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

GB/T 13958-2022

Replacing GB/T 13958-2008

**Test methods for small power permanent magnet synchronous
motors**

小功率永磁同步电动机试验方法

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Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Basic requirements for testing	1
5 Test preparation	1
6 Temperature rise test	1
7 Determination of efficiency	2
8 Stall test	3
1 Number of measuring points for stalled rotor	3

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. This document replaces GB/T 13958-2008 "Test methods for synchronous motors without DC excitation winding" and GB/T 22672-2008 "Small Power Synchronous Motor Test Method", this document is based on GB/T 13958-2008 and integrates the content of GB/T 22672-2008. Compared with GB/T 13958-2008 and GB/T 22672-2008, except for structural adjustment and editorial changes, the main technical changes are as follows:

- Added terms and definitions (see Chapter 3);
- Deleted "test requirements and preparation" (see Chapter 3 of GB/T 13958-2008);
- Added "Basic Requirements for Test" and "Test Preparation" (see Chapter 4 and Chapter 5);
- Changed the temperature rise test method (see Chapter 6, Chapter 13 of GB/T 13958-2008, Chapter 12 of GB/T 22672-2008 chapter);
- Deleted "overspeed test", "vibration measurement", "turn-to-turn impulse withstand voltage test", "short-time elevated voltage test" and "withstand voltage test" "Other Safety Experiments", "Determination of Noise", "Determination of Input Power and Input Current" (see Chapter 7~ of GB/T 13958-2008 Chapter 12, Chapter 19, Chapter 21), related test items are combined in "Other Test Items" (see Chapter 9). Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed by China Electrical

Equipment Industry Association. This document is under the jurisdiction of the National Standardization Technical Committee of Rotating Electric Machines (SAC/TC26). This document is drafted by: China Electric Apparatus Research Institute Co., Ltd., Wolong Electric Drive Group Co., Ltd., Guangdong Welling Motor Manufacturing Co., Ltd., Qingdao Haier Intelligent Technology R&D Co., Ltd., Huzhou Yueqiu Motor Co., Ltd., Zhejiang Verde Drive Technology Co., Ltd. Co., Ltd., Guangdong Yidong Technology Co., Ltd., Hangzhou Weiguang Electronics Co., Ltd., Qingdao Hairong Commercial Cold Chain Co., Ltd., Guangdong Mei White Household Appliance Technology Innovation Center Co., Ltd., Dongguan Benmo Technology Co., Ltd., Nanjing Nanwei Motor Co., Ltd., Jiangsu Shangqi Group Co., Ltd., Zhejiang Youshengkang Technology Co., Ltd., Huzhou Nanyang Motor Co., Ltd., Qingdao Aipu Intelligent Instrument Co., Ltd., Haicheng Sanyu Pump Industry Co., Ltd., Xingdesheng Technology (Suzhou) Co., Ltd., Aile Power Technology (Suzhou) Co., Ltd., Weikai Testing Technology Co., Ltd., Weikai Certification and Testing Co., Ltd. The main drafters of this document. Zhang Chuanjia, Du Rongfa, Chi Chuang, Nie Shengyuan, Zhang Xuxing, Shao Mingyuan, Wu Yunshan, Luo Junbo, Zhong Dazhi, Liu Mingtao, Wan Xiaokang, Liu Haiping, Du Juan, Yin Shanmin, Liu Hailong, Zhang Di, Lu Xiaomao, Yin Guangyu, Li Junkai, Liu Jing, Shen Rongquan, Han Qingjiang, Li Lulu, Zhu Yunfang, Wang Conning, Li Huifang. The release status of previous versions of this document and the documents it replaces are as follows:

---In.1992, it was first published as GB/T 13958-1992 "Test Methods for Synchronous Motors without DC Excitation Windings", and it was the first in.2008 Minor revision;

---This is the second revision, incorporating the contents of GB/T 22672-2008 "Test Methods for Small Power Synchronous Motors" (GB/T 22672-2008 is the first release). Small power permanent magnet synchronous motor test method

1 Scope

GB/T 13958-2022 is the Chinese national standard on test methods for small power permanent magnet synchronous motors, in the field of electrical engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 30 December 2022 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2023. Classification: ICS 29.160.01, CCS k20. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes the basic requirements of small power permanent magnet synchronous motor test, test preparation, temperature rise test, efficiency measurement,

stall test and other test items. This document applies to permanent magnet synchronous, hysteresis synchronous and reluctance synchronous low-power synchronous motors without DC excitation windings (self-starting, not run with the controller). This document does not apply to electromagnetic deceleration permanent magnet synchronous motors and synchronous motors with DC field windings.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 755 Rating and performance of rotating electrical machines

GB/T 5171.21-2016 Small power motors Part

21.General test methods

GB/T 5171.22-2017 Small power motors Part

22.Test methods for permanent magnet brushless DC motors

GB/T 10069.1 Measurement methods and limits of noise of rotating electrical machines Part

3 Terms and Definitions

The terms and definitions defined in GB/T 5171.21-2016 and GB/T 5171.22-2017 apply to this document.

4 Basic requirements of the test

4.1 The environmental conditions of the test shall comply with the provisions in

4.1 of GB/T 5171.21-2016.

4.2 The test power supply shall comply with the provisions in

4.2 of GB/T 5171.21-2016.

4.3 The use of measuring instruments shall comply with the provisions in

4.3 of GB/T 5171.21-2016.

5 Test preparation

5.1 The measurement of insulation resistance shall comply with the provisions in

5.1 of GB/T 5171.21-2016.

5.2 The measurement of cold winding temperature θ_{w1} and cold winding resistance R_1 shall comply with the provisions in

5.2 of GB/T 5171.21-2016.

6 Temperature rise test

6.1 Overview The purpose of the temperature rise test is to determine that the temperature of the winding and some parts of the motor is higher than that of the cooling medium when the motor is running under specified load conditions.