

Flywheel energy storage rotor weight





Overview

What is a flywheel rotor?

Flywheel rotors are a key component, determining not only the energy content of the entire flywheel energy storage system (FESS), but also system costs, housing design, bearing system, etc. Using simple analytic formulas, the basics of FESS rotor design and material selection are presented.

What size rotor is used in a flywheel energy storage system?

The shown unit features a rotor with a full-size 400 mm outer diameter but axial height scaled to 24% of the full-scale design with 1.0 kWh nominal capacity. Figure 1. Cutaway schematic of a flywheel energy storage system for experimental research. Inset shows the actual device [16].

How does a flywheel energy storage system work?

Flywheel Energy Storage Systems (FESS) rely on a mechanical working principle: An electric motor is used to spin a rotor of high inertia up to 20,000-50,000 rpm. Electrical energy is thus converted to kinetic energy for storage. For discharging, the motor acts as a generator, braking the rotor to produce electricity.

What is a shaftless flywheel energy storage system?

Texas A&M University has developed a shaftless flywheel energy storage system [17,18] with a coreless motor/generator . The system is aimed at: To increase the recyclability and reduce the environmental impact of FESSs In the remainder of this paper, we first propose a simplified flywheel design criterion, considering rotor-shaft assembly.



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Shaft-less flywheels-2022

The shaftless flywheel is further optimized using finite element analysis with the magnetic bearing and motor/generators' design considerations.

Keywords: Battery, Energy ...

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