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Jernbaner – Faste installationer – Elektrisk sikkerhed, jording og returledning – Del 1: Beskyttelsesforanstaltninger mod elektrisk stød

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

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English Version

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

Applications ferroviaires - Installations fixes - Sécurité électrique, mise à la terre et circuit de retour - Partie 1: Mesures de protection contre les chocs électriques

Bahnanwendungen - Ortsfeste Anlagen - Elektrische Sicherheit, Erdung und Rückleitung - Teil 1: Schutzmaßnahmen gegen elektrischen Schlag

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.

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European foreword

This document (EN 50122-1:2022) 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- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2025-07-25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 50122-1:2011 and all of its amendments and corrigenda (if any).

EN 50122-1:2022 includes the following significant technical changes with respect to EN 50122-1:2011:

- some definitions were modified;
- the dimensions for protection by clearance were modified, and there are now voltage dependent differences for high voltage electric traction power supply systems;
- methods for the use of protective obstacles were significantly changed.

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.

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1 Scope

This document specifies requirements for the protective provisions relating to electrical safety in fixed installations associated with AC and/or DC traction systems and to any installations that can be endangered by the electric traction power supply system. This also includes requirements applicable to vehicles on electrified lines.

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

This document applies to new electric traction power supply systems and major revisions to electric traction power supply systems for:

- a) railways;
- b) guided mass transport systems such as
 - 1) tramways,
 - 2) elevated and underground railways,
 - 3) mountain railways,
 - 4) trolleybus systems,
 - 5) electric traction power supply systems for road vehicles, which use an overhead contact line system, and
 - 6) magnetically levitated systems, which use a contact line system;
- 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 or via transformers from the contact line system and are not endangered by the electric traction power supply system,
- c) suspended cable cars,
- d) funicular railways,
- e) existing vehicles.

This document does not specify working rules for maintenance.

The requirements within this document related to protection against electric shock are applicable to persons only.

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

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 d.c. traction systems*

EN 50124-1:2017, *Railway applications - Insulation coordination - Part 1: Basic requirements - Clearances and creepage distances for all electrical and electronic equipment*

EN 50153:2014,¹ *Railway applications - Rolling stock - Protective provisions relating to electrical hazards*

EN 50163:2004,² *Railway applications - Supply voltages of traction systems*

EN 50341 (series), *Overhead electrical lines exceeding AC 1 kV*

EN 50522:2010, *Earthing of power installations exceeding 1 kV a.c.*

EN 60529:1991,³ *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60898-1:2019, *Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Part 1: Circuit-breakers for a.c. operation (IEC 60898-1:2016)*

EN 61140:2016, *Protection against electric shock - Common aspects for installation and equipment (IEC 61140:2016)*

EN 61936-1:2010,⁴ *Power installations exceeding 1 kV a.c. - Part 1: Common rules (IEC 61936-1:2010)*

EN 62305 (series), *Protection against lightning (IEC 62305 series)*

HD 60364-4-41:2017,⁵ *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock (IEC 60364-4-41:2005, modified)*

IEC 60755:2017, *General safety requirements for residual current operated protective devices*

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 7010:2019, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

¹ As impacted by EN 50153:2014/A1:2017 and EN 50153:2014/A2:2020.

² As impacted by EN 50163:2004/AC:2013 and EN 50163:2004/A2:2020.

³ As impacted by EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013.

⁴ As impacted by EN 61936-1:2010/AC:2011, EN 61936-1:2010:2013 and EN 61936-1:2010/A1:2014.

⁵ As impacted by HD 60364-4-41:2017/A11:2017 and HD 60364-4-41:2017/A12:2019.