STN

Dráhové aplikácie Interakcia systémov Kritériá na dosiahnutie technickej kompatibility medzi pantografickým zberačom a vrchným trolejovým vedením

STN EN 50367

36 2315

Railway applications - Fixed installations and rolling stock - Criteria to achieve technical compatibility between pantographs and overhead contact line

Táto norma obsahuje anglickú verziu európskej normy. This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/20

Obsahuje: EN 50367:2020

Oznámením tejto normy sa od 27.07.2023 ruší STN EN 50367 (36 2315) z marca 2013

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN 50367

August 2020

ICS 29.280

Supersedes EN 50367:2012 and all of its amendments and corrigenda (if any)

English Version

Railway applications - Fixed installations and rolling stock - Criteria to achieve technical compatibility between pantographs and overhead contact line

Applications ferroviaires - Systèmes de captage de courant - Critères techniques d'interaction entre le pantographe et la ligne aérienne de contact (réalisation du libre accès)

Bahnanwendungen - Zusammenwirken der Systeme - Technische Kriterien für das Zusammenwirken zwischen Stromabnehmer und Oberleitung für einen freien Zugang

This European Standard was approved by CENELEC on 2020-07-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents						
Euro	pean forew	ord	6			
1	Scope					
2	Normative references					
3	Terms and	d definitions	8			
4	Symbols and abbreviations					
5	Geometry					
5.1	General					
5.2	Overhead contact line characteristics					
	5.2.1	General				
	5.2.2	Infrastructure gauge for free passage of pantograph	14			
	5.2.3	Contact wire height				
	5.2.4	Contact wire gradient	15			
	5.2.5	Lateral deviation of contact wire	15			
	5.2.6	Contact wire uplift	18			
	5.2.7	Neutral sections	18			
	5.2.8	Change over area between pantograph profiles	19			
5.3	Pantograph characteristics					
	5.3.1	General				
	5.3.2	Assessment of the pantograph head profile				
	5.3.3	Conducting range				
6	Interface r	material	23			
6.1						
6.2		ire				
6.3		rips				
7	Interaction	n performance	24			
7.1	General		24			
7.2		tact forces and current capacity				
7.3	•	pehaviour and quality of current collection				
8	•	al requirements				
8.1	Requirement for pantograph					
8.2	Minimum and maximum distance between two operating pantographs					
	8.2.1	General				
	8.2.2	Design of overhead contact lines	28			
	8.2.3	Formation of train with multiple pantographs - Arrangement of pantographs				
9	Assessment requirements - Dynamic behaviour and quality of current collection					
9.1	General2					
9.2	Overhead	contact line	30			

	9.2.1	Assessment of overhead contact line design	30
	9.2.2	Integration of an assessed OCL into a network	
9.3	• .	າ	
	9.3.1	Assessment of pantograph design	
	9.3.2	Integration of an assessed pantograph into a vehicle	
	-	tive) Special requirements	
A.1		ctions	
		f neutral section	
	_	al section	
		ral section	
	•	al section	
		ent of pantographs on trains	
A.2		interoperable pantograph head	
	• .	h head with length of 1 600 mm	
		h head with length of 1 950 mm	
		tests for DC systems at standstill	
	_	nditions	
	•	ethod	
		S	
		on of mean contact forces	
	=	ative) Data of existing networks	
B.1			
B.2		naracteristics	
B.3		aracteristics of pantograph head	
Anne		tive) Additional tests for DC at standstill – alternative method – To rip configuration	
Anne	contact wir	ative) Specimen calculation for the permissible lateral deviation of according to the requirements of 5.2.5 with typical values from t	he German
D.1	Calculation	Values	57
D.2	Calculation	independent of type of pantograph	59
D.2.1	Calculation	of reference height	59
D.2.2	Calculation	of tolerances of track at the lower verification point	59
D.2.3	Calculation	of tolerances of track at the upper verification point	59
D.2.4	Calculation	of additional overthrow on the inside/outside of the curve for pan	tographs59
D.2.5	Calculation	of quasi static effect	60
D.3	Pantograpl	n head with length of 1600 mm	60
D.3.1		of lateral movement of contact wire caused by forces from non-hipantograph head	
D.3.2	Calculation	of tolerances of overhead contact line	60

D.3.3	Calculation of width of mechanical kinematic pantograph gauge at minimum verificatio neight of the pantograph gauge in a raised position6	
D.3.4	Calculation of width of mechanical kinematic pantograph gauge at maximum rerification height of the pantograph gauge in a raised position6	i 1
D.3.5	Calculation of width of mechanical kinematic pantograph gauge at reference height for nteraction between contact wire and pantograph6	
D.3.6	permissible lateral deviation of the contact wire for stability against dewirement according to 5.2.5.26	i 1
D.3.7	Calculation of width of mechanical kinematic gauge for serviceability of overhead contact line at minimum verification height of the pantograph gauge in a raised cosition	32
D.3.8	Calculation of width of mechanical kinematic gauge for serviceability of overhead contact line at maximum verification height of the pantograph gauge in a raised cosition	32
D.3.9	Calculation of width of mechanical gauge for serviceability of overhead contact line gauge at reference height for interaction between contact wire and pantograph6	32
D.3.1	Permissible lateral deviation of the contact wire from the track centre line to meet the serviceability limit state case according to 5.2.5.3	
D.3.1	Permissible lateral deviation of the contact wire from the track centre line according to 5.2.5.36	3
D.4	Pantograph head with length of 1 950 mm6	4
D.4.1	Calculation of lateral movement of contact wire caused by forces from non-horizontal sections of pantograph head6	
D.4.2	Calculation of tolerances of overhead contact line6	4
D.4.3	Calculation of width of mechanical kinematic pantograph gauge at minimum verificationeight of the pantograph gauge in a raised position6	
D.4.4	Calculation of width of mechanical kinematic pantograph gauge at maximum verification height of the pantograph gauge in a raised position6	64
D.4.5	Calculation of width of mechanical kinematic pantograph gauge at reference height for nteraction between contact wire and pantograph6	
D.4.6	permissible lateral deviation of the contact wire for stability against dewirement according to 5.2.5.26	5
D.4.7	Calculation of width of mechanical kinematic gauge for serviceability of overhead contact line at minimum verification height of the pantograph gauge in a raised position	35
D.4.8	Calculation of width of mechanical kinematic gauge for serviceability of overhead contact line at maximum verification height of the pantograph gauge in a raised position	66
D.4.9	Calculation of width of mechanical gauge for serviceability of overhead contact line gauge at reference height for interaction between contact wire and pantograph6	6
D.4.1	Permissible lateral deviation of the contact wire from the track centre line to meet the serviceability limit state case according to 5.2.5.3	
D.4.1	Permissible lateral deviation of the contact wire from the track centre line according to 5.2.5.36	5 7
D.5	Ilustration lateral deviation6	8

Annex ZA (informative) Relationship between this European standard and the essential	
requirements of EU Directive 2016/797/EU [2016 OJ L138] aimed to be covered	72
Bibliography	74

European foreword

This document (EN 50367:2020) has been prepared by CLC/SC 9XC "Electric supply and earthing systems for public transport equipment and ancillary apparatus (Fixed installations)".

The following dates are fixed:

•	to be publica	implen ation	nente of a	ed at na	tional itical	ment has level by national	(dop)	2021-07-27
•	latest	date	by	which	the	national	(dow)	2023-07-27

standards conflicting with this document have to be withdrawn

This document supersedes EN 50367:2012 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Annex B gives some parameters for existing lines (informative).

Compared with the previous version, the most significant changes in this version are:

- · Update of definitions;
- Changes to 5.2.5 concerning the lateral deviation on the basis of RfS 51 from the European Union Agency for Railways;
- Changes in 5.2.7;
- Revision of 5.3.2, including update of figures;
- Improvement of testing method for DC contact strips: 6.3, A.3;
- · Addition of tunnel requirements in Clause 7;
- Revision of Table 9;
- Assessment requirements in Clause 9;
- Addition of an introduction for Annex B;
- Addition of Annex C;
- · Addition of Annex D.

1 Scope

This document specifies requirements for the technical compatibility between pantographs and overhead contact lines, to achieve free access to the lines of the European railway network.

NOTE These requirements are defined for a limited number of pantograph types conforming to the requirements in 5.3, together with the geometry and characteristics of compatible overhead contact lines.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15273-1:2013+A1:2016, Railway applications - Gauges - Part 1: General - Common rules for infrastructure and rolling stock

EN 15273-2:2013+A1:2016, Railway applications - Gauges - Part 2: Rolling stock gauge

EN 15273-3:2013+A1:2016, Railway applications - Gauges - Part 3: Structure gauges

EN 50119:2020, Railway applications - Fixed installations - Electric traction overhead contact lines

EN 50125-2:2002, Railway applications - Environmental conditions for equipment - Part 2: Fixed electrical installations

EN 50149:2012, Railway applications - Fixed installations - Electric traction - Copper and copper alloy grooved contact wires

EN 50206-1:2010, Railway applications - Rolling stock - Pantographs: Characteristics and tests - Part 1: Pantographs for main line vehicles

EN 50317:2012, Railway applications - Current collection systems - Requirements for and validation of measurements of the dynamic interaction between pantograph and overhead contact line

EN 50318:2018, Railway applications - Current collection systems - Validation of simulation of the dynamic interaction between pantograph and overhead contact line

EN 50388:2012, Railway Applications - Power supply and rolling stock - Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability

EN 50405:2015, Railway applications – Current collection systems – Pantographs, testing methods for contact strips¹⁾

IEC 60050-811:2017, International Electrotechnical Vocabulary (IEV) - Part 811: Electric traction

koniec náhľadu – text ďalej pokračuje v platenej verzii STN

_

¹⁾ This standard is impacted by EN 50405:2015/A1:2016.