

SIMULATION OF THREE PHASE INDUCTION MACHINES USING SIMULATION OF MATLAB

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Electrical Engineering (Hons.)



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In the name of Allah the most benevolent and the most merciful

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ABSTRACT

There is a growing demand for three-phase induction machine in the industries today. Realizing the importance of this demand, this thesis is represented. The thesis attempts to analyzed three phase induction machines using simulation of Matlab (MATrix LABoratory) for reducing the problem that normally exists in the machine. The analyses are using 1hp and 20hp for three phase and also 1/4hp Single-phase induction machines as a sample. Five types of analysis are presented such as; Operating Characteristics, Starting Methods, Linearized Analysis, Some Non-zero Vsg Conditions and Single-phase Induction Motor.

In this thesis, the approach of arbitrary reference frame is used in modeling; Simulink is versatile and powerful analysis tool with a rich feature set and powerful numerical algorithms where it is most suitable to handle the case of the machines. The simulation is produce in stationary reference frame to standardize the variable used in simulation.

The result obtained through these experiments showed that the proposed to used simulink simulation is easier to monitor the signal that come by the difference kinds of variables that consumer want. Result from the analysis that have already made can be used as to eliminated or reduce the failure or problem that normally contributed in induction machines. Furthermore, it also can be used to compare with difference types of input signal either three-phase or single-phase.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Robust construction, relatively low manufacturing cost, and ease of control have resulted in the induction motor being the most populous of all electric machines. Where as dc motors and the synchronous motors require two excitation connections (*doubly excited*), the induction motor has only one excitation connection (*singly excited*). Currents that flow in the secondary winding of the induction motor are established by the process of magnetic *induction* through coupling with the singly excited winding, from whence the name *induction motor* is derived.

In applications where power requirement is small and suited to single-phase distribution, the induction motor is available in single-phase versions. Many domestic appliances such as washers, dryers, fans, and air conditioning units use single-phase induction motors, however, common industrial applications use the three-phase induction motor in integral-horsepower ratings with typical voltage ratings.

1.2 Construction

By far the greatest number of electrical motor manufactured motors, ranging from small single-phase fractional-horse-power large machines delivering 10000 h.p. and running direct from 11kV mains. As a general-purpose approximately constant-speed motor for general industrial drives, the cage-rotor type has a remarkably simple and robust construction enabling it to operate in the most adverse circumstances and to give excellent service with little demands on maintenance.