

Abstract

Traditionally ac-dc converters are commonly used for providing dc link voltage, Adjustable Speed Drives (ASD), UPS application and front end supply for the SMPS. Till recent past the ac-dc converter technology is dominated by line commutated uncontrolled rectifier and phase controlled thyristor bridge rectifiers which have some inherent draw back.

However, with the development of power semiconductor device technology, the self-commutated devices are evolved and researchers paid their attention to operate these converters with pulse width modulation (PWM) technique. Meanwhile more and more application requires that these converters should have both rectifying and regenerating capabilities with fast response to improve the dynamic performance. With the development of digital signal processor and Micro controller such control strategies can be efficiently implemented in real time.

PWM ac-dc voltage sources converter is preferred to phase controlled converters because of its ability to deliver nearly sinusoidal current at unity power factor. The main objectives in the control of PWM ac-dc converters are to achieve high power factor and minimum harmonic distortion in input line currents. There are various PWM techniques which are used for control purpose, have their own merits and demerits.

In the present work a single phase ac-dc converter has to be introduced which will have the property of providing the desired dc voltage with very low ripple in it, unity power factor at the supply side and THD (Total Harmonic Distortion) of less than 5% in supply current as per the IEEE-519 standard. Here Sinusoidal Pulse Width Modulation (SPWM) technique is used to give base pulses to the respective IGBTs. In this project an analog circuit is used for controlling purpose. Either DSP or Micro controller can also be used as per the requirement. By using DSP or microcontroller close loop operation of the circuit can be obtained.