

STUDY OF THREE-PHASE INDUCTION MOTOR SPEED CONTROL USING PULSE WIDTH MODULATION (PWM) TECHNIQUE

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ABSTRACT

Three phase induction motor (squirrel cage) have many applications in the industries such as for cranes, lifts, and elevators. The speed control of induction motor is important to achieve the maximum torque and efficiency. In this paper, the speed control of three phase induction motor in Pulse Width Modulation (PWM) technique using MATLAB Simulink was studied. PWM technique is an effective way to control the speed of induction motor. The purpose of this project is to develop algorithm to perform the PWM operation using MATLAB Simulink version R2010a. This method provides means to control speed of induction motor.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

In this new era, the popularity of the induction motor has been increased. AC Induction motors are being applied today to a wider range of applications requiring variable speed. Generally, variable speed drives for Induction Motor require both wide operating range of speed and fast torque response, regardless of load variations.

The three-phase induction motor is rotating electric machine designed to operate from a three phase source of alternating voltage [1]. Induction motor is a type of AC motor where power is supplied to the rotor by means of electromagnetic induction.

Three phase of the induction motor (squirrel cage) widely used in industrial application which is used in elevators, lifts, cranes, etc. This is because the induction motor is of high efficiency and the loss is low.

There are many techniques to control speed of induction motor such as varying the slip and synchronous speed, and Pulse Width Modulation (PWM). Changing the rotor resistance or terminal voltage can vary the slip. When changing the rotor resistance, it requires wound rotor induction motor and any resistances inserted to the rotor circuit will reduce the efficiency of the motor. By changing terminal voltage will limit the range of