

ABSTRACT

The needs for a particular electricity form in accordance with industry specification become one of the necessity to improve the efficiency and performance of an industrial equipment. Limited capability of power supply in the desired form of electricity can be overcome by making a device tools called converter, which change a form of electricity to another form of electricity. DC power supply is a power converter which can convert electrical alternating current (AC) to form a direct current (DC). The development of this final assignment is devoted to design a power supply which is capable to receive three-phase alternating current input and pure direct current output. This circumstance is becomes important because it can alter the three-phase AC power as the output of industrial electric generators into DC electricity directly for various purposes.

In the design of switching mode DC power supply, there are several main sections, those are : three-phase full-wave rectifier, IGBT power switch, switching transformer, PWM and power factor correction controller, converter DC Chopper circuit topology, optocoupler and voltage reference. Pulse width modulation is used to regulate the ON and OFF cycle at the IGBT power switch, so that we can get a signal with high frequency regulating the output DC current. Optocoupler as feedback, is connected with the PWM controller IC as the main controller. Switching pulses generated by the PWM signal generator is the main control element for setting the output DC voltage and current.

In the design of this final project, it has been made the switching mode DC power supply with power efficiency 74.147% at 24V voltage and 0.2A current. The design of the DC power providers can be implemented on industrial use of DC current from the three-phase AC voltage source.

Key words: DC power supply, three-phase AC current, pulse width modulation