A High Quality Output Voltage for HEPWM of Single Phase AC Motor Drive

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Abstract
A new Harmonic Elimination (HE) PWM method with fast recursive algorithm is used that provide the exact on-line solution to the optimal PWM problem. The proposed algorithm optimization technique is applied to a 3-level unipolar single-phase inverter to determine optimum switching angles for eliminating low order harmonics while maintaining the required fundamental voltage to drive single-phase induction motor with high quality.

The proposed HE method contributes to the existing methods because it not only generates the desired fundamental frequency voltage, but also completely eliminates any number of harmonics. It provides high quality sine-wave output voltage on the induction motor terminals with very low THD.

The high quality sinusoidal output voltage produced by the inverter at different number of switching angles is presented. The complete solutions for 3-level unipolar switching patterns to eliminate the 3rd and 5th harmonics are given. Finally, the unipolar case is again considered where the first 14 harmonics are eliminated.

Keywords: Harmonic Elimination, SHEPWM, THD.

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