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

GB/T 16439-2024

Replacing GB/T 16439-2009

General specification for AC servo systems

交流伺服系统通用技术规范

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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 for standardization documents" Drafting is required. This document replaces GB/T 16439-2009 "General Technical Requirements for AC Servo Systems". Compared with GB/T 16439-2009, In addition to structural adjustments and editorial changes, the main technical changes are as follows: Changed the scope (see Chapter 1, Chapter 1 of the.2009 edition);

a) Added the terms and definitions of sensor (device), working system, temperature rise, position tracking error, and positioning setting time (see 3.4, 3.5, 3.8, 3.10, 3.14);

b) Changed the AC servo system, AC servo drive, AC servo motor, working area, speed adjustment rate, static stiffness Terms and definitions (see 3.1, 3.2, 3.3, 3.6, 3.9, 3.13, 3.1, 3.2, 3.3, 3.4, 3.9, 3.13 of the.2009 edition) 3.14);

c) Deleted position control, torque control, positive and negative speed difference, torque fluctuation coefficient, speed fluctuation coefficient, speed ratio, inertia adaptation Terms and definitions for application range, dynamic position tracking error, steady-state position tracking error, system efficiency, and electromagnetic compatibility (see 3.5, 3.7, 3.8, 3.10, 3.11, 3.12, 3.15, 3.16, 3.17, 3.18, 3.19 of the.2009 edition);

d) The test voltage value in "Dielectric Properties" has been changed (see Table 1, Table 1 of the.2009 edition);

e) Modified the technical requirements in "System Function Test" (see 5.6.1.1,

5.7.1 of the.2009 edition);

f) The technical requirements and test methods in "Working Area" have been changed (see 5.7,

5.8 of the.2009 edition);

g) Added "temperature rise" technical requirements and test methods (see 5.9);

h) The test method for "position tracking error" has been changed (see 5.12.2,

1 Scope

China's national general specification for AC servo systems - the drive, the motor and the two together, which is how a machine tool axis, a robot joint or a packaging machine actually moves. It defines the terms and definitions of AC servo systems, specifies the operating environment conditions and the technical requirements, describes the corresponding test methods, and sets the inspection rules and the delivery preparation. It applies to AC servo systems with an input supply of not more than 1 000 V AC or 1 500 V DC, and to the AC servo drives and AC servo motors that make them up. A servo system is bought on numbers that are easy to quote and hard to compare: torque, speed range, positioning accuracy, settling time, bandwidth. The standard makes them comparable by fixing how each is defined and measured. It establishes the working area of the system - the torque-speed envelope, given separately for rotary and for linear servos - and defines positioning settling time on a specified transient. It sets the dielectric and insulation tests with their voltage levels, including the auxiliary circuits not fed directly from the main circuit, gives recommended heat sink dimensions for motor mounting, since a servo motor rating means nothing without the thermal path it was rated on, prescribes sine sweep and shock parameters separately for the drive and for the motor, and sets the electromagnetic immunity tests. The inspection chapter fixes the items and the order in which they are performed, and the final chapter covers what must accompany the product on delivery. Issued on 23 August 2024 and in force since 1 March 2025, it replaces GB/T 16439-2009.

This document defines the terms and definitions of AC servo systems, specifies operating conditions and technical requirements, and describes the corresponding test methods. Inspection rules and delivery preparation are specified. This document applies to AC servo drives with an input power supply rated voltage of no more than 1 000 V AC and a rated voltage of no more than 1 500 V DC. The servo system and the AC servo drive and AC servo motor that constitute the servo system.

Note. For technical requirements related to servo systems that are not included in this document, please refer to relevant motor standards and industrial machinery electrical control equipment standards.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

GB/T 2423.1-2008 Environmental testing for electric and electronic products Part