

## Master 2015

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LCL Filters Design for Harmonic Mitigation of Single Phase Full Bridge AC – DC Converter.

## ABSTRACT - Masterthesis

Due to the rapid rise in the use of electrical equipment in recent years (i.e. computers, telecommunications systems, consumer electronics, etc.), power converter manufacturers are being pressured by regulatory agencies to implement some form of power-factor correction (PFC) in their products. High power factor and low input current harmonics are more and more becoming mandatory performance criteria for power converters. In some rectifier / power converter applications, such as in the electrochemical industries and magnet power supplies, a rectifier is usually operated as a dc current source with very low ripple requirement. Single phase full bridge AC-DC converters offer control of the power factor correction (PFC) as well as the DClink voltage while emitting less current harmonics to the grid. Either L filter or LCL filter can be used for the grid connection. Since the L-filter can become very large and impractical, it is often desirable to use high-order filter, such as an LCL-filter.

This master thesis describes simulation and performance analysis of LCL-filters for harmonic mitigation in single phase full bridge AC-DC converter. To attenuate the harmonics distortion while increasing the power factor on grid side with an LCL Filter, cost-effectiveness must be considered to design and select filter's parameters. This master thesis proposes a LCL filter design method based on a computer simulation tool (MatLab / Simulink). Depending on user's optimal cost function, the LCL-filter parameters are chosen without tedious and repetitive mathematical calculations.