RAUDTEEALASTE RAKENDUSTE PÜSIPAIGALDISED. ELEKTRIOHUTUS, MAANDAMINE JA TAGASIVOOLUAHEL. OSA 3: ALALIS- JA VAHELDUVVOOLU VEOSÜSTEEMIDE VASTASTIKUSED KOOSTOIMED

Fixed installations for railway applications - Electrical safety, earthing and the return circuit - Part 3: Mutual Interaction of AC and DC traction systems

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50122-3:2022 +A1:2025 sisaldab Euroopa standardi EN 50122-3:2022 ja selle muudatuse A1:2025 ingliskeelset teksti.	This Estonian standard EVS-EN 50122-3:2022+A1:2025 consists of the English text of the European standard EN 50122-3:2022 and its amendment A1:2025
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.09.2022, muudatus A1 01.08.2025.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. Date of Availability of the European standard is 02.09.2022, for A1 01.08.2025.
Muudatusega A1 lisatud või muudetud teksti algus ja lõpp on tekstis tähistatud sümbolitega ⟩A1⟨ ⟩A1⟨. Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The start and finish of text introduced or altered by amendment A1 is indicated in the text by tags ⟩A1⟨ ⟩A1⟨. The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.120.50; 29.280

EUROPEAN STANDARD

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EN 50122-3 + A1

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Supersedes EN 50122-3:2010

English Version

[A1] Fixed installations for railway applications [A1] - Electrical safety, earthing and the return circuit - Part 3: Mutual Interaction of AC and DC traction systems

[A1] Installations fixes pour applications ferroviaires [A1] - Sécurité électrique, mise à la terre et circuit de retour - Partie 3: Interactions mutuelles entre systèmes de traction en courant alternatif et en courant continu

[A1] Ortsfeste Anlagen für Bahnanwendungen [A1] - Elektrische Sicherheit, Erdung und Rückleitung - Teil 3: Gegenseitige Beeinflussung von Wechselstrom- und Gleichstrombahnen

This European Standard was approved by CENELEC on 2022-07-25. Amendment A1 was approved by CENELEC on 2025-06-23. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard and its amendment the status of a national standard without any alteration.

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

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European foreword

This document (EN 50122-3:2022) 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:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2023-07-25
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2025-07-25

This document supersedes EN 50122-3:2010 and all of its amendments and corrigenda (if any).

EN 50122-3:2022 includes the following significant technical changes with respect to EN 50122-3:2010:

— harmonization with EN 50122-1:2022.

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 Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

A1 Amendment A1 European foreword

This document (EN 50122-3:2022/A1:2025) was prepared by SC 9XC, "Electric supply and earthing systems for public transport equipment and ancillary apparatus (fixed installations)", of CLC/TC 9X, "Electrical and electronic applications for railways".

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1 Scope

This document specifies requirements for the protective provisions relating to electrical safety in fixed installations, when it is reasonably likely that hazardous voltages or currents will arise for people or equipment, as a result of the mutual interaction of AC and DC electric power supply traction systems.

It also applies to all aspects of fixed installations that are necessary to ensure electrical safety during maintenance work within electric power supply traction systems.

The mutual interaction can be of any of the following kinds:

— parallel running of AC and DC electric traction power supply systems;

— crossing of AC and DC electric traction power supply systems;

— shared use of tracks, buildings or other structures;

— system separation sections between AC and DC electric traction power supply systems.

The scope is limited to galvanic, inductive and capacitive coupling of the fundamental frequency voltages and currents and their superposition.

This document applies to all new lines, extensions and to all major revisions to existing lines for the following electric traction power supply systems:

a) railways;

b) guided mass transport systems such as:

   1) tramways,

   2) elevated and underground railways,

   3) mountain railways,

   4) magnetically levitated systems, which use a contact line system,

   5) trolleybus systems, and

   6) electric traction power supply systems for road vehicles, which use an overhead contact line system;

c) material transportation systems.

The document does not apply to:

a) electric traction power supply systems in underground mines;

b) cranes, transportable platforms and similar transportation equipment on rails, temporary structures (e.g. exhibition structures) in so far as these are not supplied directly or via transformers from the contact line system and are not endangered by the electric traction power supply system for railways;

c) suspended cable cars;

d) funicular railways;

e) procedures or rules for maintenance.

The rules given in this document can also be applied to mutual interaction with non-electrified tracks, if hazardous voltages or currents can arise from AC or DC electric traction power supply systems.

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 50122-1:2022, *Railway applications – Fixed installations – Electrical safety, earthing and the return circuit – Part 1: Protective provisions against electric shock*

EN 50122-2:2022, *Railway applications – Fixed installations – Electrical safety, earthing and the return circuit – Part 2: Provisions against the effects of stray currents caused by DC traction systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50122-1:2022 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Hazards and adverse effects

4.1 General

The different requirements specified in EN 50122-1:2022 and EN 50122-2:2022, concerning connections to the return circuit of the AC railway, and connections to the return circuit of the DC railway, shall be taken into account in order to avoid risks of hazardous voltages and stray currents.

Such hazards and risks shall be considered from the start of the planning of any installation which includes both AC and DC railways. Suitable measures shall be specified for limiting the voltages to the levels given in this document, while limiting the damaging effects of stray currents in accordance with EN 50122-2:2022.

Additional adverse effects are possible, for example:

— thermal overload of conductors, screens and sheaths;

— thermal overload of transformers due to magnetic saturation of the cores;

— restriction of operation because of possible effects on the safety and correct functioning of signalling systems;

— restriction of operation because of malfunction of the communication system.

These effects are not considered in this Standard.

4.2 Electrical safety of persons

Where AC and DC voltages are present together the limits for touch voltage given in Clause 7 apply in addition to the limits given in EN 50122-1:2022, Clause 9.

5 Types of mutual interaction to be considered

5.1 General

Coupling describes the physical process of transmission of energy from a source to a susceptible device.

The following types of coupling shall be considered:

a) galvanic (conductive) coupling;

b) non-galvanic coupling,