

AC VOLTAGE CONVERTER USING PWM TECHNIQUE AS SOFT  
STARTER FOR SINGLE PHASE INDUCTION MOTOR

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*In the name of ALLAH S.W.T., the most Merciful and the most Gracious*

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## **ABSTRACT**

This thesis report presents pulse width modulation (PWM) method in AC voltage converter as a soft starter of an induction motor. This technique is used to limit the starting currents that occur in an induction motor. The starting current limiting device for single phase induction motor is driven by an AC power supply. This technique is usually used in household electrical equipment to reduce an inrush starting current at initial start-up. When the induction motor is turn ON, high starting current will flow in the induction motor. The propose system capable to reduce some portions of positive and negative periods in sinusoidal waveform of the AC power such that the average voltage input to the single phase induction motor is increase gradually due to the increasing of PWM duty cycle. Thus, the initial high starting current of an induction motor can be reduced and the average input voltage to the induction motor could be increased gradually.

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# CHAPTER 1

## INTRODUCTION

### 1.1 PROJECT OVERVIEW

Nowadays, the requirement of electric motor in household equipment has recently become global trend as used to run some machines equipment. The type of electric motor used is depending on the application that would apply to the machines are normally AC motor.

The present invention relates to a starting current limiting device for a single phase induction motor used in household electrical equipment. Household electrical equipment such as an air conditioner, a refrigerator, a washing machine or an electrical fan, ordinarily utilizes a single phase induction motor for a driving purpose since the electrical power readily available from a socket is usually single phase AC supply with a voltage 230V and a frequency of 50Hz [1].

The single phase induction motor of this household electrical equipment must usually turned on and off repeatedly. For description purpose, the term “working current” is defined as the current flowing from a power source into an induction motor, the term “starting current” as the working current when a AC source is just applied to an induction motor, and the term “rating current” as the term working current when the induction motor is running under a steady state. It is found that the starting current is usually about three to six times as large as the rating current [1].