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

GB/T 40294-2021

**Methods for determining electrically excited synchronous
machine quantities from tests**

Issued on: May 21, 2021

Implemented on: December 1, 2021

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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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 of Standardization Documents"

Drafting.

The translation method used in this document is equivalent to the adoption of IEC 60034-4-1.2018 "Rotating Electrical Machines Part 4-1. Determining the Parameters of Electrically Excited Synchronous Motors"

Number of test methods."

The Chinese documents that have consistent correspondence with the normatively cited international documents in this document are as follows.

---GB/T 25442-2018 Rotating electrical machines (except traction motors) Test methods for determining loss and efficiency (IEC 60034-2-1.

2014, IDT).

The following editorial changes have been made to this document.

---Modified the file name.

1 Scope

This document applies to three-phase synchronous motors with a rated power of 1kVA and

above.

The test method of this document is mainly applicable to synchronous motors with excitation windings and slip rings and brushes in the excitation power supply circuit.

Certain tests of brushless synchronous motors require special treatment; for permanent magnet motors, the applicability of the test method is limited, and special measures should be taken.

To prevent permanent demagnetization of the motor.

This document does not apply to axial flux motors and special synchronous motors, such as induction motors, transverse flux motors and reluctance motors.

Any or all of the test items described in this document are not required to be performed for any specified motor. Some specific tests can be made according to

The agreement between the supplier and the customer is carried out.

2 Normative references

The contents of the following documents constitute indispensable clauses of the documents through normative references in the text. Among them, dated reference documents,

Only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

file.

GB/T 755-2019 Rotating electric machine rating and performance (IEC 60034-1.2017, IDT)

IEC 60034-2-1 Rotating electrical machines Part 2-1. Test methods to determine loss and efficiency (except traction motors) (Rotating

electrical machines-Part

2-1. Standards methods for determining losses and efficiency from tests (ex-

cluding machines for traction vehicles)]

IEC 60051 (all parts) Direct acting analog indicating electrical measuring instrument and its accessories (Directing indicating analogue

electrical measuring instruments and their accessories)

3 Terms and definitions

The following terms and definitions apply to this document.

ISO and IEC maintain a database of terminology used for standardization at the following websites.

3.1

Initial starting impedance (synchronous motors) initial starting impedance (synchronous motors)

The ratio of the applied armature voltage to the steady-state average armature current when the motor is at a standstill.

3.2

Direct-axis synchronous reactance

When the motor is running at the rated speed, the continuous AC fundamental wave induced by the total flux linkage of the straight-axis armature winding generated by the straight-axis armature current

The ratio of voltage to AC fundamental current.

[Source. GB/T 2900.25-2008,411-50-07]