GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 29.200

K 81

GB/T 28569–2012

Electric energy metering for electric vehicle AC charging spot

电动汽车交流交电桩电能计量

Issued on: June 29, 2012 **Implemented on: November 01, 2012**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;

Standardization Administration of the People's Republic of China.

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Foreword

This Standard is drafted according to the regulations specified in GB/T 1.1-2009.

This Standard was proposed by the National Energy Administration of the People's Republic of China and the Ministry of Industry and Information Technology of the People's Republic of China.

This Standard shall be under the jurisdiction of the China Electricity Council.

Drafting organizations of this Standard: State Grid Corporation of China, China Electric Power Research Institute, State Grid Electric Power Research Institute, China Institute of Metrology, Yunnan Electric Power Research Institute, XJ Group Corporation, North China Grid Company Limited, Liaoning Electric Power Supply Co., Ltd.

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Electric energy metering for electric vehicle AC charging spot

1 Scope

This Standard specifies the technical requirements of electric energy metering for electric vehicle AC charging spots, as well as electric energy metering device's configuration and installation requirements, test methods and inspection rules.

This Standard applies to the electric energy metering of AC charging spots.

2 Normative references

The articles contained in the following documents have become part of this Standard when they are quoted herein. For the dated documents so quoted, all the modifications (including all corrections) or revisions made thereafter shall be applicable to this Standard.

GB/T 15284 Particular requirements for multi-rate electricity metering

GB/T 17215.211-2006 Electricity metering equipment(a.c.) - General requirements, tests and test conditions - Part 11:Metering equipment （IEC 62052-11:2003）

GB/T 17215.321-2008 Electricity metering equipment (a.c.) - Particular requirements - Part 21: Static metering for active energy (classes 1 and 2) (IEC 62053-21-2003)

GB/T 17215.421-2008 Electricity metering equipment (a.c) - Tariff and load control - Part 21: Particular requirements for time switches (IEC 62054-21:2004)

DL/T 645 Multi-function watt-hour metering communication protocol

NB/T 33002 Specification for electric vehicle AC charging spot

3 Terms and definitions

The terms and definitions specified in GB/T 17215.211-2006 apply to the document.

4 Configuration requirements and installation location

a) The charging metering device of AC charging spots shall be static multi-rate AC active electric energy metering (hereinafter referred to as the electric energy

5.1.5 Functional requirements

5.1.5.1 Measurement of the electric energy

Electric energy metering shall measure the total active electric energy and the active electric energy of the various rates.

5.1.5.2 Storage function

Storage function shall meet the following requirements:

a) The electric energy metering shall at least memory the total power energy and all rates of electricity data of the first two months or the first two settlement cycle; the default value of data archived separation time shall be at 24:00 of the last day of each month, or at any time of 1st -28th of each month.

b) After power supply of electric energy metering fails, the stored data shall be kept for at least 1 year;

c) Electric energy and other key charging information shall be stored in built-in security module of electric energy metering to prevent key data from being tampered.

5.1.5.3 Clock and rate period

Clock and rate period shall meet the following requirements:

a) The built-in hardware clock circuit with temperature compensation function has the automatic switching function among calendar, timing and leap year. Under the reference temperature, the clock accuracy is ≤ ± 0.5s/d. The variation of the accuracy of the clock with temperature shall be less than 0.15s/°C per 24h. The clock can be timed under the programming state, and perform broadcast timing under the non-programming state; the clock error of the broadcast timing shall not be more than 5min, and it can be timed only once a day.

b) It shall have at least two sets of rate period; the automatic switching of the two sets of rate period can be achieved via pre-setting the time. Each rate period can at least set 2 time zones in the whole year; it can set at least 8-periods set within 24h; the minimum time interval is 15min; the period can be set crossing the zero point.

c) Electric energy metering shall have a multifunction signal output interface, and with the default output of second signal, which can be set by software to period switching signal output.

5.1.5.4 Event recording

Event recording shall meet the following requirements:

a) Record the total number of programming, the time of the last 10 times of

d) The data collected by AC charging spots from the electric energy metering shall be consistent with the corresponding display.

6 Test methods

6.1 Conventional test

Items and methods for conventional test of electric energy metering shall comply with GB/T 17215.211-2006 and GB/T 17215.321-2008.

6.2 Function inspection

After the electric energy metering is powered, check whether the electric energy metering function meets the requirements of 5.1.5 by visual, buttons wheel show, software copy reading and other ways.

6.3 Electric energy indication error within rate period

Carry out the tests as specified in GB/T 15284.

6.4 Composition error of total electric energy indication of counters

Carry out the tests as specified in GB/T 15284.

6.5 Day timing error

Carry out the tests according to the provisions in 7.5.2.3 of GB/T 17215.421-2008.

6.6 Influence of ambient temperature on day timing error

Carry out the tests according to the provisions in 7.5.2.3 of GB/T 17215.421-2008.

6.7 Communication protocol conformance

Inspect electric energy metering communication frame format, delay time, data identification, authentication method and so on, in accordance with the provisions of DL/T 645.

6.8 Measurement error test

With the reference voltage I_{max}, I_b and 10% I_b, the power factor are 1.0 and 0.5L respectively; read the numerical value for voltage, current, power factor and active power in the electric energy metering; calculate the reference error of the measurement parameters; all these operations shall meet the requirements of 5.1.5.5.

6.9 Data safety testing

Inspect whether the data in security module is consistent with the electric energy metering

display by the software reading detection.

6.10 Data consistency comparison

Compare the related measurement information collected and shown by the AC charging spots and the corresponding display content of the electric energy metering to judge whether they are consistent.

7 Inspection rules

7.1 Electric energy metering inspection

7.1.1 Exit-factory inspection

Each of the electric energy metering shall be inspected in accordance with the test methods provided by this Standard; the factory seal shall be imposed; the quality certification shall be issued after passing the inspection; the test items are shown in Table 1.

7.1.2 Type inspection

If the type identification of new products or the structure, process, the main material (components) of the electric energy metering, as well as the software has significant changes, then the type tests shall be carried out; the test items are shown in Table 1.

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