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

GB/T 42431-2023

**General specification for aerospace AC induction electric motor
driven, variable delivery, hydraulic pumps**

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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:

This document is modified to adopt ISO 18170:2017 "General requirements for variable displacement hydraulic pumps driven by AC induction motors for aerospace series":

Compared with ISO 18170:2017, this document has more structural adjustments, and the comparison list of structural number changes between the two documents

See Appendix A:

The technical differences between this document and ISO 18170:2017 and their reasons are as follows:

- a) Added the scope of application of "applicable to military or civil aircraft with a rated working pressure of 35MPa and below" (see Chapter 1);
- b) Replace ISO 8278 (see Chapter 3) with GB/T 42434 for normative reference;
- c) Replace the reference ISO 1540 with GB/T 30203 (see reference);
- d) Deleted the explanatory description of the frequency range of variable frequency AC power supply "the ratio between the maximum and minimum frequency may exceed 2:1"

[see 4:2:1:1:3b), see 5:1:1:3:2 of ISO 18170:2017];

e) The lap joint requirements for bench tests and the specific lap joint requirements for electric pump casings are deleted (see 4:2:1:3:1, see ISO 18170:

5:1:3:1 of:2017);

f) The requirements for the degree of contamination of hydraulic oil have been added (see 4:2:2:1 and Chapter 6);

g) Delete the "rated output pressure value should be specified in the special specification" in the rated output pressure requirements, refer to ISO 6771 for pressure

Class provisions" (see 4:2:2:2, see 5:2:2:1 of ISO 18170:2017);

h) Added the specific index of "the maximum permissible pulsation amplitude of the output pressure should not exceed ± 2.1 MPa or specified in the special specification"

requirements (see 4:2:2:4);

i) Replaced ISO 3601-1 (see 4:3:2) with the normative referenced GB/T 3452:1;

j) The description of the requirements for the use of non-standard seals and electric pump protection rings for commercial aircraft and military Type III systems has been deleted (see 4:3:2, see

6:3 of ISO 18170:2017);

k) Deleted "should not use lead type locking wire seal" (see 4:3:6, see 6:7 of ISO 18170:2017);

l) Replaced ISO 2093 with the normative referenced GB/T 12599 (see 4:5:2:2);

m) Replaced ISO 2669 (see 4:9) with normative reference HB6167:16;

n) The control accuracy of the inlet temperature of the test bench is required to supplement the temperature tolerance when it exceeds 107°C (see 5:2:1);

o) Added pressure pulsation test conditions at different speeds of variable frequency motors (see 5:4:3:7);

p) Added checking the filter every (50 $\pm$ 10)h to monitor product oil contamination (see 5:4:3:11:4:2);

q) The temperature has been rounded: "-54°C" is changed to "-55°C"; "71°C" is changed to "70°C"; "-51°C" is changed to

"-50°C" (see 5:4:3:11:11);

r) Added a description of the test sample requirements for the additional durability test (see 5:4:3:11:14);

s) Added verification methods corresponding to the requirements of 4:9 "environmental adaptability" such as temperature-altitude, sand dust, steady-state acceleration, etc:

(see 5:4:3:14:3, 5:4:3:14:8 and 5:4:3:16);

t) The chapter "Packaging, Transportation and Storage" has been added, and the five-year storage period requirements have been clarified (see Chapter 6):

The following editorial changes have been made to this document:

a) In order to coordinate with existing standards, change the name of the standard to "General Specifications for Aircraft AC Induction Motor Driven Variable Displacement Hydraulic Pumps";

b) Delete the same terms and definitions as the normatively referenced GB/T 42434;

c) Delete the term and definition "nominal power supply conditions" used only once in the text to meet the requirements of GB/T 1:1-2020;

d) Deleted Note 2 in "Purchaser" in terms and definitions, and the buyer and supplier negotiate to determine the writer of the special specification;

e) Deleted the conversion content using the psi pressure unit in the original text, and converted kPa to MPa;

f) Deleted the "relationship between the maximum recommended value of rated speed and pump displacement" expressed in imperial units in the original text, and only retained the figure in which

Diagram expressed in metric units:

Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies the basic requirements, certification methods and procedures for variable displacement hydraulic pumps driven by aircraft AC induction motors (hereinafter referred to as electric pumps):

And packaging, transportation and storage:

This document applies to constant frequency or variable frequency AC induction motors in the hydraulic system of military or civil aircraft with a rated working pressure of 35MPa and below:

Motive driven variable hydraulic pump:

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 3452:1 O-shaped rubber seal rings for hydraulic and pneumatic use Part 1: Dimension series and tolerances (GB/T 3452:1-2005, ISO 3601-1:2002, MOD)

GB/T 12599 Technical specifications and test methods for tin plating on metal coatings (GB/T 12599-2002, ISO 2093:1986, MOD)

GB/T 30206:1 Aerospace fluid system vocabulary Part 1: General terms and definitions related to pressure (GB/T 30206:1-2013, ISO 8625-1:1993, IDT)

GB/T 30206:2 Aerospace fluid system vocabulary Part 2: General terms and definitions related to flow (GB/T 30206:2-2013, ISO 8625-2:1991, IDT)

GB/T 30206:3 Vocabulary for aerospace fluid systems Part 3: General terms and definitions related to temperature (GB/T 30206:3-2013, ISO 8625-3:1991, IDT)

GB/T 30213 Aircraft hydraulic accessories identify signs of hydraulic oil applicable to accessories (GB/T 30213-2013, ISO 3323:1987, IDT)

GB/T 42434 General Specifications for Aircraft Constant Pressure Variable Hydraulic Pumps (GB/T 42434-2023, ISO 8278:2016, MOD)

HB6167:15 Environmental conditions and test methods for airborne equipment of civil aircraft Part 15: Sound and vibration test (HB6167:15-2014, ISO 2671:1982, IDT)

HB6167:16 Environmental conditions and test methods for airborne equipment of civil aircraft Part 16: Acceleration test (HB6167:16-