



**SLOVENSKI STANDARD**  
**SIST EN 60118-4:2002**

**01-september-2002**

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**Hearing aids - Part 4: Magnetic field strength in audio-frequency induction loops for hearing aid purposes (IEC 60118-4:1981)**

Hearing aids -- Part 4: Magnetic field strength in audio-frequency induction loops for hearing aid purposes

Hörgeräte -- Teil 4: Magnetische Feldstärke in Sprechfrequenz-Induktionsschleifen für Hörgeräte

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Appareils de correction auditive -- Partie 4: Intensité du champ magnétique dans les boucles d'induction audiofréquences utilisées à des fins de correction auditive

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**Ta slovenski standard je istoveten z: EN 60118-4:1998**

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**ICS:**

11.180.15 Ú!ā [ { [ \ á æ ] ~ @ Á • ^ à ^ Á A Aids for deaf and hearing impaired people  
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**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 60118-4**

August 1998

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Descriptors: Hearing aids, induction loop, audio frequency

English version

**Hearing aids**  
**Part 4: Magnetic field strength in audio-frequency induction loops**  
**for hearing aid purposes**  
**(IEC 60118-4:1981)**

Appareils de correction auditive  
Partie 4: Intensité du champ magnétique  
dans les boucles d'induction  
audiofréquences utilisées à des fins de  
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(CEI 60118-4:1981)

Hörgeräte  
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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 the International Standard IEC 60118-4:1981, prepared by IEC TC 29, Electroacoustics, was approved by CENELEC as HD 450.4 S1 on 1984-09-11.

This Harmonization Document was submitted to the formal vote for conversion into a European Standard and was approved by CENELEC as EN 60118-4 on 1998-08-01.

The following date was 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) 1999-05-01

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### Endorsement notice

The text of the International Standard IEC 60118-4:1981 was approved by CENELEC as a European Standard without any modification.

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Quatrième partie: Intensité du champ magnétique dans les boucles d'induction audiofréquences  
utilisées à des fins de correction auditive

iTeh STANDARD PREVIEW

Methods of measurement of electro-acoustical  
characteristics of hearing aids

Part 4: Magnetic field strength in audio-frequency induction loops  
for hearing aid purposes

**Mots clés:** appareils de correction auditive à transmission inductive; boucles d'induction; intensité du champ magnétique.

**Key words:** hearing aids for inductive transmission; induction loops; magnetic field strength.



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**METHODS OF MEASUREMENT OF ELECTRO-ACOUSTICAL  
CHARACTERISTICS OF HEARING AIDS**
**Part 4: Magnetic field strength in audio-frequency induction loops  
for hearing aid purposes**


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## 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.

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PREFACE

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This standard has been prepared by IEC Technical Committee No. 29: Electro-acoustics.

A first draft was discussed at the meeting held in Stockholm in 1979. As a result of this meeting, a draft, Document 29(Central Office)113, was submitted to the National Committees for approval under the Six Months' Rule in August 1979.

The National Committees of the following countries voted explicitly in favour of publication:

Australia	Norway
Austria	Poland
Belgium	Romania
Canada	South Africa (Republic of)
Denmark	Spain
Germany	Sweden
Hungary	Turkey
Italy	United Kingdom
Japan	United States of America
Netherlands	

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## METHODS OF MEASUREMENT OF ELECTRO-ACOUSTICAL CHARACTERISTICS OF HEARING AIDS

### Part 4: Magnetic field strength in audio-frequency induction loops for hearing aid purposes

#### INTRODUCTION

Induction loop systems generate an alternating magnetic field which may be detected, over a definable area, by receivers equipped with induction pick-up coils. Induction loop systems are used for various applications, e.g. in public address, paging and simultaneous interpretation systems, and as an aid for the hearing-impaired. Audio-frequency induction loop systems, in particular, are often employed in schools for hearing-impaired children, as attachments to domestic radio and television receivers and in churches, theatres and cinemas, for the benefit of hearing-impaired people.

The pick-up device for an audio-frequency induction loop system will usually be a personal hearing aid, of a type fitted with a pick-up coil; however, special induction loop receivers may be used in certain applications. Transmission of an audio-frequency signal via an induction loop system can often establish an acceptable signal-to-noise ratio in conditions where a purely acoustical transmission would be degraded by reverberation and background noise.

The use of personal hearing aids as loop system receivers enables the wearers of these aids to take advantage of induction loop signal transmission wherever such loops are provided. For this advantage to be most effective it is necessary for a standard value of magnetic field strength to be adopted, thus allowing a corresponding adjustment of the sensitivity of the pick-up coil in the hearing aid. The magnetic field strength must be chosen so that:

- a) it is high enough to produce an acceptable signal-to-noise ratio over ambient electro-magnetic noise from power installations, etc.;
- b) it is not so high as to cause overloading of the hearing aid.

The value of magnetic field strength recommended in this standard has been chosen so that these requirements are met. The lower limit of magnetic field strength is governed by the expected level of ambient electro-magnetic noise, measurements of which have been made in a number of homes, churches, schools, theatres, etc., in order to determine typical values. Measurements have also been made on hearing aids currently in use, to determine an acceptable range of input levels and on which the higher limit is based.

An induction loop system will typically incorporate a driving amplifier which is not specified in this standard. However, a recommendation of the frequency dependence of the magnetic field strength is included.

The recommended value for magnetic field strength may also be applicable to transmitting coils intended for very short range (i.e. close contact) inductive coupling of other devices, such as radio and television receivers, to hearing aids.

In the case of large areas or magnetic disturbances from mains or lighting regulation systems, it may be necessary to deviate from this standard or refrain from using an induction loop system.

## 1. Scope

This standard applies to audio-frequency induction loop systems producing an alternating magnetic field and intended to provide an input signal for hearing aids operating with an induction pick-up coil.

## 2. Object

The object of this standard is to specify a standard value of magnetic field strength in audio-frequency induction loops for hearing aid purposes, such as will give an adequate signal-to-noise ratio without overloading the hearing aid.

## 3. Explanation of terms

### 3.1 *Recommended average value for magnetic field strength*

The magnetic field strength obtainable within a specified area, corresponding to the long-time average of the speech signal applied to the system.

### 3.2 *Maximum magnetic field strength*

The magnetic field strength obtainable within a specified area, corresponding to the maximum short-time average of the speech signal (approximately 0.125 s, referring to the integration time used during the averaging process) applied to the system.

### 3.3 *Specified magnetic field area*

The area within which the hearing aid induction coil will be located under normal use of the hearing aid and within which the magnetic field strength is required to meet the recommended specifications.

*Note.* — The specified magnetic field area is not necessarily the geometrical area of the plane of the induction loop.

### 3.4 *Specified vector component of the magnetic field strength*

3.4.1 For many purposes, such as in spaces where the users of hearing aids are standing or sitting in upright positions, the vertical component of the magnetic field will be the significant one. In such cases the specified vector component relates to the vertical component. If other field components may be of importance, these should be reported and the direction stated.

3.4.2 For other cases, such as small transmitting coils used for close contact coupling, orientation of the coil for maximum sensitivity may be possible. Therefore the specified vector component relates to the field strength at the location and in the direction for maximum sensitivity of the user's induction pick-up coil.