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# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/T 40815.5-2022

## Mechanical structures for electrical and electronic equipment - Thermal management for cabinets in accordance with inch and metric system - Part 5: Cooling performance evaluation for indoor cabinets

电气和电子设备机械结构 符合英制系列和公制系列机柜的热管理 第5部分：户内机柜的冷却性能评估

**Issued on: November 8, 2022** **Implemented on: June 1, 2023**

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**Standardization Administration of the PRC**

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## Foreword

This document was issued on 8 November 2022 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 June 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 31.240, Chinese classification K05.

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 the first part of GB/T 40815 "The mechanical structure of electrical and electronic equipment conforms to the thermal management of imperial series and metric series cabinets"

5 parts. GB/T 40815 has issued the following parts.

--- Part 2.Determination method of forced air cooling;

--- Part 4.Cooling performance test of water supply heat exchanger in electronic cabinet;

--- Part 5.Cooling performance evaluation of indoor cabinets.

This document is equivalent to IEC 62610-5.2016 "Mechanical structure of electrical and electronic equipment in accordance with IEC 60297 and IEC 60917

Thermal Management of Column Cabinets Part 5.Cooling Performance Evaluation of Indoor Cabinets.

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

--- In order to coordinate with existing standards, change the name of the standard to "Electrical and electronic equipment mechanical structure complies with imperial series and metric series machines

Thermal Management of Cabinets Part 5.Evaluation of Cooling Performance of Indoor Cabinets.

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

This document is proposed and managed by the National Technical Committee for Comprehensive Standardization of Electrical and Electronic Equipment Structure (SAC/TC34).

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## Introduction

Inch series and metric series cabinets are widely used in data center computer rooms and various communication equipment computer rooms for installing various information and communication

communication equipment. In order to improve the heat dissipation efficiency of the equipment in the cabinet, ensure the safe and effective operation of the equipment, and reduce the energy consumption of the equipment room, GB/T 40815 "Electrical

The mechanical structure of gas and electronic equipment conforms to the thermal management of imperial series and metric series cabinets

The thermal management method provides a design guide for the thermal management of the cabinet. The main problems it solves are.

---Specify the universal installation interface specifications and requirements of the thermoelectric cooling system for indoor electronic cabinets;

---Specify the optimal air duct design specifications and requirements for indoor electronic cabinets and cabinet insert boxes and cabinets;

---Specify the cooling performance evaluation specifications for indoor electronic cabinets and thermoelectric cooling systems;

---Specify the performance test specifications and requirements for water supply heat exchangers in indoor electronic cabinets;

---Specify the test specifications for air recirculation and bypass of indoor electronic cabinets.

GB/T 40815 "Thermal Management of Electrical and Electronic Equipment Mechanical Structures Conforming to Inch Series and Metric Series Cabinets" is proposed to be composed of six parts

constitute.

--- Part 1.Design guidelines Thermoelectric cooling system (Peltier effect) interface dimensions and regulations. Designed to standardize thermoelectric cooling systems

The system has universal installation interface dimensions and requirements.

--- Part 2.Determination method of forced air cooling. It is designed to specify the preferred

air duct form and design for indoor electronic cabinets, sub-boxes, and chassis

method.

--- Part 3.Design Guidelines Evaluation method for thermoelectric cooling systems (Peltier effect). Designed to standardize the performance of thermoelectric cooling systems

Can evaluate methods and provide design guidelines.

--- Part 4.Cooling performance test of the water supply heat exchanger in the electronic cabinet. Designed to specify performance test specifications for water supply heat exchangers

Fan, to guide the experiment.

--- Part 5.Cooling performance evaluation of indoor cabinets. It is intended to specify a method for assessing the air cooling capacity of indoor electronic cabinets.

--- Part 6.Air recirculation and bypass for indoor cabinets. Tests designed to specify air recirculation and bypass for indoor electronic cabinets

specification.

Among them, the international documents corresponding to the design guidelines of Part 1 and Part 3 have not yet been transformed into Chinese documents due to immature technical content.

This document classifies the cooling methods of empty indoor cabinets, simplifies the thermal-hydraulic formulas used to evaluate and classify the cooling performance of cabinets, and introduces

A simplified method for evaluating the overall cooling performance of an empty indoor cabinet is presented. Provides a standardized evaluation of the cooling performance of indoor cabinets

estimation method.

Mechanical construction of electrical and electronic equipment

Compliant with thermal management of imperial and metric series cabinets

Part 5.Evaluation of cooling performance of indoor cabinets

## 1 Scope

GB/T 40815.5-2022 is the part of the GB/T 40815 series that asks how much heat an indoor cabinet can shed - a method of evaluating the cooling capacity of an empty cabinet built to the inch and metric series of IEC 60297 and IEC 60917, where the heat is carried away mainly by air. It sets classification criteria for cabinet cooling, then the cooling methods open to an indoor cabinet and how each of them performs: natural convection,