

A Soft-Switched Isolated Three-Phase Unfolding-Based Modular AC-DC Converter for DC Current Distribution Systems

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Abstract

EV charging is growing in popularity, so existing charging solutions must scale to compete in the fast-paced market. Unfortunately, scaling charging systems requires extensive wiring and several bulky conversion modules, which increase losses and construction costs. Researchers at ASPIRE have developed an innovative approach, using one single AC-DC conversion system that distributes power to multiple DC current distributor modules.

What It Is

An AC-DC conversion system optimized for large-distance high-power distribution.

Value Proposition

This innovation decreases losses, assembly costs, and results in more effective power transfer/EV charging in large-scale networks.

Applicable Markets

EV charging, wireless charging, data centers.

Benefit

In large-scale power distribution, networks require extensive, lengthy wiring and several bulky conversion modules. These great physical distances result in serious losses, low efficiency, and expensive assembly. This is especially relevant in EV charging—wired or wireless—and at large datacenters.

By utilizing a modular, three-phase approach, researchers at USU and ASPIRE have created a technology that circumvents these high costs and efficiencies. The technology utilizes DC-current distribution to transfer power over great distances for a lower cost. The technology places a DC-DC converter module at each output location for a customizable system.

This system decreases losses, increases overall efficiency, lowers assembly costs, and makes scalability simple for companies.

Researchers

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Intellectual Property

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