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PEOPLE'S REPUBLIC OF CHINA**

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**Technical specification for dry-type air core reactor
anti-overvoltage test equipment
(English Translation)**

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Foreword

This standard is compiled in accordance with the rules given in GB/T 1.1-2009 "Guidelines for Standardization Work Part 1: Standard Structure and Compilation".

This standard was proposed by the China Electricity Council.

This standard is under the jurisdiction of the Power Transformer Standardization Technical Committee (DL/T C 02) of the power industry.

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Limited company.

1 Scope

This standard specifies the operating conditions, composition, performance requirements, test methods and inspections of dry-type air-core reactor turn-to-turn overvoltage test equipment Rules, as well as signs, packaging, transportation and storage.

This standard applies to 6kV~35kV dry-type air-core reactor turn-to-turn overvoltage test equipment.

Other voltage levels dry-type air-core reactor turn-to-turn overvoltage test equipment can be implemented by reference.

2 Normative references

The following documents are indispensable for the application of this standard. For dated reference documents, only the dated version applies to this standard.

For undated reference documents, the latest version (including all amendments) is applicable to this standard.

GB/T 191 Packaging, storage and transportation pictorial signs GB/T 1094.6-2011 Power Transformer Part 6: Reactor GB 4208 enclosure protection class (IP code) GB/T 6587-2012

General Specification for Electronic Measuring Instruments GB 16896.1-2005 High Voltage Impulse Measuring Instruments and Software Part 1: Requirements for Instruments DL/T 1222-2013 Shock divider calibration specification JB/T 8168 Pulse capacitor and DC capacitor

3 Terms and definitions

The following terms and definitions apply to this standard.

High frequency pulse oscillation voltage wave an AC sinusoidal voltage wave whose amplitude decays exponentially. Its wave front time is much shorter than the standard lightning shock wave front time. The voltage wave frequency the rate is in the range of 10kHz to 100kHz.

Full voltage

100% test voltage applied to both ends of the sample.

Initial testing voltage the test voltage used to obtain the reference waveform generally does not exceed 20% of the full voltage.

Turn-to-turn overvoltage test A test in which a high-frequency pulse oscillating voltage wave is applied to a reactor to assess its turn-to-turn insulation. Also called high frequency pulse oscillation voltage test.

Dry-type air-core reactor turn-to-turn overvoltage test equipment it is used to test the inter-turn insulation performance of dry-type air-core reactors, and has the functions of generating, measuring and displaying high-frequency pulse oscillation voltage equipment.

4 Conditions of use

The equipment should be able to work normally under the following conditions of use.

- a) Ambient temperature. $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$;
- b) Environmental relative humidity. no more than 85% (25°C);
- c) External power supply requirements.
 - 1) Rated voltage. AC single-phase 220V ($1 \pm 10\%$) or three-phase 380V ($1 \pm 10\%$);
 - 2) Frequency. (50 ± 0.5) Hz;
 - 3) Total harmonic distortion rate. not more than 5%;
- d) Altitude. not higher than 1000m;

If the working environment conditions exceed the above-mentioned regulations, special

design and manufacturing shall be carried out through negotiation between the supplier and the buyer.

5 Equipment composition

The equipment consists of a DC power supply, a charging resistor, a charging capacitor, a discharge switch, a voltage divider, a digital recorder, etc. It usually has a discharge switch. There are two types of structures: off-grounding type and charging capacitor grounding type. The wiring principles are shown in Figure 1 and Figure 2 respectively.

6.1 Overall output performance

The equipment should be able to continuously output high-frequency pulse oscillating voltage waves, the voltage amplitude should be adjustable within the maximum output voltage range, the voltage waveform and frequency the following requirements should be met.

- a) The equipment should be able to generate no less than 3000 high-frequency pulse oscillating voltage waves within 1 min;
- b) The initial peak deviation of each voltage wave is less than 3%;
- c) The maximum initial peak value of the voltage wave should reach the full power of the reactor turn-to-turn overvoltage test specified in Appendix G of GB/T 1094.6-2011 Pressure value
- d) The oscillation frequency of each voltage wave should be in the range of 10kHz~100kHz;
- e) Near the peak value of the voltage wave, the overshoot or oscillation amplitude should not exceed 5% of the peak value of the voltage wave;
- f) The wavefront time of the voltage wave should be much less than the wavefront time of the standard lightning impulse test.

6.2.1 DC power supply

- a) The maximum output voltage should not be lower than the full test voltage, and the output voltage should be continuously adjustable.
- b) Have enough output capacity to ensure that the initial voltage peak of each discharge waveform reaches the full test voltage.

6.2.2 Charging capacitor

- a) The pulse capacitor should be selected, and its performance meets the requirements of JB/T 8168.
- b) The capacitance should meet the formula (1)