

ICS 29.240

DL

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

DL/T 540-2024

Codes for the inspection of buchholz relay

气体继电器检验规程

(English Translation)

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1 Scope

This document specifies the inspection conditions, inspection methods and inspection requirements, etc. of Buchholz relays for transformers.

This document is applicable to the inspection of Buchholz relays for transformers (hereinafter referred to as the relays). The inspection of Buchholz relays installed on other oil-filled electrical equipment may take this document as a reference.

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 4208-2017 Degrees of Protection Provided by Enclosure (IP code)

GB/T 7595 Quality of Transformer Oils in Service

DL/T 573-2021 Maintenance Guide for Power Transformers

DL/T 2255 Technical Specification for Buchholz Relay Test Equipment

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1

setting of the flow rate

The present oil flow rate value for the operation of the relay signal contact.

3.2

operating value of the flow rate

During the inspection, evenly and steadily increase the flow rate to the steady-state oil flow rate value, at which, the relay signal contact operates.

3.3

operating value of the gas volume

During inspection, slowly inflate or drain the relay filled with transformer oil, until the gas volume reaches the value, at which, the relay signal contact operates.

3.4

insulating liquid loss contact

When the transformer continues to lose oil and the oil level drops to near the bottom of the connecting pipeline, the relay electrical contact operates.

4.1 Requirements for Inspection Equipment

4.1.1

The test pipeline of the inspection device shall be consistent with the caliber of the relay under test, and the accuracy class of the inspection device shall not be lower than Class 2.0.

4.1.2

The technical requirements for the inspection device shall comply with the provisions of DL/T 2255.

4.1.3

The flow velocity inspection range of the inspection device is: $\phi 25$: 0.6 m/s ~ 4.0 m/s; $\phi 50$: 0.6 m/s ~ 3.0 m/s; $\phi 80$: 0.6 m/s ~ 2.0 m/s.

4.1.4

The gas volume inspection range of the inspection device is: 0 mL ~ 500 mL.

4.1.5

Inspection parameters for the sealing performance of the inspection device: 0.2 MPa; 20 min.

4.1.6

During inspection, the oil temperature shall be controlled between 25 °C ~ 40 °C.

4.1.7

Users with special requirements for the inspection device may specify them themselves.

4.2 Requirements for Other Instruments and Equipment

4.2.1

Insulation resistance meter (megohmmeter)

Output voltage is 1,000 V and maximum output current is not less than 1 mA.

4.2.2

Withstand voltage tester

Frequency is 50 Hz and output voltage is not less than 2,000 V.

4.2.3

DC resistance tester

When the measurement range is 0 ohm ~ 2 ohm, the test current is 100 mA, and the absolute value of the measurement error is not greater than 0.01 ohm.

4.2.4

Vacuum gauge

When the measurement range is 10 Pa ~ 1,000 Pa, the absolute value of the relative error of the indication is not greater than 10%.

4.2.5

All measuring instruments used for the inspection shall be verified or calibrated.

4.3 Environmental Conditions of Inspection

4.3.1

Ambient temperature

0 °C ~ +40 °C.

4.3.2

Relative humidity

≤ 75%.

4.4 Working Medium of Inspection

Transformer oil that complies with GB/T 7595.

5.1 Appearance and Structural Inspection

5.1.1

The relay nameplate shall be durable and not prone to corrosion; the nameplate shall be firmly fixed, and the writing shall be clear; the nameplate content shall include the manufacturer or trademark, product name, model, exit-factory No., serial No. of production standard, contact capacity and production date, etc.

5.1.2

The surface of the relay housing shall be smooth, without paint peeling or rust; the glass window scale shall be clear; the outlet terminal shall be structurally intact, with complete accessories and no damaged threads; the screw shall not be loose, and the vent valve and probe shall be intact; the oil flow direction mark shall be clear and intact.

5.1.3

The relay outlet terminals shall be clearly marked.

5.1.4

The operation of the vent valve and probe shall be flexible; the operating probe shall be able to normally disconnect and conduct the dry reed contact.

5.1.5

Parts that need to be rotated shall flexibly move, and without any jamming during operation.

5.1.6

When the baffle is turned to the end position, the dry reed contact shall be reliably engaged.

5.1.7

If necessary, the following inspections may be carried out:

- a) The internal parts of the relay shall be intact, without burrs, metal chips and other defects; the fasteners shall be firmly connected, the fixing brackets shall be firm and reliable, and the welds shall be well welded without any lack of weld;
- b) The dry reed switch is firmly fixed and has a buffer sleeve; the glass tube shall be intact without oil leakage, the root lead wire shall be reliably welded, the dry reed switch pin cannot be bent, and shall be arranged and fixed in an oil-resistant insulating tube, and the permanent magnet shall be firmly fixed in the frame;
- c) The dry reed contact movable piece faces the permanent magnet and remains parallel.