



BSI Standards Publication

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

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National foreword

This British Standard is the UK implementation of EN 50122-2:2022. It supersedes BS EN 50122-2:2010, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/9/3, Railway Electrotechnical Applications - Fixed Equipment.

A list of organizations represented on this committee can be obtained on request to its committee manager.

BSI, as a member of CENELEC, is obliged to publish EN 50122-2:2022 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval.

The UK committee submitted a negative vote because it is of the opinion that this standard contains:

- unquantifiable opinions used as a basis for normative guidance;
- technical inaccuracies;
- no guidance for the assessment and mitigation of stray current corrosion; and
- a lack of consideration for global experience and requirements as opposed to European experience and requirements.

The UK committee advises users that in the UK there is wide use of an alternative (and, in the opinion of the UK committee, more pragmatic) approach to the rail insulation assessment given in Annex B, in which rail voltage and current measurements are captured with synchronized portable data loggers. The data is then analysed on a common time base and compared to previously determined acceptable baseline values. The loggers are self-powered and can easily be relocated to assess the data at other locations instead of being fixed. It is the UK committee's opinion that the system illustrated in Annex B can only be applied to a new system in perfect condition.

In addition, it is the opinion of the UK committee that stray current collecting mats, if correctly installed and monitored, can be effective. The UK committee advises users that these mats are in use in the UK.

Finally, the UK committee recommends that users consult the following additional standards when applying this standard:

- BS EN ISO 18086, *Corrosion of metals and alloys – Determination of AC corrosion – Protection criteria*
- BS EN ISO 8044, *Corrosion of metals and alloys – Vocabulary*
- BS EN ISO 21857, *Petroleum, petrochemical and natural gas industries – Prevention of corrosion on pipeline systems influenced by stray currents*
- BS EN ISO 12696, *Cathodic protection of steel in concrete*
- BS EN 14505, *Cathodic protection of complex structures*

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Amendments/corrigenda issued since publication

Date	Text affected
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English Version

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

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 Gleichstrombahnen

This European Standard was approved by CENELEC on 2022-07-25. 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, Türkiye 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

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This document (EN 50122-2:2022) 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 50122-2:2010 and all of its amendments and corrigenda (if any).

EN 50122-2:2022 includes the following significant technical changes with respect to EN 50122-2:2010:

- harmonization with EN 50122-1:2022;
- improvement of measurement specification in Annex A;
- new Annex D "Laboratory testing of materials for the insulation of rails".

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.

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.

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This document specifies requirements for protective provisions against the effects of stray currents, which result from the operation of DC electric traction power supply systems.

As several decades' experience has not shown evident corrosion effects from AC electric traction power supply systems, this document only deals with stray currents flowing from a DC electric traction power supply system.

This document 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 document applies to all new DC lines and to all major revisions to existing DC lines. The principles can also be applied to existing electrified transportation systems where it is necessary to consider the effects of stray currents.

This document does not specify working rules for maintenance but 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) magnetically levitated systems, which use a contact line system, and
 - 5) trolleybus systems,
- c) material transportation systems.

This 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 from the contact line system and are not endangered by the electric traction power supply system,
- c) suspended cable cars,
- d) funicular railways.

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 50122-3:2022, *Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 3: Mutual Interaction of AC and DC traction systems*

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