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

**GB/T 36547-2024**

Replacing GB/T 36547-2018

**Technical requirements for connecting electrochemical energy  
storage stations to the power grid**

电化学储能电站接入电网技术规定

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## Table of Contents

|     |                                                  |
|-----|--------------------------------------------------|
| 1   | Scope                                            |
| 2   | Normative References                             |
| 3   | Terms and Definitions                            |
| 4   | Overall Requirements                             |
| 5   | Power Control                                    |
| 5.1 | Active Power Control                             |
| 5.2 | Reactive Power Control                           |
| 6   | Primary Frequency Control                        |
| 7   | Inertia Response                                 |
| 8   | Fault Ride-through                               |
| 8.1 | Low-voltage Ride-through                         |
| 8.2 | High-voltage Ride-through                        |
| 8.3 | Continuous Fault Ride-through                    |
| 9   | Operation Adaptability                           |
| 9.3 | Frequency Adaptability                           |
| 10  | Power Quality...                                 |
| 11  | Relay Protection and Automatic Safety Devices... |
| 12  | Dispatching Automation and Communication...      |
| 13  | Simulation Models...                             |

### 1 Scope

GB/T 36547-2024 sets the technical requirements for connecting an electrochemical energy storage station to the power grid. It is the grid code for battery storage in China: the document that says what the network operator requires of the station before it is allowed to connect, and it governs a market that has grown faster than any other in the world. The standard covers the connection point and the voltage level according to the capacity of the station, the active and reactive power capability and the power factor range, the voltage and frequency ride-through requirements and the behaviour during and after a disturbance, the active power control and the ramp rate, the voltage and frequency regulation and the participation in primary frequency response, the power quality requirements covering harmonics, flicker and unbalance, the protection and the anti-islanding requirements, the metering, communication and the signals the station must exchange with the dispatch centre, and the requirements for the connection assessment. Its companion GB/T 36548

gives the tests. The 2024 edition replaces GB/T 36547-2018.

This document stipulates the overall requirements for connecting electrochemical energy storage stations to the power grid, as well as the technical requirements for power control, primary frequency control, inertia response, fault ride-through, operation adaptability, power quality, relay protection and automatic safety devices, dispatching automation and communication, simulation models, and test and evaluation of connection to the power grid. This document is applicable to the construction, connection, commissioning, test, inspection, operation, maintenance and overhaul of newly constructed, renovated and expanded electrochemical energy storage stations connected to the public power grid through voltage levels of 10 (6) kV and above.

## 2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 12325 Power Quality - Deviation of Supply Voltage

GB/T 12326 Power Quality - Voltage Fluctuation and Flicker

GB 14050 Types and Safety Technical Requirements of System Earthing

GB/T 14285 Technical Code for Relaying Protection and Security Automatic Equipment

GB/T 14549 Quality of Electric Energy Supply - Harmonics in Public Supply Network

GB/T 15543 Power Quality - Three-phase Voltage Unbalance

GB/T 19862 General Requirements for Monitoring Equipment of Power Quality

GB/T 22239 Information Security Technology - Baseline for Classified Protection of Cybersecurity

## 3 Terms and Definitions

The terms and definitions defined in DL/T 2528, and the following are applicable to this document.

3.1 primary frequency control; PFC When the power system frequency deviates from the target frequency, the control function of the electrochemical energy storage station to automatically regulate the active power in response to frequency deviations of the power system.

3.2 delay time of PFC From when the power system frequency exceeds the primary

frequency control dead zone, the time required for the actual output active power change of the electrochemical energy storage station to reach 10% of the difference between the target value and the initial value of active power.

3.3 rise time of PFC From when the power system frequency exceeds the primary frequency control dead zone, the time required for the actual output active power change of the electrochemical energy storage station to reach 90% of the difference between the target value and the initial value of active power.

3.4 settling time of PFC From when the power system frequency exceeds the primary frequency control dead zone, the shortest time that the absolute value of the difference between the actual output active power and the target value of active power of the electrochemical energy storage station exceeds the allowable deviation.

## 4 Overall Requirements

4.1 The electrochemical energy storage station shall have the capability of participating in peak regulation, frequency control and voltage regulation, etc. of the power system, and its safe and stable operation shall comply with the provisions of GB 38755 and GB/T 31464.

4.4 The network security protection of the electrochemical energy storage station shall comply with the provisions of GB/T 36572.

4.5 The grounding mode of the electrochemical energy storage station shall be compatible with the grounding mode of the power grid, to which, it is connected. Lightning protection and grounding shall comply with the technical regulations of GB 14050, GB 50057 and GB/T 50065.

4.6 The electrochemical energy storage station connected to the power grid shall establish electromagnetic transient, electromechanical transient and medium and long-term dynamic simulation models in accordance with the requirements of GB/T 42716.

4.7 The electrochemical energy storage station shall have a clarified electric energy measurement point. The electric energy measurement point shall be located at the grid connection point, equipped with a two-way electric energy measurement device, and have the function of remote transmission of electric energy measurement information. The technical requirements shall comply with the provisions of GB/T 50063 and DL/T 448.

4.8 The charge energy and discharge energy of the electrochemical energy storage station shall not be lower than the rated charge energy and rated discharge energy.

### 5.1 Active Power Control

5.1.1 The electrochemical energy storage station shall have the capability of controlling active power and shall be able to accept local and remote active power control instructions to achieve continuous regulation of active power.

## 5.2 Reactive Power Control

5.2.1 The electrochemical energy storage station shall have the capabilities of reactive power regulation and voltage control and shall be able to accept local and remote control instructions to achieve continuous regulation of reactive power / voltage.

5.2.2 The electrochemical energy storage station shall have the control modes for power factor, reactive power and voltage control, and have the function of online switching control modes.

5.2.3 The power factor of the grid connection point of the electrochemical energy storage station shall be continuously adjustable within the range of 0.9 (lead) ~ 0.9 (lag).

5.2.4 Within the adjustable range of reactive power of the electrochemical energy storage station, the reactive power control deviation shall not exceed 3% of the rated power.

5.3 Overload Capability The electrochemical energy storage station shall have the overload capability. Under the nominal voltage, the operating time of 110% rated power shall not be less than 10 minutes, and the operating time of 120% rated power shall not be less than 1 minute.

## 6 Primary Frequency Control

6.1 The electrochemical energy storage station shall have the function of primary frequency control, which can be turned on or off through local or remote control in accordance with the demands of the power system.

6.2 The electrochemical energy storage station shall upload the turn-on-off signals and action status signals of primary frequency control to the power grid dispatching institution.

6.4 When the power system frequency drops and exceeds the frequency control dead zone, the electrochemical energy storage station shall increase the active power for discharging or reduce the active power for charging in accordance with the primary frequency control curve.

6.7 The error adjustment rate of primary frequency control of the electrochemical energy storage station shall be 0.5% ~ 3%.

6.8 The delay time of PFC shall not be greater than 1 second, the rise time of PFC shall not be greater than 3 seconds, and the settling time of PFC shall not be greater than 4 seconds. When reaching stability, the active power control deviation shall not exceed 1% of the rated power.

## 7 Inertia Response

7.1 The electrochemical energy storage station shall have the function of inertia response,