

PROTOTYPE OF ALTERNATOR USING INDUCTION MOTOR

**A proposal submitted in fulfillment of the requirement for the award of the degree of
Bachelor of Electrical Engineering (Power)**

MOHD ZAHINI BIN CHE DIN

2009758591

Faculty of Electrical Engineering

Mara University of Technology

40450 Shah Alam, Selangor, Malaysia.

JAN 2013

ACKNOWLEDGEMENT

Bismillahirrahmanirrahim,

Alhamdulillah. Thank to Allah SWT, whom with His willing giving me the opportunity to complete this Final Year Project with the title Prototype of Alternator Using Induction Motor. This final year project report was prepared for Faculty of Electrical Engineer (Power), University Technology Mara Shah Alam (UiTM), basically for student in final year to complete the undergraduate program.

Firstly, I would like to express my deepest thanks to, Pn Wan Noraishah Binti Wan Abdul Munim, a lecturer at University Technology Mara Shah Alam (UiTM), as my supervisor who had guided me during two semester session 2012. I also want to thanks the lecturers and staffs of Machine Laboratory Uitm Shah Alam for their cooperation during completing the final year project that had given invaluable information, suggestions and guidance in the compilation and preparation for this technical report.

Deepest thanks and appreciation goes to my parents, family, and others for their cooperation, encouragement, constructive suggestion and full of support for the report completion, from the beginning till the end. Also thanks to all my friends and everyone, that has contributed by supporting my work and helped me during the final year project progress till it fully completed.

ABSTRACT

Induction motor is an electrical machine that converts electrical energy to mechanical energy. This type of electrical motor, which can be found in any home appliance, such as ceiling fan, washing machine, mixer and automation, it can be transformed into alternator. The ceiling fan motor is a single phase induction motor and can be transformed to an alternator. This alternator is easy to be made, simple to handle and operate. It was a good exercise for students during transformation of these induction motor into generator and it make students easy to understand the knowledge of the electrical theory. Student can apply the knowledge theory by transforming these induction motor into generator. The purpose of this project is to give an idea on how to make simple energy generator that can generate electric. Energy that generated by these alternator can be stored in battery.

INTRODUCTION

1.1 Background Study

An alternator is an electromechanical device that converts mechanical energy to electrical energy in the form of alternating current. Most alternators use a rotating magnetic field with a stationary armature but occasionally, a rotating armature is used with a stationary magnetic field or a linear alternator is used. Alternators generate electricity using the same principle as DC generators, namely, when the magnetic field around a conductor changes, a current is induced in the conductor. Typically, a rotating magnet, called the rotor turns within a stationary set of conductors wound in coils on an iron core, called the stator. The field cuts across the conductors, generating an induced EMF (electromotive force), as the mechanical input causes the rotor to turn. In this project an induction motor will be converted to permanent magnet generator (alternator). Ceiling fan motor is one of induction motor, it consuming single-phase 230V electrical energy to operate. This induction machine can be transformed to an alternator because it is a bi-directional machine. The construction of ceiling fan's motor consists of seven pair poles winding and an auxiliary shifted winding. These windings are placed in the centre of the ceiling fan and to turn the blades of the fan a squirrel cage of rotor was placed in the periphery. To convert this induction machine into a permanent magnet generator, 14 small magnets will be fixed in the rotor, this will create same amount of magnetic flux path that equivalent to the one that was created by the coils when it working as motor [1].

1.2 Objective of project

There are several main objectives that that associated with this project:

- To design and transform an induction machine to permanent magnet generator.
- To maximize the usage of renewable energy.
- To converting AC voltage to DC voltage and storage in battery.