SLOVENSKI STANDARD
oSIST prEN IEC 62590-3-1:2024

01-oktober-2024

Železniške naprave - Fiksni postroji - Elektronski elektroenergetski pretvornik - 3-1. del: Sistem vleke z izmenično napetostjo - Elektronski elektroenergetski kompenzator

Railway applications - Fixed installations - Electronic power converters - Part 3-1: AC traction applications - Electronic power compensators

Bahnanwendungen - Ortsfeste Anlagen - Leistungselektronische Stromrichter - Teil 3-1: Anwendungen der Wechselstrom-Zugförderung - Elektronische Leistungskompensatoren

Applications ferroviaires – Installations fixes – Convertisseurs électroniques de puissance – Partie 3-1: Applications de traction en courant alternatif – Compensateurs électroniques de puissance

Ta slovenski standard je istoveten z: **prEN 62590-3-1:2024**

ICS:

45.060.01	Železniška vozila na splošno	Railway rolling stock in general

oSIST prEN IEC 62590-3-1:2024 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 62590-3-1

August 2024

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English Version

Railway applications - Fixed installations - Electronic power converters - Part 3-1: AC traction applications - Electronic power compensators (IEC 62590-3-1:2022)

Applications ferroviaires - Installations fixes - Convertisseurs electroniques de puissance - Partie 3-1: Applications de traction en courant alternatif - Compensateurs électroniques de puissance (IEC 62590-3-1:2022)

Bahnanwendungen - Ortsfeste Anlagen - Leistungselektronische Stromrichter - Teil 3-1: Anwendungen der Wechselstrom-Zugförderung - Elektronische Leistungskompensatoren (IEC 62590-3-1:2022)

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2024-11-01.

The text of this draft consists of the text of IEC 62590-3-1:2022 (9/2843/FDIS).

If this draft becomes a European Standard, 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.

This draft European Standard was established by CENELEC 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.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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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

European foreword

This document (prEN 62590-3-1:2024) consists of the text of IEC 62590-3-1:2022, prepared by IEC/TC 9 “Electrical equipment and systems for railways”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-151	2001	International Electrotechnical Vocabulary - Part 151: Electrical and magnetic devices	-	-
+ AMD1	2013		-	-
+ AMD2	2014		-	-
+ AMD3	2019		-	-
+ AMD4	2020		-	-
+ AMD5	2021		-	-
IEC 60146-1-1	2009	Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements	EN 60146-1-1	2010
IEC 60146-2	1999	Semiconductor converters - Part 2: Self-commutated semiconductor converters including direct d.c. converters	EN 60146-2	2000
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60850	-	Railway applications - Supply voltages of traction systems	-	-
IEC 61000-4-30	2015	Electromagnetic compatibility (EMC) - Part 4-30: Testing and measurement techniques - Power quality measurement methods	EN 61000-4-30	2015
+ A1	2021		+ A1	2021
IEC 61936-1	-	Power installations exceeding 1 kV AC and 1,5 kV DC - Part 1: AC	EN IEC 61936-1	-
IEC 62236-2	-	Railway applications - Electromagnetic compatibility -- Part 2: Emission of the whole railway system to the outside world	-	-

Publication	Year	Title	EN/HD	Year
IEC 62236-5	-	Railway applications - Electromagnetic compatibility -- Part 5: Emission and immunity of fixed power supply installations and apparatus	-	-
IEC 62313	-	Railway applications - Power supply and rolling stock - Technical criteria for the coordination between power supply (substation) and rolling stock	-	-
IEC 62590	2019	Railway applications - Fixed installations - Electronic power converters for substations	-	-
IEC 62695	2014	Railway applications - Fixed installations - Traction transformers	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Fixed installations – Electronic power converters – Part 3-1: AC traction applications – Electronic power compensators

Applications ferroviaires – Installations fixes – Convertisseurs electroniques de puissance – Partie 3-1: Applications de traction en courant alternatif – Compensateurs électroniques de puissance

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RAILWAY APPLICATIONS – FIXED INSTALLATIONS – ELECTRONIC POWER CONVERTERS –

Part 3-1: AC traction applications – Electronic power compensators

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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IEC 62590-3-1 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways. It is an International Standard.

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

Draft	Report on voting
9/2843/FDIS	9/2864/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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62590 series, published under the general title *Railway applications – Fixed installations – Electronic power converters*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

Single-phase AC traction systems are typically used for railway lines with high power load up to the double-digit MW range. The nature of the loads serving the intended traffic in those railway lines leads to permanent power fluctuations. Due to their inherent structure, single-phase traction systems are prone to having difficulty with power quality indicators such as power factor, voltage fluctuation and/or imbalance within the electric traction system and/or the feeding three-phase power network. In order to improve the power quality, an electronic power compensator can be applied.

Components of electronic power compensators especially electronic power converters must withstand the more rugged electric environment when compared with those for other industrial use, due to the nature of electric traction systems mentioned above. This includes not only high load fluctuation, but also frequent switching operation with inrush current and short circuits caused by faults on the overhead contact line systems. Therefore, specific requirements are needed in addition to the common requirements for converters for other industrial use.

This document defines typical system configurations and basic requirements as well as appropriate test methods for electronic power compensators used for single-phase AC traction systems. This document is intended for the use by railway operators, manufacturers and system integrators.

RAILWAY APPLICATIONS – FIXED INSTALLATIONS – ELECTRONIC POWER CONVERTERS –

Part 3-1: AC traction applications – Electronic power compensators

1 Scope

This document specifies the requirements and test methods for electronic power compensators for 1AC traction systems. This equipment is used to improve electric power quality inside the electric traction system and/or at the interface to the 3AC power network, applying power electronics technology.

This document applies to equipment which is installed to achieve one or more of the following objectives as its function(s):

- to mitigate voltage fluctuation;
- to improve power factor;
- to reduce imbalance at the interface to the 3AC power network.

NOTE In some cases, this type of equipment is used to reduce harmonics from the traction load towards the 3AC power network, and for energy saving.

The equipment designed to conform to each particular installation site and the packaged equipment for generic use both fall within the scope of this document.

This document applies to equipment with all possible configurations to implement different technical solutions for compensation, but equipment consisting of only passive components is excluded.

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 60050-151:2001, *International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices*
IEC 60050-151:2001/AMD1:2013
IEC 60050-151:2001/AMD2:2014
IEC 60050-151:2001/AMD3:2019
IEC 60050-151:2001/AMD4:2020
IEC 60050-151:2001/AMD5:2021

IEC 60146-1-1:2009, *Semiconductor converters – General requirements and line commutated converters – Part 1-1: Specification of basic requirements*

IEC 60146-2:1999, *Semiconductor converters – Part 2: Self-commutated semiconductor converters including direct d.c. converters*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*