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BIDIRECTIONAL DC WALLBOX WITH DC-BUS INTERFACE AND INTEGRATED BIDIRECTIONAL ENERGY METER

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BIDIRECTIONAL DC WALLBOX WITH DC-BUS INTERFACE AND INTEGRATED BIDIRECTIONAL ENERGY METER

Technical task:

Current electric and hybrid vehicles have wired charging systems to recharge the high-voltage accumulator (the traction battery). In general, there are two different processes.

1st AC charging: The HV traction battery is charged via the AC infrastructure. The energy conversion is done by the onboard charger installed in the vehicle. This makes outputs of 3.6kW-22kW possible. This charging method is currently very widespread in private households.

2nd DC charging: The HV traction battery is directly charged with DC current via a DC charging station / DC wallbox. This makes much higher charging capacities possible - up to 150kW. This charging method is currently very widespread at public charging points and forms the basis for the later fast charging network. A few manufacturers already offer unidirectional DC charging systems / DC wall boxes for private households on the market. These have a maximum charging power of 20kW. The wallboxes are galvanically isolated and are connected to the house network as consumers.

Initial situation:

If one assumes in the future that vehicles will be able to feed the energy of their HV traction battery back into the public and/or private grid, the current charging systems are not designed for this.

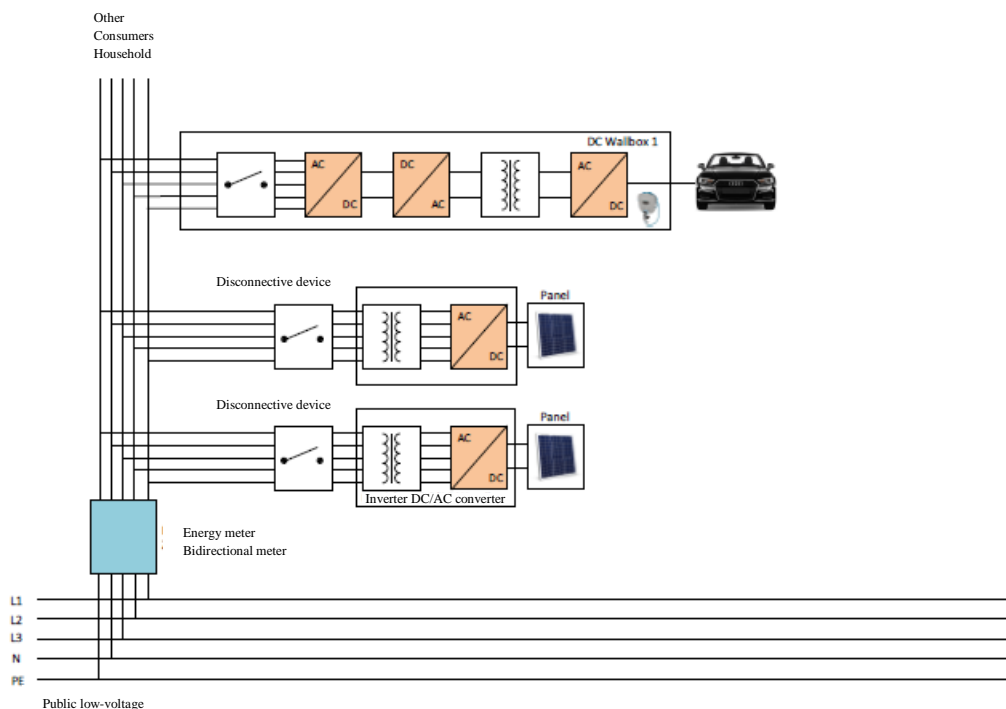
Solution:

The invention report includes a bidirectional DC wall box which makes it possible to charge the vehicle directly with a DC current as well as to feed a DC current from the vehicle back into the network infrastructure. In addition, the DC Wallbox integrates a DC bus which makes it possible to connect solar modules directly to the DC Wallbox. Due to the bidirectionality of the wallbox, the energy can also be fed into the grid. The solar inverter can therefore be omitted and the functionality is completely taken over by the bidirectional DC wallbox.

Advantages:

- bidirectional energy transmission.
- Integration of a bidirectional energy meter
- DC bus interface for the connection of solar modules
- Any, Modular Expandable
- For DC voltages up to 800V DC possible.
- Elimination of the solar inverter.
- Additional premium experience AUDI

Sketch of current implementation



Sketch of invention disclosure

