

Abstract

Yasser Gaber A. Dessouky

Selective Harmonic Control for AC-DC-AC Regulated Converter

Static power converters are used for many applications, such as general power supplies. This paper analyzes the performance of single phase AC-DC-AC converter, where the converter consists of two parts, an AC to DC controlled rectifier cascaded with a DC to AC multilevel inverter, so as to increase the number of voltage levels of the inverter to reduce the filter size of the output voltage of the DC-AC converter. Multilevel converter technology has recently emerged as an important alternative in the area of high-power applications. The topology configuration consists of multilevel three single-phase Hbridge inverters connected in series each of which is fed from an unequal DC voltage through a multilimb output transformer via full controlled thyristor bridges, whose control signals are generated from a closed loop control circuit to maintain constant load voltage for different load conditions. In the literature, several modulation methods have been applied to multilevel inverters where higher switching frequency reduces filter size but increases switching losses. The five Harmonic Elimination, SHE modulation method is presented where additional notches are introduced in the multi-level output voltage. These notches eliminate harmonics at the low order/frequency and shifts it a higher order/frequency and hence the filter size is reduced without increasing the switching losses and cost of the system. The proposed modulation method is verified through simulation and also validated practically.