

Abstract

Yasser Gaber A. Dessouky

Regulated AC/DC/AC Power Supply Using Scott Transformer

In today's industry, it is necessary to convert power for equipment used in environments where dissimilar voltages and frequencies are the norm. Static frequency converters industrial power supplies are used for converting either 50Hz 60Hz utility line power to 400Hz power. They are more efficient than motor-generator sets. In addition, they offer harmonic cancellation, power factor correction, phase conversion, voltage conversion with balanced, smooth, and controlled power output. Many varied applications in power electronics require sinusoidal outputs at frequency 400Hz. This paper describes the design, simulation and implementation of a power converter topology and control techniques for realizing sinusoidal output systems. A 150 KVA 3-phase power supply, whose line voltage and frequency are 440V are used to convert the dc voltage to get two phase AC power supply which is converted via a Scott transformer to a three phase, whose line voltage and frequency are 440V and 400 Hz. A resonant filter is used to eliminate harmonics. Feedback signals from load voltage and dc link current are used to control the rectifier so as to maintain constant voltage at variable load conditions. The system is theoretically analyzed and experimentally verified.