SLOVENSKI STANDARD
SIST EN 61377-1:2006

01-september-2006

Nadomešča:
SIST EN 61377:1998

Železniške naprave – Vozna sredstva – 1. del: Kombinirano preskušanje razsmerniško napajanih izmeničnih motorjev in njihovega krmiljenja (IEC 61377-1:2006)

Railway applications - Rolling stock -- Part 1: Combined testing of inverter-fed alternating current motors and their control system

Bahnanwendungen - Bahnfahrzeuge -- Teil 1: Kombinierte Prüfung von wechselrichtergespeisten Wechselstrommotoren und deren Steuerung

Applications ferroviaires - Matériel roulant -- Partie 1: Essais combinés de moteurs à courant alternatif alimentés par onduleur et de leur régulation

Ta slovenski standard je istoveten z: **EN 61377-1:2006**

ICS:

29.160.30	Motorji	Motors
45.060.01	Železniška vozila na splošno	Railway rolling stock in general

SIST EN 61377-1:2006 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61377-1

March 2006

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English version

Railway applications - Rolling stock Part 1: Combined testing of inverter-fed alternating current motors and their control system

(IEC 61377-1:2006)

Applications ferroviaires - Matériel roulant Partie 1: Essais combinés de moteurs à courant alternatif alimentés par onduleur et de leur régulation (CEI 61377-1:2006)

Bahnanwendungen - Bahnfahrzeuge Teil 1: Kombinierte Prüfung von wechselrichtergespeisten Wechselstrommotoren und deren Steuerung (IEC 61377-1:2006)

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61377-1:2006 E

Foreword

The text of document 9/904/FDIS, future edition 1 of IEC 61377-1, prepared by IEC TC 9, Electrical equipment and systems for railways, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61377-1 on 2006-03-01.

This European Standard supersedes EN 61377:1996 + corrigendum November 1996.

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)	2006-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-03-01

This European Standard makes reference to International Standards. Where the International Standard referred to has been endorsed as a European Standard or a home-grown European Standard exists, this European Standard shall be applied instead. Pertinent information can be found on the CENELEC web site.

Endorsement notice

The text of the International Standard IEC 61377-1:2006 was approved by CENELEC as a European Standard without any modification.

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2006-02

Applications ferroviaires – Matériel roulant –

Partie 1: Essais combinés de moteurs à courant alternatif alimentés par onduleur et de leur régulation

Railway applications – Rolling stock –

Part 1: Combined testing of inverter-fed alternating current motors and their control system

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RAILWAY APPLICATIONS – ROLLING STOCK –

Part 1: Combined testing of inverter-fed alternating current motors and their control system

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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International Standard IEC 61377-1 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This publication cancels and replaces IEC 61377 (1996).

The text of this standard is based on the following documents:

FDIS	Report on voting
9/904/FDIS	9/929/RVD

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

The present revision of IEC 61377 (1996) has been done to be editorially and technically consistent with the Part 2, Chopper-fed direct current traction motors and their control, and Part 3, Alternating current motors, fed by an indirect convertor, and their control system.

IEC 61377 consists of the following parts, under the general title *Railway applications – Rolling stock:*

Part 1: Combined testing of inverter-fed alternating current motors and their control system

Part 2: Combined testing – Chopper-fed direct current traction motors and their control

Part 3: Combined testing of alternating current motors, fed by an indirect convertor, and their control system

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

RAILWAY APPLICATIONS – ROLLING STOCK –

Part 1: Combined testing of inverter-fed alternating current motors and their control system

1 Scope and object

This part of IEC 61377 applies to the combinations of motor(s), inverter and their control system, and its object is to specify:

– the performance characteristics of electric drives consisting of an inverter, alternating current motors, and the related control system;

– methods of verifying these performance characteristics by tests.

Two categories of combined systems can be considered:

a) alternating current motors fed from an inverter without any control between the mechanical output (torque, speed) and the inverter itself (mostly auxiliary motors, for example cooling fan motors). The motor works exactly as if it were fed from a busbar (at variable frequency and voltage or not);

b) alternating current motor(s) (paralleled or not) with a control between the mechanical output and the inverter.

The first category of systems is tested according to IEC 60349-2 and IEC 61287-1.

This standard applies to the second category, mainly traction drives.

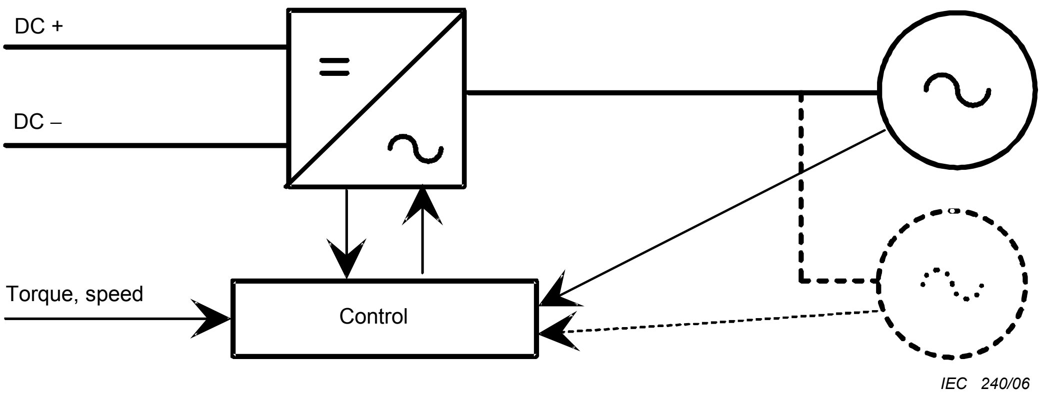


Figure 1 – Traction drive

IEC 60349-2 applies to convertor-fed alternating current motors, IEC 61287-1 to power electronic convertors, IEC 60571 to electronic equipments, and this standard applies to the combination of motor(s), inverter, and their control system. As a consequence, IEC 60349-2 describes the tests to demonstrate the compliance of the motor to its specification, IEC 61287-1 does the same for the inverter. It is self-evident that some of the tests mentioned in this standard generally may replace the corresponding ones described in the above-mentioned standards. An agreement should be reached between the parties to avoid the duplication of tests.

A complete combined test is heavy, and often requires high power, which is not always available in a workshop. An agreement between user and manufacturer may be reached to allow testing either in the workshop or on the vehicle. Testing may be split off partially in a workshop and partially on track.

At the time of drafting this standard, only the following combinations of motors and inverters were used for traction applications, but it may also apply to other combinations which may be used in the future:

– asynchronous motors fed by voltage stiff (voltage source) inverter;
– asynchronous motors fed by current stiff (current source) inverter;
– synchronous motors fed by current stiff (current source) inverter.

The input of these inverters can be a d.c. supply line, a rectifier, a chopper, an input convertor, a diesel generator with integrated rectifiers, etc.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies. .

IEC 60050(411), *International Electrotechnical Vocabulary (IEV) – Chapter 411: Rotating machinery*

IEC 60050(551), *International Electrotechnical Vocabulary (IEV) – Chapter 551: Power electronics*

IEC 60050(811), *International Electrotechnical Vocabulary (IEV) – Chapter 811: Electric traction*

IEC 60349-2:2002, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 2: Electronic convertor-fed alternating current motors*

IEC 60571, *Electronic equipment used on rail vehicles*

IEC 60850, *Railway applications – Supply voltage of traction systems*

IEC 61287-1:1995, *Railway applications – Power convertors installed on board rolling stock – Part 1: Characteristics and test methods*

IEC 61377-2:2002, *Railway applications – Rolling stock – Combined testing – Part 2: Chopper-fed direct current traction motors and their control*

IEC 61377-3:2002, *Railway applications – Rolling stock – Part 3: Combined testing of alternating current motors, fed by an indirect convertor, and their control system*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050(411), IEC 60050(551), IEC 60050(811), IEC 61287-1, IEC 60349-2 and the following apply:

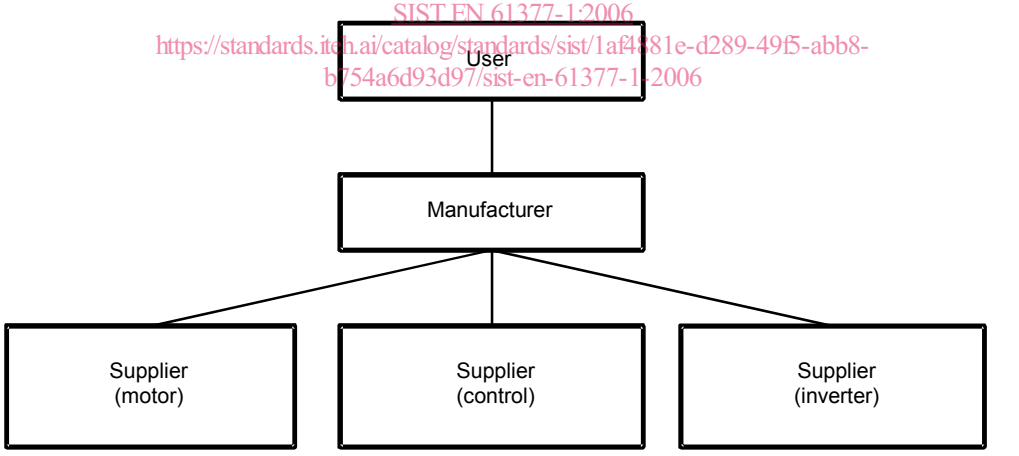
3.1
combined system
unit consisting of the inverter, the motor(s), their related control system, equivalent power cables connecting them, and an equivalent cooling system

3.2
user
organization which orders the combined system. The user is normally an organization which uses the vehicle or the equipment, unless the responsibility is delegated to a main contractor or consultant

3.3
manufacturer
organization which has the technical responsibility for the supply of the combined system

NOTE The manufacturer as defined above may also be the supplier of the motor, of the inverter, of the control, or of all of them, or of none of them.

3.4
supplier
organization which has the responsibility of one or more of the constituents of the combined system



3.5
manufacturer's works
location where tests are generally performed

3.6
duty
statement of the load to which the combined system is subjected, including, if applicable, electric braking, no load, rest and de-energized periods, including their durations and sequence in time