SLOVENSKI STANDARD
SIST ENV 60349-2:1998

01-november-1998

Electric traction - Rotating electrical machines for rail and road vehicles - Part 2: Electronic converter-fed alternating current motors (IEC 60349-2:1993)

Electric traction - Rotating electrical machines for rail and road vehicles -- Part 2: Electronic converter-fed alternating current motors

Elektrische Zugförderung drehende elektrische Maschinen auf Schienen- und Straßenfahrzeugen -- Teil 2: Umrichtergespeiste Wechselstrommotoren

Traction électrique - Machines électriques tournantes des véhicules ferroviaires et routiers -- Partie 2: Moteurs à courant alternatif alimentés par convertisseur électronique

Ta slovenski standard je istoveten z: **ENV 60349-2:1993**

ICS:

29.160.30	Motorji	Motors
29.280	Električ na vleč na oprema	Electric traction equipment

SIST ENV 60349-2:1998 **en**

EUROPEAN PRESTANDARD

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ENV 60349-2

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Descriptors: Railway rolling stock, road vehicles, electric traction, rotating electric machines, electric motors, alternating current, electric power supply, electric converters, definitions, characteristics, heat limit, tests, acoustic measurements, verification, marking, name plates

ENGLISH VERSION

Electric traction - Rotating electrical machines for rail and road vehicles
Part 2: Electronic convertor-fed alternating current motors
(IEC 349-2:1993)

Traction électrique - Machines électriques tournantes des véhicules ferroviaires et routiers
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(CEI 349-2:1993)

Elektrische Zugförderung drehende elektrische Maschinen auf Schienen- und Straßenfahrzeugen
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(IEC 349-2:1993)

This European Prestandard (ENV) was approved by CENELEC on 1993-07-06 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CENELEC will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard (EN).

CENELEC members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, 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 09(CO)297, as prepared by IEC Technical Committee N° 9: Electric traction equipment, and adopted by the International Mixed Committee on Electric Traction Equipment (CMT), was submitted to the IEC-CENELEC parallel vote in May 1992.

The reference document was approved by CENELEC as ENV 60349-2 on 6 July 1993.

The following date was fixed:

- latest date of announcement of the ENV at national level (doa) 1993-10-01

Annexes designated "normative" are part of the body of the standard. In this standard, annexes A, B, C, D, E and ZA are normative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 349-2:1993 was approved by CENELEC as a European Prestandard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT 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.

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

IEC Publication	Date	Title	EN/HD	Date
34-2	1972	Rotating electrical machines Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicules)	HD 53.2 S1*	1982
34-5	1991*	Part 5: Classification of degrees of protection provided by enclosures of rotating electrical machines (IP code)	-	-
34-8 (mod)	1972	Part 8: Terminal markings and direction of rotation of rotating machines	HD 53.8 S4*	1993
34-14	1982	Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of the vibration severity	HD 53.14 S1*	1992
50(131)	1978	International Electrotechnical Vocabulary (IEV) - Chapter 131: Electric and magnetic circuits	-	-

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* HD 53.2 S1 is based on IEC 34-2:1972 + IEC 34-2A:1974
IEC 34-5:1981 is harmonized as EN 60034-5:1986
HD 53.8 S4 includes A1:1990 to IEC 34-8
HD 53.14 S1 includes A1:1988 to IEC 34-14

IEC Publication	Date	Title	EN/HD	Date
50(151)	1978	Chapter 151: Electrical and magnetic devices	-	-
50(411)	1973	Chapter 411: Rotating machines	-	-
50(811)	1991	Chapter 811: Electric traction	-	-
85	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
411-5	1992	Power convertors for electric traction Part 5: Electronic power convertors with multiphase output installed on board railway rolling stock	-	-
850	1988	Supply voltages of traction systems	-	-

Other publication

ISO/R70,1680:1970	Acoustics - Test code for the measurement of the airborne noise emitted by rotating electrical machinery

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Traction électrique – Machines électriques tournantes des véhicules ferroviaires et routiers –

Partie 2: Moteurs à courant alternatif alimentés par convertisseur électronique

Electric traction – Rotating electrical machines for rail and road vehicles –

Part 2: Electronic convertor-fed alternating current motors

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ELECTRIC TRACTION –

ROTATING ELECTRICAL MACHINES FOR RAIL AND ROAD VEHICLES –

Part 2: Electronic convertor-fed alternating current motors

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

This International Standard IEC 349-2 has been prepared by IEC Technical Committee No. 9: Electric traction equipment, and adopted by the International Mixed Committee on Electric Traction Equipment (CMT).

It constitutes the first edition of IEC 349-2 and supersedes the parts of IEC 349 (second edition, 1991) relating to electronic convertor-fed alternating current motors.

According to decisions made in Stockholm in 1991, IEC 349-2 will be completed by the following two documents which are in preparation:

1) a technical report of type 2 concerning the determination of the efficiency of motors by summation of losses (see 6.2.1, second paragraph);

b) a document on combined tests on alternating current motor-convertor assemblies.

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

DIS	Report on Voting
09(CO)297	09(CO)300

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

ELECTRIC TRACTION –

ROTATING ELECTRICAL MACHINES FOR RAIL AND ROAD VEHICLES –

Part 2: Electronic convertor-fed alternating current motors

SECTION 1: GENERAL

1.1 Scope and object

1.1.1 This part of IEC 349 applies to convertor-fed alternating current motors forming part of the equipment of electrically propelled rail and road vehicles.

The object of this part is to enable the performance of a motor to be confirmed by tests and to provide a basis for assessment of its suitability for a specified duty and for comparison with other motors.

Particular attention is drawn to the need for collaboration between the designers of the motor and its associated convertor as detailed in clause 3.1.

NOTES

1 This part also applies to motors installed on trailers hauled by powered vehicles.

2 The basic requirements of this part may be applied to motors for special purpose vehicles such as mine locomotives but this part does not cover flameproof or other special features that may be required.

3 It is not intended that this part should apply to motors on small road vehicles, such as battery-fed delivery vehicles, factory trucks, etc. This part also does not apply to minor machines such as windscreen wiper motors, etc. that may be used on all types of vehicles.

4 Industrial type motors complying with IEC 34 may be suitable for some auxiliary drives, providing that it is demonstrated that operation on a convertor supply will meet the requirements of the particular application.

1.1.2 The rating of traction motors fed in parallel by a common convertor shall take account of the effect on load-sharing of differences of wheel diameter and of motor characteristics and also of weight transfer when operating at high coefficients of adhesion. The user shall be informed of the maximum permissible difference in wheel diameter for the particular application.

1.1.3 The electrical input to motors covered by this part shall be from an electronic convertor.

NOTE - At the time of drafting this part only the following combinations of motors and convertors had been used for traction applications, but it may also apply to other combinations which may be used in the future:

- asynchronous motors fed by voltage source convertors;
- asynchronous motors fed by current source convertors;
- synchronous motors fed by current source convertors.

1.1.4 The motors covered by this part are classified as follows:

1.1.4.1 *Traction motors*

Motors for propelling rail or road vehicles.

1.1.4.2 *Auxiliary motors not covered by IEC 34*

Motors for driving compressors, fans, auxiliary generators or other auxiliary machines.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 349. All normative documents are subject to revision, and parties to agreements based on this part of IEC 349 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 34-2: 1972, *Rotating electrical machines – Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles).*

IEC 34-5: 1991, *Rotating electrical machines – Part 5: Classification of degrees of protection provided by enclosures of rotating machines (IP code).*

IEC 34-8: 1972, *Rotating electrical machines – Part 8: Terminal markings and direction of rotation of rotating machines.*

IEC 34-14: 1988, *Rotating electrical machines – Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher – Measurement, evaluation and limits of the vibration severity.*

IEC 50 (131): 1978, *International Electrotechnical Vocabulary – Chapter 131: Electric and magnetic circuits.*

IEC 50 (151): 1978, *International Electrotechnical Vocabulary – Chapter 151: Electrical and magnetic devices.*

IEC 50 (411): 1973, *International Electrotechnical Vocabulary – Chapter 411: Rotating machines.*

IEC 50 (811): 1991, *International Electrotechnical Vocabulary – Chapter 811: Electric traction.*

IEC 85: 1984, *Thermal evaluation and classification of electrical insulation.*

IEC 411-5: 1991, *Electronic power convertors with multiphase output installed onboard railway rolling stock.*

IEC 850: 1988, *Supply voltages of traction systems.*

ISO/R70, 1680: 1970, *Acoustics – Test code for the measurement of the airborne noise emitted by rotating electrical machinery.*