

**Raudteealased rakendused.
Elektromagnetiline ühilduvus. Osa 5:
Elektrivarustussüsteemi püsipaigaldiste
ja seadiste kiirgus ja häirekindlus**

Railway applications - Electromagnetic compatibility
Part 5: Emission and immunity of fixed power supply
installations and apparatus

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 50121-5:2006 sisaldab Euroopa standardi EN 50121-5:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 22.09.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 50121-5:2006 consists of the English text of the European standard EN 50121-5:2006.</p> <p>This document is endorsed on 22.09.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This European Standard applies to emission and immunity aspects of EMC for electrical and electronic apparatus and systems intended for use in railway fixed installations associated with power supply. This includes the power feed to the apparatus, the apparatus itself with its protective control circuits, trackside items such as switching stations, power autotransformers, booster transformers, substation power switchgear and power switchgear to other longitudinal and local supplies.</p>	<p>Scope:</p> <p>This European Standard applies to emission and immunity aspects of EMC for electrical and electronic apparatus and systems intended for use in railway fixed installations associated with power supply. This includes the power feed to the apparatus, the apparatus itself with its protective control circuits, trackside items such as switching stations, power autotransformers, booster transformers, substation power switchgear and power switchgear to other longitudinal and local supplies.</p>
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Võtmesõnad: buildings, electrically-operated, energy supply systems, interference rejections, interfering emissions, limits (mathematics), mathematics, power supplies, radio disturbances, railway applications, railway fixed equipment, railways, stationary, tests, traction network

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Railway applications - Electromagnetic compatibility
Part 5: Emission and immunity of fixed power supply installations
and apparatus

Applications ferroviaires -
Compatibilité électromagnétique
Partie 5: Emission et immunité des
installations fixes d'alimentation de
puissance et des équipements associés

Bahnanwendungen -
Elektromagnetische Verträglichkeit
Teil 5: Störaussendungen und
Störfestigkeit von ortsfesten Anlagen und
Einrichtungen der Bahnenergieversorgung

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CENELEC

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

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Foreword

This European Standard was prepared by SC 9XC, Electric supply and earthing systems for public transport equipment and ancillary apparatus (fixed installations) of the Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways, in accordance with the decisions taken by TC 9X.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50121-5 on 2000-04-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2001-04-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-04-01

This European Standard is to be read in conjunction with EN 50121-1:2000.

This standard forms part 5 of the European Standard series EN 50121, published under the general title "Railway applications - Electromagnetic compatibility". The series consists of:

- Part 1 : General
- Part 2 : Emission of the whole railway system to the outside world
- Part 3-1 : Rolling stock - Train and complete vehicle
- Part 3-2 : Rolling stock - Apparatus
- Part 4 : Emission and immunity of the signalling and telecommunications apparatus
- Part 5 : Emission and immunity of fixed power supply installations and apparatus

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given only for information.

In this standard, annexes A, B and C are informative.

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Introduction

The requirements of this standard have been specified so as to ensure a level of electromagnetic emission which will cause minimal disturbance to other equipment. The levels, however, do not cover the following cases:

- a) where the probability of an occurrence likely to produce emissions in excess of those which would normally be experienced is extremely low,
- b) where highly susceptible apparatus will be used in close proximity of the equipment covered by this standard, in which case further measures may have to be taken.

The emission limits given are on the basis that the equipment of the product family range is installed in railway substation areas.

1 Scope

This European Standard applies to emission and immunity aspects of EMC for electrical and electronic apparatus and systems intended for use in railway fixed installations associated with power supply. This includes the power feed to the apparatus, the apparatus itself with its protective control circuits, trackside items such as switching stations, power autotransformers, booster transformers, substation power switchgear and power switchgear to other longitudinal and local supplies.

Filters operating at railway system voltage (for example for harmonic suppression or power factor correction) are not included in this standard since each site has special requirements. Filters would normally have separate enclosures with separate rules for access. If electromagnetic limits are required, these will appear in the specification for the equipment.

The limits in this standard do not apply to intentional communication signals.

The frequency range covered is from d.c. to 400 GHz. At present testing is defined only up to 1 GHz.

Limits are given for the EMC between items of apparatus which are situated:

- a) within the boundary of a substation which delivers electric power to a railway;
- b) beside the track for the purpose of controlling or regulating the railway power supply, including power factor correction and filtering;
- c) along the track for the purpose of supplying electrical power to the railway other than by means of the conductors used for contact current collection, and associated return conductors. Included are high voltage feeder systems within the boundary of the railway which supply substations at which the voltage is reduced to the railway system voltage.

NOTE 1 Examples are one conductor of a 25-0-25 kV 50 Hz system and the 110 kV 16,7 Hz supply systems.

NOTE 2 Similar conductors which are outside the railway boundary are treated as in the public area and are considered to be general overhead power lines although they feed only the railway.

- d) beside the track for controlling or regulating electric power supplies to ancillary railway uses. This category includes power supplies to marshalling yards, maintenance depots and stations;
- e) various other non-traction power supplies from railway sources which are shared with railway traction.

Apparatus and systems which are in an environment which can be described as residential, commercial or light industry, even when placed within the physical boundary of the railway substation shall comply with the relevant generic European EMC standard.

Excluded from the immunity requirements of this standard is power supply apparatus which is intrinsically immune to the tests defined in Tables 1 to 6 of this standard.

NOTE 3 An example is an 18 MVA 230 kV to 25 kV power supply transformer.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited in the appropriate places in the text and the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 50081-2	1993	Electromagnetic Compatibility (EMC) - Generic emission Standard Part 2: Industrial environment
EN 50121-1		Railway applications - Electromagnetic compatibility Part 1: General
EN 50121-2		Part 2: Emission of the whole railway system to the outside world
ENV 50204		Radiated electromagnetic field from digital radio telephones - Immunity test
EN 55022		Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 22, modified)
EN 61000-3-2		Electromagnetic Compatibility (EMC) Part 3-2: Limits -- Limits for harmonic current emissions (equipment input current up to and including 16 A per phase) (IEC 61000-3-2)
EN 61000-3-3		Part 3-3: Limits - Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16 A (IEC 61000-3-3)
EN 61000-4-2		Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test (IEC 61000-4-2)
EN 61000-4-3		Part 4-3: Testing and measurement techniques - Radiated, radio- frequency, electromagnetic field immunity test (IEC 61000-4-3, modified)
EN 61000-4-4		Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test (IEC 61000-4-4)
EN 61000-4-5		Part 4-5: Testing and measurement techniques - Surge immunity test (IEC 61000-4-5)
EN 61000-4-6		Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6)
EN 61000-4-8		Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test (IEC 61000-4-8)
EN 61000-4-12		Part 4-12: Testing and measurement techniques - Oscillatory waves immunity test (IEC 61000-4-12)