Bachelor-/Masterthesis

Power Storage for Shock Power Supply

Topic

Inverter

Focus

☒ Theory
☒ Literature
☒ Simulation
☐ Programming
☒ Construction
☒ Hardware
☒ Experiments

Courses of Study

☒ Electrical Engineering
☐ Mechanical Engineering
☐ Mathematics
☐ Computer Science

Starting Date

As soon as possbile

Please send your application to:

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Motivation

In inverter-fed or self-sufficient grids there are problems with the coverage of short-term peak loads with today's state of the art technology, since existing generators/converters are usually designed for continuous power. Under certain circumstances, that can lead to the shutting down of inverters and thus to power failures. Possible causes of multiple short-term overloads can be, for example, direct starting of motors and mains faults. Commercially available line circuit breakers trip at 5 to 10 times the rated current in the event of a short circuit. If the current sources in the network area under consideration cannot provide these currents, the so-called selectivity is also not guaranteed. Direct starting of the asynchronous motors, which need 4 to 7 times the rated current for a short time, is also problematic in current-limited networks.

Tasks

The aim of the work is to develop a prototype of the energy storage device, which can be used in an autonomous power grid as a virtual flywheel storage device for the provision of the shock power and is additionally capable of triggering the conventional protective devices in the event of a fault.

The work topics include, among others, the problems, an overview of the state of the art and areas of application, storage media candidates for the provision of short-circuit power, coupling possibilities of the shock storage media on the grid as well as relevant inverter topologies.