

Thitiphat Liangchipwat 2014: Design and Implementation of Grid Connected Converters for Renewable Energy Sources. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Siriroj Sirisukprasert, Ph.D. 121 pages.

This thesis presents a practical design method and the an implementation of grid connected converters for renewable energy sources. The converter system is designed to be utilized with three phase alternators. The converter circuits are composed for a three phase rectifier and a three phase inverter. This research is discussed in the designed parameters in various parts of the system: the power stage, the digital signal processor circuit and software programming. Furthermore, the accuracy of the proposed design technique has been verified by the computer simulation. To ensure the performance of the prototype, the steady state testing and the circulated power testing has been conducted. The experiment has been performed up to 15 kilowatt (75% of the maximum load). The experimental results indicate that the prototype can generate nearly sinusoidal current and voltage wave form into system, has a total efficiency of 90 % and can be practically synchronized with the utility grid.

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Thesis Advisor's signature