
Električna vleka – Rotacijski električni stroji za železniška in cestna vozila – 1. del: Stroji, razen elektronsko napajanih izmeničnih motorjev – Dopolnilo A1 (IEC 60349-1:1999/A1:2002)

Electric traction - Rotating electrical machines for rail and road vehicles -- Part 1: Machines other than electronic convertor-fed alternating current motors

Elektrische Zugförderung - Drehende elektrische Maschinen für Bahn- und Straßenfahrzeuge -- Teil 1: Elektrische Maschinen ausgenommen umrichter gespeiste Wechselstrommotoren

Traction électrique - Machines électriques tournantes des véhicules ferroviaires et routiers -- Partie 1: Machines autres que les moteurs à courant alternatif alimentés par convertisseur électronique

Ta slovenski standard je istoveten z: EN 60349-1:2000/A1:2002

ICS:

29.160.01	Rotacijski stroji na splošno	Rotating machinery in general
29.280	Električna vlečna oprema	Electric traction equipment

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EUROPEAN STANDARD

EN 60349-1/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2002

ICS 29.280; 45.060

English version

**Electric traction -
Rotating electrical machines for rail and road vehicles
Part 1: Machines other than electronic convertor-fed
alternating current motors
(IEC 60349-1:1999/A1:2002)**

Traction électrique -
Machines électriques tournantes
des véhicules ferroviaires et routiers
Partie 1: Machines autres que les moteurs
à courant alternatif alimentés
par convertisseur électronique
(CEI 60349-1:1999/A1:2002)

Elektrische Zugförderung -
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ausgenommen umrichter gespeiste
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This amendment A1 modifies the European Standard EN 60349-1:2000; it was approved by CENELEC on 2002-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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 9/683/FDIS, future amendment 1 to IEC 60349-1:1999, 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 amendment A1 to EN 60349-1:2000 on 2002-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2003-07-01
- latest date by which the national standards conflicting
with the amendment have to be withdrawn (dow) 2005-10-01

Annexes designated "informative" are given for information only.
In this standard, annex C is informative.

Endorsement notice

The text of amendment 1:2002 to the International Standard IEC 60349-1:1999 was approved by CENELEC as an amendment to the European Standard without any modification.

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

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IEC**

60349-1

1999

AMENDEMENT 1
AMENDMENT 1
2002-08

Amendement 1

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

STANDARD PREVIEW

Partie 1:

**Machines autres que les moteurs à courant
alternatif alimentés par convertisseur électronique**

[SIST EN 60349-1:2001/A1:2003](https://standards.iteh.ai/catalog/standards/sist/90f5741a-206f-49d5-829b-889ccfb0273e/sist-en-60349-1-2001-a1-2003)

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Amendment 1

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

Part 1:

**Machines other than electronic convertor-fed
alternating current motors**

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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For price, see current catalogue*

FOREWORD

This amendment has been prepared by IEC technical committee 9: Electric railway equipment.

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

FDIS	Report on voting
9/683/FDIS	9/700/RVD

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

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2007. At this date, the publication will be

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

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Annex C (informative) Noise

Replace the existing title of this annex by the following :

Annex C (informative) Noise measurement and limits

Tableau C.3 Limiting mean sound power level for airborne noise emitted by rotating electrical machines for rail and road vehicles other than traction motors

Replace the existing title of this table by the following:

Tableau C.3 Correction for pure tones

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Annex C

Replace the existing annex C by the following:

Annex C (informative)

Noise measurement and limits

C.1 Noise measurement

If noise measurement is required, this should be specified by the user and carried out on one machine only or the order. If however, a test record showing that the noise requirements have been met on an identical machine, constructed on a previous occasion, using the test method detailed in this annex, or a previous edition of IEC 60349, is deemed acceptable to the user, this may be regarded as meeting the requirement for noise measurement.

C.2 Terms and definitions

For the purposes of this annex, the following terms and definitions are used.

C.2.1

sound pressure level

sound pressure level L_p , expressed as

$$L_p = 20 \log_{10} \frac{p}{p_0} \quad \text{in dB}$$

where

p is the measured sound pressure;

p_0 is the reference sound pressure expressed in the same units as p .

$$p_0 = 2 \cdot 10^{-5} \text{ Pa or } 20 \text{ } \mu\text{Pa}$$

C.2.2

sound level

reading given by a sound level meter complying with IEC 60651.

C.2.3

noise spectrum

spectrum showing the sound pressure level distribution throughout the frequency range. The appearance of the spectrum depends on the bandwidth characteristics of the analyser used.

C.2.4

band pressure level

for a specified frequency band, the effective sound pressure level corresponding to the sound energy contained within the band

C.2.5

sound power level

sound power level L_w , is expressed as

$$L_w = 10 \log_{10} \frac{W}{W_0} \quad \text{in dB}$$

where

W is the measured sound power;

W_0 is the reference sound power expressed in the same unit as W

$$W_0 = 10^{-12} W \text{ (or 1 pW)}$$

NOTE L_{WA} is a weighted sound power level determined in such a manner that the acoustic power level in each of the frequency bands is weighted according to the A scale.

C.2.6

prescribed path

imaginary line around the machine as detailed in this annex and along which the measurement points are located

C.2.7

equivalent hemisphere

hypothetical hemisphere surrounding the machine on which the measurements are assumed to be made, its radius being denoted by r_s

C.3 Test conditions

C.3.1 Preparation of the machine

Structure-borne vibrations from a machine to its mounting, or other parts of the test room, can influence the sound pressure level in the test room. Such effects should be minimised, for example by mounting the machine on suitably designed resilient mountings.

The machine is fully assembled with all covers in position and is not coupled to any other equipment. Traction motors are tested without their associated gears.

Separately ventilated machines are tested with their normal airflow but the ventilation fan is arranged so that its own noise does not significantly affect the results.

C.3.2 Operating conditions

The machine should be run on no-load at its normal operating speed or, if there is a speed range, at the maximum working speed of the application. A machine designed to operate at two or more discrete speeds should be tested at each of those speeds. A reversible machine should be tested in both directions of rotation.

C.3.3 Background noise

The results of the measurement at each measuring point should be corrected for the effects of any background noise i.e. any noise at the points of measurement other than that of the machine being tested. It also includes the noise of any test equipment.

The background noise reading when the machine is not under test should be determined, for each octave band, at the same points as for the test. The readings at each point with the machine under test ought to exceed those due to the background noise alone by at least 10 dB. When the differences are less than 10 dB, corrections as given table C.1 should be applied.

Table C.1 – Corrections

Decibel increase in level produced by the machine	Decibels to be subtracted from the measured values
3	3
4 to 5	2
6 to 9	1

When corrections of 3 dB are applied, the corrected levels should be reported in brackets.

When the increase is less than 3 dB, measurements in general cease to have any significance.

C.4 Measuring instruments

C.4.1 Grade

The sound level meter should be of type 1 as specified in IEC 60651.

Any filters used for noise analyses should be of class 1 as specified in IEC 61260.

C.4.2 Calibration of measuring equipment

The overall acoustic performance of the complete measuring equipment should be checked, and any specified adjustments made, immediately before each series of machine noise measurements and re-checking should be carried out immediately after.

These site checks should be augmented by detailed laboratory calibrations of the whole measuring equipment carried out at least once every two years.

C.4.3 Location of instruments and observer

Any measuring amplifiers or filters should be at least 0,3 m and the observer should be at least 1 m from the microphone to reduce errors due to reflections.

When the noise radiated from a machine has marked directivity, measurement of the machine noise under semi-reverberant conditions should be regarded as an approximate method of machine noise measurement.

C.5 Method of measurement

C.5.1 Method

For all machines, measurements should be made on the prescribed paths, shown in figure C.2 or C.3.

For machines having a maximum linear dimension l (excluding shaft) equal to or exceeding 0,25 m these rectilinear paths are, at their nearest point, 1 m from the surface of the machine.