

ENHANCED AC-TO-AC FREQUENCY CHANGER BASED ON MULTI-PHASE SMART COMPARATIVE COMMUTATION

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ABSTRACT

Direct AC to AC power conversion was always a challenge to be proposed as an alternative for the DC-link one. This is due to multiple of reasons such as less complexity, power regeneration, and unity power factor privileges. However, the challenge is represented by producing a direct AC to AC system with output waveforms having reduced total harmonic distortion comparable or superior to that generated by the DC-link converters. In such a trend this paper introduces an enhanced AC-to-AC frequency changer with reduced total harmonic distortion frequency spectrum compared to the envelope cycloconverter one. This proposed work introduces smart comparative phases switching carried out via a processing unit that detects and measure the analogue voltages of each phase and sends a switching triggers to the power switching circuit. The proposed work reflected an effective reduction in output waveforms harmonic content (about 60%) compared to the envelope cycloconverter with low cost system requirements.

KEYWORDS: A. C. Converters, Cyclo Converters, Frequency Changers, Power Electronics