Arethe inverter circuit

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A power inverter, inverter, or invertor is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC).[1] The resulting AC frequency obtained depends on the particular device employed. Inverters do the opposite of rectifiers which were originally large electromechanical devices converting AC to DC.[2]

The input voltage, output voltage and frequency, and overall power handling depend on the design of the specific device or circuitry. The inverter does not produce any power; the power is provided by the DC source.

A power inverter can be entirely electronic or maybe a combination of mechanical effects (such as a rotary apparatus) and electronic circuitry.Static inverters do not use moving parts in the conversion process.

Power inverters are primarily used in electrical power applications where high currents and voltages are present; circuits that perform the same function for electronic signals, which usually have very low currents and voltages, are called oscillators. Circuits that perform the opposite function, converting AC to DC, are called rectifiers.

A typical power inverter device or circuit requires a stable DC power source capable of supplying enough current for the intended power demands of the system. The input voltage depends on the design and purpose of the inverter. Examples include:

There are two basic designs for producing household plug-in voltage from a lower-voltage DC source, the first of which uses a switching boost converter to produce a higher-voltage DC and then converts to AC. The second method converts DC to AC at battery level and uses a line-frequency transformer to create the output voltage.[5]

A 50% duty cycle square wave is one of the simplest waveforms an inverter design can produce, but adds ~48.3% THD to its fundamental sine wave.[4] Thus, a square wave output can produce undesired "humming" noises when connected to audio equipment and is better suited to low-sensitivity applications such as lighting and heating.

Where power inverter devices substitute for standard line power, a sine wave output is desirable because many electrical products are engineered to work best with a sine wave AC power source. The standard electric utility provides a sine wave, typically with minor imperfections but sometimes with significant distortion.

Sine wave inverters with more than three steps in the wave output are more complex and have significantly higher cost than a modified sine wave, with only three steps, or square wave (one step) types of the same power handling. Switched-mode power supply (SMPS) devices, such as personal computers or DVD players,

function on modified sine wave power. AC motors directly operated on non-sinusoidal power may produce extra heat, may have different speed-torque characteristics, or may produce more audible noise than when running on sinusoidal power.

The modified sine wave is the sum of two square waves, one of which is delayed one-quarter of the period with respect to the other. The result is a repeated voltage step sequence of zero, peak positive, zero, peak negative, and again zero. The resultant voltage waveform better approximates the shape of a sinusoidal voltage waveform than a single square wave. Most inexpensive consumer power inverters produce a modified sine wave rather than a pure sine wave.

Numerous items of electric equipment will operate quite well on modified sine wave power inverter devices, especially loads that are resistive in nature such as traditional incandescent light bulbs. Items with a switched-mode power supply operate almost entirely without problems, but if the item has a mains transformer, this can overheat depending on how marginally it is rated.

However, the load may operate less efficiently owing to the harmonics associated with a modified sine wave and produce a humming noise during operation. This also affects the efficiency of the system as a whole, since the manufacturer"s nominal conversion efficiency does not account for harmonics. Therefore, pure sine wave inverters may provide significantly higher efficiency than modified sine wave inverters.