Abstract

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Series connected self-excited synchronous generator: steady state and transient behaviors

Series Connected Synchronous Generator (SCSG) is an induction machine with stator and rotor windings connected in series via excitation capacitors. This generator operates synchronously to produce sinusoidal output voltage with half rated frequency. This paper presents theoretical and experimental investigation for transient and steady state performances based on the d-q model as derived for a synchronously rotating frame. The minimum capacitor needed to cause self-excitation for a particular speed is calculated.