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Inductive Charging System

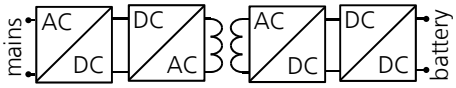
Inductive Charging System

Wireless charging using inductive power transfer is a key technology for the prevalence of electric vehicles. Thereby, cost and efficiency aspects are research and development focuses.

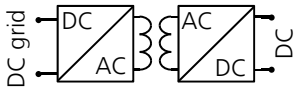
One possibility to increase the efficiency and reduce external stray fields is the minimization of the air gap between the primary side (charging station) and secondary side (pick-up coil). In this regard, a coil system mounted in front of the car is reasonable to achieve small air gaps using an autonomous parking assist system.

In detail, the system topology from a power electronic point of view could be,

- a conventional AC mains connection



- or a connection to a local DC grid



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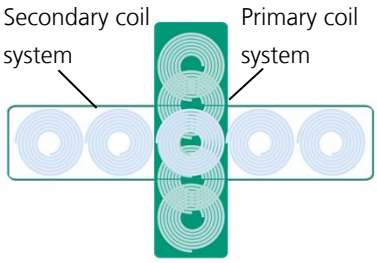
Positioning Tolerant Configurations

Three different coil arrangements are practical to achieve a required positioning tolerance and reduce system costs.

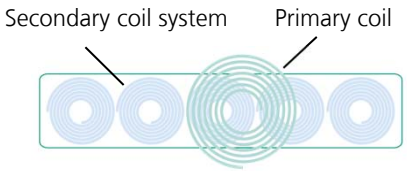
Non adaptive – highly tolerant

- Primary and secondary multi coil system
- Very high positioning tolerant in lateral and vertical direction without adaption
- Higher cost of materials



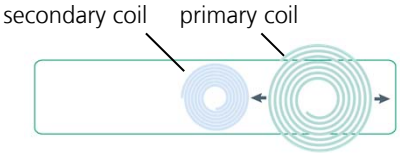
Non adaptive – medium tolerant

- Secondary multi coil system for high lateral tolerance without adaption
- Reduced cost of materials



Adaptive Primary Coil

- Mechanical adaption of primary coil to best coupling position
- Single secondary coil for minimal cost of materials



Technical Data

Power rating	3,6 kW
Efficiency up to (DC-to-DC)	97%
Efficiency up to (mains-to-battery)	93%
Operating frequency	≤150kHz

System Advantages

- **High** transfer **efficiency** and **small stray fields** through minimal air gap
- High **interoperability** through orthogonal alignment
- **Very inexpensive** setup for private use possible with only one primary coil
- **High positioning tolerance**
- **Lightweight** pick-up
- Coils **fit in** conventional and standardized **license plate dimension**
- **Minimal package** volume compared to underbody systems

Contact Us!

The Fraunhofer IISB is your research and development partner for inductive power transfer.

We develop and realize complete inductive power transfer systems. From the FEM-Simulation, over power electronics analysis/simulation and mechanical integration to the realization of complete demonstrators.