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

GB/T 44639.1-2024

**Railway applications - Energy measurement system on board
trains - Part 1: General**
(English Translation)

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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 part 1 of GB/T 44639 "Electric Energy Measurement System for Rail Transit Trains".

Lower part.

- Part 1: General;
- Part 2: Electrical energy measurement;
- Part 3: Data processing;
- Part 4: Communications;
- Part 5: Conformance test;
- Part 6: Requirements other than billing.

This document is modified to adopt IEC 62888-1:2018 "Rail transit train electrical energy measurement system Part 1: General principles".

The technical differences between this document and IEC 62888-1:2018 and their reasons are as follows.

- Replace IEC 60850:2007 (see Chapter 1) with the normative reference GB/T 1402-2010 to adapt to my country's technical requirements parts, increasing operability;
- Define "contactline" as "traction network", and change "power receiving equipment" in the term explanation to "contact network or conductive rail and other equipment" and the term source (see 3.1.5, 3.1.5 of IEC 62888-1:2018) has been deleted to include different traction power supply systems;
- Added the term "auxiliary power supply" (see 3.1.22) to clarify its definition;
- Replace IEC 62888-6 with the normative reference GB/T 44639.6 (see 4.1, 4.2.2, 4.2.4.1, 4.2.4.2, 4.2.6.1, 4.3.2.1, 4.3.2.2.3, 4.3.2.3, 4.3.4.3, 4.3.4.4, 4.3.5.1) to adapt to my country's technical conditions and increase operability;
- Replace IEC 62888-2 (see 4.2.2, 4.2.4.2) with the normative reference GB/T 44639.2 to adapt to my country's technical requirements parts, increasing operability;
- Replace IEC 60571:2012 with the normative reference GB/T 25119-2021 (see 4.2.3.1, 4.3.6.1, 4.3.6.3, 4.3.7.1) to adapt to my country's technical conditions and increase operability;
- Changed the start-up time parameter values of PWR-A and PWR-B types (see Table 2, Table 2 of IEC 62888-1:2018) and deleted the PWR-X type (see Table 2 of IEC 62888-1:2018) is adopted to meet the actual application needs of my country;
- Deleted the content of "Changes in 600V to 750V DC traction power supply system do not need to be recorded" (see IEC 62888-1:2018 4.2.5.1), because there is no DC600V

traction power supply system in my country;

--- Deleted the TSC-X type (see Table 3 of IEC 62888-1:2018) to avoid the use of undefined parameters;

--- Changed the description of VIN (see 4.2.5.2, 4.2.5.2 of IEC 62888-1:2018) to comply with the existing vehicle identification in my country Regulation;

--- Replace ISO 3166-1 (see 4.2.5.2) with the normative reference GB/T 2659.1 to adapt to my country's technical conditions and increase the Operability;

--- Replace IEC 61991 (see 4.2.6.4) with the normative reference GB/T 21414 to adapt to my country's technical conditions and increase operability Sex;

--- Replace IEC 62888-4 (see 4.3.2.1) with the normative reference GB/T 44639.4 to adapt to my country's technical conditions, and add Operability;

--- Replace IEC 62498-1:2010 with the normative reference GB/T 32347.1-2015 (see 4.3.6.1, 4.3.6.2, 4.3.6.9) to adapt to my country's technical conditions and increase operability;

--- Replace IEC 61010-1 (see 4.3.7.4) with the normative reference GB/T 4793.1 to adapt to my country's technical conditions and increase Operability;

--- Replace IEC 60085 (see 4.3.8.1) with the normative reference GB/T 11021 to adapt to my country's technical conditions and increase operability Sex;

--- Replace IEC 62497-1:2010 (see 4.3.8.2, 4.3.8.3) with the normative reference GB/T 32350.1-2015 to adapt to our the technical conditions of the country increase operability.

The following editorial changes were made to this document.

--- Deleted the VIN European format description (see 3.1.21 Note 1 of IEC 62888-1:2018);

--- Deleted the CPID European format description (see 4.2.5.2 Note 1 of IEC 62888-1:2018);

--- Changed the safety guide description, changing "European country related guidelines EN50155, EN45545-2 and EN45545-5" to "Refer to relevant fire protection requirements of EN45545-2" (see Note 2 of 4.2.6.4, Note 1 of 4.2.6.4 of IEC 62888-1:2018).

Introduction

Energy efficiency is essential to meet the challenges of supporting energy policies, protecting the environment and conserving natural resources.

Energy efficiency, especially the standardization of overall energy efficiency of rail transit vehicles, has attracted great attention from the rail transit industry, and relevant standards are being gradually formulated.

The main contents include the definition and boundary of energy efficiency, influencing factors, test methods, etc. GB/T 44639 "Electric Vehicles for Rail Transit" the Energy Measurement System is designed to standardize the process of acquiring train power data and ensure the reliability of the data. It consists of six parts.

--- Part 1: General. The purpose is to specify the system-level requirements of the energy measurement system and to implement one or more General requirements for equipment with multiple functions.

--- Part 2: Electric energy measurement. The purpose is to specify the requirements for electric energy measurement functions for measuring the electric energy consumed and regenerated by traction units, and Requirements for the voltage measurement function, current measurement function and energy calculation function that make up the energy measurement function.

--- Part 3: Data processing. The purpose is to specify the data processing system and ground data collection service in the electric energy measurement system requirements.

--- Part 4: Communications. The purpose is to specify the requirements for on-board data communication services and vehicle-to-ground communication services of the energy measurement system.

These communication services enable data to be transferred between functions within the energy measurement system, between the energy measurement system and other on-board units, and between data Handles exchanges between the system and ground servers.

--- Part 5: Conformance test. The purpose is to specify the consistency test of new energy measurement systems installed on traction units Arrangements, and conformance testing procedures for replacement of equipment and auxiliary components.

--- Part 6: Requirements other than billing. The purpose is to clarify the requirements for energy consumption benchmark testing, daily energy consumption monitoring, and technology research and development.

Able to measure the specific requirements of the system.

The functional structure, main sub-functions and data flow of the train power measurement system are shown in Figure 1.

Figure 1 Schematic diagram of EMS functional structure and data flow

Rail transit train power measurement system Part 1: General