

Abstract

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Performance control of three-phase induction motor operated from a single-phase supply

This paper presents analytical and experimental performance and control of a three-phase induction motor fed from a single-phase supply via a single capacitor. The transient and steady state analysis are predicted using d-q model representation whose frame is chosen stationary. The value of capacitance to provide minimum unbalance ratio is theoretically calculated and is experimentally implemented using Fixed Capacitor-Thyristor Controlled Reactor (FC-TCR) scheme applied for large induction motors. The speed is controlled using a TRIAC coupled in series with the supply. The dynamic model is introduced and both simulated and experimental waveforms are predicted. This is applied for a fractional horsepower fan drive.