MICROCONTROLLER FOR PWM INVERTER

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ABSTRACT

In this a three phase microcontroller pulse width modulation(PWM) transistors inverter has been introduced. The PWM control signals are produced using a software in PC, so that the complex control circuit hardware of the inverter can be replaced by the software. The PWM switching strategy is proposed, which is closely approximates and exhibits many of the desirable performance characteristics of optimized PWM strategies based on minimized the total harmonics distortion. The drive system hardware includes the implementation of PC control system, transistor inverter, interface circuits, and driving circuits. The transistors are used as efficient switching devices for the inverter power circuits. The PWM inverter is designed to feed an induction motor with the adjustable frequency. Variable frequency output is generated by varying the width of PWM pulses biasing the transistors of the inverter. This is achieved when the computer generated the pulses through the interface to the inverter. This computer are links to the various sub-system to control the speed of the three phase induction motor.

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CHAPTER 1

1.0 INTRODUCTION

There are many industrial applications requiring variable speed drives robust and maintenance free. The three phase induction motor are widely used nowaday in areas requiring wide range of control of speed and torque.

In ac machine, a three phase ac power produces a rotating magnetic field in the air gap which reacts with the rotor mmf wave to develop the torque. The rotor mmf in a synchronous machines is created by a separate field winding which carries dc current, whereas in an induction motor it is created by by the stator induction effect. The speed of the machine is related to the stator supply frequency which produces synchronously rotating magnetic field. It frequency increased to increase speed of the machine, magnetising reactance and correspondingly the develop torque is reduced.

For this reason, an ac machine normally requires variable-voltage variable-frequency power supply for the speed of control. The type of power supply can be obtained by a dc link converter system which consists of a rectifier followed by an inverter. This inverter is control by PWM. By controlling the frequency and the amplitude of the voltage, in a proper relationship to maintain the the constant-rated flux in the machine, it is possible to operates the motor efficiency from stand still up to the maximum rated speed[1]. A major