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**NATIONAL STANDARD OF THE  
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**GB/T 33348-2024**

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**Voltage sourced converter valves for high-voltage direct current  
power transmission - Electrical testing**  
**(English Translation)**

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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 replaces GB/T 33348-2016 "Electrical test of voltage source converter valves for high voltage direct current transmission" and GB/T 33348-Compared with:2016, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- Changed the scope (see Chapter 1, Chapter 1 of the:2016 edition);
- Changed the definition of the term "dynamic brake valve" (see 3.4:12, 3:4:12 of the:2016 edition);
- Deleted the term "valve base electronic equipment" (see 3.5:5 of the:2016 edition);
- When expressing the minimum number of valve stages for type testing, "type test" is subdivided into "operation type test" and "insulation type test":  
"Testing", and corresponding provisions are given [see 4.1:2b), 4:1:2b of the:2016 edition)];
- Deleted the note on "test frequency" (see 4.1:5, 4:1:5 of the:2016 edition);
- Deleted the provisions of the test product: "The arrester should be proportional to the number of series-connected valves under test and provide at least the same lightning protection as the actual application "For valves with valve arresters, proportionally sized valve arresters are required" is included" (see 6.2, 6:2 of the:2016 edition);
- Added "The test current should include harmonic currents and other currents flowing through the valve" (see 6.4);
- Added "maximum transient overvoltage continuous operation test" (see 6.7);
- Changed the value of the test safety factor "k3" in the DC voltage test of the valve bracket (see 7.3:1, 7:3:1 of the:2016 edition);
- Changed the calculation formula and description of the valve bracket AC voltage test (see 7.3:2, 7:3:2 of the:2016 edition);
- Added "steep wavefront impact test of valve bracket" (see 7.3:5);
- Changed the value of the test safety factor "k5" and the calculation formula and description of the AC voltage test of the multiple valve unit (see 8.3:1 and 8:3:2, 8:3:1 and 8:3:2 of the:2016 edition);
- Added "test method" (see 9.4);
- Deleted "Current is not applied test safety factor" (see 11.3 of the:2016 edition);

- Added the provisions for test equivalent waveform and recovery voltage (see 11.3);
- Added "If the valve impact test is implemented in accordance with 9:4, the test results shall not be used as the basis for the valve's resistance to electromagnetic interference:" (see 12.1);
- Added a chapter on "Special Tests" (see Chapter 13);
- Added pressure test parameter requirements (see 14.5:8);
- Added "Dynamic brake valve test" (see Chapter 16):

This document is modified to adopt IEC 62501:2017 "Electrical tests on valves of voltage source converters for high voltage direct current transmission":

This document has many technical differences compared to IEC 62501:2017:

The single line (I) indicates these technical differences and their reasons as follows:

- The normative reference GB/T 16927.1 replaces IEC 60060-1, which may affect 7:3:4 "Lightning impulse test of valve bracket the selection of voltage waveforms in 8:3:4 "Lightning impulse test for multiple valve units" and 9:3:4 "Lightning impulse test for valves" may affect this affects the selection of test procedures and instruments in 13:2 "Valve AC-DC voltage wet test";
- The normative reference GB/T 16927.2 replaces IEC 60060-2, which may affect Chapter 15 "Table of type test results Calculation of uncertainty of high voltage measurement system in "
- The normative reference GB/T 16927.3 replaces IEC 60060-3, which may affect Chapter 7 "Insulation test of valve bracket" Test equipment parameters in Chapter 8 "Insulation test for multiple valve units" and Chapter 9 "Insulation test between terminals" Selection;
- The use of the current measurement specified in GB/T 16927.4, which is a normative reference, may affect the "Type Test Results" in Chapter 15:

Calculation of uncertainty of large current measurement system in "expression";

- Added "maximum transient overvoltage continuous operation test" (see Table 3 and 6:7);
- Added "The atmospheric correction for the test level shall be as specified in 4:2:" (see 7:3:3 and 7:3:4);
- Added "steep wavefront impact test of valve bracket" (see Table 3 and 7:3:5);
- Added "Special Tests" (see Chapter 13), and the original chapter numbers of Chapters 13 to 15 are postponed:

The following editorial changes were made to this document:

- Move the suspended paragraphs under the title of Article 7:3 to 7:3:1, 7:3:2, 7:3:3, and