

On-Board Charger

Efficient power electronics for AC and DC charging



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AC and DC charging with integrated charging communication



HIGHLIGHTS

- DC charging communication (PLC) according to ISO 15118 and DIN SPEC 70121
- Full interoperability with all standard-compliant charging stations
- Charging power up to 22 kW
- Increase of charging power by parallel connection of several innoelectric On-Board Chargers
- Maximum efficiency thanks to silicon carbide technology

In order to win over the market and ensure satisfied customers, it must be possible to charge an electric vehicle efficiently and reliably. In addition, conformity with international standards is crucial for uninterrupted charging. These standards form the basis for trouble-free use of the innoelectric On-Board Charger now and in the future.

The innoelectric solution

The innoelectric On-Board Charger can be used for various charging concepts. It can thus be used flexible and in the long run. The component ensures AC charging with the related PWM communication as well as the PLC communication while DC charging. Thus the innoelectric On-Board Charger permits standard-compliant charging to IEC 61851-1 (PWM) and to ISO 15118 and DIN SPEC 70121 (PLC).

Possible fields of application

- Passenger and recreational vehicles
- Commercial vehicles (busses and trucks)
- Off-road vehicles
- Construction machinery
- Municipal vehicles

Efficient power electronics

Equipped with the innoelectric On-Board Charger the vehicle is prepared for the expansion of the charging infrastructure. If it is extended from 22 kW AC up to 350 kW DC the On-Board Charger does not need to be refitted or even replaced. The On-Board Charger is able to charge with 22 kW AC as well as assume the DC communication and the control of necessary HV contactors in the vehicle.

innoelectric is already looking to pioneering silicon carbide technology for its On-Board Chargers. This produces an On-Board Charger with maximum energy density and efficiency, which is reflected in the small size and low weight. At the same time, the increased efficiency reduces the requirements for the necessary cooling system.



Two innoelectric On-Board Chargers connected in parallel (44 kW) with HV battery and charging inlet (CCS2 exemplary).

The On-Board Charger has a modular architecture so that multiple devices can be connected in parallel without any problems. The charging power can therefore be adapted to customer requirements. The implemented software automatically detects further On-Board Chargers and configures them into a master/slave topology. Within this topology, one innoelectric On-Board Charger manages the charging communication and controls the associated slave.

The On-Board Charger additionally offers numerous safety features like galvanic isolation between AC and DC side and a high-voltage interlock.

Integrated V2G ComModule

The communication module integrated in the On-Board Charger guarantees trouble-free communication between the charging column and the vehicle while both AC and DC charging. The interoperability of the components is ensured by standard-compliant software.

innoelectric is continuously updating the ISO 15118 and DIN SPEC 70121 protocols, and offers software updates on request. These can be implemented via the CAN interface with minimal effort to enable successful and long-term charging.

The innoelectric V2G ComModule offers further benefits for the user:

- Value added services (VAS), e.g. to pre-book public charging spots as well as
- Plug and charge (PnC), so that the driver can start charging easily and without any obstructions.

Technical data of the innoelectric On-Board Charger

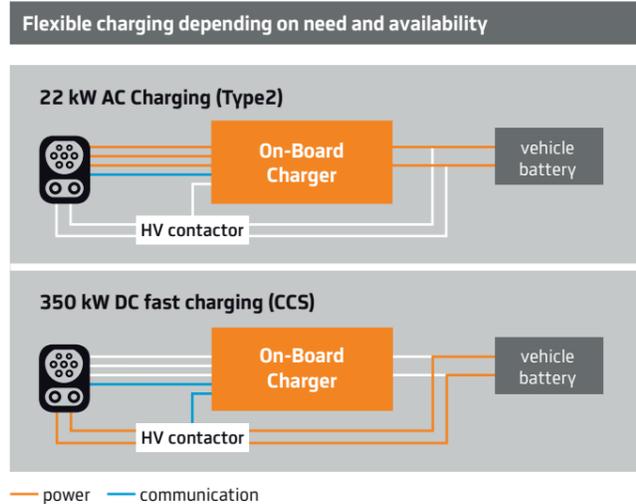
Charging power	Up to 22 kW
Input voltage	1- und 3~, EU and US
Input current	Up to 32 A per phase
Charging communication	PWM, PLC optionally
Energy conversion rate	More than 98 %
Output voltage	Up to 920 V
Output current	Up to 45 A
Dimensions (L x B x H)	Approx. 520 x 350 x 100 mm
Weight	Approx. 12 kg
Degree of protection	IP 67
Interfaces	2 x CAN (vehicle and diagnostic)

Safety and interoperability

Every innoelectric component is comprehensively tested and verified. It includes the power electronics and the communication, for example in critical operation states and with the emulation of international power grids.

The innoelectric team is convinced of electric mobility, and works out solutions for our customers that are simply better. Profound comprehension of electric mobility, personal enthusiasm and a strong sense of responsibility are the foundation we build our projects on.

Our customers benefit of component solutions for the electrified drive train and the charging process for automotive and industrial applications. Thus includes not only components for charging technology and power electronics, but also battery systems.





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