

Preliminary Studies on Number of Coil Turns per Phase and Distance between the Magnet Pairs for AFPM Ironless Electricity Generator

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ABSTRACT

The generator that normally used in the market, which is the iron-cored electricity generator has high cogging and starting torques. By redesigning of the iron-cored electricity generator, Axial-flux Permanent Magnet (AFPM) configuration minimizes the usage of ferrite material. AFPM, one of the coreless electricity generator configuration has a less counter electromotive force (CEMF) compare to the cored electricity generator. AFPM configuration also has no cogging torque and low starting torque. Application of a coreless electricity generator is the most suitable compare to the cored electricity generator. However, it is expected that the elimination of the ferrite material within the coreless electricity generator itself increases the power generation. The configuration is the ironless electricity generator. This paper presents the design and analysis of the AFPM ironless electricity generator. There are two main parameters present in this paper, different number of turns of coil per phase and distance between a pair of the magnet. The result of the analysis shows that when the coil turns per phase increased, the voltage output and magnetic flux within the coil also increased. While increasing the distance between the magnets, the voltage output, and magnetic flux within the coil decreases.

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