STEP-UP THREE PHASE CONVERTER

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ABSTRACT

In this paper, a rectifier system having voltage step-up characteristics is treated. The system consists of a three-phase PWM voltage source rectifier and a dc-to-dc boost converter connected in cascade. The designing process of this project is by using MATLAB/SIMULINK simulation model. This project basically can be divided into three parts. First is to design the PWM in order to control the rectifier. Next is to identify and design the rectifier circuit which consist of 6 ideal switches topology and the last part is to step-up the output voltage of the rectifier by using a boost converter circuit. The result of MATLAB/SIMULINK was analyzed at the end of this paper/project.

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INTRODUCTION

BACKGROUND OF STUDY

Application of Power Electronics

The demand for control of electric power for electric motor drive systems and industrial controls existed for many years, and this led to early development of the Ward-Leonard system to obtain a variable dc voltage for the control of dc motor drives. Power electronics have revolutionized the concept of power control for power conversion and for control of electrical motor drives [1].

Power electronics combine power, electronics, and control. Control deals with the steady-state and dynamic characteristics of closed-loop systems. Power deals with the static and rotating power equipment for the generation, transmission, and distribution of electric energy. Electronics deal with the solid-state devices and circuits for signal processing to meet the desired control objectives. Power electronics may be defined as the application of solid-state electronics for the control and conversion of electric power. The interrelationship of power electronics with power, electronics, and control is shown in Figure 1.1 as below [1].