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

GB/T 15284-2022

Replacing GB/T 15284-2002

Multi-rate electricity meters - Particular requirements

多费率电能表 特殊要求

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1 Scope

China's national standard for multi-rate electricity meters - the meters that record consumption separately in different tariff periods, which is what makes time-of-use pricing possible and therefore what makes demand shifting possible. It specifies the terms and definitions, the technical requirements, the test methods, the inspection rules, the identification and documentation, and the packaging and storage for multi-rate electricity meters. The requirements here are particular ones: the general requirements of an electricity meter - its accuracy class, its influence quantities, its electrical and mechanical safety - come from the base meter standards, and this document adds what follows from the multi-rate function alone. The essential addition is the tariff clock and everything that depends on it. A multi-rate meter allocates energy to registers according to the time of day, so the meter's timekeeping is not a convenience but a metrological quantity: a clock that drifts by minutes a month puts consumption into the wrong register and bills the customer wrongly, and neither party can detect it from the readings. The standard therefore specifies the accuracy of the internal clock, its behaviour and its reserve during a supply interruption, the synchronisation, and the changeover between tariff periods and seasons. Around that sit the registers and their capacity and rollover, the tariff programme and how it may be changed and by whom, the security of that programming - since a meter whose tariff table can be altered is a meter whose bill can be altered - the display and what the customer must be able to read, and the communication interface where one is fitted. Issued on 15 April 2022 and in force since 1 November 2022, it replaces GB/T 15284-2002.

This Standard specifies the terms and definitions, technical requirements, test methods, inspection rules, identification and documentation, packaging and storage for multi-rate electricity meters hereinafter referred to as "the meters". This Standard applies to newly manufactured meters for measuring and controlling electricity in a 50Hz or 60Hz grid with a voltage not exceeding 600V. This Standard is only applicable to the meters whose time switch is digital display and use battery or capacitor as working reserve. This Standard does not apply to meters whose time switch is an analog dial, nor does it apply to electromechanical meters.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2423.5-2019, Environmental testing - Part 2: Test methods - Test Ea and guidance: Shock

GB/T 2423.43-2008, Environmental testing for electric and electronic products - Part 2: Test methods - Mounting of specimens for vibration, impact and similar dynamic tests

GB/T 2423.56-2018, Environmental testing - Part 2: Test methods - Test Fh: Vibration, broadband random and guidance

GB/T 2900.77-2008, Electrotechnical terminology - Electrical and electronic measurements and measuring instruments - Part 1: General terms relating to measurements

GB/T 13384-2008, General specifications for packing of mechanical and electrical product

GB/T 16935.1-2008, Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests

GB/T 17215.211-2021, Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 11: Metering equipment

GB/T 17215.321-2021, Electricity metering equipment (AC) - Particular requirements - Part 21: Static meters for active electricity (classes A, B, C, D and E)

GB/T 17215.323-2008, Electricity metering equipment (a.c.) - Particular requirements - Part 23: Static meters for reactive electricity (classes 2 and 3)

GB/T 17215.324-2017, Electricity metering equipment (a.c.) - Particular requirements - Part 24: Static meters for reactive electricity at fundamental frequency (classes 0.5S, 1S and 1)

JJF 1245.2-2019, Program of Pattern Evaluation of Fixed AC Electricity Meters - Software Requirements
DL/T 1490-2015, Functional specification for smart electricity meters

IEC 62052-31:2015, Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 31: Product safety requirements and tests

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 17215.211-2021, GB/T 2900.77-2008, DL/T 1490-2015 as well as the followings apply.

3.1 multi-rate electricity meter A meter that has one or more electricity registers and the rate plan is set in the local meter or on the remote billing system side. NOTE: The rate plan

is set in the meter or in the remote billing system. It works on time or consumption baselines, or via external control signals. [Source: GB/T 17215.211-2021, 3.1.7, with modifications]

3.2 static multi-rate electricity meter A meter that the measurement unit produces an output proportional to the electricity by applying current and voltage to a solid-state (electronic) device, and its rate electricity metering function is realized by electronic circuit or remote billing system.

3.3 local static multi-rate electricity meter A meter that the rate plan is set in the meter, the meter records the electricity data of each rate according to the rate plan and stores it in the corresponding register.

3.3 local static multi-rate electricity meter - According to the accuracy of reactive electricity: 0.5S, 1S, 1, 2 and 3.

4.3 According to where the rate plan is set According to where the rate plan is set, it is divided into: - Local static multi-rate electricity meter; - Remote static multi-rate electricity meter.

4.4 According to with or without the function of bidirectional measurement of electricity According to with or without the function of bidirectional measurement of electricity, it is divided into: - Bidirectional multi-rate electricity meter; - One-way multi-rate electricity meter.

5 Standard power value

5.1 Voltage The nominal voltage and voltage range shall comply with the provisions of 4.1 in GB/T 17215.211-2021.

5.2 Current For active meters, the current shall comply with the provisions of 4.2 in GB/T 17215.321-2021. For reactive meters, the current shall comply with the provisions of Chapter 4 in GB/T 17215.323-2008 and Chapter 4 in GB/T 17215.324-2017.

5.3 Frequency It shall comply with the provisions of 4.3 in GB/T 17215.211-2021.

5.4 Power consumption It shall comply with the provisions of 4.4 in GB/T 17215.211-2021.

6.1 Functional requirements

6.1.1 Basic functions Unless otherwise specified, under normal operating conditions, the design of the meter shall meet the following requirements: - The clock has calendar, timing, leap year automatic conversion function; - It has the function of time being calibrated; - The date and time are set with security measures to prevent operations by unauthorized