WALMER ENERGY

Flywheel energy storage and heat dissipation

Overview

Can flywheel energy storage systems recover kinetic energy during deceleration?

Flywheel energy storage systems (FESS) can recover and store vehicle kinetic energy during deceleration. In this work, Computational Fluid Dynamics (CFD) simulations have been carried out using the Analysis of Variance (ANOVA) technique to determine the effects of design parameters on flywheel windage losses and heat transfer characteristics.

What is a flywheel energy storage system?

The flywheel energy storage system in this paper is a vertical flywheel supported by active magnetic bearings. A spiral cooling water jacket is designed outside the stator of the motor. Table 1 lists the basic dimensions and performance parameters of the flywheel energy storage system.

How does a flywheel energy storage unit affect system performance?

With the power of a single flywheel energy storage unit reaching up to 1000 kW, system losses increase, leading to an overall temperature rise . Heat loss and transportation issues become critical factors affecting motor performance, which restrict the improvement of system stability and reliability [, , ,].

What are the disadvantages of a flywheel energy storage system?

High idling loss, high cost, and the complexity of the electromechanical control system are notable weaknesses [16, 17]. With the power of a single flywheel energy storage unit reaching up to 1000 kW, system losses increase, leading to an overall temperature rise .

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