

Permanent Magnet Generator - One Phase Regime Operation

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Abstract : The article presents the concept of an electromagnetic circuit of a 3-phase surface-mounted permanent magnet generator designed for a single phase operation. A cross section of electromagnetic circuit and a field-circuit model of generator used for computations are shown. The paper presents comparative analysis of simulation results obtained for two different versions of generator regarding construction of armature winding. In the first version of generator the voltages generated in each of three winding phases have different rms values (different number of turns in each of phases), three winding phases are connected in series and one phase load is connected to the two output terminals of generator. The second version of generator is very similar, i.e. three winding phases are connected in series and one phase load is powered by generator, but in this version the voltages generated in each of winding phases have exactly the same rms values (the same number of turns in each of phases). The time waveforms of voltages, currents and electromagnetic torques in the airgaps of two machine versions for rated power are shown.

Keywords : permanent magnet generator, permanent magnets, synchronous generator, vibration, course of torque, single phase work, unsymmetrical operation point, serial connection of winding phase

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