Abstract

Three-phase pwm voltage source inverters are widely employed in high performance ac drive system, active filters and uninterrupted power supply (UPS) etc. For these applications, the converter should provide good dynamic response. However, the performance of the converter system largely depends on the accuracy of the applied current control strategy. The current controllers can be classified as linear and non-linear current controllers. Linear current controller includes PI (synchronous & stationary reference frame) controller, state feedback controller and predictive current controller. Nonlinear current controller includes ramp type, hysteresis controller and delta modulator etc. This paper presents a novel delta modulator and modified ramp type current controller for current controlled voltage source inverter. Delta modulator provides constant switching frequency during load parameter changes and it gives good dynamic response. Modified ramp type current controller provides lower value of THD and it reduces the lower order harmonic content in the three-phase load current.

The comparative study between these two current controllers is verified through MATLAB computer simulation environment and THD level of three-phase load currents have been calculated for different values of load parameters.
A Novel Delta Modulator and Modified Ramp Type Current Controller-Two Viable Scheme for Current Controlled Voltage Source Inverter

Reference


Index Terms

Power Engineering

Control Systems

Key words

Hysteresis current controller
delta modulator
voltage source inverter (VSI)

total harmonic distortion (THD)

pulse width modulation (PWM)

switching frequency