

OPTIMIZATION OF PERFORMANCE OF A SPIM

Prepared by: Tong Yia Li

ABSTRACT

Traditionally, a single phase induction motor is started by providing some auxiliary means to the motor. An auxiliary winding (starting winding) is connected right angle to the main winding with one capacitor and a centrifugal switch (a kind of switch that operates depending on the speed of the motor) is connected in series with the auxiliary winding to create a starting torque during the starting period.

However, this traditional way has the disadvantage that the centrifugal switch will switch the auxiliary winding and the starting capacitor out from the motor when it reaches 75 percent of synchronous speed, leaving behind the main winding to continue to run at a speed which is low. Therefore, the project will added in a single capacitor (running capacitor) which is connected in series with auxiliary winding and connected in parallel with the starting capacitor. This method solved the problems that involve the use of only one capacitor because the running capacitor increases the efficiency during the running conditon and has better performance as the traditional method.

This project will shows the theoretical results through simulation analysis process by using the Matlab and Simulink to start a single phase induction motor, where a capacitor which act as a starting capacitor and a capacitor which act as a running capacitor is used and a centrifugal switch is connected in parallel with the running capacitor. At last, the design of the motor using two capacitor and a centrifugal switch in relation to their optimum torque and efficiency is compared with that of the design of the motor using only one capacitor and a centrifugal switch.