

ICS 29.200
CCS K81



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 29318-2024

Replacing GB/T 29318-2012

**Electric energy metering for off-board chargers of electric
vehicles**

电动汽车非车载充电机电能计量

Issued on: September 29, 2024

Implemented on: April 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

GB/T 29318-2024 specifies the electric energy metering of DC fast chargers for electric vehicles. Metering at a DC charger is a legal metrology problem with a technical complication: the customer is billed for direct current energy delivered at a point that includes the cable and the connector, the current is high and varies rapidly through the charge, and there is no long tradition of DC metering to fall back on as there is for AC. This

standard settles it. It sets the requirements on the metering device and its accuracy class, the definition of the metering point and the treatment of the losses between it and the vehicle, the measurement conditions and the influence quantities, the requirements on the display, the data records and the anti-tamper and sealing provisions, the requirements on the communication of the metering data to the billing system, and the type test and verification methods. The 2024 edition replaces GB/T 29318-2012. For a charger maker, a charging network operator or a metrology authority in China, this is the text a billing meter is approved against.

This document stipulates the technical requirements, test methods and inspection rules for the DC electric energy metering part between the off-board charger of electric vehicles and electric vehicles. This document is applicable to the design, manufacturing, acceptance and use of the complete-machine electric energy metering part of public off-board charger (hereinafter referred to as the "charger"). Other types of chargers may take this document as a reference.

2 Normative References

The content of the following documents constitutes indispensable clauses of this document through normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 2423.1 Environmental Testing for Electric and Electronic Products - Part

3 Terms, Definitions and Symbols

The terms and definitions defined in GB/T 29317, and the following are applicable to this document.

3.1 public off-board charger An off-board charger used to provide public services and carry out electric energy transactions.

3.2 total charging energy The total charging energy recorded by the charger from the first charge when it is in working condition.

3.3 rate amount The amount of electric energy output by the charger during the corresponding period of time when it is, in working condition, multiplied by the rate.

3.4 additional amount Charges in addition to the rate amount recorded when the charger is in working condition. NOTE. for example, parking fees, etc.

3.5 billable amount The sum of the rate amount and the additional amount recorded when the charger is in working condition, which is used for settlement with the user.

4 Technical Requirements

4.1 Metering Interface The charger's interface for electric energy metering satisfies the following requirements.

4.2 Functions

4.2.1 Metering function The charger has the following functions.

4.2.2 Billing function The charger shall have the function of calculating the billable amount based on time, electric energy and rate, etc.

4.2.3 Rate period setting function The charger has the following functions.

4.2.4 Time adjustment function The charger shall have a time adjustment function. In addition, it is prohibited to adjust the time during the charging process.

4.2.5 Information recording function

4.2.6 Clear function The charger has the following functions.

4.2.7 Display function

4.2.7.1 Basic requirements The charger shall have a display function that allows display on the machine body or other carriers.

4.2.7.2 Display digits and resolution The display digits and resolution of the charger satisfy the following requirements.

4.2.7.3 Charging display

4.2.8 Charging receipt function The charging receipt function of the charger satisfies the following requirements.

4.2.9 Consistency requirements If the charger has multiple human-machine interaction modes, all information related to metering and billing shall be consistent at the end of charging.

4.2.10 Software protection function

4.2.10.1 Prevention of mis-operation The charger shall have a software protection function that minimizes the possibility of mis- operation.

4.2.11 Other functions During the charging process, if the charger cannot normally perform billing, the current charging, metering and billing shall be immediately stopped, and the metering and billing value shall be stored; after the above-mentioned functions are restored, metering and billing shall be re-started.

4.3 Requirements for Complete Machine

4.3.1 Connection point location The connection point location of the charger satisfies the following requirements.

4.3.2 Nameplate The charger shall have a nameplate, and the nameplate identification shall include the following meter-related information. If there are multiple charging interface outputs, the maximum current and minimum current of each channel shall be marked. If each channel is not separately marked, it is the same by default.

4.3.3 Measurement range The measurement range of the charger shall comply with the following requirements.

4.3.4 Accuracy requirements

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

4.3.6 Error variation At the same test point of the charger, the absolute value of the maximum error change between adjacent test results shall not exceed 1/5 of the maximum allowable error shown in Table 1 and Table 2.

4.3.7 Clock time error For chargers with time-sharing billing function, the clock time error of the chargers shall not exceed 5 seconds.

4.4 Requirements for metering module The shell of the metering module shall be able to be sealed. Only after the seal is broken is it possible to access the internal components of the module. For the metering module, which is an electric energy meter plus a supporting sensor device, the electric energy meter and sensor device shall be respectively and independently sealed.

5 Test Methods

5.1 Reference Conditions of Test In order to verify the accuracy, the test conditions comply with the following requirements.

5.2 Metering Interface and Nameplate Inspection During the test, visually inspect the metering interface and nameplate identification of the charger. Check whether the test results comply with the provisions of

5.3 Function Inspection During the test, the charger needs to be powered on. Check various functions through visual inspection, simulated charging and software copying, etc.

5.4 Accuracy Test

5.4.1 General requirements Under the test reference conditions specified in Table 4,