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## Inverter Terminology

## Application Note

976-0169-10-01 Rev A

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The following is a glossary of terms that may be routinely heard when shopping for equipment or reading operator's manuals.

**Absorption Stage** In this second stage of three stage charging, the batteries are held at a constant voltage (the bulk voltage setting) and the battery is charged to its maximum capacity.

**AC** Alternating Current. Electrical current that varies with time. The rate at which the voltage changes polarity is the frequency in Hertz(Hz).

**Automatic Transfer Relay** An automatic switch that switches between inverter and charger mode depending on availability of AC input power. If AC is present the unit will be a battery charger, when AC goes away the unit becomes an inverter.

**Battery Equalization** Controlled "overcharging" of the battery causing it to bubble and mix. This reduces stratification.

**Bulk Charge Stage** This is the first of the three stages in three stage charging. In this stage a constant current is fed to the batteries and as they accept the current the battery voltage will rise.

**Current(Amps)** The volume of electricity flowing through a conductor. Equivalent to gallons per unit time of water flowing through a hose.

**DC** Direct Current. Electrical current that does not vary with time.

**Deep Cycle Battery** A battery designed to be routinely discharged to 20% of its maximum capacity without damage. These are the type of battery most commonly used with an inverter system.

**Efficiency** Usually given as a percentage, efficiency is the ratio of the output to the input. The efficiency changes with power output levels of any inverter.

**Float stage** During the third stage of three stage charging, the voltage and current are reduced to a level that will trickle charge or maintenance charge the battery. This assures the battery remains fully charged even while sitting.

**Fuse or Disconnect** An electrical pressure relief valve. When current exceeds a preset limit the fuse or disconnect will fail before the wiring or equipment it is protecting. Disconnects are also called circuit breakers. These are usually resettable and can act as a switch to turn off power to equipment for servicing.

**The grid** Also called the utility grid, this refers to the public power distribution system.

**Impedance** Opposition to flow of alternating current (AC)

**Islanding** The condition present when the utility power grid fails and the inverter attempts to power the grid. An inverter which is "islanding protected" senses the loss of AC power from the grid and does not back feed into the grid system.

**LED** Light Emitting Diode. A light made up of semi-conducting material.

**Line Tie** Term used when the inverter is connected to the public power or "grid" system.

**Load(s)** Any electrical item which draws power. (i.e. lights, radio, washer/dryer, refrigerator, etc.)

**Locked Rotor Amps** The current drawn by an electric motor with the shaft or rotor stopped and locked in position. This can be used to determine if an inverter has enough surge current to start a motor. If the inverter is capable of producing more amperage than the locked rotor amps rating of a motor, it will most likely start the motor easily.

**Modified Sinewave** Also called a quasi waveform or a modified sine wave. This output looks like a one step staircase. Most loads that will run from a sinewave will run from a modified sinewave. However things such as clocks and furnace controllers may have trouble. (See Figure 1).

**NEC code** National Electric Code. The guidelines and acceptable practices for electrical installations. It is a book published every three years.

**Off grid** Not connected to public power in any way.

**Output Waveform** Shape of the wave that alternating current makes as its voltage rises and falls with time.

**Pass Through Current** The amount of current the inverter can safely pass directly from the AC input to the AC output.

**PV** Photo Voltaic. Solar powered.

**Resistance** The opposition to flow of direct current (DC)

**RMS** Root Mean Square, a measure of AC voltage that would provide the equivalent heating value across a resistor as a DC source of the same voltage.

**Sellback or Selling back to the grid** Some inverters have the capability to take energy stored in batteries or from solar panels and put it back into the utility grid. The public utility company will then pay you for using your energy. Check with the power company before attempting this.

**Sinewave** A waveform that looks like rolling waves on water. It rises and falls smoothly with time. The grid puts out a sine waveform. Any plug in AC equipment will operate from a sinewave output. (See Figure 1).

**Square Wave** The simplest wave form, this is shown below. Some types of equipment behave strangely when run from a square wave.(See Figure 1).

**.Stacking** Two inverters operating together to produce more power and higher output voltage. The units must be stackable, and an interface cable must be utilized. See the manual for details on stacking if it is an option.

**Stratification** With time, the liquid portion of a battery (the electrolyte) will separate into layers. The sulfuric acid will go to the bottom, and the water to the top. If allowed to sit in this condition the battery will be ruined. Equalization will bubble and mix the electrolyte eliminating this problem.

**True RMS Digital Volt Meter (DVM)** A voltmeter that incorporates an RMS converter to read true RMS for any waveform shape.

**Voltage** The pressure of electrical flow. Equivalent to water pressure in a hose.

**Watts** Measure of power output or utilization.  $\text{Watts} = \text{Volts} \times \text{Amps}$

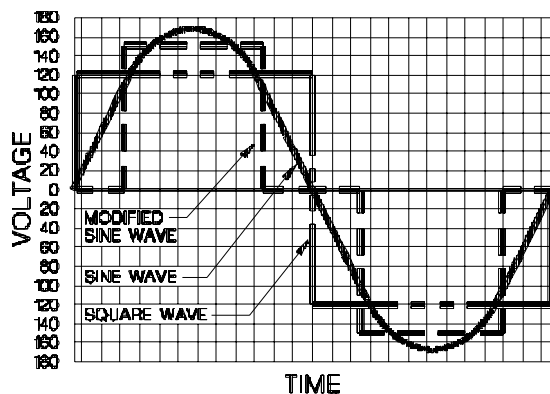


Figure 1 Comparison of Modified Sinewave, Square Wave and Sinewave

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**Date and Revision** August 2007 Rev A

**Part Number** 976-0169-10-01

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