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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 34120-2023

Technical requirements for power conversion system of electrochemical energy storage system

电化学储能系统储能变流器技术要求

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Standardization Administration of the PRC

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Foreword

This document was issued on 28 December 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 July 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 34120-2023 specifies the converter that stands between a storage battery and the grid. The battery holds the energy, but the power conversion system decides what the installation can actually do: it converts between DC and AC in both directions, and it is what responds when the grid frequency moves, what rides through a voltage dip instead of disconnecting, and what holds the battery within the operating window that determines its life. As storage has grown from a niche to a substantial share of new grid connections, its

behaviour during disturbances has stopped being the operator's private business - a fleet of converters that all disconnect at the same threshold turns a local fault into a system event. This document specifies the technical requirements for the power conversion system of an electrochemical energy storage system, including functional requirements such as start-up and shutdown and power control, together with the performance, protection and grid interaction requirements and the corresponding tests. Under CCS F19, it is written for converter manufacturers, for storage system integrators and project developers, and for the grid operators who set connection conditions and the laboratories that verify compliance with them.

This document specifies the technical requirements for power conversion system of electrochemical energy storage system (hereinafter referred to as "power conversion system"), including functional requirements such as start-up and shutdown, power control, grid-connected and grid-disconnected switching, alarm and protection, insulation resistance detection, communication, operation information monitoring, statistics, data display and storage; the performance requirements such as electrical performance and safety performance; and the requirements for classification and coding, normal operating conditions, appearance and protection grade, electromagnetic compatibility, auxiliary systems, inspection rules, marking, packaging, transportation and storage, etc.

This document is applicable to the design, manufacture, testing, inspection, operation, maintenance and repair of power conversion systems using electrochemical cells as the energy storage medium, with an AC terminal voltage of 35 kV and below.

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 191, Packaging - Pictorial marking for handling of goods

GB/T 4208, Degrees of protection provide by enclosure (IP code)

GB/T 4798.2, Classification of environmental conditions - Classification of groups of environmental parameters and their severities - Part 2.Transportation and

handling

GB/T 12325, Power quality - Deviation of supply voltage

GB/T 12326, Power quality - Voltage fluctuation and flicker

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

GB/T 14549, Quality of electric energy supply - Harmonics in public supply network

GB/T 15543, Power quality - Three-phase voltage

GB/T 15945, Power quality - Frequency deviation for power system

GB/T 17626.2, Electromagnetic compatibility - Testing and measurement techniques?Electrostatic discharge immunity test

GB/T 17626.3, Electromagnetic compatibility - Testing and measurement techniques - Part 3.Radiated, radio-frequency, electromagnetic field immunity test

GB/T 17626.4, Electromagnetic compatibility ? Testing and measurement techniques - Electrical fast transient/burst immunity test

GB/T 17626.5, Electromagnetic compatibility - Testing and measurement techniques - Surge immunity test

GB/T 17626.6, Electromagnetic compatibility - Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields

GB/T 17626.8, Electromagnetic compatibility (EMC) - Part 4-8.Testing and measurement techniques - Power frequency magnetic field immunity test

GB/T 17799.2, Electromagnetic compatibility - Generic standards - Part 2. Immunity standard for industrial environments

GB/T 20626.1, Specific environmental condition - Electric and electronic products for plateau - Part 1.General technical requirements

GB/T 24337, Power quality - Interharmonics in public supply network

GB/T 34133, Testing code for power conversion system of energy storage system

DL/T 860 (all parts), Communication networks and systems for power utility automation

DL/T 2528, General terminology of electrical energy storage

3 Terms and definitions

For the purposes of this document, terms and definitions given in DL/T 2528, as well as the following, applies to this document.

3.1

The capability of the power conversion system to continuously operate without being disconnected from the grid within the specified voltage rise range and time interval when the AC terminal voltage of the power conversion system increases due to power system accidents or disturbances.

3.8

primary frequency control

The control function in which the power conversion system automatically adjusts active power in response to the frequency deviation of the power system when the power system frequency deviates from the target frequency.

[Source. GB/T 40595-2021, 3.1, modified]

3.9

inertia response

The control function in which the power conversion system adjusts active power in response to the rate of change of power system frequency when the power system frequency changes rapidly.

3.10

touch current

The current flowing through the body of a person or livestock when the person or livestock touches one or more accessible parts of an electrical installation or electrical equipment.

[Source. GB/T 17045-2020, 3.9]