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OF THE PEOPLE'S REPUBLIC OF CHINA

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Calibrator of off-board chargers for electric vehicles

电动汽车非车载充电机校验仪

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Verification regulation of calibrator of off-board chargers for electric vehicles

1 Scope

This Regulation applies to the first verification, subsequent verification, in-use inspection of the calibrator of off-board chargers for electric vehicles.

2 Normative references

This procedure references the following documents:

JJG 1149 Off-board chargers for electric vehicles

JJG 1186 Verification equipment for DC electrical energy meters

JJF 1662 Calibration specification for clock testers

For dated references, only the dated version applies to this regulation; for undated references, its latest version (including all amendments) applies to this Regulation.

3 Overview

The calibrator of off-board chargers for electric vehicles (hereinafter referred to as the calibrator) is a device, which is used to calibrate the electric vehicle off-board charger. It can verify the electric energy, time, current, voltage and other parameters of the off-board charger.

The schematic diagram of the calibrator is as shown in Figure 1. It is mainly composed of a control unit, a charging gun port, a load interface, a DC power standard (including a monitoring unit), a clock unit, a display unit, a control guidance unit (provided by the load).

The calibrator simulates the charging demand of the electric vehicle, by controlling the guiding unit. The load interface connects the simulated load, to simulate the battery of the electric vehicle, to realize the charging demand. The monitoring unit measures parameters such as voltage and current; completes the metering and error test of the electric energy by the DC electric energy standard. The measured quantity is output to the display unit.

4.6 Clock time error

The absolute error of the clock time is better than ± 1 s.

5 General technical requirements

5.1 Appearance and power inspection

The calibrator shall display the following information:

- Product name and model;
- Manufacturer and exit-factory number;
- Pulse constant C (imp/kWh);
- Level of accuracy;
- Measuring range.

After the calibrator is powered on, the functions and software control shall be normal.

5.2 AC withstanding voltage

The calibrator powered by AC is in the non-working state; the power switch is placed in the ON position; the voltage of AC 1.5 kV is applied between the input terminal of the power supply and the casing, for a duration of 1 min. There shall be no spark discharge or breakdown.

All the lines, whose reference voltage exceeds 40 V, are connected together as one point; the other point is the grounded. The test voltage is applied between these two points, which shall be able to withstand the AC 3 kV withstanding voltage test for 1 minute. There shall be no spark discharge or breakdown during the test.

time is not less than 5 s.

2) Watt-second method

Use the measurement standard to measure the set constant power. Use the standard timer to measure the time, which is required for the calibrator to accumulate the electric energy value. This time is multiplied by the constant power to obtain the measure electric energy, which is then compared with the accumulative electric energy of the calibrator, to determine the relative error of the calibrator's electric energy.

When the calibrator is verified by the watt-second method, the time measurement error (%) of the standard time measuring device shall not be greater than 1/20 of the accuracy level of the calibrator. When counting and reading the time, the standard time meter shall have enough readings, so that the reading error of 1 word due to the change of the last digit does not exceed 1/10 of the accuracy level of the calibrator.

c) Cumulative power error

At 500 V and $I_{\max}$, the calibrator runs synchronously with the current line of the measurement standard in series and the voltage line in parallel. The cumulative electric energy value shall meet the requirements of 4.1. Calculate the relative error γ' , according to formula (3).

6.3.2.4 Limit operating error

Carry out verification, according to the test load point, which is specified in Table 10.

The verification is according to 6.3.2.3.

6.3.2.5 Energy measurement repeatability

Under repeatability conditions, conduct no less than 5 electric energy error determinations, according to the provisions in Table 3. Calculate the standard deviation

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