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

GB/T 17948.3-2017

Replacing GB/T 17948.3-2006

**Rotating electrical machines -- Functional evaluation of insulation systems -- Test
procedures for form-wound windings -- Thermal evaluation and classification of
insulation systems used in rotating machines**

(English Translation)

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Foreword

GB/T 17948 "functional evaluation of the insulation structure of rotating electrical machines" is divided into seven parts.

--- Winding test procedures thermal rating and grading (GB/T 17948.1);

--- Scattered winding test procedures change and classification of insulation components alternative (GB/T 17948.2);

Test procedures for forming windings - Thermal evaluation and classification of insulation structure of rotating electrical machines (GB/T 17948.3);

Forming coil test procedures voltage durability assessment (GB/T 17948.4);

Test procedures for forming windings - Assessment of multi - factor of overall stress and durability of heat and electricity (GB/T 17948.5);

Test procedure for forming windings - Assessment of thermo - mechanical durability of insulating structure (GB/T 17948.6);

--- General (GB/T 17948.7).

This section GB/T 17948 Part 3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB/T 17948.3-2006 "functional structure of the rotating electrical insulation molded test rules 50MVA, 15kV and below thermal insulation and classification of

motor insulation structure ", and GB/T 17948.3-2006 compared to the main technical changes are as follows.

- Modify the standard range (see Chapter 1, 2003 edition Chapter 1);
- Added "recommended aging temperature and aging sub-cycle exposure time" (see Table 2);
- Modify the moisture treatment procedures sealed insulation structure (see 6.1.3, 2003 version 6.2.2);
- Modify the inter-turn insulation diagnostic procedures (see 6.2.4, 2003 6.3.1);
- Increasing the eligibility criteria in different situations (see Chapter 7).

This section uses the translation method identical with IEC 60034-18-31:2012 "Rotating Electrical Machines Part 18-31 Functional Evaluation of Insulation Fixed-shaped winding test procedures Thermal motor insulation rating and thermal classification. " the documents of our country that are consistent with the corresponding international documents that are normative references in this section are as follows.

- GB/T 11021-2014 Electrical insulation heat resistance and representation (IEC 60085:2007, IDT)
- GB/T 11026.1-2003 Thermal insulation of electrical insulating materials Part 1. Assessment of aging procedures and test results (IEC 60216-1:2001, IDT)
- GB/T 11026.4-2010 Electrical insulating materials heat resistance - Part 4. Aging oven Single-chamber oven (IEC 60216-4-1:2006, IDT)
- GB/T 11026.7-2014 Electrical insulating materials heat resistance Part 7 of the insulating material to determine the relative heat index (RTE) (IEC 60216-5:2008, IDT) High voltage test techniques - Part 1. General definitions and test requirements (IEC 60060-1. 2010, MOD)
- GB/T 20112-2015 Electrical insulation system assessment and identification (IEC 60505:2011, IDT)
- GB/Z 22720.2-2013 Rotating electrical machinery Rotating electrical machinery that the voltage type frequency changer supplies power is partial electric discharge resistance electrical insulating structure (Type II) identification and approval test (IEC/T S60034-18-42.2008, IDT) this section made the following editorial changes.
- Modify the standard name.

This part is proposed by China Electrical Equipment Industry Association.

This part of the National Standardization Technical Committee rotating electrical (SAC/TC26) centralized.

This part of the drafting unit. Shanghai Electric Institute of Science and Technology, Suzhou Jiufeng Electric Insulation Systems Co., Ltd., Beijing Gold Wind Branch a wind Equipment Co., Ltd., Shanghai Electric Power System Engineering Research Center Co., Ltd., Shanghai Electric Equipment Testing Institute, Lanzhou Electric shares Limited, Lilaisenma Motor Technology (Fuzhou) Co., Ltd.

Introduction

IEC 60034-18 series consists of several parts, suitable for functional evaluation and special test procedures for the insulation structure of rotating electrical machines.

IEC 60034-18-1 specifies the general rules of these procedures and identification criteria, IEC 60034-18-21, IEC 60034-18-31, IEC 60034-18-32, IEC 60034-18-33, IEC 60034-18-34, IEC 60034-18-41 and IEC 60034-18-42 Detailed instructions for different types of windings.

IEC 60034-18-31 specifies the thermal rating and classification of molded winding insulation and provides thermal aging methods and diagnostic test procedures.

The relevant parts to IEC 60034-18-31 are as follows.

- IEC 60034-18-1. General;
- IEC 60034-18-21. Winding test procedures;
- IEC 60034-18-41. Identification and type test of type I insulation structure of rotary electric machine powered by voltage type inverter;
- IEC 60034-18-42. Voltage-driven inverter-driven rotating electrical partial discharge resistance of electrical insulation structure (II type) identification and recognition can test.

Functional Evaluation of Insulating Structure for Rotating Electrical Machines Molding Winding Test Procedures Rotating Electrical Insulation Structural thermal rating and classification

1 Scope

GB/T 17948 This section describes the heat resistance test procedures for the use of indirect cooling and forming a winding AC or DC spin Classification of the motor insulation structure.

The performance of the insulation structure to be evaluated is compared with that of the basic insulation structure which has been verified by the operation experience.

The test procedures described in this section are applicable to the comparison of the heat resistance of the main insulation between conductor and ground and the design of the coil or bar Comparison of heat resistance between turn-to-turn insulation.

Test procedures are not applicable to simulate the mechanical stresses generated by the end supports or ancillary materials during operation. Test procedures are not included in the heat Evaluation of thermo-mechanical degradation caused by insulation expansion and contraction during cycling.

GB/T 17948.7-2016 describes the basic test principle of heat resistance of the insulation structure of rotating electrical machines. Except the rules listed in this section Process, follow the GB/T 17948.7-2016 principle.

Insulation structure heat resistance reference to its maximum allowable ("hot") temperature. The average temperature measured during operation according to IEC 60034-1 [1] should not exceed allowable temperature rise.

Note 1: Large motors, especially those with bar windings, may require special thermal rating test procedures not covered in this section.

Note 2: For molded-in winding coils designed for type II design with variable frequency motors, the recommended parameters for the diagnostic test are to be selected in accordance with IEC 60034-18-42.

2 Normative references

The following documents for the application of this document is essential. 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 17948.7-2016 General functional assessment of the insulation structure of rotating electrical machines (IEC 60034-18-1:2010, IDT) GB/T 22715-2016 Rotating AC motor stator forming coil withstand voltage level (IEC 60034-15:2009, IDT) IEC 60034-18-42 Rotating electrical machines - Part 18-42. Rotating electrical machines powered by voltage-fed inverters - Resistant to partial discharges Electrical insulation Structure (type II) identification and approval test [Rotatingelectrmachines-Part 18-42.Qualificationandacceptance testsforpartialdischargeresistantelectricalinsulationsystems (TypeII) usedinrotatingelectrical machinesfedfromvoltageconverters] IEC 60060-1 High voltage test techniques - Part 1. General definitions and test requirements (High-voltage test techniques-Part 1: Generaldefinitionsandtestrequirements) IEC 60085 Electrical insulation heat resistance and representation (ElectricalInsulation-Thermalevaluationanddesig-nation IEC 60216-1, Electrical insulating materials, heat resistance - Part 1. Evaluation of aging procedures and test results (Electrical insulatingmaterials-Propertiesofthermalendurance-Part 1: Ageingproceduresandevaluationof testresults) IEC 60216-4-1 Electrical insulating materials - Heat resistance - Part 4-1. Aging ovens Single chamber ovens (Electricalinsulating