

ICS 29.160.01

CCS K 20



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

GB/T 32891.3-2026

**Rotating electrical machines - Efficiency classes (IE-code) -
Part 3: High voltage AC motors**

旋转电机 效率分级 (IE代码) 第3部分: 高压交流电动机

(English Translation)

Issued on: July 2, 2026

Implemented on: February 1, 2027

Issued by: State Administration for Market Regulation

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms, Definitions, and Symbols	4.
4 Efficiency Classification	5.
5 Document Requirements	
Appendix A (Informative) Standardized Nameplate Efficiency Values	
Appendix C (Informative) Example 15 for determining nominal efficiency	
References	

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 3 of GB/T 32891 "Efficiency Classification of Rotating Electrical Machines (IE Codes)". GB/T 32891 has been published as follows.

---Part 1: AC motors powered by the mains;

---Part 2: Variable Speed AC Motors;

---Part 3: High-voltage AC motors.

This document is equivalent to IEC 60034-30-3:2024 "Rotating electrical machines - Part 30-3. Efficiency classification of high-voltage AC motors (IE standard)".

code)".

The following minimal editorial changes have been made to this document.

---To harmonize with existing standards, the standard name has been changed to "Efficiency Classification of Rotating Electrical Machines (IE Code) Part 3: High Voltage Alternating Current".

motivation".

Please note that some content in this document may involve patents. The issuing

organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of Rotating Electrical Machines (SAC/TC26).

Introduction

This document provides a globally unified standard for the energy efficiency rating of three-phase squirrel-cage induction motors with a rated voltage greater than 1000V, applicable to...

An electric motor that can be started and run at a constant speed directly online under a 50Hz or 60Hz sinusoidal voltage power supply.

The design of these motors is typically influenced by the power supply and the requirements of the driven equipment. Due to the larger size and power of high-voltage motors, they require more stringent specifications.

Low-voltage motors are complex and can easily limit design. Conversely, the characteristics of the motor itself often have a significant impact on the power grid.

To ensure the applicability of this document, its scope is limited to conventional uses, namely electric motors used in most pumps, fans, and compressors, accounting for approximately [percentage missing].

80% to 90% of motors are suitable for specific applications. This document does not apply to motors for special purposes, such as those used for accelerating loads with very high moment of inertia or during startup.

Very low supply voltage, very low stall current, and accelerates high load torque.

The motor has the following parameters.

---Rated voltage;

---Cooling method;

---Stalled rotor current.

Similar to rated frequency, rated power, and number of poles, these factors significantly impact the achievable motor efficiency and are considered when determining the energy efficiency rating.

consider.

Note: In specific power transmission system designs, low-voltage motors are generally more efficient than high-voltage motors at the same rated power. However, considering the overall...

In terms of system losses (including cable and transformer losses), high-voltage motors may be more advantageous.

GB/T 32891 provides efficiency classifications for different types of rotating electrical machines, consisting of three parts.

---Part 1: AC motors powered by the mains. The purpose is to define the efficiency class of single-speed motors powered by a sinusoidal wave.

---Part 3: High-voltage AC motors. The purpose is to specify the requirements for three-phase squirrel-cage induction motors with a rated voltage greater than 1000V.

Efficiency level.

Efficiency classification of rotating electrical machines (IE code) Part 3: High-voltage AC motors

1 Scope

According to IEC 60034-1 standard, this document specifies the efficiency of high-voltage constant-speed three-phase squirrel-cage induction motors as defined in IEC 60034-1.

Rate level, i.e..

a) Rated voltage above 1000V, but not exceeding 11kV;

b) Rated power.200kW~2000kW;

Note 1: Electric motors with a rated power of.2000kW and above are produced in very small quantities. The focus of their design and production is always on achieving optimal efficiency, even if...

With increasingly specific requirements, allocating efficiency levels will be a redundant task and will not bring any measurable energy-saving effect.

c) 2-pole, 4-pole, or 6-pole motors;

d) A single-speed motor operating online;

e) For direct online starting at rated or reduced voltage and rated frequency;

f) Protection level IP address not limited;

g) Cooling method. IC411, IC511, IC611, IC01 or IC81W;

h) It can operate continuously at the rated operating point (torque/power, speed) with temperature rise within the specified insulation class;

Note 2: Most of the motors mentioned in this document are rated for S1 (continuous duty). However, some motors with other duty cycles can achieve their rated power...

Continuous operation is also included.

Note 3: Motors with rated temperatures outside the range of -20°C to 60°C are considered to have special structures and are therefore not covered in this document.

j) Applicable to altitudes of 2000m and below;

Note 4: Rated efficiency and efficiency grade are based on the quota below 1000m altitude.

k) Under rated voltage and frequency power supply conditions, the locked-rotor current I_l , without considering IEC or negotiated tolerances, is $I_l/I_N \geq 4.5$;

l) Designed so that the load torque does not exceed the envelope (see Figure 1), and its low-speed torque is 25% of the rated torque, plus a $T \sim n^2$ of 2 the power curve represents the maximum load torque at full speed. For a 2-pole motor, it's 60% of the rated torque; for a 4-pole or 6-pole motor, it's 100%. (This is after starting.) After completion, the load torque of the 2-pole motor increases to 100% of its rated torque;

m) The customer-required load moment of inertia shall not exceed the values given in Table 1. Considering all starting conditions defined in this document, cold start...

No more than 3 starts or 2 hot starts;

n) The starting stall voltage is designed to be at least 80% of the rated voltage.