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# INTERNATIONAL STANDARD



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**Railway applications – Fixed installations – Protection principles for AC and DC electric traction power supply systems**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS – FIXED INSTALLATIONS –  
PROTECTION PRINCIPLES FOR AC AND DC ELECTRIC  
TRACTION POWER SUPPLY SYSTEMS**

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IEC 63438 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways. It is an International Standard.

EN 50633 (2016) has served as a basis for the elaboration of this document.

The text of this International Standard is based on the following documents:

Draft	Report on voting
9/3114/FDIS	9/3143/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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- reconfirmed,
- withdrawn, or
- revised.

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# RAILWAY APPLICATIONS – FIXED INSTALLATIONS – PROTECTION PRINCIPLES FOR AC AND DC ELECTRIC TRACTION POWER SUPPLY SYSTEMS

## 1 Scope

This International Standard applies to the electrical protection system, provided for AC and DC electric traction power supply systems. It:

- establishes railway specific protection principles;
- describes the railway specific protection system functionality;
- specifies minimum functional requirements and informative examples of their application;
- establishes limitations of the protection system and the acceptability of residual risks;
- specifies principles for design verification.

This document is applicable to:

- railways;
- guided mass transport systems, such as tramways, elevated and underground railways, mountain railways, trolleybus systems, and magnetically levitated systems which use a contact line system.

This document can also be applied to electrified road traffic with a contact line, such as truck-trolley systems.

This document applies to new electric traction power supply systems and can be applied to changes of existing systems.

This document does not apply to:

- underground mine traction systems;
- 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 traction power supply system;
- suspended cable cars;
- funicular railways;
- magnetic levitated systems (without a contact line system);
- railways with an inductive power supply without contact system;
- railways with a buried contact system that is required to be energized only below the train to ensure safety.

This document does not cover:

- technical requirements for products, e.g. protection devices;
- rules for maintenance of protection 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.

IEC 61991:2019, *Railway applications – Rolling stock – Protective provisions against electrical hazards*

IEC 61992-1:2006, *Railway applications – Fixed installations – DC switchgear – Part 1: General*  
IEC 61992-1:2006/AMD1:2014

IEC 61992-7-1:2006, *Railway applications – Fixed installations – DC switchgear – Part 7-1: Measurement, control and protection devices for specific use in d.c. traction systems – Application guide*

IEC 62128-1:2013, *Railway applications – Fixed installations – Electrical safety, earthing and the return circuit – Part 1: Protective provisions against electric shock*

IEC 62128-3:2013, *Railway applications – Fixed installations – Electrical safety, earthing and the return circuit – Part 3: Mutual interaction of a.c. and d.c. traction systems*

IEC 62590:2019, *Railway applications – Fixed installations – Electronic power converters for substations*

IEC 62313:2009, *Railway applications – Power supply and rolling stock – Technical criteria for the coordination between power supply (substation) and rolling stock*