ICS 27.010
CCS F 01

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 18613-2020

Replacing GB 18613-2012; GB 25958-2010

Minimum allowable values of energy efficiency and values of efficiency grades for motors

电动机能效限定值及能效等级

Issued on: May 29, 2020 **Implemented on: June 1, 2021**

Issued by: State Administration for Market Regulation;
Standardization Administration of China

Table of Contents

Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2009.

This document replaces GB 18613-2012 and GB 25958-2010, merging the two into a single standard. Compared with those editions, the main technical changes are as follows:

- the scope has been modified, to cover together what the two previous standards covered separately;

- the target minimum allowable values and the energy-saving evaluation values have been deleted, both for motors (3.2 and 3.3 of GB 18613-2012) and for low-power motors (4.4 and 4.5 of GB 25958-2010);

- the minimum allowable efficiency values for three-phase asynchronous motors have been raised (Table 1);

- efficiency grades for 8-pole three-phase asynchronous motors have been added (Table 1);

- the efficiency requirements for capacitor-start, capacitor-run and two-value capacitor asynchronous motors have been raised (Tables 2 to 4);

- the efficiency requirements for room air conditioner fan motors have been deleted (Table 5 of GB 25958-2010);

- efficiency requirements for capacitor-run motors and for brushless DC motors used in air conditioner fans have been added (Tables 5 and 6);

- the 120 W efficiency grade for single-phase and three-phase low-power motors has been deleted;

- test methods for AC-fan capacitor-run motors and for brushless DC motors have been added (Clause 6), and the test methods have been revised throughout.

This document is under the jurisdiction of the Standardization Administration of China (SAC). The main drafting organization is the China National Institute of Standardization (CNIS), with thirty-four bodies in total, among them the Shanghai Electrical Apparatus Research Institute, the China National Electric Apparatus Research Institute, ABB Shanghai Motors, Siemens (China), SEW-Eurodrive (Suzhou), Wolong Electric Nanyang Explosion Protection Group and the International Copper Association Shanghai Office.

This is the fourth edition of GB 18613, which was first issued in 2002 and revised in 2006 and 2012.

1 Scope

This document specifies the efficiency grades, the minimum allowable values of energy efficiency and the test methods for three-phase asynchronous motors, single-phase asynchronous motors and air conditioner fan motors.

For three-phase asynchronous motors it applies to machines of rated voltage below 1 000 V and rated frequency 50 Hz, rated output from 120 W to 1 000 kW, with 2, 4, 6 or 8 poles, single speed, totally enclosed and fan-cooled, of N design, for continuous duty, and of general-purpose or general-purpose explosion-proof type.

For single-phase asynchronous motors of rated voltage up to 690 V and 50 Hz it applies to capacitor-start motors from 120 W to 3 700 W, capacitor-run motors from 120 W to 2 200 W, and two-value capacitor motors from 250 W to 3 700 W.

For air conditioner fan motors it applies to capacitor-run motors and to brushless DC motors from 10 W to 1 100 W.

2 Normative references

The following documents are normatively referenced in this document and are indispensable for its application. For dated references, only the version corresponding to that date applies; for undated references, the latest version - including all amendments - applies.

GB/T 755-2019 Rotating electrical machines - Rating and performance · GB/T 1032 Test procedures for three-phase induction motors · GB/T 5171.1-2014 Small power motors -

Part 1: General technical requirements · GB/T 5171.21 Small power motors - Part 21: General test methods

3 Terms and definitions

3.1 minimum allowable value of energy efficiency for motors - the lowest efficiency permitted under the test conditions of this document.

4 Energy efficiency grades

The efficiency of a motor is divided into three grades, grade 1 being the highest.

The efficiency measured at rated output shall be not less than the value given, for the grade claimed, in Tables 1 to 6.

Tolerances are those of Table 21 of GB/T 755-2019, of Tables 2 to 6 of GB/T 5171.1-2014, and of the relevant product standards.

For ratings not listed in the tables, the values are obtained by linear interpolation.

5 Technical requirements

5.1 Basic requirements. The general performance, the safety, the explosion-proof characteristics, the noise and the vibration of the motor shall comply with the relevant standards.

5.2 Minimum allowable values of energy efficiency. The minimum allowable value of energy efficiency is the grade 3 value given in Tables 1 to 6.

6 Test methods

The efficiency of three-phase asynchronous motors shall be determined by method B of GB/T 1032, the loss-analysis input-output method.

The efficiency of single-phase asynchronous motors shall be determined by the direct method of GB/T 5171.21.

For air conditioner fan motors - both capacitor-run and brushless DC - this edition introduces dedicated test methods.