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

GB/T 33708.3-2025

**Electricity metering equipment (DC) - Part 3: Direct-connected
static meters (classes 0.5 and 1)**

直流电能测量设备 第3部分：直接接入静止式电能表（0.5级和1级）

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 3 of GB/T 33708 "DC Power Measurement Equipment". GB/T 33708 has already published the following parts.

---Part 1: General Requirements;

---Part 2: Indirect Connection to Static Energy Meters (Class 0.2, 0.5, and 1);

---Part 3: Direct connection to static energy meters (Class 0.5 and Class 1).

This document is modified to adopt IEC 62053-41:2021 "Electrical measuring equipment - Part 41: Static DC energy meters" (Level 0.5 and Level 1).

Compared with IEC 62053-41:2021, this document has undergone the following structural adjustments.

---Chapter 12 corresponds to Chapter 10 in IEC 62053-41:2021;

---Chapters 10 and 11 have been added;

---Appendix B corresponds to Appendix A in IEC 62053-41:2021.

The technical differences between this document and IEC 62053-41:2021, and the reasons therefor, are as follows.

---IEC 61000-4-19:2014 has been replaced with the revised standard GB/T 17626.19-2022 to adapt to my country's national conditions and facilitate [further development].

To better understand and use this document;

---IEC 62052-11:2020 has been replaced with GB/T 33708.1-2025, which has a non-equivalent level of conformity with international standards, in order to adapt to...

In accordance with my country's national conditions, and to facilitate better understanding and use of this document;

---Table 3 adds the requirement of "3W power consumption for voltage circuits (Class B instruments)" to apply to scenarios powered by voltage measurement circuits;

---Add a column to Table 5 titled "Specified Range (or Value) and Recommended Value of Test Voltage", and add "Voltage Change Test" and "Superimposed Interval Test".

The test content, "Current and AC Voltage Tests," is designed to be applicable to DC measurement scenarios in my country.

--- Safety requirements and tests (see Chapter 10) and metrological performance protection (Chapter 11) have been added to make them applicable to DC power consumption scenarios in my country.

The following editorial changes have been made to this document.

---To harmonize with existing standards, the standard title has been changed to "DC Energy Measurement Equipment Part 3: Direct Connection to Static Energy Meters".

(Levels 0.5 and 1)

---The low-power instrument transformer (LIPT) has been modified to a DC sensor (see Chapter 1);

---Delete footnote a in Table 5 and add descriptions for Class A and Class B instruments;

---Added informative Appendix A, "A summary of the technical differences between GB/T 33708.1-2025 and IEC 62052-11:2020 and the reasons thereof".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Electrical Instruments and Meters (SAC/TC104).

Introduction

The GB/T 33708 series of standards aims to specify the general requirements, tests, and test conditions for DC power measurement equipment. GB/T 33708 is proposed...

It consists of four parts.

---Part 1: General Requirements. The purpose is to specify the general technical requirements and test conditions for type testing of DC energy meters.

---Part 2: Indirect Connection to Static Energy Meters (Class 0.2, 0.5, and 1). The purpose is to specify the requirements for newly manufactured meters with direct current...

Indirect access static DC power for measuring and controlling DC power in the network,

with accuracy classes of 0.2, 0.5, and 1.

The type test requirements and test methods for the table.

---Part 3: Direct Connection to Static Energy Meters (Class 0.5 and Class 1). The purpose is to specify the requirements for newly manufactured meters for measuring energy in DC power grids.

Type test requirements for direct-connection static energy meters that measure and control DC power with accuracy classes of 0.5 and 1.

and its experimental methods.

---Part 4: Digital Static DC Energy Meters. The purpose is to specify the measurement...

Quantitative performance, influence quantity requirements, and type testing, etc.

This document is the standard for type testing of electricity meters. It covers the specific requirements for indoor meters, as this type of application is the most common.

If the instrument is placed in an additional instrument cabinet to provide appropriate protection against environmental influences, it can also be used for outdoor applications. It does not include...

This includes special implementation methods (e.g., the metering components and/or displays are located in different housings).

This document, in conjunction with GB/T 33708.1-2025, constitutes the standard for direct connection of static DC energy meters (Class 0.5 and Class 1).

The requirements for the standard test shall apply. Where any requirement in this document relates to a clause already existing in GB/T 33708.1-2025, the requirements of this document shall take precedence.

In accordance with the requirements of GB/T 33708.1-2025.

This document outlines the minimum test levels required to ensure proper instrument function under normal operating conditions; other requirements apply to special application scenarios.

The testing level can be agreed upon by the user and the manufacturer.

DC power measurement equipment, Part 3: Direct connection Static energy meters (Class 0.5 and Class 1)

1 Scope

This document applies only to the measurement of DC power in DC systems with accuracy classes of 0.5 and 1 for direct-connection static DC power supplies.

The current energy meter (hereinafter referred to as "the meter") is only applicable to its type testing.

Note 1: For other general requirements, such as security and reliability, see the relevant parts of GB/T 17215.2 (all parts) or GB/T 17215.9 (all parts).

This document applies to electrical measuring equipment designed according to the following conditions.

---Measure and control electrical energy on a bipolar power grid, one pole of which is grounded and the voltage does not exceed 1500V DC;

Note 2: Other configurations or DC networks with more than two poles (e.g., networks with positive, negative and ground poles at the same time) also exist.

---Except for the indicator display, all functional units, including additional modules, are encapsulated within a single watch case or comprise a separate watch case;

---Use integrated or separate indicator displays, or do not use indicator displays;

--- Installed on a dedicated matching socket or rack;

---Optionally, additional functions besides power measurement can be provided.

The power measurement equipment covered in this document is used to measure DC power in the following or similar applications.

---In electric vehicle (EV) charging stations or EV charging infrastructure (e.g., when measured on the DC side);

---In the information technology (IT) server cluster group;

---In low-voltage DC networks in residential or commercial areas (e.g., when measured on the DC side);

---In solar photovoltaic (PV) systems that measure DC power generation;

---DC power supply point for public transportation networks (such as trolleybuses).

Instruments designed for use with DC sensors [such as shunts or LPITs as defined in GB/T 20840 (all parts)], only these instruments and their DC sensors are considered applicable to this document only if they are tested together and meet the requirements for direct connection to the instrument.

Note 3: Modern electricity meters typically include additional functions, such as voltage amplitude, current amplitude, power measurement, power quality parameter measurement, and load measurement.

Control functions; transmission, timing, testing, settlement, and recording functions; data communication interface and related data security functions. In addition to the requirements of this document, [further details are needed].