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**Centrifugal vapour compression chillers (heat pumps) with
oil-free bearings**

无油悬浮离心式冷水（热泵）机组

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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. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee for Standardization of Refrigeration and Air-conditioning Equipment (SAC/TC238). This document was drafted by: Qingdao Haier Air Conditioning Electronics Co., Ltd., Hefei General Mechanical and Electrical Products Testing Institute Co., Ltd., Chongqing Midea General Refrigeration Equipment Co., Ltd., Qingdao Hisense Hitachi Air Conditioning System Co., Ltd., Johnson Controls Hitachi Wanbao Air Conditioning (Guangzhou) Co., Ltd., Ice Ring Environmental Technology Co., Ltd., Xinlei Compressor Co., Ltd., Kunlin Refrigeration Machinery (Shanghai) Co., Ltd., Guangdong Haiwu Technology Co., Ltd. Zhejiang Qingfeng Environmental Protection Co., Ltd., Virbac (Tianjin) Co., Ltd., Guangzhou Simote Refrigeration Equipment Manufacturing Co., Ltd., China Telecom Co., Ltd. Procurement Supply Chain Management Center, Shandong Zhongkeneng Artificial Environment Co., Ltd., Shuangliang Energy Saving System Co., Ltd., Shijiatou Bojie Power Rugao Co., Ltd., LEITS Intelligent Equipment (Guangdong) Co., Ltd., Tsinghua University, Yantai Vocational College, SINOMACH General Machinery Technology Co., Ltd. and Hefei General Machinery Research Institute Co., Ltd. The main drafters of this document are. Fu Songhui, Guo Defang, Ma Jinping, Li Zhenshan, Zhang Wenqiang, Zhang Zhenjun, Xu Shuwu, Yang Zhihua, Yuan Ming, Lü Dongjian, Jin Xiansong, Yin Bing, Wang Yinyan, Wang Yaonan, Zhang Caixia, Hu Yimu, Wang Haijun, Wu Yanguang, Shi Wenxing, Li Aiyan, Zhang Xiuping, Zhou Kun, Li Yayun, Xia Linfeng, Qian Xuefeng, and Peng Fei. Oil-free suspended centrifugal chiller (heat pump) unit

1 Scope

China's national standard for centrifugal vapour compression chillers and heat pumps using magnetic, gas or refrigerant-lubricated bearings. What these have in common is the absence of oil, and removing the oil from a large chiller changes it more than the phrase suggests. A conventional centrifugal machine circulates lubricating oil through its compressor, and some of that oil inevitably enters the refrigerant circuit, where it coats the heat exchanger tubes and degrades the heat transfer progressively over the machine's life - so a chiller's rated efficiency is a figure it has when new. Oil-free bearings eliminate that, along with the oil pump, the separator and the oil management that goes with them, and magnetic bearings additionally allow variable speed operation down to very low loads, which is where a chiller spends most of its hours. The standard specifies types and basic parameters, technical requirements, test methods, inspection rules, marking, packaging, transport and storage.

This document specifies the types and basic parameters, technical requirements, test Inspection methods, inspection rules, as well as marking, packaging, transportation and storage. This document applies to centrifugal vapor compression circulating chillers (heat pumps) using magnetic bearings, gas bearings and refrigerant lubricated bearings unit.

2 Normative references

The contents of the following documents constitute 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 to This document.

GB 2894-2008 Safety signs and their use guidelines

GB/T 4706.32-2024 Safety of household and similar electrical appliances Part

32.Special requirements for heat pumps, air conditioners and dehumidifiers Require

GB/T 9237 Safety and environmental requirements for refrigeration systems and heat pumps

GB/T 10870-2014 Performance test method for vapor compression cycle chillers (heat pumps) GB/T 13306 Labels

GB/T 13384 General technical requirements for packaging of electromechanical products

GB/T 18430.1-2024 Vapor compression cycle chillers (heat pumps) Part

1.Chillers for industrial or commercial and similar purposes Water (heat pump) unit

GB/T 19409 Water (ground) source heat pump unit

JB/T 7249 Terminology of Refrigeration and Air-conditioning Equipment NB/T 47012-2020
Pressure vessels for refrigeration equipment

3 Terms and definitions

The terms and definitions defined in JB/T 7249, GB/T 18430.1-2024 and GB/T 19409 and the following apply to this document.

3.1 Oil-free centrifugal water chilling (heat pump) packages A centrifugal vapor compression cycle chiller (heat pump) unit using magnetic bearings, gas bearings or refrigerant lubricated bearings. Note

1. Magnetic bearings are bearings that use the attractive or repulsive force of a magnetic field to suspend and dynamically stabilize the rotor. Note

2. Aerostatic bearings are sliding bearings that use air and refrigerant vapor (or other gases) as lubricants. There are two types. static pressure air suspension bearings and dynamic pressure air suspension bearings. Note

3. Refrigerant lubricated bearings are rolling bearings or sliding bearings that use refrigerant liquid as lubricant.

3.2 Pressure ratio The ratio of the absolute pressure at the compressor discharge port to the absolute pressure at the compressor suction port.