

A Continuous Switching Technique for a Single Phase Bridgeless and Transformer-Less Active Rectifier with High Power Factor and Voltage Stabilization

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Abstract : In this paper, a proposed approach to improve the power factor of single-phase rectifiers and to regulate the output voltage against the change in grid voltage and load is presented. This converter topology is evaluated on the basis of performance and its salient features like simplicity, low cost and high performance are discussed to analyze its applicability. The proposed control strategy is bridgeless, transformer-less and output current sensor-less and consists of only two Bi-directional IGBTs and two diodes. The voltage regulation is achieved by a simple voltage divider to communicate to a controller to control the duty cycles of PWM. A control technique and operational procedure are also developed, both theoretically and experimentally. The experimental results clearly verify the theoretical analysis from the prototype connected to grid unity.

Keywords : Active Rectifier (AC-DC), power factor, single phase, voltage regulation

Conference Title : ICMET 2014 : International Conference on Materials Engineering and Technology

Conference Location : Bangkok, Thailand

Conference Dates : December 24-25, 2014