
**Železniške naprave – Vozna sredstva – Kombinirano preskušanje – 2. del:
Čopersko napajani enosmerni vlečni motorji in njihovo krmiljenje (IEC 61377-
2:2002)**

Railway applications - Rolling stock - Combined testing -- Part 2: Chopper-fed direct
current traction motors and their control

Bahnanwendungen - Bahnfahrzeuge - Kombinierte Prüfung -- Teil 2: Chopper-gepeiste
Gleichstrom-Bahnmotoren und deren Steuerung

Applications ferroviaires - Matériel roulant - Essais combinés -- Partie 2: Moteurs de
traction à courant continu alimentés par hacheur et leur régulation

Ta slovenski standard je istoveten z: EN 61377-2:2002

ICS:

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

SIST EN 61377-2:2003

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61377-2:2003

<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

EUROPEAN STANDARD

EN 61377-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2002

ICS 45.060

English version

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

Applications ferroviaires -

Matériel roulant -

Essais combinés

Partie 2: Moteurs de traction
à courant continu alimentéspar hacheur et leur régulation
(CEI 61377-2:2002)

Bahnanwendungen -

Bahnfahrzeuge -

Kombinierte Prüfung

Teil 2: Chopper-gespeiste Gleichstrom-
Bahnmotoren und deren Steuerung

(IEC 61377-2:2002)

[SIST EN 61377-2:2003](https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003)<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

This European Standard was approved by CENELEC on 2002-09-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

Foreword

The text of document 9/676/FDIS, future edition 1 of IEC 61377-2, 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 61377-2 on 2002-09-01.

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) 2003-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-09-01

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

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annex A is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61377-2:2002 was approved by CENELEC as a European Standard without any modification.

SIST EN 61377-2:2003

<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-411	1996	International Electrotechnical Vocabulary (IEV) Chapter 411: Rotating machines	-	-
IEC 60050-551	1998	Part 551: Power electronics	-	-
IEC 60050-811	1991	Chapter 811: Electric traction	-	-
IEC 60349-1	1999	Electric traction - Rotating electrical machines for rail and road vehicles Part 1: Machines other than electronic converter-fed alternating current motors	EN 60349-1	2000
IEC/TR2 60349-3	1995	Part 3: Determination of the total losses of converter-fed alternating current motors by summation of the component losses	-	-
IEC/TS 61287-2	2001	Power convertors installed on board railway rolling stock Part 2: Additional technical information	-	-
IEC 60571	1998	Electronic equipment used on rail vehicles	-	-
IEC 60850	2000	Railway applications - Supply voltages of traction systems	-	-
IEC 61287-1	1995	Power convertors installed on board rolling stock Part 1: Characteristics and test methods	-	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61377-2:2003

<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

NORME INTERNATIONALE INTERNATIONAL STANDARD

**CEI
IEC**

61377-2

Première édition
First edition
2002-06

Applications ferroviaires – Matériel roulant – Essais combinés –

Partie 2: Moteurs de traction à courant continu alimentés par hacheur et leur régulation

(standards.iteh.ai)

Railway applications – Rolling stock – Combined testing –

<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

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

© IEC 2002 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembe, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

T

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

FOREWORD.....	7
1 Scope and object.....	11
2 Normative references.....	13
3 Definitions	15
4 Combined system interfaces and characteristics	19
4.1 Specified interfaces	19
4.2 Specified characteristics	19
4.3 Declared characteristics	21
4.4 Combined system characteristics and values	21
4.5 Exchange of information and responsibility.....	23
5 Test categories.....	23
5.1 General	23
5.2 Type tests	23
5.3 Investigation tests.....	25
6 Tests.....	25
6.1 General	25
6.2 Test conditions	25
6.2.1 Cooling during the tests	25
6.2.2 Power cables	25
6.2.3 Power supply	25
6.2.4 Mechanical output measurement.....	27
6.3 Temperature-rise tests.....	27
6.3.1 General	27
6.3.2 Measurement of temperatures	27
6.4 Commutation test	27
6.5 Characteristic tests and tolerances	29
6.5.1 Torque characteristics	29
6.6 Protection system testing.....	31
6.6.1 Power supply for control equipment of the combined system	31
6.6.2 DC power supply.....	31
6.6.3 Short-time d.c. power supply interruption (optional type test)	31
6.6.4 Sudden variation of the supply voltage (optional type test).....	31
6.6.5 Harmonics in the input current of the chopper (optional type test)	31
6.6.6 Interference test (optional type test).....	31
6.7 Investigation tests.....	33
Annex A (informative) List of clauses in which agreement between user and manufacturer is mentioned	47

Figure 1 – Traction drive	11
Figure 2 – Mandatory external characteristics and optional internal characteristics for a combined system with chopper and d.c. series motor, in motoring configuration.....	35
Figure 3 – Mandatory external characteristics and optional internal characteristics for a combined system with chopper and separately excited d.c. motor, in motoring configuration	37
Figure 4 – Mandatory external characteristics and optional internal characteristics for a combined system with chopper and series or separately excited d.c. motor, in braking configuration	39
Figure 5 – Mandatory external characteristics and optional internal characteristics for a combined system with chopper and series or separately excited d.c. motor, in braking configuration	41
Figure 6 – Example of braking configuration for a combined system with separately excited d.c. motor	43
Figure 7 – Test-bed arrangement for back-to-back test of a chopper and d.c. motor combined system	43
Figure 8 – Example of circuit configuration for short-time d.c. power supply interruption.....	45
Figure 9 – Example of circuit configuration for sudden variation of supply voltage	45
Table 1 – List of tests	33

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61377-2:2003

<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RAILWAY APPLICATIONS – ROLLING STOCK – COMBINED TESTING –

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

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, express as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61377-2 has been prepared by IEC technical committee 9: Electric railway equipment.

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

FDIS	Report on voting
9/676/FDIS	9/682/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next revision.

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2009. At this date, the publication will be

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61377-2:2003

<https://standards.iteh.ai/catalog/standards/sist/1780c789-0b0f-411f-9ac5-e409eb30840e/sist-en-61377-2-2003>

RAILWAY APPLICATIONS ROLLING STOCK – COMBINED TESTING –

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

1 Scope and object

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

- the performance characteristics of electric drives consisting of a chopper, direct current motors, and the related control system;
- methods of verifying these performance characteristics by tests.

In traction drives, a combined system with chopper and direct current motor(s) without any control between the mechanical output and the chopper is not usual. It is not, therefore, considered in this standard.

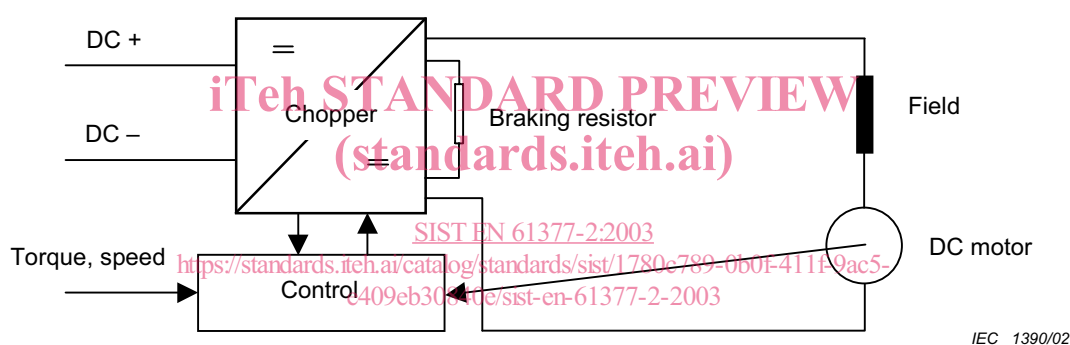
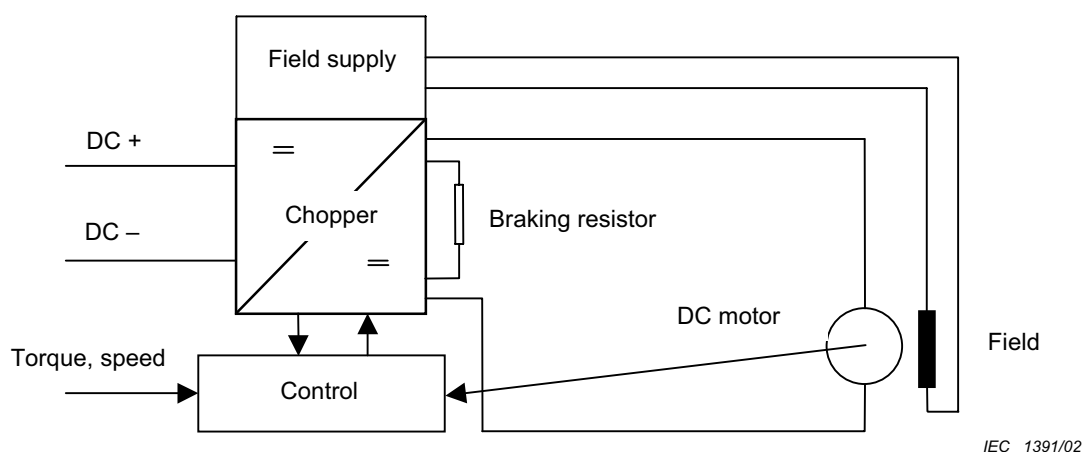


Figure 1a – Combined system with series d.c. motor



NOTE The smoothing reactor is considered as a part of the chopper.

Figure 1b – Combined system with separately excited d.c. motor

Figure 1 – Traction drive