

Operating limits of the current-regulated delta-modulated current-source PWM rectifier

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Abstract

A stand alone, three-phase, delta-modulated, current-source PWM rectifier has been built and has been shown to be capable of operating with near sinusoidal current waveforms, unity power factor, and good DC current regulation. A mathematical model that has been justified against experimental measurements and results from digital simulations is presented. The current waveform distortion limit and the asymptotic stability limit are established. It is shown that the rectifier can operate safely within these limits in the entire range of its power ratings.

Keywords: pulse width modulation; rectifying circuits; operating limits; current-source PWM rectifier