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Abstract:

Three phase inverters are widely used to control different industrial process. Power electronics based inverters are very popular for fast response and precise control. In this paper an IGBT based three phase power inverter is proposed. Conventional three different conduction modes of 1200, 1500 and 1800 have been adopted. Micro-controller based firing pulse generation circuit using a special multi-winding transformer and opt-coupler to apply isolated firing pulses for each IGBT has been developed and tested successfully. Simulation and test results of the inverter for three phase resistive as well as inductive loads have been presented. The test results are found to be in good agreement with the simulation outcome and also with the theoretical analysis. The main objective is to make an inverter with selectable conduction modes so that specific mode can be defined for resistive or reactive loads. The required correction for PFI is done by adjusting the percentage of duty cycle firing pulse of IGBT to control the capacitive current. The result of the experiment can be used to design PFI (Power Factor Improvement) units for the small industries and domestic users as well. In this paper a three phase inverter of multiple conduction mode with a switching capacitor power factor improvement (PFI) system is analyzed.

Keywords: Power Electronics, Phase controller, Converter, Inverter, Microcontroller, IGBT, Algorithm