

## ContainerPower Energy Solutions

# Design of energy storage flywheel



## Overview

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Is flywheel storage energy system a new technology?

Flywheel storage energy system is not a new technology; however, the deep interest in applying its principle in power system applications has been greatly increasing in the recent decades.

What are the components of a flywheel energy storage system?

The key components of the flywheel energy storage system [6, 7] comprise the flywheel body , magnetic levitation support bearings [9, 10, 11], high-efficiency electric motors [12, 13, 14, 15, 16, 17, 18], power electronic conversion equipment, and vacuum containers.

What is a flywheel energy storage system (fess)?

According to Al-Diab (2011) the flywheel energy storage system (FESS) could be exploited beneficially in dealing with many technical issues that appear regularly in distribution grids such as voltage support, grid frequency support, power quality improvement and unbalanced load compensation.

How can flywheels be more competitive to batteries?

The use of new materials and compact designs will increase the specific energy and energy density to make flywheels more competitive to batteries. Other opportunities are new applications in energy harvest, hybrid energy systems, and flywheel's secondary functionality apart from energy storage.

How does a flywheel energy unit work?

D. Power Electronics The flywheel energy unit produces variable frequency AC current. To reliably operate the system, power electronics devices must be installed in order to keep the frequency constant so that it can be connected to the grid. Power converters for energy storage systems are based on SCR, GTO or IGBT switches.

Are flywheel-based hybrid energy storage systems based on compressed air energy storage?

While many papers compare different ESS technologies, only a few research [152,153] studies design and control flywheel-based hybrid energy storage systems. Recently, Zhang et al. present a hybrid energy storage system based on compressed air energy storage and FESS.

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