

ICS 45.060
CCS S 34



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

GB/T 44639.2-2024

**Railway applications - Energy measurement system on board
trains - Part 2: Energy measurement**
(English Translation)

Issued on: September 29, 2024

Implemented on: April 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms, definitions, abbreviations and symbols	
3.1 Terms and Definitions	
3.2 Abbreviations	
3.3 Symbols	
4 General requirements	
4.1 Overview	
4.2 Electric energy measurement function	
4.3 Sensor	
4.4 Electric energy calculation function	
5 Conformance Test	
5.1 General Principles	29
5.2 Experimental Framework	
5.3 Design Review	
5.4 Type inspection	
5.5 Factory Inspection	
Appendix A (Normative) EMF Configuration	
Appendix B (Informative) EMF Accuracy Expression	
Appendix C (Informative) Recalibration and its mechanism recommendations	
Appendix D (Normative) External magnetic induction test	
Appendix E (Informative) Durability Test	
References	

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 2 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 62888-2:2018 "Rail transit train power measurement system Part 2: Power measurement".

This document has made the following structural adjustments compared to IEC 62888-2:2018.

- Appendix A corresponds to Appendix B of IEC 62888-2:2018;
- Appendix B corresponds to Appendix C of IEC 62888-2:2018;
- Appendix C corresponds to Appendix D of IEC 62888-2:2018;
- Appendix D corresponds to Appendix A of IEC 62888-2:2018.

The technical differences between this document and IEC 62888-2:2018 and the reasons are as follows.

- Replace IEC 60085 (see 4.3.3.3, 4.3.4.2, 4.4.3.5) with the normative reference GB/T 11021 to adapt to my country's technology Conditions, increase operability;
- Replace IEC 60068-2-1 (see 5.4.2.4) with the normative reference GB/T 2423.1 to adapt to my country's technical conditions, and add Operability;
- Replace IEC 60068-2-30 (see 5.4.2.6) with the normative reference GB/T 2423.4 to adapt to my country's technical conditions, and add Increase operability;
- Replace IEC 60121 (see 5.4.3.11.1) with the normative reference GB/T 3954 to adapt to my country's technical conditions and increase Operability;
- Replace IEC 60529 (see 5.4.2.3) with the normative reference GB/T 4208 to adapt to my country's technical conditions and increase operability Sex;
- Replace IEC 60028 (see 5.4.3.11.1) with the normative reference GB/T 5585.1 to adapt to my country's technical conditions, and add Operability;
- Replace IEC 61000-4-2 (see 5.4.4.5.3) with the normative reference GB/T 17626.2 to adapt to my country's technical conditions, and add Increase operability;

--- Replace IEC 61000-4-3 (see 5.4.4.5.4) with the normative reference GB/T 17626.3 to adapt to my country's technical conditions, and add Increase operability;

--- Replace IEC 61000-4-4 (see 5.4.4.5.5) with the normative reference GB/T 17626.4 to adapt to my country's technical conditions, and add Increase operability;

--- Replace IEC 61000-4-5 (see 5.4.4.5.7) with the normative reference GB/T 17626.5 to adapt to my country's technical conditions, and add Increase operability;

--- Replace IEC 61000-4-6 (see 5.4.4.5.6) with the normative reference GB/T 17626.6 to adapt to my country's technical conditions, and add Increase operability;

--- Replace IEC 61869 with the normative reference GB/T 20840 (all parts) (see 4.3.2.1, 4.3.2.2.1, 5.4.2.11.1,

--- Replace IEC 62497-1 with the normative reference GB/T 32350.1 (see 4.3.2.2.1, 4.3.2.2.2, 5.3.2.5, 5.4.2.11.1,

--- Deleted the following information. "If EMF is included as a function of traction equipment or auxiliary equipment, there is no need to classify the equipment type.

Marking. " (see 4.2.1.3 of IEC 62888-2:2018) to meet the requirements of Class 1 electrical energy measurement;

--- Deleted the description of "other voltages may be agreed upon by the parties concerned." in the rated voltage (see 4.2.2.1 of IEC 62888-2:2018) to Adapt to the technical conditions of our country;

--- Deleted the description of "other frequencies may be agreed upon by the parties concerned" in the rated frequency (see 4.2.2.3 of IEC 62888-2:2018) to Adapt to the technical conditions of our country;

--- Changed "Continuous magnetic induction from external sources", "Radio frequency electromagnetic field 30kHz~2GHz", "Conducted interference induced by radio frequency field 150kHz~ 80MHz" and "external magnetic induction at the reference frequency", the reference values of the influencing quantities are changed from "equal to zero" to "environmental electromagnetic Field" (see Table 1, Table 1 of IEC 62888-2:2018) to adapt to practical applications;

--- Deleted the requirements for frequencies of 16.7 Hz and 60 Hz (see 4.3.2.3.4, Table 18, 5.4.4.4.3 of IEC 62888-2:2018) because There is no 16.7Hz and 60Hz power supply standard in my country;

--- Deleted the description of analog sensors "The rated value shall be determined by agreement between the supplier and the purchaser." (see IEC 62888-2:2018 4.3.3.1.2) to adapt to my country's national conditions;

--- Changed the functional random vibration test requirements to vibration test requirements

(see 5.4.2.8, 5.4.2.8 of IEC 62888-2:2018) to Consistent with GB/T 25119-2021 requirements;

--- Changed the electromagnetic compatibility requirement to "During the test, the ECF should not show any temporary degradation, loss of function or loss of performance." (See 4.4.7.1.3, 4.4.7.1.4, 4.4.7.1.3, 4.4.7.1.4 of IEC 62888-2:2018) to be consistent with GB/T 24338.4-2018 Requires consistency;

--- Changed the test site ambient temperature range to between 5°C and 40°C (see 5.4.3.10, 5.4.3.11.1, 5.4.4.2.2, IEC 62888-2:2018 5.4.3.10, 5.4.3.11.1, 5.4.4.2.2) to adapt to my country's national conditions;

--- Changed the requirement of "A.8 EMF without VMF" to "if applicable" (see A.8, B.8 of IEC 62888-2:2018) to apply should be applied in practice.

The following editorial changes were made to this document.

--- Deleted the standard description of the frequency variation range (see Table 18 of IEC 62888-2:2018), because the frequency specified in the national standard the rate range does not match the actual usage of the equipment;

--- Deleted the European description of frequency change control (see footnote c of Table 18 of IEC 62888-2:2018) and changed the traction unit Description of the operating frequency variation range (see footnote c of Table 18, footnote c of Table 18 of IEC 62888-2:2018) to adapt to my country's national conditions;

--- Deleted the description of the relevant guidelines for heat and fire resistance tests in European countries (see Note 5.4.2.7 of IEC 62888-2:2018);

--- Added the reference standard description of AC active power under harmonic conditions (see B.4.1) to adapt to practical applications.

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 Energy Measurement for Rail Transit Trains" the "Electricity Measurement System" aims to standardize the process of obtaining 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