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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 28569-2024

Replacing GB/T 28569-2012

Electric energy metering for AC charging spots of electric vehicles

电动汽车交流充电桩电能计量

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1 Scope

GB/T 28569-2024 specifies the electric energy metering of AC charging points for electric vehicles, the companion to GB/T 29318 on DC chargers. An AC charging post looks like a simple metering case and is not: the load is a single vehicle drawing a current that steps and modulates under the control pilot, the post is outdoors and unattended, and the energy is billed to a customer who is not present at the meter. The standard sets the requirements

on the metering device and its accuracy class, the definition of the metering point, the measurement conditions and the influence quantities including temperature, harmonics and unbalance, the requirements on the display and on the data records and their retention, the sealing and anti-tamper requirements, the communication of the metering data for billing, and the type test and verification methods. The 2024 edition replaces GB/T 28569-2012. For a charging post maker, a network operator or a metrology authority in China, this is the text the billing meter is approved against.

This document specifies the technical requirements, test methods and inspection rules for AC power metering between electric vehicle AC charging spots and electric vehicles. This document is applicable to the design, manufacture, acceptance and use of the whole-spot electric energy metering of public AC chargers (hereinafter referred to as "charging spot"). Other types of AC charging spots shall refer to this document for implementation.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2423.1, Environmental testing for electric and electronic products - Part 2. Test methods - Tests A. Cold

GB/T 2423.2, Environmental testing for electric and electronic products - Part 2. Test methods - Tests B. Dry heat

GB/T 2423.4, Environmental testing for electric and electronic products - Part 2. Test method - Test Db. Damp heat, cyclic (12 h + 12 h cycle)

GB/T 18487.1-2023, Electric vehicle conductive charging system - Part

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 29317 as well as the followings apply.

3.1 public AC charger An AC charging spot installed in a public area to realize the transfer of electric energy ownership, with metering and billing functions, and providing a settlement voucher after charging is completed.

3.2 total charging energy The total charging energy recorded by the charging spot in working state since the first charging.

3.4 additional amount Fees other than the rate amount recorded when the charging spot is in working condition.

3.5 billable amount The sum of the rate amount and additional amount recorded by the

charging spot when it is in working state is used for settlement with the user.

3.6 total billable amount The sum of the billable amounts recorded by the charging spot when it is in working condition, starting from the first charging.

4 Technical requirements

4.1 Interfaces The charging spot energy metering interface meets the following requirements. detection.

4.2 Function

4.2.1 Metering function The charging spot has the following functions.

4.2.2 Billing function Charging spots shall have the function of calculating the billable amount based on time, electricity, rates, etc.

4.2.3 Rate period setting function The charging spot has the following functions.

4.2.4 Time calibration function The charging spot shall have a time calibration function and shall not be calibrated during the charging process.

4.2.5 Information recording function

4.2.5.1 Metering and billing information The charging spot has the following functions.

4.2.5.2 Event Recording The charging spot shall have the following functions.

4.2.6 Clearing function The charging spot has the following functions.

4.2.7 Display function

4.2.7.1 Basic requirements The charging spot shall have a display function that can be displayed on the spot body or other carriers.

4.2.7.2 Display digits The number of display digits and resolution of the charging spot shall meet the following requirements.

4.2.7.3 Charging display

4.2.8 Charging receipt function The charging receipt function of the charging spot meets the following requirements.

4.2.9 Consistency requirements If the charging spot has multiple human-computer interaction methods, all information related to metering and billing shall be consistent when charging is completed.

4.2.10 Software protection function

4.2.11 Other functions During the charging process, if the charging spot cannot perform billing normally, the current charging and metering and billing shall be stopped immediately. The current metering and billing value is stored. After the above functions are restored, metering and billing shall be restarted.

4.3 Whole spot requirements

4.3.1 Connection point location The location of the charging spot connection point meets the following requirements.

4.3.2 Nameplate The charging spot shall have a nameplate. The nameplate shall include the following measurement-related information. If there are multiple charging interface outputs, the maximum current and minimum current of each channel shall be indicated. If each channel is not marked separately, they are assumed to be the same.

4.3.3 Measurement range The measurement range of the charging spot shall meet the following requirements.

4.3.4 Accuracy requirements

4.3.5 Pulse constant The relationship between the number of electric energy pulses output by the charging spot test and the change in electric energy indicated by the display shall be consistent with the electric energy pulse constant indicated on the nameplate.

4.3.6 Error variation For the same test point of a charging spot, the absolute value of the maximum error variation between adjacent test results shall not exceed 1/5 of the absolute value of the error limit shown in Table 1.

4.3.7 Clock time error For charging spots with time-sharing billing function, the charging spot clock indication error shall not exceed 5 s.

4.3.8 Climate and environmental impact requirements When the charging spot is operating within the normal operating temperature range and humidity conditions specified in

15.1.2 of GB/T 18487.1-2023, its basic error in electric energy shall meet the requirements of Table 1.

4.4 Requirements for measuring modules The housing of the measuring module shall be able to be sealed. The internal components of the module can only be accessed after the seal is broken.

5 Test methods

5.1 Test reference conditions To verify the accuracy requirements of the charging spot, the test conditions meet the following requirements.

5.2 Metering interface and nameplate inspection During the test, visually inspect the