

## SolarTech Power Solutions

# Bipolar unipolar three-phase inverter



✓ IP65/IP55 OUTDOOR CABINET

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## Overview

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The three-phase inverter uses insulated gate bipolar transistor (IGBT) switches which have advantages of high input impedance as the gate is insulated, has a rapid response ability, good thermal stability, simple driving circuit, good ability to withstand high voltage, snubber-less operation and controllability of switching behavior providing reliable short-circuit protection. What is the difference between bipolar and unipolar switch inverter voltage?

Table.2 represents THD at different modulation index. By comparing the nine level bipolar and unipolar switch inverter we can say that the distortion of bipolar nine level switch inverter voltage is less. The current waveforms are closed to sinusoidal.

What is a bipolar PWM inverter?

The inverter terminal voltages are obtained denoted by  $V_{AN}$  and  $V_{BN}$  and the inverter output voltage  $V_{AB} = V_{AN} - V_{BN}$ . Since the waveform of  $V_{AB}$  switches between positive and negative dc voltages this scheme is called bipolar PWM.

IV. UNIPOLAR PWM INVERTER.

How many switching states does a three-phase voltage source inverter generate?

Generally, a three-phase voltage source inverter generates eight switching states, including six active and two zero states, by the bipolar method. This study proposes a novel way to synthesise the output voltage vector by turning off both switches in a leg. Accordingly, new leg switching states are defined.

Are unipolar and bipolar PWM inverters better?

Similarly for bipolar inverter the FFT analysis for modulation index 1.0 and overmodulation with modulation index 1.2 are as shown. It can be clearly concluded that unipolar PWM inverters are better in terms of efficiency and lower THD (TOTAL Harmonic Distortion) as compared to bipolar PWM inverter.

How a bipolar inverter works?

A three-phase low-power AC motor is connected to the inverter. The modulation wave realised by the bipolar method is a type of discontinuous PWM. The inverter leg could be clamped to the DC bus when the leg current crosses zero, thus avoiding the leg state '× 0 '.

What is the difference between bipolar modulation and VSI?

In contrast, in bipolar modulation, the output voltage is positive and negative. However, the same voltage can be output while the low-power AC induction motor is connected to the three-phase VSI. A novel unipolar switching reference function is defined to generate the circular trajectory of the voltage vector in a three-phase inverter.

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