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Terminology of electric vehicle charging/battery swap infrastructure

电动汽车充换电设施术语

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Terminology of electric vehicle charging/battery swap infrastructure

1 Scope

This Standard defines the terms and definitions related to charging and battery swap facilities for electric vehicles.

This Standard is applicable to electric vehicle charging and swap facilities that provide electrical energy for pure electric vehicles and plug-in hybrid vehicles.

2 Normative references

There are normative references for this Standard.

3 Charging / battery swap infrastructure

3.1 charging / battery swap infrastructure

The general term for related facilities that provide electric energy for electric vehicles.

NOTE: The charging / battery swap infrastructure includes charging infrastructure and battery swap infrastructure.

3.1.1 charging infrastructure

The general term for related facilities that use the whole vehicle charging method to provide electric energy for electric vehicles.

NOTE: The charging infrastructure includes charging station and dispersal charging infrastructure.

3.1.1.1 charging station

A dedicated place to provide charging services for electric vehicles.

NOTE: The charging station is composed of multiple centralized charging equipment and related power supply equipment, monitoring equipment, supporting facilities, etc.

3.1.1.2 dispersal charging infrastructure

The general term for charging and swapping facilities and their management systems that provide electric vehicle users with charging and swapping services and other auxiliary services, and with information management functions.

4 Charging and swap method

4.1 conductive charge

A way that uses electrical conduction to charge the battery.

[Source: GB/T 19596-2017, 4.2.1]

4.1.1 DC charge

A method that uses conduction method to provide electrical energy to electric vehicle power battery with direct current.

4.1.2 AC charge

A method that uses conduction method to provide electrical energy to electric vehicle on-board charger with alternating current.

4.1.3 charging mode

The way to connect electric vehicle to the grid (power supply) to supply electric vehicle.

[Source: GB/T 18487.1-2015, 3.1.2]

4.1.3.1 mode 1

When connecting an electric vehicle to the AC power grid (power supply), plugs and sockets that meet the requirements of GB/T 2099.1 and GB/T 1002 are used on the power supply side, and phase wires, neutral wires, and conductors for grounding protection are used on the power supply side.

[Source: GB/T 18487.1-2015, 3.1.2.1]

4.1.3.2 mode 2

When connecting an electric vehicle to the AC power grid (power supply), plugs and sockets that meet the requirements of GB/T 2099.1 and GB/T 1002 are used on the power supply side, and phase wires, neutral wires and grounding protection conductors are used for the power supply side; the on-cable control and protection device (IC-CPD) is used during the charging connection.

[Source: GB/T 18487.1-2015, 3.1.2.2]

A swapping method that the battery box is replaced at the bottom of the vehicle body.

4.3.3 top-swapping of SBS

A swapping method that the battery box is replaced on the top of the vehicle body.

4.3.4 front/rear-swapping of SBS

A swapping method that the battery box is replaced at the front and rear of the vehicle body.

4.3.5 middle-swapping of SBS

A swapping method that the battery box is replaced in the middle of the chassis.

5 Conductive charging equipment

5.1 off-board charger

A special device that is fixedly connected to an AC or DC power source and converts its electrical energy into DC electrical energy, and uses conduction to charge the power battery of electric vehicles.

NOTE: Referred to as charger.

5.1.1 charging terminal

When charging an electric vehicle, a component of the off-board conductive charger that the charging operator needs to face and operate.

NOTE: The charging terminal is generally composed of a vehicle plug and a human-computer interaction interface. It can also contain components such as metering and communication control.

5.1.2 integral charger

A charger that puts the power conversion unit, charging terminal function related components and other components in a cabinet (box), and integrate them in structure.

5.1.3 split type charger

A charger that the power conversion unit and the charging terminal are structurally separated, and the two are connected by a cable.

5.10.1 cable assemble

Flexible cables equipped with power plugs and/or vehicle plugs, used to connect electric vehicles and charging equipment.

5.10.2 function box

A device installed on mode 2 cable assembly to realize control function and safety function.

5.10.3 in-cable control and protection device; IC-CPD

A group of components or elements that connect the electric vehicle to the AC grid in charging mode 2.

NOTE: The in-cable control and protection device includes a function box, a cable, a power supply plug and a vehicle plug, with control functions and safety functions.

5.11 automated connection coupler

A device that automatically realizes the electrical and physical connection between the charging equipment and the electric vehicle, including the active end and the passive end.

5.11.1 automated connection device; ACD

In the automated connection coupler, the part that realizes the electrical and physical connection between the charging device and the electric vehicle through active mechanical action.

NOTE: Referred to as the active end.

5.11.2 ACD counterpart

In the automated connection coupler, the part that passively realizes the electrical and physical connection between the charging device and the electric vehicle.

NOTE: Referred to as the passive end, also known as ACD docking end.

5.12 top contact charging system

The charging system that the automated connection coupler is located on the top of the electric vehicle to provide electricity for the electric vehicle.

NOTE: The top contact charging system is composed of off-board chargers, automated connection couplers, etc.

5.12.1 off-board pantograph

High frequency power conversion units that load the required AC excitation to the primary device.

6.2.3 power transfer controller; PTC

The communication service unit of electric vehicle wireless power transfer that realizes the inverter from DC to high frequency AC, outputs AC power that meets the working frequency of the electric vehicle wireless power transfer, drives the primary device to work, and completes the control of the electric vehicle wireless charging process according to the control instructions of the CSU.

6.2.4 communication service unit; CSU

The communication controller of the off-board supply equipment of the electric vehicle wireless power transfer, which communicates with the IVU to complete the control of the charging process. It can also communicate with the equipment management platform to complete the control and management functions of the off-board supply equipment of the electric vehicle wireless power transfer.

6.3 on-board supply circuit

A general term for on-board side equipment of electric vehicle wireless power transfer.

NOTE: The on-board supply circuit includes secondary device, on-board power components and communication units.

6.3.1 secondary device

A receiving end of energy, a device that is coupled with the primary device to receive the alternating electromagnetic field and convert it into electrical energy.

6.3.2 on-board power components

Convert the electrical energy received by the secondary device into direct current through a power converter and supply it to electric vehicles.

6.3.3 power pick-up controller; PPC

The power control unit of on-board supply circuit of electric vehicle wireless power transfer, which rectifies the high-frequency AC output from the secondary side, outputs DC that meets the requirements of the electric vehicle's on-board power battery, and completes the control of the electric vehicle wireless charging process according to the control instructions of vehicle BMS.

6.3.4 in-vehicle unit; IVU

7.4 metering and billing system

Device and system for realizing electric energy metering and fee settlement between charging stations and power grids, between charging stations and electric vehicle users.

8 Battery swap station

8.1 battery swap system

A system composed of mechanical equipment and electrical equipment to realize the swap of electric vehicle power batteries.

8.1.1 swappable battery system; SBS

A device composed of a number of single batteries or power battery modules, cabinets, battery information collection units and related electrical and mechanical accessories, etc.

NOTE: Abbreviated as battery system.

8.1.2 SBS coupler

A special electrical connection device for realizing conductive connection between battery system and electric vehicle, battery system and charging rack.

8.1.3 SBS lock mechanism

Mechanical and electrical mechanisms that fix the battery system on the battery system rack or electric vehicle.

8.1.4 SBS charging rack

The battery system carrying equipment composed of mechanical, electrical and other devices used to charge the battery system.

8.1.5 SBS storage rack

A device that is used to centrally carry the battery system.

8.1.6 SBS charger

Special charging equipment for charging the power battery system in the battery swap station.

8.1.7 SBS swap equipment

and swap facilities.

NOTE: Referred to as infrastructure operator.

9.4 charging and battery swap operation and service system

A system that realizes business services, dispatch management, operation monitoring, data collection, statistical analysis, and operation decision-making related to the charging and swap of electric vehicles, so as to provide information services for connected electric vehicle users.

NOTE: The charging and battery swap operation and service system is composed of charging and battery swap supervisor and control platform, charging and battery swap service platform, charging and battery swap service client, etc.

9.4.1 charging and battery swap supervisor and control platform

A supporting system that monitors electric vehicle information and electric vehicle charging and swap infrastructure information, including alarms, collection of key equipment indicators, and remote operation of equipment.

NOTE: Referred to as monitoring platform.

9.4.2 charging and battery swap service platform

A supporting system that collects, processes and operates management of electric vehicle information and electric vehicle charging and swap infrastructure information, and provide users with charging and swap services, business management and information service functions.

NOTE: Referred to as service platform.

9.4.3 charging and battery swap service client

The client required by electric vehicle driver to use charging and swap services.

NOTE: The charging and battery swap service client includes mobile phone application software, in-vehicle control screen, etc.

9.5 charging and battery swap service roaming

The process in which one operator provides charging and swap services to registered users of another operator.

9.6 third-party services and management platform

An independent operating platform for information exchange with the electric vehicle charging and swap service platform.

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