

Permanent magnet flywheel energy storage self-circulating power generation system





Overview

Can a compact flywheel energy storage system eliminate idling loss?

Abstract: This article proposed a compact and highly efficient flywheel energy storage system (FESS). Single coreless stator and double rotor structures are used to eliminate the idling loss caused by the flux of permanent magnet (PM) machines. A novel compact magnetic bearing is proposed to eliminate the friction loss during high-speed operation.

How does a flywheel energy storage system work?

Based on the aforementioned research, this paper proposes a novel electric suspension flywheel energy storage system equipped with zero flux coils and permanent magnets. The newly developed flywheel energy storage system operates at high speeds with self-stability without requiring active control.

Why are permanent magnet synchronous machines used in flywheel energy-storage systems?

Therefore, various machines are utilized in flywheel energy-storage systems to fulfill actual requirements [13, 14]. Permanent magnet synchronous machines (PMSMs), as conventional machines, offer advantages such as high efficiency, high power density, low noise, and low vibration [15, 16, 17, 18, 19].

How does a flywheel generator work?

The operating principle of a flywheel generator is simple and yet strong. When the system is supplied with energy, the flywheel speeds up, storing the energy as kinetic motion. When there is a demand for power, the stored energy is converted back into electrical energy, which provides a smooth supply of power.



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