **STAY ALERT.** Watch what you are doing. Use common sense. Do not operate tool when you are tired.
- **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this instruction manual. Have defective switches replaced by authorized service center. Do not use tool if switch does not turn it on and off.
- **DO NOT OPERATE** portable electric tools near flammable liquids or in gaseous or explosive atmospheres. Motors in these tools normally spark, and the sparks might ignite fumes.
- **OUTDOOR USE EXTENSION CORDS.** When tool is used outdoors, use only extension cords intended for use outdoors and so marked.

Volts	Minimum Gage for Cord Sets				
	Total Length of Cord in Feet				
120V	0-25	26-50	51-100	101-150	
	(0-7,6m)	(7,6-15,2m)	(15,2-30,4m)	(30,4-45,7m)	
240V	0-50	51-100	101-200	201-300	
	(0-15,2m)	(15,2-30,4m)	(30,4-60,9m)	(60,9-91,4m)	
Ampere Rating					
More Than	Not more Than	American Wire Gage			
0 -	6	18	16	16	14
6 -	10	18	16	14	12
10 -	12	16	16	14	12
12 -	16	14	12	Not Recommended	

• **EXTENSION CORDS.** Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. The accompanying table shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.

SAFETY GUIDELINES / DEFINITIONS

- ⚠ **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:** Used without the safety alert symbol indicates potentially hazardous situation which, if not avoided, may result in property damage.

RISK OF UNSAFE OPERATION. When using tools or equipment, basic safety precautions should always be followed to reduce the risk of personal injury. Improper operation, maintenance or modification of tools or equipment could result in serious injury and property damage. There are certain applications for which tools and equipment are designed. Black & Decker strongly recommends that this product NOT be modified and/or used for any application other than for which it was designed. Read and understand all warnings and operating instructions before using any tool or equipment.

IMPORTANT SAFETY INSTRUCTIONS

⚠ **WARNING:** This product or its power cord contains lead, a chemical known to the State of California to cause cancer and birth defect or other reproductive harm. Wash hands after handling.

⚠ **WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK:**

- Do not connect to AC distribution wiring.
- Do not make any electrical connections or disconnections in areas designated as IGNITION PROTECTED. This unit is NOT approved for ignition protected areas.
- NEVER immerse the unit in water or any other liquid, or use when wet.
- Do not insert foreign objects into the AC outlet or the USB outlet.

⚠ **WARNING: TO REDUCE THE RISK OF FIRE:**

- Do not operate near flammable materials, fumes or gases.
- DO NOT expose to extreme heat or flames.

⚠ **CAUTION: TO REDUCE THE RISK OF INJURY OR PROPERTY DAMAGE:**

- Remove appliance plug from outlet before working on the appliance.
- DO NOT attempt to connect or set up the unit or its components while operating your vehicle. Not paying attention to the road may result in a serious accident.
- Always use the inverter where there is adequate ventilation. Do not block ventilation slots.
- ALWAYS turn the inverter OFF by disconnecting it from the power source when not in use.
- Make sure the nominal powering voltage is 12 volts DC, center connection positive (+).
- When using this unit in a vehicle, check the vehicle owner's manual for maximum power rating and recommended output. Do not install in engine compartment — install in a well ventilated area.
- Do not use with positive ground electrical systems*. Reverse polarity connection will result in a blown fuse and may cause permanent damage to the inverter and will void warranty.

*The majority of modern automobiles, RVs and trucks are negative ground.

- Keep in mind that this inverter will not operate high wattage appliances or equipment that produce heat, such as hair dryers, microwave ovens and toasters.
- Do not open the inverter — there are no user-serviceable parts inside.
- Do not use this inverter with medical devices. It is not tested for medical applications.
- Keep away from children. This is not a toy!
- Install and operate unit only as described in this Instruction Manual.
- Check unit periodically for wear and tear. Take to a qualified technician for replacement of worn or defective parts immediately.

IMPORTANT CABLE INFORMATION:

Substantial power loss and reduced battery operating time results from inverters installed with cables that are not able to supply full power. Symptoms of low battery power can result from cables that are either excessively long or an insufficient gauge. Marine installations are also subjected to vibration and stresses that exceed those of other mobile installations. Therefore, the installer/operator should be especially aware of the requirements to maintain secure, tight, water-resistant electrical connections and to provide for strain relief for DC cables and appliance wiring. Cable insulation must be the appropriate type for the environment.

- Read And Understand This Instruction Manual Before Using This Unit.

SAVE THESE INSTRUCTIONS

THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS FOR THE MAXX SST™ COMPACT POWER INVERTER MODEL VEC054D.

⚠ WARNING: TO REDUCE THE RISK OF INJURY:

- Follow these instructions and those published by battery manufacturer and the manufacturer of any equipment you intend to use with this unit. Review cautionary markings on these products and on engine.

INTRODUCTION

Thank you for purchasing the **VEC054D MAXX SST™ Compact Power Inverter**. Please read this Instruction Manual carefully before use to ensure optimum performance and to avoid damage to this product.

This Power Inverter is configured with the latest Soft Start Technology (SST) and supplies continuous power and peak watts in the form of 120 volt AC outlets to run most household or electronic appliances. Before introduction of SST, high start-up currents from large inductive loads could shut down an inverter. SST improves inverter operation by:

- Gradual voltage ramp-up during inverter start-up, eliminating failed cold starts under load.
- Output that momentarily dips in voltage and quickly recovers to allow large motorized loads to start, eliminating most shutdowns from momentary overloads.
- A new technology that cools the power transistors more efficiently, and, combined with Soft Start, dramatically increases reliability and life of the product.

Added safety features include automatic shutdown and a low battery alarm to prevent damage to your battery.

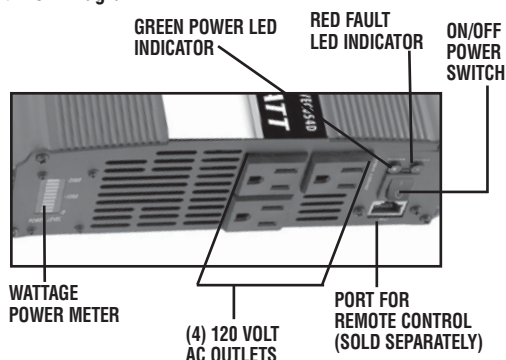
FEATURES

On the front panel are two LED indicators. The green LED indicates power and proper operation of the inverter; the red LED indicates inverter shutdown from over-load or over-temperature condition, or abnormal input voltages. The ON/OFF Switch turns the inverter ON and OFF. The switch can also be used to force reset of inverter circuits by switching it OFF, then back ON again. All models also feature a port to attach a remote control (sold separately).

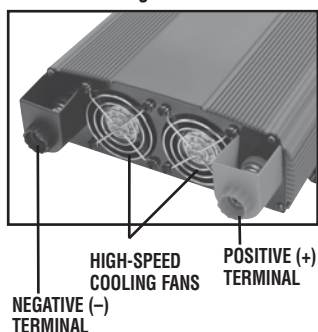
120 volt AC power is supplied through three North American three-prong type outlets. The outlets can accommodate either two- or three-pin AC plugs.

Controls and Functions

Front View Diagram



Back View Diagram



Maxx SST™ Safety Features

Built-in Automatic Safety Features include:

- Overload and over-temperature shutdown activated if AC output exceeds rated watts
- AC short-circuit shutdown
- Low voltage audible alarm (sounds at 10.5 volts input)
- Low-voltage shutdown (activates at 10.0 volts DC)
- High-input voltage shutdown (activates at above 15.5 volts DC)

MAXX SST™ uses a 12 volt DC power source like those found in motor vehicles, or it can be operated using multiple battery configurations with commercial battery chargers or solar battery chargers. For most heavy-duty applications, a multiple battery configuration and the use of deep-cycle batteries is required.

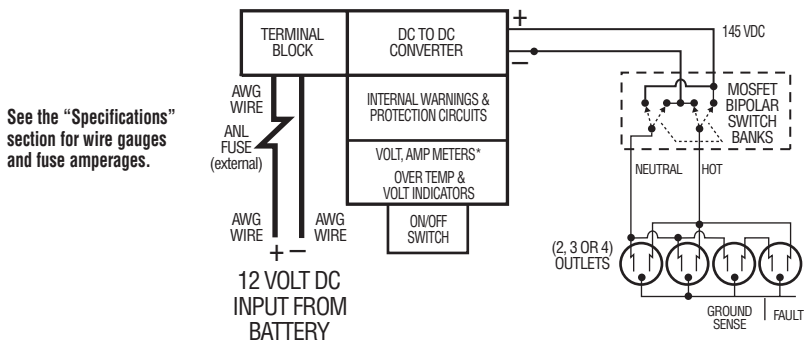
When using multiple batteries, inverters can be operated from one of the vehicle 12 volt batteries, so there's always one battery with adequate charge to start an engine.

MAXX SST™ includes a high-surge capability. This is required to start heavy loads, such as motors and other inductive devices.

PRINCIPLE OF OPERATION

The MAXX SST™ inverter converts 12 volt DC (direct current) from a vehicle battery or other 12 volt DC power source to standard 120 volt AC (alternating current) household power.

It converts power in two stages (see the diagram below). In the first stage, the inverter raises the 12 volt DC input to 145 volts DC. This MAXX SST™ inverter uses high-frequency conversion techniques that replace bulky and heavy transformers found in older inverters. In the second (output) stage, the inverter converts the 145 volt DC to 110/120 volt AC using multiple banks of metal-oxide semiconductor field-effect transistors (MOSFETs). The unit's solid-state circuitry ensures excellent overload protection and the ability to operate reactive loads such as those found in inductive motors. In this stage, the inverter functions as a high-power bipolar switch, alternately applying opposite polarity to the AC outlet HOT and NEUTRAL terminals.



Notes: Simplified diagram.

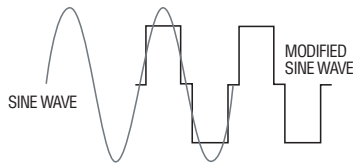
Cables, fuse and battery are not included and must be supplied by user.

The Power Inverter Output Waveform

The AC output waveform of the Power Inverter is known as “modified sine wave.” It is a waveform that has characteristics similar to the sine wave shape of utility power. This type of waveform is suitable for most AC loads, including linear and switching power supplies used in electronic equipment, transformers, and motors.

The modified sine wave produced by the Power Inverter has an RMS (root mean square) voltage of 115 volts, which is the same as standard household power. Most AC voltmeters (both digital and analog) are sensitive to the average value of the waveform rather than the RMS value. They are calibrated for RMS voltage under the assumption that the waveform measured will be a pure sine wave. These meters will not read the RMS voltage of a modified sine wave correctly. They will read about 20 to 30 volts low when measuring the output of the inverter. For accurate measurement of the output voltage of this unit, use a true RMS reading voltmeter such as a Fluke 179, Fluke 79 III series, Beckman 4410 or Triplett 4200.

Modified Sine Wave and Sine Wave Comparison



APPLIANCE POWER CONSUMPTION

MAXX SST™ inverters are ideal for powering:

- Lights
- TVs and TV/DVD (VCR) combinations units
- Radio receivers/transceivers and stereo systems
- Computers and peripheral equipment
- Refrigerator/freezers
- Small microwave ovens
- Household appliances
- Dry and/or wet/dry vacuums
- Heavy duty power tools & chargers
- Sump pumps, motors and other electric-powered equipment

Most electrical tools, appliances and audio/video equipment have labels that show the unit's power consumption in amps, watts, or both. To avoid inverter shutdown and possible damage to the inverter, avoid exceeding the wattage rating of this unit. To obtain a rough estimate of the current (in amperes) the power source must deliver where the power consumption of the tool or device is given in watts AC, simply divide the power consumption of the load by 10.

Example: If a load is rated at 200 watts AC, the power source must be able to deliver: 200 divided by 10 = 20 amperes.

The inverter has built-in overload protection so that if you do exceed the inverter's output capacity continuously, the unit will automatically shut down. Once the excessive load is removed, the inverter can be restarted and resume normal operation.

Note: To restart the inverter, turn it off, and then on again. The on/off Switch is located on the unit's Front Panel (refer to the "Control and Functions" section of this Instruction Manual).

The inverter powers resistive loads the easiest; however, larger resistive loads, such as electric stoves or heaters, could draw more wattage than the inverter can deliver on a continuous basis.

⚠ CAUTIONS

Ensure that total continuous power consumption of all tools and/or appliances connected to the inverter (and in use) does not exceed the inverter's continuous watts rating. Also ensure that start-up wattage for inductive loads does not exceed peak watts for more than a second.

Appliances such as microwave ovens will normally draw more than their rated current and could possibly overload the inverter when operating simultaneously with other appliances. For example: A 600 watt microwave oven draws approximately 940 watts.

The following chart shows the approximate amperage and corresponding wattage at 120 volts AC for various common tools and appliances.

APPLIANCE CONSUMPTION IN AMPS AND WATTS CHART

APPLIANCE	AMPS@ 120VAC	WATTS@ 120VAC
Laptop Computer	0.45	55
Household Power Mixer	1.83	220
240-Watt Stereo/Amplifier	2.01	242
Refrigerator	2.75	330
3/8" Variable Speed Drill	2.75	330
Variable Speed Jig Saw	2.75	330

Appliance Consumption in Amps and Watts Chart (continued)

APPLIANCE	AMPS@ 120VAC	WATTS@ 120VAC
10-Speed Blender	2.93	352
Belt Sander	3.11	374
3/8" Reversible Drill	3.20	385
Household Food Processor	3.30	396
Computer and Monitor	3.66	440
Portable Vacuum	4.21	506
8-Cup Coffee Maker	5.04	605
Electric Trimmer	5.04	605
1/2" Hammer-Drill	5.04	605
Reciprocating Saw	5.50	660
Vacuum Cleaner	6.60	792
1-1/8" Rotary Hammer	7.15	858
1/6 H.P. Submersible Sump Pump	7.33	880
Compact Microwave Oven	7.91	935
10" Bench Saw	12.50	1500

Note: Appliance specifications may vary from brand to brand. This table is offered only as a guide to approximate power ratings. Check appliance manuals or product labeling for actual ratings. For continuous use at maximum output, the MAXX SST™ inverter must be connected to a DC power supply capable of providing at least 1/10th of the inverter's continuous wattage rating.

The inverter will operate most AC loads within its power rating. Some induction motors used in refrigerators, freezers, pumps and other motor-operated equipment, require very high surge currents to start them. The inverter may not be able to start some of these motors even though their rated current draw is within specifications for this power inverter.

If a motor refuses to start, observe the battery voltage using a DC voltmeter while trying to start the motor. If the battery voltmeter drops below 11 volts while the inverter is attempting to start the motor, this may be why the motor won't start. Make sure the battery connections are tight and the battery (or batteries) is (are) fully-charged. If the connections are good and the battery is charged, but the voltage still drops below 11 volts, you may need to use a larger battery (or battery combination).

CAUTION

Rechargeable Devices

Certain rechargeable devices do not operate well from a modified sine wave inverter. They only operate properly from a standard household outlet, which provides a pure sine wave. Therefore, the manufacturer recommends that these types of devices be operated from a standard household outlet only, not from the inverter.

This problem does not occur with most battery-operated equipment. Most of these devices use a separate charger or transformer that is plugged into an AC receptacle. This inverter is easily capable of running most chargers and transformers.

OPERATING INSTRUCTIONS

Power Source Requirements

The inverter will operate from input voltages between 11 and 15 volts DC. If the voltage drops below 10.5 volts, an audible low battery warning alarm will sound. The inverter will shut down if the input voltage drops below 10 volts DC. This built-in feature protects the battery from being completely discharged.

The inverter will also shut down if the input voltage exceeds 15.5 volts. This protects the inverter against excessive input voltage. Although the inverter has built-in protection against over voltage, it may still be damaged if the input voltage exceeds 15.5 volts.

Inductive loads, such as TVs and stereos, require more current to operate than do resistive loads with the same wattage rating. Induction motors, as well as some TVs, may require two to six times their rated wattage to start up. Because the MAXX SST™ inverters have a peak watt power rating, many such appliances and tools may be

safely operated. The equipment that needs the highest starting wattage are pumps and compressors that start under load. This equipment can be safely tested. If an overload is detected, the inverters will simply shut down until the overload situation is corrected. Use the front panel switch to turn OFF the inverter, then ON, to reset the inverter.

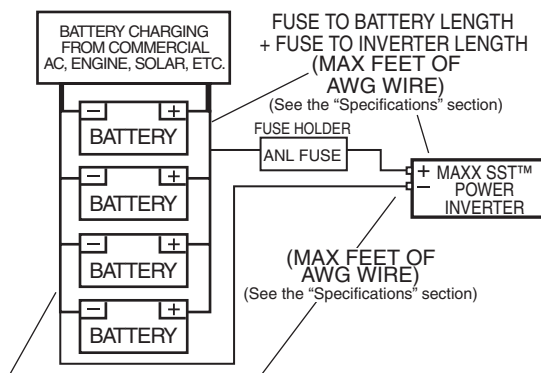
⚠ CAUTIONS

Exceeding recommended voltage limits will void manufacturer's warranty.

NEVER try to use the inverter with any 12 volt DC power source that uses a positive ground. (Most vehicles and boats use negative ground systems.)

The DC power source must be a well-regulated DC power supply as typically found in vehicle and deep-cycle marine batteries. The DC power source may also be two 12 volt batteries connected in parallel. On larger applications the power source may be several batteries connected in parallel as shown in the following "Battery Wiring" diagram.

Battery Configuration



Note: For typical heavy-duty uses, the manufacturer recommends a specified or equivalent ANL fuse be added as close as possible to the power source (battery) positive terminal. The fuse amperage size must be appropriate to allow simultaneous operation of all the AC appliances to be powered, with delay characteristics that allow for the momentary high start-up current requirements of inductive loads. Use the recommended fuse block (fuse holder) and fuse, or an electrical equivalent. For full rated output and motor start-up surge output, ensure that the installation is configured to handle the full load. See the "Specifications" section of this Instruction Manual.

Determining Battery Size

To determine the minimum battery size you will need to operate appliances from MAXX SST™ inverters, follow these steps:

1. Determine the wattage of each appliance and/or tool you will need to simultaneously operate from the inverter. To do this, read the labels on the equipment to be operated.
2. Estimate the number of hours the equipment will be in use between battery recharges.
3. Determine the total watt-hours of energy use, the total running time and the average power consumption.

Keep in mind that some appliances are not drawing the same power continuously. For example, a typical home-use coffee maker draws 500 watts during brew time (approx. 5 minutes), but maintains the pot temperature at only about 100 watts. Typical use of a microwave is only for a few minutes, sometimes at low power.

Runtime

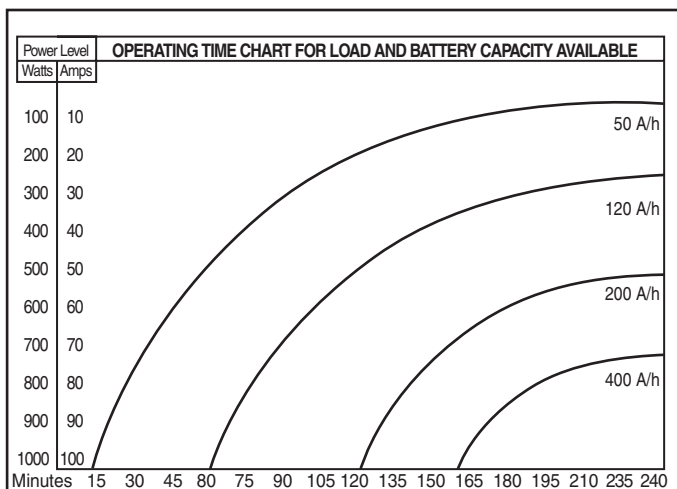
The following graph is a set of curves that show how appliance load, in watts or in amperes, affects runtime. These curves are only estimates of operating time, dependent upon:

- The condition of the batteries
- The state of charge on the batteries
- The amount of other DC appliances drawing current from the batteries

Three curves were developed for a battery of 50 Ampere Hours (AH) capacity, and three for multiple batteries in parallel. The higher capacity curves are for 120 AH, 200 aH and 400 aH capacities. These large capacity batteries clearly extend operating time at full load. To extend operating time in general, reduce the heavy appliance load to a minimum. Remember, you are operating on stored energy and probably under power loss conditions.

Note: All operating time curves assume permanent installation with the appropriate DC input wire (See the "Specifications" section of this Instruction Manual) and a full charge on the batteries.

Battery Operating Times



For example, as shown in the above graph, using a 400 A/h battery (batteries), if the average power usage will be 1000 watts, the operating time will be about 150 minutes. A larger capacity battery will deliver more operating time between recharges.

Note: The manufacturer recommends conservative estimates when selecting a battery. More amp hours will deliver a reserve capacity, and a larger capacity battery will not be subject to deep discharges. Ideally, the number of amp hours (A/h) you expect to use should be less than 50% of the battery's rated capacity.

Protective Features

LOW BATTERY ALARM

An audible alarm will sound when the 12 volt DC power supply voltage drops down to 10.5 ± 0.3 volts. This indicates that the battery needs to be charged or there is an excessive voltage drop between the battery power source and the inverter.

Notes: It is normal for the alarm to sound when the inverter is being connected to, or disconnected from, a 12 volt DC power source. This does not indicate a problem. However, if this alarm sounds continuously, discontinue inverter operation and charge the battery before resuming operation. If the voltage drops to 10.0 volts DC, the inverter will automatically shut down. If the low voltage alarm sounds when the battery is fully charged refer to the "Troubleshooting" section of this Instruction Manual).

CIRCUIT PROTECTION

The inverter has electronic circuit protection against overload or short circuit conditions.

⚠ CAUTION

If turning the ON/OFF Switch OFF then ON again does not reset the inverter, DO NOT ATTEMPT TO OPEN THE INVERTER. Opening the inverter for any reason will void the warranty. The unit must be returned to Vector Manufacturing for testing and repair by professional factory technicians.

INSTALLATION

MAXX SST™ inverters will provide you with continuous electrical power when powered by a 12 volt DC source, such as a vehicle battery or a multiple battery configuration (see the diagram under "Battery Configuration," page 6). This manual does not describe all of the possible configurations.

Operating Environment

Do not locate inverters in an area, room or compartment where explosives or flammable fumes might be present, such as engine rooms, engine compartments, and boats or small, unvented battery compartments.

To avoid possible dangerous conditions, the inverters must be located where:

1. The unit is kept dry;
2. Air temperature is between 30°F (-1°C), non-condensing, and 105° F (40°C);

3. At least three inches of clearance from other objects is maintained for cooling airflow;
4. The unit is not exposed to direct heat, sunlight or to explosive or flammable fumes; and
5. The unit is as close to the DC power source as possible.

Never connect the chassis ground wire from the inverter to the DC negative input.

- CHECK to ensure that the combined loads of the appliances being powered by the inverter DO NOT continuously exceed the inverter's wattage rating.
- NEVER place items on or over the inverter during operation.

MAXX SST™ inverters generate heat during operation and must be placed where cool air can circulate to the internal fan, and hot air can be removed.

For optimum operation, the inverter should be placed or mounted on a flat surface; ideally, a normally cool metal surface to help diffuse the heat that is generated. Two cables (see the diagram on page 8) are not supplied, but will be required to allow for full power operation and to provide flexibility in positioning the inverter.

Marine Applications

In all marine applications, DO NOT install the inverter below or near the waterline, and keep the inverter away from moisture and water.

Use ONLY non-corrosive marine fasteners and fittings for installation. Only connect the inverter's DC input to existing wiring (which must be approved for marine use) at the appropriate gauge, cable and length (see the "Specifications" section). For cable lengths exceeding 6 feet from inverter to batteries, call Vector for additional installation information. The cable, fuse holder and fuse (not supplied) can be purchased at an electrical supply company. The fuse holder and fuse are a specified amperage rating (see Specifications, page 16). Call Vector Technical Support toll-free at 1-800-544-6986 with any questions.

Installation Procedures

When wiring the inverter to a 12 volt DC power source, ensure that polarity is correct. Reversed polarity will blow a fuse and may cause permanent damage to the inverter. Review diagrams on page 3, if necessary, to identify the location of the DC terminals.

Note: The manufacturer's warranty does NOT cover damage due to reversed polarity.

Quick Operational Test or Emergency Use

You will need:

- A heavy-duty jumper cable set of the specified AWG wire rating (see the "Specifications" section of this Instruction Manual)
- A fully-charged automobile battery
- A common slip joint plier for loosening and tightening terminal nuts

PROCEDURE

1. Unscrew nuts in input terminal block.
2. Identify the positive and negative terminals on the 12 volt DC battery (or other 12 volt DC power source) and identify the positive and negative terminals on the inverter.
3. Using a set of heavy-duty jumper cables, attach the red cable to the inverter's positive (+) terminal and the black cable to the inverter's negative (-) terminal.
4. Connect the clamps on the other ends of the jumper cables to the corresponding positive (+) and negative (-) terminals on the 12 volt DC vehicle battery (or other 12 volt DC power source). There may be some minor sparking.
5. Turn the inverter ON/OFF Switch ON.
6. Plug in a lamp with a 100 watt light bulb and switch the lamp on. If the lamp works normally, the inverter is functioning properly and you can proceed to a permanent installation or continue to use the inverter with low wattage appliances. If the lamp does not light or does not work correctly:
 - A. Check all connections and tighten any that may be loose.
 - B. Ensure that the source battery has adequate charge.
 - C. If steps A and B do not correct the problem, refer to the "Service Information" section of this Instruction Manual for assistance.

Permanent Installation

For permanent installation to heavy-duty battery power you will need:

- Two cables (as indicated in the “Specifications” section)
- Terminals to fit cable ends and stud terminals to inverter
- Hardware and battery connector to connect cables to the battery bank
- A single length of AWG cable multi-stranded, flexible, insulated cable (as indicated in the “Specifications” section of this Instruction Manual) for chassis ground connection
- A holder and fuse (see the “Specifications” section of this Instruction Manual)
- Mounting screws, bolts and nuts for mounting the inverter and fuse holder
- A drill for mounting the inverter and fuse holder
- Lead-tin solder, flux, propane torch and an igniter for the torch
- Wire stripper/cutting tool

PRELIMINARY STEPS

The inverter has four slots in its mounting bracket that allow the unit to be fastened against a bulkhead, floor, wall or other flat surface. Ideally, the mounting surface should be cool to the touch. It is more efficient to use longer AC wiring than DC wiring, so install the inverter as close as possible to the 12 volt DC power source.

Vector inverters should be operated in horizontal position; if it is to be mounted on a wall, mount it horizontally so that indicators, switches, outlets and terminal blocks on the front panel are visible and accessible.

1. If inverter is to be installed in a vehicle, it is recommended that the unit be shock mounted to either the floor (in a clear, safe area) or on a secure flat surface.
2. Locate a convenient place to mount the inverter and fuse holder.
3. Perform a test routing of the proposed cable length, but don't do any cutting at this time (refer to the diagram in the “Battery Configuration” section of this Instruction Manual).
4. Be sure that the positive (+) and negative (-) cables to the battery do not exceed six feet.
5. Using an appropriate AWG cable (see the diagram on page 7), reposition the inverter and fuse holder if necessary.
6. After you have performed the above preliminary installation steps, proceed with the actual inverter installation.

Contact the manufacturer for any further installation information or questions.

Note: This procedure is for using locally purchased supplies. If a Vector Cable Set is used, follow the directions included with that set.

PERMANENT INSTALLATION PROCEDURE

The cables between the power source and inverter should be set up as illustrated in the diagram in the “Battery Configuration” section of this Instruction Manual. Unscrew terminal nuts before beginning permanent installation. Proceed with DC cable and fuse installation as follows:

1. Ensure the inverter's ON/OFF Power Switch is in the OFF position.
2. Using tools and hardware, mount the inverter to a flat surface.
3. Ensure that mounting hardware does not touch any fuse holder or fuse contacts. Ensure that fuse is removed from its holder.
4. Measure the cable twice before cutting the cable.
5. Cut one cable length to connect the negative (-) battery terminal to the inverter's negative terminal, leaving a little slack in the cable.
6. Cut another cable to connect the positive (+) battery terminal to one side of fuse holder, leaving a little slack.
7. Cut the final cable to connect the other side of fuse holder to the inverter's positive (+) terminal.
8. Strip the end insulation of all three cables to 1-inch (2.45 cm).
9. Sweat-solder end ends of all cables. For safety, do this in an open space because it may require the use of a propane torch.
10. Connect one end of the negative (-) cable to a ring terminals* going to the battery(ies).
11. Connect the short end of the positive (+) cable to a ring terminals* going to the battery(ies).
12. Crimp or clamp ring terminals of the negative (-) and positive (+) cables (going to the battery), but do not connect the battery yet.

13. Connect the stripped, soldered (longer) end of the positive (+) cable to the red stud marked (+) on the inverter and tighten the retaining nut.
14. Connect the stripped, soldered end of the negative (-) cable to the black stud marked (-) on the inverter and tighten the retaining nut.
15. Connect the other (long) end of the (+) positive cable to one terminal of the heavy-duty fuse holder.
16. Connect the other conductor of the heavy-duty fuse holder to the (short) positive (+) battery terminal.
17. Connect the other end of the (-) negative cable with the ring terminal to the negative (-) battery terminal.
18. Connect an insulated wire (at least #12 AWG) between the chassis grounding screw on the inverter's case and a solid electrical ground to minimize possible electrical noise in TVs and radios. **Do not connect this wire to the negative DC input terminal.**
19. Ensure that all electrical connections have been tightened.
20. Ensure that the inverter's on/off Switch is in the off position.
21. Insert the fuse into the fuse holder. There may be some sparking.
22. Ensure the 12 volt DC power source has an adequate charge.
23. Turn the inverter ON and apply a test load to the 120 volt AC outlets.

* Ring terminals are not included and must be supplied by user.

If, after following all of the above steps, the inverter does not perform properly, the source voltage may be too low or the cables may be too long (or the gauge too light). Having checked and, if necessary, corrected these conditions, refer to the "Service Information" section of this Instruction Manual for assistance if problems persist.

Connection To Load

The Power Inverter is equipped with standard North American three-prong type outlets. Plug the cord from the equipment you wish to operate into the AC outlet(s). Make sure the combined load requirement of your equipment does not exceed maximum continuous power.

The Power Inverter is engineered to be connected directly to standard electrical and electronic equipment in the manner described above. Do not connect the Power Inverter to household or RV AC distribution wiring. Do not connect the Power Inverter to any AC load circuit in which the neutral conductor is connected to ground (earth) or to the negative of the DC (battery) source.

⚠ WARNING

Do not connect to AC distribution wiring!

Operating Tips

For best operating results, the inverter should be placed on a stable, flat surface. The inverter should only be used in locations that meet the following criteria:

DRY — Do not allow water or other liquids to come into contact with the inverter.

COOL — Surrounding air temperature should be between -0°C and 40°C — ideally between 15°C and 25°C (60-80°F). Keep the inverter away from direct sunlight, when possible.

WELL-VENTILATED — Keep the area surrounding the inverter clear to ensure free air circulation around the unit. Do not place items on or over the inverter during operation. The unit will shut down if the internal temperature gets too hot.

SAFE — Do not use the inverter near flammable materials or in any locations that may accumulate flammable fumes or gases. This is an electrical appliance that can briefly spark when electrical connections are made or broken.

Notes on Using the Remote Control (sold separately)

For ease of use, Vector offers (as a separate item) a Remote Control specifically designed for this line of MAXX SST inverters. The inverter ON/OFF Switch must be in the OFF position when connecting the Remote Control to the unit or the Remote Control will not operate. Once the unit has been turned ON using the Remote Control, inverter operation will continue to be controlled through the Remote Control. Turn the inverter OFF before disconnecting the Remote Control.

For more information about attaching and using the Remote Control, please refer to the Remote Control User's Manual.

TROUBLESHOOTING

Common Audio/Visual Problems

Problem	Solution
"Buzzing" sound in audio systems	Some inexpensive stereo systems and "boom boxes" emit a buzzing sound from their speakers when operated from the Power Inverter. This occurs because the power supply in the electronic device does not adequately filter the modified sine wave produced by the inverter. The only solution to this problem is to use a higher quality sound system that incorporates a higher quality power amplified supply.
Television Interference	The Inverter is shielded to minimize interference with TV signals. However, in some instances, some interference may still be visible, particularly with weak TV signals. Try the following corrective measures: <ul style="list-style-type: none">• Position the inverter as far as possible from the television, the antenna and the antenna cables. Use an extension cable, if necessary.• Adjust the orientation of the inverter, the antenna cables and the TV power cord to minimize interference.• Make sure the antenna feeding the television provides an adequate ("snow free") signal and that high quality, shielded antenna cable is used.• Do not use the inverter to operate high-power appliances or tools at the same time you are using it to operate the TV.• Make sure the inverter's case is properly grounded (refer to the "Permanent Installation Procedure" section of this Instruction Manual).

Resetting the Unit

After over-voltage or thermal automatic shutdown, the VEC054D will reset automatically. To reset all other units, turn the ON/OFF Power Switch to the "OFF" position, then back "ON."

Fault Protection and Troubleshooting Guide

INVERTER POWER SWITCH TURNED ON

Trouble/Indication	Possible Cause	Suggested Remedy
No AC output — red LED lit	DC input is below 10 volts	Recharge or replace battery.
	Excessive appliance load — thermal shutdown	Turn unit OFF. Reduce the load, wait for the inverter to cool down, then turn the unit ON again.
No AC output — green LED not lit	Fuse(s) open	Check DC input — fuse(s) in vehicle. Replace the fuse with one of the same type and rating if necessary.
Low battery alarm sounds continuously	Low battery voltage	Recharge battery. Remove load from the inverter while recharging battery.
	Bad connection or wiring	Tighten all DC connections.
Motorized power tool will not start	Excessive start-up load	If appliance does not start, appliance is drawing excessive voltage and will not work with inverter.
Motorized power tool does not operate at correct speed	Purely inductive load	Make the load not purely inductive. Operate an incandescent lamp at the same time as motor.
Television/radio interference	Snow in picture, "buzzing" sound	Keep inverter and antenna distant from each other. Use shielded antenna. Connect antenna to amplifier.

CARE AND MAINTENANCE

Storage

1. Ideal storage temperature range is 50-68°F (10-20°C).
2. Store and use the inverter in a cool, dry place with adequate ventilation.
3. Avoid locations that are exposed to heating units, radiators, direct sunlight or excessive humidity or dampness.

Fuse Replacement

This inverter is equipped with multiple internal fuses. Normally, these fuses will not “blow” unless there is a serious problem inside the unit. ***Internal fuses are replaceable; however, only trained personnel should attempt fuse replacement.*** Refer to the “Service Information” section of this Instruction Manual.

Preventive Maintenance

Inverters require minimal maintenance. For optimum performance, the manufacturer recommends periodically performing the following preventive maintenance.

1. Turn OFF the inverter using the front panel ON/OFF Power Switch.
2. Remove the DC power fuse.
3. Check and tighten all electrical connections, including the ground.
4. Using a non-metallic vacuum cleaner hose, vacuum the air slots and fan area.
5. Clean the outside of the unit using a damp (not wet) cloth.
6. Wipe unit surfaces thoroughly with a dry cloth.
7. Re-insert the fuse and resume operation.

Accessories

Recommended accessories for use with your tool are available from your local dealer or authorized service center. If you need assistance regarding accessories, please call: 1-800-544-6986.

⚠ **WARNING:** The use of any accessory not recommended for use with this tool could be hazardous.

Service Information

All Black & Decker Service Centers are staffed with trained personnel to provide customers with efficient and reliable power tool service. Whether you need technical advice, repair, or genuine factory replacement parts, contact the Black & Decker location nearest you. To find your local service location, refer to the yellow page directory under “Tools—Electric” or call: **1-800-544-6986** or visit **www.blackanddecker.com**.

⚠ **CAUTION**

If the cord becomes damaged, return the entire unit to manufacturer immediately for service/repair.

FULL TWO-YEAR HOME USE WARRANTY

Black & Decker (U.S.) Inc. warrants this product for two years against any defects in material or workmanship. The defective product will be replaced or repaired at no charge in either of two ways.

The first, which will result in exchanges only, is to return the product to the retailer from whom it was purchased (provided that the store is a participating retailer). Returns should be made within the time period of the retailer's policy for exchanges (usually 30 to 90 days after the sale). Proof of purchase may be required. Please check with the retailer for their specific return policy regarding returns that are beyond the time set for exchanges.

The second option is to take or send the product (prepaid) to a Black & Decker owned or authorized Service Center for repair or replacement at our option. Proof of purchase may be required. Black & Decker owned and authorized Service Centers are listed under “Tools-Electric” in the yellow pages of the phone directory and on our website www.blackanddecker.com.

This warranty does not apply to accessories. This warranty gives you specific legal rights and you may have other rights which vary from state to state or province to province. Should you have any questions, contact the manager of your nearest Black & Decker Service Center. This product is not intended for commercial use.

FREE WARNING LABEL REPLACEMENT: If your warning labels become illegible or are missing, call 1-800-544-6986 for a free replacement.

SPECIFICATIONS

Maximum continuous power:	2000 watts
Surge capacity (peak power):	4000 watts
Output voltage range:	105-125 volts
Output frequency:	58-62 Hz
Output voltage:	110/120 VAC, 60 Hz
Maximum efficiency:	$\geq 87\%$
Full load efficiency:	$\geq 82\%$
No load current draw:	>1.0 amp
Over voltage shutdown:	15.5 ± 0.5 volts DC
Low voltage shutdown:	10.0 ± 0.3 volts DC
Thermal shutdown auto reset:	Yes
North American standard outlets:	3
ANL fuse rating for direct hardwire:	500
Proper cable gauge (AWG) @ 6 ft.	1/0
Proper cable gauge (AWG) @ 10 ft.*	3/0

*For lengths greater than 10 feet, please call: 1-800-544-6986.

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