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

GB/T 17948.4-2024

**Rotating electrical machines - Functional evaluation of
insulation systems (Type II) - Procedures for form-wound
windings - Electrical endurance qualification
(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 is required.

This document is Part 4 of GB/T 17948. GB/T 17948 has published the following parts.

Functional assessment of the insulation structure of rotating electrical machines Test procedures for random-wound windings Thermal assessment and classification;

Functional assessment of the insulation structure of rotating electrical machines Randomly wound winding test procedures Changes and classification of insulation component replacements;

Functional assessment of insulation structures of rotating electrical machines Test procedures for formed windings Thermal assessment and classification of insulation structures of rotating electrical machines;

Functional evaluation of the insulation structure of rotating electrical machines (Type II) Test procedures for formed windings Electrical durability evaluation;

Functional evaluation of rotating electrical machine insulation structure Formed winding test procedures Thermal and electrical comprehensive stress durability Multi-factor evaluation;
-Functional evaluation of insulation structures of rotating electrical machines Test procedures for formed windings Evaluation of the thermomechanical durability of insulation structures;

General principles for the functional assessment of the insulation structure of rotating electrical machines. -this document replaces GB/T 17948.4-2016 "Test procedure for functional evaluation of insulation structure of rotating electrical machines - Formed windings - Voltage withstand Compared with GB/T 17948.4-2016, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

The scope of application of the standard has been changed (see Chapter 1, Chapter 1 of the 2016 edition); -Added terms and definitions such as "confidence interval" and "test temperature" (see Chapter 3, Chapter 3 of the 2016 edition); -the test procedures for aging tests have been modified and added (see Chapter 4 and Chapter 6 of the 2016 edition); -the structure and quantity of the test samples have been changed (see Chapter 5, Chapter 5 of the 2016 edition); -Changed the "Identification conditions for structures to be evaluated" (see Table 1, 4.2 of the 2016 edition); -Added "Qualified insulation structures to be evaluated with the same voltage level and different expected service life" (see Figure 4); -Added "qualified insulation structures with higher voltage levels and the same expected service life" (see Figure 5); -Added "Qualified insulation structures to be evaluated with different service life and voltage level from the reference structure" (see Figure 6); -Modified

and added data functional assessment, added the performance of the insulation structure to be assessed and the reference insulation structure (see Chapter 9, Chapter 9 of the 2016 edition);

Added "Main insulation reference life line when the manufacturer does not have a reference life line" (see Appendix A). -this document is equivalent to IEC 60034-18-32:2022 "Rotating electrical machines - Part 18-32.Functional assessment of insulation structures" (Type II) Electrical durability assessment procedures for formed windings.

The following minimal editorial changes were made to this document.

In order to coordinate with the existing standards, the name of the standard is changed to "Functional Evaluation of Insulation Structure of Rotating Electrical Machines (Type II) Formed Winding Test Method" "Testing Procedure for Electrical Durability Assessment";

To be consistent with the main text, the normative reference IEC 60034-18-1:2010 is adjusted to IEC 60034-18-1.-

Introduction

The insulation structure of the rotating motor powered by the inverter is divided into type I and type II. Type I insulation structure is usually used for rated voltage less than 700 Vr.ms and tend to use random windings, which are not subject to partial discharge during their service life and under specified conditions; Type II is for the entire Formed windings where any part of the insulation structure is subjected to partial discharge during the service life (see IEC 60034-18-41 and GB/T 22720.2). Different parts of the insulation structure of rotating motor windings may have different dominant influencing factors, corresponding to a variety of evaluation criteria and Identification method.

GB/T 17948 provides functional assessment and special test procedures for the insulation structure of rotating electrical machines, and is intended to consist of the following parts.

Functional evaluation of the insulation structure of rotating electrical machines Test procedures for random-wound windings Thermal evaluation and classification.

This standard specifies test procedures for thermal assessment and classification of insulation structures of randomly wound windings used or intended for use in rotating electrical machines.

Functional evaluation of the insulation structure of rotating electrical machines - Changes to the test procedures for random-wound windings and classification of insulation component replacements.

Specifies the thermal assessment and classification test procedures for changes in the insulation structure of randomly wound windings and replacement of insulation components.

Functional assessment of the insulation structure of rotating electrical machines - Test procedure for formed windings - Thermal assessment and classification of the insulation structure of rotating electrical machines.

To specify the test procedure for the thermal resistance of the insulation structure of AC or DC rotating electrical machines with indirect cooling and formed windings and classification, and provides thermal aging methods and diagnostic test procedures.

Functional evaluation of the insulation structure of rotating electrical machines (Type II) Test procedure for formed windings Electrical durability evaluation.

This standard specifies the test procedure for evaluating the electrical durability of the insulation structure of a formed-winding rotating electrical machine supplied with a sinusoidal power frequency voltage.

Functional evaluation of rotating electrical machine insulation structure Formed winding test procedures Thermal and electrical comprehensive stress durability Multi-factor evaluation.

The purpose is to specify the insulation structure of the formed winding used or intended for AC motors when subjected to thermal and electrical stress durability tests.

Assessment procedures.

Functional evaluation of insulation structures of rotating electrical machines Test procedure for formed windings Evaluation of the thermomechanical durability of insulation structures.

Specifies the evaluation of the insulation structure of formed windings under thermal cycling. This durability is important for slender types (especially indirect cooling) and normal operation.

This is particularly important for motors that experience considerable load changes during operation.

General principles for functional evaluation of the insulation structure of rotating electrical machines. The purpose is to specify the requirements for the insulation structure of rotating electrical machines that are applied or to be applied to the specifications of GB/T 17948.

General rules for the assessment of the functionality of the electrical insulation arrangements of rotating electrical machines within the range of 1000 to 2000 for the purpose of classifying them.

Functional evaluation of the insulation structure of rotating electrical machines (Type II) Formed winding test procedures Electrical durability assessment

1 Scope

This document specifies the qualification procedure for the assessment of the electrical durability of the insulation structure of formed-wound rotating electrical machines supplied