

**Elektrilise ajamiga maantesõidukid.  
Spetsiifilised ohutusnõuded. Osa 3:  
Kasutajate kaitsmine elektriohu eest**

Electrically propelled road vehicles - Specific requirements for safety - Part 3: Protection of users against electrical hazards

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1987-3:2000 sisaldab Euroopa standardi EN 1987-3:1998 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1987-3:2000 consists of the English text of the European standard EN 1987-3:1998.</p> <p>This document is endorsed on 11.01.2000 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>
--	---

<p><b>Käsitlusala:</b> Käesolev standard määrab kindlaks nõuded elektrilise ajamiga sõidukite elektriohutuse mõttes, kui sõiduk ei ole välise vooluvõrguga ühendatud. Kehtib elektrisõidukite kohta, kus üheski elektriahelas ei esine üle 750 V või 500 V vahelduvpinget.</p>	<p><b>Scope:</b></p>
--	----------------------

ICS 43.120

**Võtmesõnad:** elektrisõidukid, kaitseaste, kaitsmine elektripinge all olevate osade eest, klassifikatsioonid, maanteesõidukid, ohutus, tehnilised andmed, testimised, õnnetuste ennetamine

ICS 13.260; 43.120

English version

Electrically propelled road vehicles – Specific requirements for safety

Part 3: Protection of users against electrical hazards

Véhicules routiers à propulsion électrique – Prescriptions particulières pour la sécurité – Partie 3: Protection des usagers contre les dangers électriques

Elektrisch angetriebene Straßenfahrzeuge – Besondere Festlegungen für die Sicherheit – Teil 3: Schutz der Benutzer gegen elektrische Gefahren

This European Standard was approved by CEN on 1997-12-04.

CEN 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 CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

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

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

<b>Contents</b>	<b>Page</b>
<b>Foreword</b>	<b>3</b>
<b>1 Scope</b>	<b>4</b>
<b>2 Normative references</b>	<b>4</b>
<b>3 Definitions</b>	<b>4</b>
3.1 conductive part	4
3.2 live part	4
3.3 exposed conductive part	5
3.4 electrical circuit	5
3.5 nominal voltage of an electrical system	5
3.6 working voltage of an electrical circuit	5
3.7 auxiliary function	5
3.8 auxiliary electrical circuit	5
3.9 power circuit	5
3.10 electrical chassis	6
3.11 direct contact	6
3.12 indirect contact	6
3.13 basic insulation	6
3.14 supplementary insulation	6
3.15 double insulation	6
3.16 reinforced insulation	6
3.17 protection degree	7
3.18 class I equipment	7
3.19 class II equipment	7
3.20 opening parts	7
3.21 temperature rise	7
3.22 ground clearance between the axles	7
<b>4 Voltage classes of an electrical circuit</b>	<b>8</b>
<b>5 Protection against direct contacts</b>	<b>8</b>
5.1 Class A	8
5.2 Class B	8
<b>6 Protection against indirect contacts</b>	<b>9</b>
6.1 Class A	10
6.2 Class B	10
6.3 Test procedure	11
<b>7 Protection against temperature rise</b>	<b>13</b>
7.1 Requirements towards temperature rise	13
7.2 Requirements towards temperature rise by overcurrent	13
<b>8 Protection against water effects</b>	<b>13</b>
8.1 Test procedure	13
8.2 Requirements	15
<b>Annex A (normative) - Hose nozzle for IPX5 test</b>	<b>15</b>
<b>Annex B (normative) - Spray nozzle (brass) for IPX3 test</b>	<b>16</b>
<b>Annex C (informative) - Bibliography</b>	<b>17</b>

## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 301 "Electrically propelled road vehicles", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1998, and conflicting national standards shall be withdrawn at the latest by July 1998.

This EN 1987 consists of the following parts, under the general title "Electrically propelled road vehicles - Specific requirements for safety :

- Part 1 : On board energy storage ;
- Part 2 : Functional safety and protection against failure ;
- Part 3 : Protection of users against electrical hazards.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This standard specifies the requirements for electrically propelled road vehicles in terms of electrical safety, when the electrical vehicle is not connected to the external power supply. This is applicable to electric vehicles for which the maximum working voltage of any electrical circuit is 750 V dc or 500 V ac.

## 2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at 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.

EN 1987-1 : 1997, Electrically propelled road vehicles - Specific requirements for safety  
- Part 1 : on board energy storage.

EN 60 529 : 1991, Degree of protection provided by enclosures (IP codes) (IEC 529 : 1989).

ISO 3864 : 1984, Safety colours and safety signs.

IEC 417K : 1991, Graphical symbols for use on equipment. Index, survey and compilation of the single sheets - Tenth supplement.

IEC 536 : 1976, Classification of electrical and electronic equipment with regard to protection against electric shock.

## 3 Definitions

For the purposes of this standard, the following definitions apply.

### 3.1 conductive part

A conductive part is a part which is capable of conducting current although it can not necessarily be energized in normal operating conditions.

### 3.2 live part

A live part is any conductor or conductive part intended to be electrically energized in normal use.