

**Raudteelased rakendused. Kohtkindlad paigaldised.
Elektriohutus, maandamine ja tagasivooluahel. Osa 2:
Ettevaatusabinõud alalisvooluveosüsteemide
põhjustatud uitvoolude mõjude vastu**

Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 2: Provisions against the effects of stray currents caused by d.c.traction systems

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50122-2:2010 sisaldab Euroopa standardi EN 50122-2:2010 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.11.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 15.10.2010.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 50122-2:2010 consists of the English text of the European standard EN 50122-2:2010.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.11.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 15.10.2010.

The standard is available from Estonian standardisation organisation.

ICS 29.120.50, 29.280

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: 605 5050; E-mail: info@evs.ee

English version

**Railway applications -
Fixed installations -
Electrical safety, earthing and the return circuit -
Part 2: Provisions against the effects of stray currents caused by d.c.
traction systems**

Applications ferroviaires -
Installations fixes -
Sécurité électrique, mise à la terre et
circuit de retour -
Partie 2: Mesures de protection contre les
effets des courants vagabonds issus de la
traction électrique à courant continu

Bahnanwendungen -
Ortsfeste Anlagen -
Elektrische Sicherheit, Erdung und
Rückleitung -
Teil 2: Schutzmaßnahmen gegen
Streustromwirkungen durch Gleichstrom-
Zugförderungssysteme

This European Standard was approved by CENELEC on 2010-10-01. 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 Central Secretariat 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 Central Secretariat 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

This European Standard was prepared by SC 9XC, Electric supply and earthing systems for public transport equipment and ancillary apparatus (Fixed installations), of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways. It was submitted to the formal vote and was approved by CENELEC as EN 50122-2 on 2010-10-01.

This document supersedes EN 50122-2:1998 + A1:2002.

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

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2011-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-10-01

This draft European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directives 96/48/EC (HSR), 2001/16/EC (CONRAIL) and 2008/57/EC (RAIL). See Annex ZZ.

This document is a preview generated by EVS

Contents

1	Scope	5
2	Normative references	5
3	Terms and definitions	6
4	Identification of hazards and risks	6
5	Criteria for stray current assessment and acceptance	7
5.1	General	7
5.2	Criteria for the protection of the tracks	7
5.3	Criteria for systems with metal reinforced concrete or metallic structures	8
5.4	Specific investigations and measures	8
6	Design provisions	9
6.1	General	9
6.2	Return circuit	9
6.3	Non-traction related electrical equipment	10
6.4	Tracks of other traction systems	11
6.5	Return busbar in the substation	11
6.6	Level crossings	11
6.7	Common power supply for tram and trolleybus	11
6.8	Changeover from the mainline to depot and workshop areas	11
7	Provisions for influenced metallic structures	11
7.1	General	11
7.2	Tunnels, bridges, viaducts and reinforced concrete slab track	12
7.3	Adjacent pipes or cables	13
7.4	Voltage limiting devices	13
8	Protection provisions applied to metallic structures	13
9	Depots and workshops	14
10	Tests and measurements	14
10.1	Principles	14
10.2	Supervision of the rail insulation	14
Annex A	(informative) Measurement of track characteristics	16
A.1	Rail resistance	16
A.2	Conductance per length between running rails and metal reinforced structures	17
A.3	Conductance per length for track sections without civil structure	18
A.4	Local conductance per length for track sections without civil structure	19
A.5	Insulating rail joints	21
A.6	Insulating joints between metal reinforced structures	21
Annex B	(informative) Stray current assessment – Rail insulation assessment using rail potential	23
B.1	Continuous monitoring of the rail potential	23
B.2	Repetitive measurements of the rail potential to monitor the conductance	24

Annex C (informative) **Estimation of stray current and impact on metal structures**25

 C.1 Estimation of the stray currents passing from the running rails to the earth.....25

 C.2 Estimation of the longitudinal voltage in metal reinforced structures26

Annex ZZ (informative) **Coverage of Essential Requirements of EC Directives**28

Bibliography.....29

Figures

Figure A.1 — Measurement of the rail resistance for a rail of 10 m length16

Figure A.2 — Measuring arrangement for the conductance per length G'_{RS} between rails and metal reinforced structure17

Figure A.3 — Determination of the conductance per length G'_{RE} for track sections without civil structures.....18

Figure A.4 — Measuring arrangement for the local conductance per length.....19

Figure A.5 — Test of insulating rail joints.....21

Figure A.6 — Test of insulating joints in metal reinforced structures.....22

Figure B.1 — Continuous monitoring of the rail potential.....23

This document is a preview generated by EVS

1 Scope

This European Standard specifies requirements for protective provisions against the effects of stray currents, which result from the operation of d.c. traction systems.

As experience for several decades has not shown evident corrosion effects from a.c. traction systems and actual investigations are not completed, this European Standard only deals with stray currents flowing from a d.c. traction system.

This European Standard applies to all metallic fixed installations which form part of the traction system, and also to any other metallic components located in any position in the earth, which can carry stray currents resulting from the operation of the railway system.

This European Standard applies to all new d.c. lines and to all major revisions to existing d.c. lines. The principles may also be applied to existing electrified transportation systems where it is necessary to consider the effects of stray currents.

It provides design requirements to allow maintenance.

The range of application includes:

- a) railways,
- b) guided mass transport systems such as:
 - 1) tramways,
 - 2) elevated and underground railways,
 - 3) mountain railways,
 - 4) trolleybus systems, and
 - 5) magnetically levitated systems, which use a contact line system,
- c) material transportation systems.

This European Standard does not apply to:

- d) mine traction systems in underground mines,
- e) cranes, transportable platforms and similar transportation equipment on rails, temporary structures (e.g. exhibition structures) in so far as these are not supplied directly from the contact line system and are not endangered by the traction power supply system,
- f) suspended cable cars,
- g) funicular railways.

This European Standard does not specify working rules for maintenance.

2 Normative references

The following referenced documents are indispensable for the application 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 50122-1:2010, *Railway applications – Fixed installations – Electrical safety, earthing and the return circuit – Part 1: Protective provisions against electric shock*

EN 50122-3:2010, *Railway applications – Fixed installations – Electrical safety, earthing and the return circuit – Part 3: Mutual interaction of a.c. and d.c. traction systems*

EN 50162:2004, *Protection against corrosion by stray current from direct current systems*

EN 50163, *Railway applications – Supply voltages of traction systems*