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

GB/T 4473-2018

Replacing GB/T 4473-2008

**Synthetic testing of high-voltage alternating current
circuit-breakers**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 4473-2008 "Synthesis Test of High Voltage AC Circuit Breakers". Compared with GB/T 4473-2008, the main technology

The changes are as follows.

- Added the term "medium asymmetry";
- Removed the term "small breaking time" and "reburning test";
- Modified the test method T100a related content, including the test method T100a final current half-wave parameters in Appendix I, di/dt

Reduction and TRV correction value;

- Added the revised procedure for the failure of the medium arc breaking in the 6.102.10.3.101 symmetrical current breaking test;
- Modified 6.119 near-zone fault test;
- Modified the example of the recovery voltage of Figure 2, the typical synthetic closure circuit of the single-phase test of Figure 5, and the typical synthesis of the out-of-step test of Figure 6.

Combined circuit

- Added a typical synthetic closing circuit for the three-phase test of Figure 7;
- Removed the original three-phase direct test (left) and three-phase synthetic test (right) arcing in the test mode T100s ($k_{pp}=1.5$)

Comparison of time setting values, three-phase direct test (left) and three-phase synthesis test (right) in test mode T100a ($k_{pp}=1.5$)

Comparison of arcing time setting values;

- Increased the recovery voltage requirement of the synthetic capacitive current opening

and closing test in Figure 8, and the three-phase straight in the test mode T100a ($k_{pp}=1.5$) in Figure 9.

Comparison of the arcing time setting values of the test (left) and the three-phase synthesis test (right), and the test mode T100a ($k_{pp}=1.3$) in Fig. 10

Comparison of three-phase direct test (left) and three-phase synthesis test (right) arcing time setting values;

--- Revised the specific procedure of the test strip with a tripping resistor breaker in Appendix F;

--- Modified Appendix H step by step arc method;

--- Modified Appendix J three-phase synthetic test circuit.

This standard uses the redrafting method to modify the use of IEC 62271-101.2017 "High-voltage switchgear and control equipment part 101.

Into the test.

The technical differences between this standard and IEC 62271-101.2017 and their reasons are as follows.

---About the normative reference documents, this standard has made technical adjustments to adapt to China's technical conditions, adjustments

The situation is reflected in Chapter 2, "Regulatory Citations", and the specific adjustments are as follows.

* Replaced IEC 62271-100.2008 with GB/T 1984-2014 modified to international standards.

--- The voltage level has been modified according to the provisions of GB/T 1984-2014, such as 245kV to 252kV;

--- According to the provisions of GB/T 1984-2014, the relevant contents of voltage class 1200kV and $k_{pp}=1.2$ are deleted;

--- Removed the test procedure for Appendix K using a three-phase current loop and a voltage loop;

--- Removed the decomposition of the test mode in the test series considering the TRV of each breaking pole in Appendix L.

This standard has made the following editorial changes.

--- In line with the existing standard system, change the standard name to "Synthetic Test of High Voltage AC Circuit Breaker".

This standard was proposed by the China Electrical Equipment Industry Association.

This standard is under the jurisdiction of the National High Voltage Switchgear Standardization Technical Committee (SAC/TC65).

This standard was drafted. Xi'an High Voltage Electric Apparatus Research Institute Co., Ltd., China Electric Power Research Institute, Liaoning High Voltage Electrical Appliances Measurement Co., Ltd., Xi'an Xidian High Voltage Switch Co., Ltd., Xi'an Xidian Switch Electric Co., Ltd., New Northeast Electric Group High Voltage

Switchgear Co., Ltd., Pinggao Group Co., Ltd., Shanghai Electric Transmission and Distribution Test Center Co., Ltd., State Grid Shanghai Electric Power Company

Institute of Science, State Grid Zhejiang Electric Power Company Shaoxing Power Supply Company, State Grid Anhui Electric Power Company Electric Power Research Institute, State Grid Power Science

Research Institute, ABB (China) Co., Ltd., Beijing Beikai Electric Co., Ltd., Xi'an Xidian Electric Research Institute Co., Ltd., Shandong

Taikai High Voltage Switch Co., Ltd., Zhejiang Switch Factory Co., Ltd., Beijing Keyui Distribution Automation Co., Ltd., Shanghai Tianling Switch Factory

Limited Company, Tianshui Great Wall Switch Factory Co., Ltd., Yunnan Yunkai Electric Co., Ltd., Ningbo Tianan (Group) Co., Ltd., Changzhou Tai

Pingyang Power Equipment (Group) Co., Ltd.

1 Scope

This standard applies to high voltage AC circuit breakers within the scope of GB/T 1984-2014. 6.102~ in GB/T 1984-2014

Within the scope of the test method specified in 6.111, it gives general rules for the ability to test the closing and breaking capacity of high-voltage AC circuit breakers by synthetic methods.

The methods and techniques described in this standard are common. The purpose of this standard is to determine the criteria for the synthesis test and to make the results of the test.

Appropriate assessment. This criterion will determine the validity of the test method without adding constraints to the update of the test loop.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1984-2014 High voltage AC circuit breaker (IEC 62271-100:2008, MOD)

IEC 62271-100:2008/AMD1:2012 High-voltage switchgear and control equipment - Part 100.

Sub-Amendment (High voltage switchgear and control gear - Part 100. Alternating-current circuit breaker

Amendment 1:2012)

IEC 62271-100:2008/AMD2:2017 High-voltage switchgear and control gear - Part 100.

Sub-Amendment (High voltage switchgear and control gear - Part 100. Alternating-current circuit breaker

Amendment 2:2017)

3 Terms and definitions

The following terms and definitions as defined in GB/T 1984-2014 apply to this document.

3.1

Direct test direct test

The applied voltage, current, and transient and power frequency recovery voltages are all tested by a single power supply loop, which can be a power system.

Either a dedicated generator used in a short-circuit test station or a combination of the two.

3.2

Synthetic test synthetic test

All current or most of the current is obtained from one power supply (current loop), while the applied voltage and/or recovery voltage (transient and power frequency)

Tests obtained in whole or in part from another independent power source (voltage loop).

3.3

Test circuit breaker test circuit-breaker

The circuit breaker that was tested.

3.4

Auxiliary circuit breaker auxiliary circuit-breaker(s)

A circuit breaker used to make the circuit breaker under test have a relationship with