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

GB/T 12974.2-2023

Replacing GB/T 12974.2-2014

**General specification for a.c. lift motor - Part 2: Permanent
magnet synchronous motor**

交流电梯电动机通用技术条件 第2部分：永磁同步电动机

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1 Scope

GB/T 12974.2-2023 is the Chinese national standard on general specification for a.c. lift motor - part 2: permanent magnet synchronous motor, 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 7 September 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 April 2024. Classification: ICS 29.160.30, CCS K21. 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 specifies the types and basic parameters, general requirements, technical requirements, inspection rules, marking, packaging and warranty period requirements of permanent magnet synchronous motor for lifts, and describes the corresponding test methods. This document is applicable to the manufacturing of permanent magnet synchronous motors for various passenger lifts, freight lifts, medical service lifts and home lifts. The manufacturing of various series of motors derived from this series of motors shall take this as a reference.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in this text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 191-2008 Packaging - Pictorial Marking for Handling of Goods

GB/T 755-2019 Rotating Electrical Machines - Rating and Performance

GB/T 997-2022 Classification of Types of Construction, Mounting, Arrangements and Terminal Box Position (IM Code) for Rotating Electrical Machines

GB/T 1971-2021 Rotating Electrical Machines - Terminal Markings and Direction of Rotation

GB/T 1993-1993 Cooling Methods for Rotating Electrical Machines

GB/T 4772.1-1999 Dimensions and output series for rotating electrical machines - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080

GB/T 4942-2021 Degrees of Protection Provided by the Integral Design of Rotating Electrical Machines (IP code) - Classification

GB/T 10068-2020 Mechanical Vibration of Certain machines with Shaft Heights 56 mm and Higher - Measurement, Evaluation and Limits of Vibration Severity

GB/T 10069.1-2006 Measurement of the Airborne Noise Emitted by Rotating Electrical Machines and the Noise Limits - Part 1: Method for the Measurement of Airborne Noise Emitted by Rotating Electrical Machines

GB/T 12665-2017 Requirements of Damp-heat Testing of Electrical Machine for Service in General Environmental Condition

GB/T 14711 Safety Requirements of Small and Medium Size Rotating Electrical Machines

GB/T 22669-2008 Test Procedures for Three-phase Permanent Magnet Synchronous Machines

GB/T 22719.1-2008 Interturn Insulation of Random-wound Winding for AC Low-voltage Electrical Machines - Part 1: Test Methods

3 Terms and Definitions

This document does not have terms or definitions that need to be defined.

4.1 Types

4.1.1 The protection degree provided by the enclosure of permanent magnet synchronous motor for lifts (hereinafter referred to as the motor) is IP20 or IP54 in accordance with the stipulations of GB/T 4942-2021.

4.1.2 The cooling method for the motor shall be IC00, IC01 or IC06 in accordance with the stipulations of GB/T 1993-1993.

4.1.3 The structure and mounting type of the motor shall be IM B3, IM B5 and IM B35 in accordance with the stipulations of GB/T 997-2022.

4.2 Basic Parameters

4.2.1 The motor shall operate in an intermittent cycle (S5). The number of starts per hour can be divided into 120 times/h and 180 times/h in accordance with the different requirements of the lifts. The load sustained rate of the motor shall be 15%, 40%, 50% or 60%.

4.2.2 The rated voltage of the motor frequency conversion device shall be 380 V, and the rated frequency shall be

4.2.3 The number of poles of the motor is divided into 6 poles, 8 poles, 10 poles, 12 poles, 16 poles, 20 poles, 24 poles, 32 poles and 48 poles.

4.2.4 The motor shall be manufactured in accordance with the following rated powers:

0.55 kW,

0.75 kW,

2.2 kW, 3 kW, 4 kW,

7.5 kW, 11 kW, 15 kW,

18.5 kW, 22 kW, 25 kW, 25 kW, 30 kW, 37 kW, 45 kW, 55 kW, 75 kW, 90 kW, 110 kW.

4.2.5 When the motor is operating at the rated speed, the rated torque and rated power shall be converted in accordance with Formula (1): Where, T_N

---the rated torque of the motor, expressed in (N m); P_2

---the rated power of the motor, expressed in (kW); n_N

---the rated speed of the motor, expressed in (r/min).

5 General Requirements

5.1 Under the following altitude and ambient air temperature conditions, the motor shall be capable of rated operation:

- a) The altitude does not exceed 1,000 m;
- b) The maximum ambient air temperature changes with the seasons, but does not exceed 40 C;
- c) The minimum ambient air temperature is 5 C;
- d) The ambient air does not contain corrosive and flammable gases;
- e) The surrounding environment of the installation site does not affect the normal ventilation of the motor. Deviations in on-site operating conditions shall be corrected in accordance with the stipulations of GB/T 755-2019.

5.2 The motor shall have three outlet terminals and grounding terminals. If the rated power exceeds 100 kW, an additional grounding terminal shall be provided on the base, and a grounding mark shall be set near the grounding terminal. It shall be ensured that this mark is indelible during the entire period of use of the motor and shall not be placed on removable parts. The design of the grounding terminal shall ensure a good connection with the grounding conductor without damaging the conductor or terminal.

5.3 The encoder (if any) of the motor shall have anti-interference shielding and mechanical protection.

6 Technical Requirements

6.1 When the power, voltage and frequency of the motor are rated, the guaranteed value of its

9.1 Marking

9.1.1 The material of the nameplate and the method of data marking on the nameplate shall ensure that the writing is indelible during the entire usage of the motor.

9.1.2 The nameplate shall be fixed on the upper half of the motor frame, and the items that shall be marked are as follows:

- a) Manufacturer's name or mark;
- b) Motor name (permanent magnet synchronous motor for lifts);
- d) Enclosure protection degree (can be marked on another nameplate);
- e) Rated torque, expressed in (N m);
- f) Rated power, expressed in (kW);
- g) Rated frequency, expressed in (Hz);
- h) Rated current, expressed in (A);