

ICS 29.280
CCS S 35



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

GB/T 32592-2023

Replacing GB/T 32592-2016

**Railway applications - Current collection systems - Requirements for
and validation of measurements of the dynamic interaction between
pantograph and overhead contact line**

(English Translation)

Issued on: November 27, 2023

Implemented on: March 1, 2024

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

Table of Contents

Preface	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Symbols	
5 Basic requirements	
6 Measurement of overall average lifting force	
7 Contact force measurement	
7.1 General requirements	
7.2 Aerodynamic effects on the measurement system	
7.3 Correction of inertia force	
7.4 Aerodynamic corrections	
7.5 Calibration of measuring systems	
7.6 Measurement parameters	
7.7 Measurement results	
8 Displacement measurement	
8.1 General requirements	
8.2 Vertical displacement of contact point	
8.3 Positioning point lifting	
8.4 Measurement of other displacements on the contact line	
9 Arc measurement	
9.1 General requirements	
9.2 Calibration of arc detection system	
9.3 Adjustment of operating distance	
9.4 Measured value 10	
9.5 Measurement results 10	
Appendix A (informative) Contact wire bending stress measurement	
Reference	

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document replaces GB/T 32592-2016 "Requirements for Measurement of Dynamic Interaction between Pantograph and Catenary in Rail Transit Current Collecting System" "Sum Verification", compared with GB/T 32592-2016, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added "minimum statistical value of contact force", "maximum statistical value of contact force", "cable force", "total average lifting force" and "transfer function amplitude" the terms and definitions of "anchor segment length", "sensitivity curve" and "contact line bending stress" (see Chapter 3), and corresponding symbols (see Chapter 4);
- b) Added "measurement of total average lifting force" (see Chapter 6);
- c) Added "Fig: 1 Schematic diagram of tethering test setup" (see Chapter 6), "Fig: 2 Schematic diagram of contact force measurement" and "Fig: 3 Segmented slide plate" Schematic diagram", as well as contact force calculation formula (4) and other related requirements (see Chapter 7);
- d) "Influence of the measurement system" was changed to "Aerodynamic influence of the measurement system" (see 7.2, 6:2 of the:2016 version);
- e) Added measurement requirements for the aerodynamic correction force $F_{corr,aero}$ in formula (2) (see 7.4);
- f) Added technical requirements for filters for contact force measurement (see 7.6);
- g) Added the definition and selection requirements for the reference threshold (x_{ref}) of the relevant reference distance (d_{ref}) for arc measurement (see 9.1):

This document is modified to adopt IEC 62846:2016 "Essentials for Measurement of Dynamic Interaction between Pantograph and Catenary in Rail Transit Current Collecting System" Sum Verification":

Compared with IEC 62846:2016, this document has made the following structural adjustments:

---Appendix A corresponds to Appendix B of IEC 62846:2016:

The technical differences between this document and IEC 62846:2016 and their reasons are as follows:

--- Added "This document is applicable to the measurement of dynamic matching performance parameters of current receiving systems using overhead contact wires for rail transit:" (See Section 1:

Chapter 1) Adapt to my country's national conditions;

---Added normative reference document GB/T 32578 (see Chapter 5) to adapt to my country's technical conditions and improve operability;

---Deleted the terms and definitions of "total arcing rate", "current loss rate" and "current loss" (see Chapter 3), the symbols "AQ", "CQ" and "tcl" "g" and "v" (see Chapter 4), not used in the text;

---Changed the route requirements for free passage (see Chapter 5) to adapt to my country's national conditions;

---Deleted the description of "lines of various countries" (see Chapter 5) to adapt to my country's national conditions;

---Added the requirements for obtaining pantograph parameters in the test configuration, which are limited to those obtained in accordance with GB/T 21561.1 and GB/T 21561.2 (see Chapter 5), to standardize and unify the parameter acquisition method:

The following editorial changes have been made to this document:

---Changed the description of "tarc" and "ttotal" (see 3.20) to make it consistent with the description in Chapter 4 and 9.5;

---Changed "tarc" to sum "tarc" (see 9.5);

---Changed the definition of the term "transfer function amplitude";

---Deleted the note on the term "offline" (see 3.22);

---Added "Note 4: Minimum working height" (see Chapter 6);

---Deleted the notes in IEC 62846:2016 that are not suitable for my country's national conditions;

---Added "Example" in "Calibration of Arc Detection System" (see 9.2);

---Deleted Appendix A and related references in IEC 62846:2016 that are not suitable for my country's national conditions;

---Changed the required terms in Appendix B of IEC 62846:2016 (see Appendix A):

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies the output functionality and accuracy of matching performance parameter measurement methods during dynamic interaction between pantographs and overhead catenaries:

degree requirements:

This document is applicable to the measurement of dynamic matching performance parameters of current receiving systems using overhead catenaries for rail transit:

2 Normative reference documents

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

GB/T 21561.1 Rail transit rolling stock pantograph characteristics and testing Part 1: Main line rolling stock pantograph (GB/T 21561.1-2018, IEC 60494-1:2013, MOD) GB/T 21561.2 Pantograph characteristics and testing of rail transit rolling stock Part 2: Pantograph of subway and light rail vehicles (GB/T 21561.2-2018, IEC 60494-2:2013, MOD) GB/T 32578 Electric traction overhead catenary for rail transit ground installations (GB/T 32578-2016, IEC 60913:

2013, MOD)

IEC 62486 Criteria for interaction between pantograph and catenary of rail transit current collecting system [Railway applications-

3 Terms and definitions

The following terms and definitions apply to this document:

pantographhead the frame-supported component of a pantograph:

Note: Including skateboards, bow angles and suspension devices, etc:

[Source: GB/T 21561.1-2018, 3.2:3, with modifications] 3.2 contactpointcontactpoint the mechanical point of contact between the slide and the contact wire:

During normal operation, the possible lateral and vertical range of the contact point on the skateboard: