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

GB/T 37863.2-2021

**Railway applications - Traction electric drive systems - Part 2:
Locomotives and multiple units**

轨道交通 牵引电传动系统 第2部分：机车、动车组

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Table of Contents

- 1 Scope
- 2 Normative references
- 4 Rail Transit Electromagnetic Compatibility Part 3-2: Rolling Stock Equipment

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 of Standardization Documents" drafted: This document is Part 2 of GB/T 37863 "Traction Electric Drive System for Rail Transit": GB/T 37863 has released the following part:

--- Part 1: Urban rail vehicles;

--- Part 2: Locomotives, EMUs: Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed by the National Railway Administration: This document is under the jurisdiction of the National Standardization Technical Committee for Traction Electrical Equipment and Systems (SAC/TC278): This document is drafted by: Zhuzhou CRRC Times Electric Co., Ltd., China Railway Research Institute Group Co., Ltd: Research Institute, CRRC Zhuzhou Electric Locomotive Co., Ltd., CRRC Dalian Locomotive Co., Ltd., CRRC Datong Electric Locomotive Co., Ltd., CRRC Qishu Yan Locomotive Co., Ltd., CRRC Zhuzhou Motor Co., Ltd., CRRC Yongji Motor Co., Ltd., CRRC Qingdao Sifang Vehicle Research Institute Co., Ltd., CRRC Changchun Railway Vehicle Co., Ltd: and CRRC Qingdao Sifang Rolling Stock Co., Ltd: The main drafters of this document: Liu Kean, Li Peng, Zhang Yi, Li Yanlei, Zou Huanqing, Zhang Yanmin, Liu Peng, Chai Yongquan, Cui Siliu, Wang Lei, Sun Guobin, Shen Di, Sun Chuanming:

Traction electric drive system is an electric drive system that realizes the functions of traction and electric braking of rail transit vehicles and converts electric energy and kinetic energy: It is the core system of rail transit high-end equipment: GB/T 37863 "Rail Transit Traction Electric Drive System" is a guideline for urban rail vehicles, The important basis for the design and manufacture of the traction electric drive system of locomotives and EMUs is different due to different power supply conditions, system composition, and application fields: GB/T 37863 consists of two parts:

--- Part 1: Urban rail vehicles: It specifies the conditions of use, system composition, technical requirements and inspection of the traction electric drive system of urban rail vehicles methods, inspection rules:

--- Part 2: Locomotives, EMUs: It specifies the operating conditions, system composition and technical requirements of the traction electric drive system of locomotives and EMUs: Requirements, inspection methods, inspection rules: Traction electric drive system for rail transit Part 2: Locomotives, EMUs

1 Scope

Part 2 of China's national standard for railway traction electric drive systems, covering locomotives and multiple units. Where Part 1 addresses the metro, this part addresses main line traction, and the differences are substantial enough to need a separate document. The supply is high voltage alternating current from an overhead catenary rather than direct current from a third rail, so the drive begins with a transformer and a line converter that must draw current at near unity power factor without injecting harmonics back into a supply that is shared with the signalling. The power is an order of magnitude greater. The duty is sustained rather than cyclic - a freight locomotive may pull at full power for an hour on a gradient. And the vehicle crosses the boundaries between electrification systems and between countries, which is why multi-system capability is a requirement rather than an option on much modern equipment.

This document specifies the operating conditions, system composition, Technical requirements, inspection methods, inspection rules: This document applies to the traction electric drive system installed on the AC drive locomotive and EMU, and the traction electric drive system of other types of vehicles Can refer to the implementation:

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document:

GB/T 1402 Rail Transit Traction Power Supply System Voltage

GB/T 2900:25 electrical terminology rotating electrical machine GB/T 2900:

33 Electrical terminology power electronics technology GB/T 2900:

36 Electrical Terminology Electric Traction

GB/T 4208-2017 Protection class of enclosure (IP code) GB/T 21413:

1 Rail Transit Rolling Stock Electrical Equipment Part 1: General Conditions of Use and General Rules

GB/T 21414 Provisions for the protection of electrical hidden dangers of rail transit locomotives

GB/T 21563 Shock and Vibration Test of Rail Transit Rolling Stock Equipment GB/T 24338:

4 Rail Transit Electromagnetic Compatibility Part 3-2: Rolling Stock Equipment

GB/T 25117-2020 Combined test method for traction system of rail transit rolling stock

GB/T 25118 Rules for open-type power resistors for electrical equipment of rail transit rolling stock

GB/T 25119-2021 Electronic devices for rail transit rolling stock

GB/T 25120 Traction transformers and reactors for railway rolling stock GB/T 25122:

1 Power Converters for Rail Transit Rolling Stock Part 1: Characteristics and Test Methods GB/T 25122:

3 Power converters for rail transit rolling stock Part 3: Locomotive traction converters GB/T 25122:

4 Power converters for rolling stock of rail transit - Part 4: Traction converters for electric trains GB/T 25123:

2 Rotating electrical machines for electric traction rolling stock and road vehicles - Part 2: Electrically powered by electronic converters AC motor GB/T 25123:

4 Rotating electrical machines for electric traction rolling stock and road vehicles - Part 4: Connected to electronic converters permanent magnet synchronous motor

GB/T 32347:1-2015 Environmental Conditions of Rail Transit Equipment Part 1: Rolling Stock Equipment TB/T 3213 General technical conditions for electrical and electronic products of plateau rolling stock TB/T 3335-2013 Main and auxiliary generators of AC drive diesel locomotives TB/T 3487 AC drive electric locomotive TB/T 3488 AC drive diesel locomotive TB/T 3523:

2 Test methods for AC drive electric locomotives - Part 2: Input characteristic test