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

GB/T 20833.3-2018

**Rotating electrical machines -- Stator winding insulation of
rotating electrical machines -- Part 3: Dielectric dissipation
factor measurement**

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Table of Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

Foreword

GB/T 20833 "Rotor Motor Rotor Motor Stator Winding Insulation" is divided into four parts.

--- Part 1. Offline partial discharge measurement;

--- Part 2. Online partial discharge measurement;

--- Part 3. Dielectric loss factor measurement;

--- Part 4. Measurement of insulation resistance and polarization index.

This part is the third part of GB/T 20833.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the translation method equivalent to IEC 60034-27-3:2015 "Rotating electrical machines Part 27-3. Rotor stator windings

Edge dielectric loss factor measurement.

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

--- GB/T 16927.1-2011 High voltage test techniques - Part 1. General definitions and test requirements (IEC 60060-1.

2010, MOD);

--- GB/T 16927.2-2013 High voltage test technology Part 2. Measurement systems (IEC 60060-2:2010, MOD).

This section has made the following editorial changes.

--- In line with the existing standard series, the name of this part is changed to "Spindle winding insulation of rotating electric machine rotating machine Part 3.

Dielectric loss factor measurement.

This part was proposed by China Electrical Equipment Industry Association.

This part is under the jurisdiction of the National Rotating Electric Machine Standardization Technical Committee (SAC/TC26).

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Introduction

This part of GB/T 20833 gives a measurement method for the stator winding bars, coils and complete winding dielectric loss factor of the formed winding.

The dielectric loss factor is the dielectric loss that measures the insulation of the stator windings. Dielectric loss factor measurement is to evaluate new and old rotary motors

A suitable method for the quality of the sub-winding insulation, which also helps to evaluate the insulation manufacturing consistency and dielectric properties. For old stator windings, medium

The loss factor provides information about the insulation state.

Compared to offline partial discharge measurements, dielectric loss factor measurements do not give information on the distribution of losses within the insulation, nor can they determine the insulation junction.

Construct a weak point location.

Measuring the dielectric loss factor over the entire voltage range will result in dielectric loss parameters of different characteristics that will be used for evaluation.

Benchmark.

In fact, empirical limits can be used to assess the quality of the stator winding insulation manufacturing process. Moreover, trend assessments can also provide information about the old

Information on the process, necessary tests, and intervals during overhaul, such as

functional assessment as part of the insulation structure or operation with a rotating motor or

Diagnostic tests related to the repair period. However, these trend ratings cannot be used to predict the time of stator winding insulation failure.

Rotating electric machine rotating electric machine stator winding insulation

Part 3. Dielectric loss factor measurement

1 Scope

This part of GB/T 20833 specifies the test procedure and test results of the measurement of the dielectric loss factor of the stator winding of a rotating electrical machine.

The guide is applicable to rotating electric machines with rated voltages of 6kV and above and with end anti-halation layer.

This section applies to single molded winding stator bars and coils that are installed/not installed in the core, new or aged motors

Completely formed stator windings.

This section applies to all types of vacuum impregnated or multi-rubber rods, coils and complete windings, not for unimpregnated single bars and

Coil or complete winding.

This part gives the introduction of single-form stator bars and coils for motors with rated voltages of 6kV and above under power frequency AC voltage.

Necessary conditions for mass loss factor measurement.

2 Normative references

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

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

IEC 60060-1 High Voltage Test Technique Part 1. General Definitions and Test Requirements (High-voltage test techniques-

Part 1. General definitions and test requirements)

IEC 60060-2 High Voltage Test Technique Part 2. Measurement Systems (High-voltage test techniques-Part 2.

Measurement systems)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Rated voltage ratedvoltage

UN

For motors with specified operating conditions, the voltage or voltage range between the ends of the motor (also known as the line-to-line voltage) is usually determined by the manufacturer.

Provisions.

3.2

Dielectric loss factor dielectricdissipationfactor

Tandelta

The tangent of the dielectric loss angle delta (the angle of the insulation power factor angle) at a predetermined temperature, frequency, voltage, or dielectric stress.

Note 1. Sometimes other terms can be used to indicate this property, such as tan delta, loss angle, dielectric loss factor or dielectric power factor. Dielectric loss factor and power factor

There is a difference in physicality between the number (the sine of the dielectric loss angle or the cosine of the power factor angle), but when the dielectric loss factor is less than 100×10^{-3}

The two measurements are almost equal (see 4.1).

Note 2. The dielectric loss factor tan delta in this part is expressed in absolute value, and can also be expressed as a percentage in other documents.