

TITLE

**THEORETICAL ANALYSIS OF A THREE-PHASE
MOTOR RUN BY A SINGLE-PHASE SUPPLY
USING SEMICONDUCTOR PHASE-CONVERTOR**

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In the name of ALLAH The Most Gracious and The Most Merciful.

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ABSTRACT

The purpose of this project is to theoretical investigate the feasibility of running three-phase machine running under single-phase supply employing the use of semiconductor devices which can be more advantages when compared to static devices.

Previous work by Brown and Jha[4], Herbermann[6] and Tozune[7] has proven that the three-phase motor could be run by a single phase converter.

However the problem of the previous methods are with the phase converters that could not be control due to the work which is done by using a static devices.

In this work solid state devices are used as and alternative to the phase converters. The attempt is made due to the capability of the solid state devices which could be controlled and optimum power could be cultivated from the machine.

1.0 INTRODUCTION

1.1 The History

The invention of induction machine in the 1880's completed the A-C system of electrical power generation, transmission and utilization which at the time was in competition with the D-C system for general acceptance. The whole concept of polyphase A-C including the induction motor was the idea of a great Yugoslavian engineer, Nikola Tesla. The system was patented in 1888.[1] The first large scale application of the Tesla polyphase A-C system was the Niagara Falls hydroplant which was completed in 1895.

1.2 Overview the significant of induction machine

Induction motor are simple, robust and reliable, relatively inexpensive, and has higher efficiency[10]. They range in sizes from a few hp to about 10,000 hp. The speed of an induction motor is nearly, but not quite constant, dropping only to a few percent in going from no load to full load. Some disadvantages of induction motor are ;

1. The speed is not easily controlled.
2. The starting current may be five to eight times of full load value.[1]
3. The power factor is low and lagging when the machine is lightly loaded.[2]