



“Variable Frequency Drive and Management System for 3 Phase Motor Operation Kit for Engineering College Lab”

A graduation project submitted to the Faculty of Engineering, Helwan
University, in partial fulfillment of the requirements for obtaining a
bachelor's degree

In electrical engineering
(Electrical Powers and Machines)

Under The Supervisions of

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ABSTRACT:

Three-phase induction motors are the workhorse of the industry. Variable speed operation of the motor enables substantial energy savings through the implementation of variable frequency drives. This project concerns the design and implementation of a three-phase voltage source inverter (VSI) for variable frequency drive. The focus was to generate variable frequency output suitable to be fed to the induction motor for variable speed control. The proposed system is a MATLAB Simulink model, which is a closed-loop model designed to achieve desired speed control of a three-phase induction motor by varying its frequency. The Simulink model has



main blocks, namely the inverter, synchronous machine, proportional-integral control. The inverter is comprised of six insulated-gate bipolar transistors (IGBTs), which are fired by gate pulses generated by the Texas Instruments TMS320F28379D DSP controller. The inverter generates variable frequency and variable voltage output, which is given to motor terminals. this project presents the working principle of variable frequency drive (VFD), its performance, and the use of Pulse Width Modulation (PWM) in a three-phase inverter to control the frequency and thus the speed. The graduation project will contribute to the educational process as part of the electrical machine lab experiments. TeSys T is a motor management system that provides protection, metering, and monitoring functions for single-phase and 3-phase, constant speed, High-performance multifunction protection, independent of the automation system a local HMI control unit for reading, displaying, and modifying the parameters monitored, diagnostics, Configuration using SoMove software Connection to the automation system via a communication network (selection according to various protocols). All the lab experiments and results will be included also.