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

GB/T 17215.301-2024

Replacing GB/T 17215.301-2007

**Electricity metering equipment (AC) - Particular requirements -
Part 1: Multi-function electricity meters**

电测量设备（交流） 特殊要求 第1部分：多功能电能表

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting: This document is Part 1 of GB/T 17215:3 "Particular requirements for electrical measuring equipment (AC)": GB/T 17215:3 has been published The following parts:

- Part 1: Multifunctional electric energy meter;
 - Part 2: Static harmonic active energy meter;
 - Particular requirements for alternating current measuring equipment - Part 3: Digital energy meters;
 - Particular requirements for AC current measuring equipment - Part 4: Static energy meters connected via electronic transformers;
 - Particular requirements for AC current measuring equipment - Part 11: Electromechanical active energy meters (classes 0.5, 1 and 2);
 - Part 21: Static active energy meters (Class A, Class B, Class C, Class D and Class E);
 - Part 23: Static reactive energy meters (level 2 and 3);
 - Part 24: Static fundamental component reactive energy meters (0.5S, 1S, 1, 2 and 3);
 - Particular requirements for alternating current measuring equipment - Part 52: Symbols:
- This document replaces GB/T 17215:301-2007 "Special Requirements for Multi-function Electric Energy Meters" and is consistent with GB/T 17215:301-2007: In addition to structural adjustments and editorial changes, the main technical changes are as follows:
- a) Added the voltage levels applicable to this document (see Chapter 1);
 - b) The scope of application of this document has been increased, that is, electric energy meters with separate indicating displays are applicable to this document (see Chapter 1);
 - c) Deleted the basic functional requirements, mechanical requirements, climatic conditions,

electrical requirements, electromagnetic compatibility, data security requirements of active energy measuring instruments: Safety requirements, battery requirements and average life (see Chapter 5 of the:2007 edition);

d) Added the requirements for harmonic energy measurement and apparent energy measurement of energy measurement function (see 4:2);

1 Scope

China's national requirements for multi-function electricity meters - the meters that do more than count kilowatt hours. It specifies the functional requirements and the type tests for multi-function meters, covering multi-energy measurement, multiple tariff rates, demand measurement, the measurement of electrical parameters, power quality monitoring and communication. A modern meter is a measuring instrument and a data source at the same time, and the two roles pull in different directions. As an instrument it is legally controlled and its accuracy is governed by the general standards of the GB/T 17215 series. As a data source it is expected to record active and reactive energy in each direction, to apply a tariff calendar with several rates and seasons, to compute and store maximum demand over defined integration periods, to report voltage, current, power factor and frequency, and increasingly to log power quality events - sags, swells, interruptions, harmonic levels - and to carry all of that over a communications link to the utility. This part sets what those functions must do and how they are verified, which is the difference between meters that can be read into one system and meters that cannot. Demand measurement is the case where definition matters most: the integration period, the sliding or fixed window, the reset and the storage of the historical maxima determine the bill for every large customer, and two meters computing demand differently from the same load produce different invoices. The type test chapter states how each function is demonstrated. Issued on 25 April 2024 and in force since 1 November 2024, it replaces GB/T 17215.301-2007.

This document defines the terms and definitions of multifunctional electric energy meters (hereinafter referred to as "meters"), and specifies the functional requirements and type test requirements:

Note 1: For other general requirements for electric energy meters (such as structure, EMC, safety, reliability, etc.), see GB/T 17215:231-2021, GB/T 17215:3 (all parts) GB/T 17215:9 (all parts): This document applies to newly manufactured instruments used for measuring and controlling electrical power in 50Hz or 60Hz power grids with a voltage not exceeding 600V: All special functional units except the electric energy measurement function can be integrated into the meter case or form a separate shell:

Note 2: The above voltage is the line-to-line neutral voltage derived from the nominal voltage, see Table 7 in GB/T 17215:231-2021: If the instrument is designed to be mounted in a specified matching socket or rack, the requirements of this document apply and the test is performed with the instrument mounted in a socket or rack: Installation is performed on

specified matching sockets or racks, but the requirements for these sockets or racks are outside the scope of this document:

Note 3: Examples of rack-mounted instruments include rail-mounted instruments, panel-mounted instruments, etc: If the instrument is designed to be fitted with a separate indicating display, the requirements of this document apply and the instrument is connected with its separate indicating display Test unless otherwise specified: If the meter has more than one current circuit per phase (e:g: multi-unit meter), the requirements of this document apply to any current measuring circuit within the meter case: All current circuits of the unit: This document distinguishes:

- Direct access to the instrument and access to the instrument through a transformer;
- Indoor instruments and outdoor instruments: This document does not apply to:
- Instruments with line-to-neutral voltage exceeding 600V derived from the nominal voltage;
- Laboratory and mobile instrument testing equipment;
- Standard table;
- A measurement system consisting of multiple devices that are physically far away from each other;
- Portable instrument;
- Instruments connected via electronic transformers that meet the requirements of GB/T 20840:8;
- Instruments connected via low-power current sensors that comply with the requirements of IEC 61869-10:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document: For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document:

GB/T 15284-2022 Special requirements for multi-rate electric energy meters

GB/T 17215:211-2021 Electrical measuring equipment (AC) General requirements, tests and test conditions Part 11: Measuring equipment

GB/T 17215:302-2024 Particular requirements for electrical measuring equipment (AC) Part 2: Static harmonic active energy meters

GB/T 17215:321-2021 Particular requirements for electrical measuring equipment (AC) Part
21: Static active energy meters (Class A,

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