

Energy Saving Analysis and Simulation for Home Electricity

ABSTRACT

This paper presents the energy saving method by applying the voltage control technique on a single-phase AC source to a thyristor rectifier and an IGBT inverter with LC filter. Based on the LC filter parameter, the values of the gain for the controller are obtainable. The proposed controller structure consists of two loops arranged in a cascaded model. The output of the first loop is the capacitor current. This current is added to the load current in order to obtain the current reference. This reference current value will be compared with the inverter current which produces the error signal to be fed into the second loop in the cascade system. The output of the second loop is the inverter voltage. This voltage is added to the load voltage to produce the voltage reference. This reference is fed to the pulse width modulation generator via the controller and compared with the triangular wave. This energy-saving circuit is designed in blocks using MATLAB Simulink.