



# SLOVENSKI STANDARD

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**Elektroakustika - Slušni pripomočki - 4. del: Sistemi z indukcijsko zanko za slušne pripomočke - Zahteve sistema**

Electroacoustics - Hearing aids - Part 4: Induction loop systems for hearing aid purposes - System performance requirements

Akustik - Hörgeräte - Teil 4: Induktionsschleifen für Hörgeräte - Leistungsanforderungen

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Electroacoustique - Appareils de correction auditive - Partie 4: Systèmes de boucles d'induction utilisées à des fins - Exigences de performances système

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17.140.50	Elektroakustika	Electroacoustics

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EUROPEAN STANDARD

**EN 60118-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2015

ICS 17.140.50

Supersedes EN 60118-4:2006

English Version

Electroacoustics - Hearing aids -  
Part 4: Induction-loop systems for hearing aid purposes - System  
performance requirements  
(IEC 60118-4:2014)

Électroacoustique - Appareils de correction auditive -  
Partie 4: Systèmes de boucles d'induction utilisées à des  
fins de correction auditive - Exigences de performances  
système  
(IEC 60118-4:2014)

Akustik - Hörgeräte -  
Teil 4: Induktionsschleifen für Hörgeräte -  
Leistungsanforderungen  
(IEC 60118-4:2014)

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of document 29/855/FDIS, future edition 3 of IEC 60118-4, prepared by IEC TC 29, Electroacoustics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60118-4:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-10-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-01-15

This document supersedes EN 60118-4:2006.

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The text of the International Standard IEC 60118-4:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61938	NOTE	Harmonised as EN 61938.
IEC 61260-1	NOTE	Harmonised as EN 61260-1.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60268-3	2013	Sound system equipment -- Part 3: Amplifiers	EN 60268-3	2013
IEC 60268-10	1991	Sound system equipment -- Part 10: Peak programme level meters	HD 483.10 S1	1993
IEC 61672-1	2013	Electroacoustics - Sound level meters -- Part 1: Specifications	EN 61672-1	2013
IEC 62489-1	2010	Electroacoustics - Audio frequency induction loop systems for assisted hearing -- Part 1: Methods of measuring and specifying the performance of system components	EN 62489-1	2010

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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Electroacoustics – Hearing aids –**  
**Part 4: Induction-loop systems for hearing aid purposes – System performance requirements**

**Électroacoustique – Appareils de correction auditive –**  
**Partie 4: Systèmes de boucles d'induction utilisées à des fins de correction auditive – Exigences de performances système**

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## CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references .....	9
3 Terms and definitions .....	9
4 General .....	10
4.1 Procedure for setting up and commissioning an audio-frequency induction loop system .....	10
4.2 Suitability of the site for the installation of an audio-frequency induction-loop system.....	10
4.3 Relation of the magnetic field strength level at the telecoil to the sound pressure level at the microphone.....	11
5 Using components of a sound system in an induction-loop system .....	11
5.1 General.....	11
5.2 Microphones .....	11
5.3 Mixer .....	11
5.4 Power amplifier.....	11
6 Meters and test signals.....	11
6.1 Meters .....	11
6.1.1 Meters in general.....	11
6.1.2 Requirements common to both types.....	11
6.1.3 True-r.m.s. meter.....	12
6.1.4 Peak programme meter (PPM).....	12
6.2 Test signals in general.....	12
6.3 Speech signals .....	13
6.3.1 Live speech signals .....	13
6.3.2 Recorded speech material .....	13
6.3.3 Simulated speech material.....	13
6.4 Pink noise signal.....	13
6.5 Sinusoidal signal.....	13
6.6 Combi signal.....	14
7 Magnetic background noise level of the installation site .....	14
7.1 Method of measurement .....	14
7.2 Recommended maximum magnetic noise levels.....	15
8 Characteristics to be specified, methods of measurement and requirements.....	15
8.1 General.....	15
8.2 Magnetic field strength.....	16
8.2.1 Characteristic to be specified.....	16
8.2.2 Method of measurement with a simulated speech signal.....	16
8.2.3 Method of measurement with pink noise .....	17
8.2.4 Method of measurement with a sinusoidal signal .....	17
8.2.5 Method of measurement with a combi signal.....	17
8.2.6 Method of measurement – Other.....	17
8.2.7 Requirements .....	17
8.3 Frequency response of the magnetic field .....	18
8.3.1 Characteristic to be specified.....	18



8.3.2	Method of measurement with a simulated speech signal .....	18
8.3.3	Method of measurement with pink noise .....	18
8.3.4	Method of measurement with a sinusoidal signal .....	18
8.3.5	Method of measurement with combi signal .....	19
8.3.6	Method of measurement – Other .....	19
8.3.7	Requirements .....	19
8.4	Useful magnetic field volume .....	19
8.4.1	Characteristic to be specified .....	19
8.4.2	Methods of measurement .....	19
8.4.3	Requirements .....	19
9	Small-volume systems .....	19
9.1	Inapplicability of the 'useful magnetic field volume' concept .....	19
9.2	Disabled refuge and similar call-points .....	20
9.3	Requirements for disabled refuge and similar call-points .....	22
9.4	Counter systems .....	22
9.5	Requirements for counter systems .....	24
10	Setting up (commissioning) the system .....	24
10.1	Procedure .....	24
10.2	Magnetic noise level due to the system .....	24
10.2.1	Explanation of term .....	24
10.2.2	Method of measurement with a speech signal .....	24
10.2.3	Method of measurement with pink noise .....	25
10.2.4	Method of measurement with a sinusoidal signal .....	25
10.2.5	Method of measurement with a combi signal .....	25
10.2.6	Method of measurement – Other (no input signal) .....	25
10.2.7	Requirements .....	25
10.3	Amplifier overload at 1,6 kHz .....	25
10.3.1	Explanation of term .....	25
10.3.2	Methods of test .....	25
10.4	Requirements .....	25
Annex A (informative)	Systems for small useful magnetic field volumes .....	27
A.1	Overview .....	27
A.2	Body-worn audio systems .....	27
A.3	Small volume, defined seating, mainly in households .....	27
A.4	Specific locations such as help and information points, ticket and bank counters, etc. ....	27
Annex B (informative)	Measuring equipment .....	30
B.1	Overview .....	30
B.2	Signal sources .....	30
B.2.1	Real speech .....	30
B.2.2	Simulated speech .....	30
B.2.3	Pink noise .....	30
B.2.4	Sine wave .....	30
B.3	Magnetic field strength level meter .....	31
B.3.1	General recommendations .....	31
B.3.2	Peak-programme meter (PPM) type .....	31
B.3.3	True r.m.s. meter type .....	31
B.4	Field strength level meter calibrator .....	32
B.5	Spectrum analyzer .....	32

Annex C (informative) Provision of information.....	33
C.1 General.....	33
C.2 Information to be provided to the hearing aid user .....	33
C.3 Information to be provided to system installers and by them to users .....	34
C.4 Information to be provided by the manufacturer of the amplifying equipment.....	34
Annex D (informative) Measuring speech signals .....	35
Annex E (informative) Basic theory and practice of audio-frequency induction-loop systems .....	36
E.1 Properties of the loop and its magnetic field.....	36
E.2 Directional response of the telecoil of a hearing aid .....	37
E.3 Supplying the loop current .....	42
E.4 Signal sources and cables .....	43
E.4.1 Microphones .....	43
E.4.2 Other signal sources.....	44
E.4.3 Cables .....	44
E.5 Care of the system.....	44
E.6 Magnetic units .....	44
Annex F (informative) Effects of metal in the building structure on the magnetic field.....	45
Annex G (informative) Calibration of field-strength meters .....	47
Annex H (informative) Effect of the aspect ratio of the loop on the magnetic field strength .....	49
H.1 Overview.....	49
H.2 Effect of aspect ratio on field patterns .....	49
Annex I (informative) Overspill of magnetic field from an induction-loop system .....	51
I.1 General.....	51
I.2 Examples of overspill issues .....	51
I.3 Addressing overspill issues.....	51
Bibliography.....	53
Figure 1 – Flow chart for the operations in this standard .....	10
Figure 2 – Measurement points for disabled refuge and similar call-points .....	21
Figure 3 – Measurement points for a counter system .....	23
Figure A.1 – Field pattern of a vertical loop.....	28
Figure A.2 – Contour plot of field strength of vertical loop .....	29
Figure C.1 – Graphical symbol: inductive coupling .....	33
Figure E.1 – Perspective view of a loop, showing the magnetic field vector paths .....	37
Figure E.2 – Strengths of the components of the magnetic field due to current in a horizontal rectangular loop at points in a plane above or below the loop plane.....	38
Figure E.3 – Field patterns of the vertical component of the magnetic field of a horizontal loop .....	39
Figure E.4 – Field patterns of the vertical component of the magnetic field of a vertical loop 0,75 m square .....	40
Figure E.5 – Perspective view of the variation of the vertical field strength level at an optimum height above a horizontal rectangular loop.....	41
Figure E.6 – Directional response of the magnetic pick-up coil (telecoil) of a hearing aid .....	42
Figure F.1 – Magnetic field pattern of a 10 m by 14 m loop, 1,2 m above its plane .....	45

Figure F.2 – Magnetic field pattern of a 10 m by 14 m loop, 1,2 m above its plane, showing the effect of metal (iron) in the floor .....	46
Figure G.1 – Triple Helmholtz coil for calibration of meters .....	47
Figure H.1 – Variation of the current required to produce a specified magnetic field strength at a specific point with the dimensions and aspect ratio of the loop .....	49
Figure H.2 – Square and rectangular loops .....	50
Table 1 – Application of signals .....	12
Table 2 – Specification of the combi signal .....	14
Table 3 – Magnetic field strengths typically produced by different test signals, with an amplifier having peak-detecting AGC .....	17

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**ELECTROACOUSTICS –  
HEARING AIDS –****Part 4: Induction-loop systems for hearing aid purposes –  
System performance requirements**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60118-4 has been prepared by IEC technical committee 29: Electroacoustics.

This third edition cancels and replaces the second edition published in 2006. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: Addition of Annexes G, H and I where more information is provided about practical considerations and methods of measurement.

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

FDIS	Report on voting
29/855/FDIS	29/861/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 2.

A list of all parts of the IEC 60118 series, published under the general title *Electroacoustics – Hearing aids*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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## INTRODUCTION

Audio-frequency induction-loop systems are widely used to provide a means for hearing aid users, whose hearing aids are fitted with induction pick-up coils, generally known as 'telecoils', to minimise the problems of listening when at a distance from a source of sound, shielded from the person speaking by a protective window, and/or in a background noise. Background noise and distance are two of the main causes of hearing aid users being unable to hear satisfactorily in other than face-to-face quiet conditions. Induction-loop systems have been widely installed in churches, theatres and cinemas, for the benefit of hearing-impaired people. The use of induction-loop systems has been extended to many transient communication situations such as ticket offices, bank counters, drive-in/drive-through service locations, lifts/elevators etc. The widespread provision of telephone handsets that provide inductive coupling to hearing aids is another significant application, where ITU-T Recommendation P370 [1]<sup>1</sup> applies.

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 significantly degraded by reverberation and background noise.

One form of audio frequency induction-loop system comprises a cable installed in the form of a loop usually around the perimeter of a room or area in which a group of hearing impaired persons wish to listen. The cable is connected via an amplifier to a microphone system or other source of audio signal, such as a radio receiver, CD player etc. The amplifier produces an audio-frequency electric current in the induction loop cable, causing a magnetic field to be produced inside the loop. The design and implementation of the induction loop is determined by the construction of the building in which it is installed, particularly by the presence of large amounts of iron, steel or aluminium in the structure. In addition the layout and position of electrical cables and equipment may generate high levels of background audio frequency magnetic fields that may interfere with the reception of the loop signal.

Another form of induction-loop system employs a small loop, intended for communication with a hearing-aid user in its immediate vicinity. Examples are: neck loops, ticket-counter systems, self-contained 'portable' systems and chairs incorporating induction loops. (See Annex A)

The pick-up device for an audio-frequency induction-loop system is usually a personal hearing aid, of a type fitted with a pick-up coil (telecoil); however, special induction loop receivers may be used in certain applications.

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<sup>1</sup> Numbers in square brackets refer to the Bibliography.

## ELECTROACOUSTICS – HEARING AIDS –

### Part 4: Induction-loop systems for hearing aid purposes – System performance requirements

#### 1 Scope

This part of IEC 60118 is applicable to audio-frequency induction-loop systems producing an alternating magnetic field at audio frequencies and intended to provide an input signal for hearing aids operating with an induction pick-up coil (telecoil). Throughout this standard, it is assumed that the hearing aids used with it conform to all relevant parts of IEC 60118.

This standard specifies requirements for the field strength in audio-frequency induction loops for hearing aid purposes, which will give adequate signal-to-noise ratio without overloading the hearing aid. The standard also specifies the minimum frequency response requirements for acceptable intelligibility.

Methods for measuring the magnetic field strength are specified, and information is given on appropriate measuring equipment (see Annex B), information that should be provided to the operator and users of the system (see Annex C), and other important considerations.

This standard does not specify requirements for loop driver amplifiers or associated microphone or audio signal sources, which are dealt with in IEC 62489-1, or for the field strength produced by equipment, such as telephone handsets, within the scope of ITU-T P.370.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60268-3:2013, *Sound system equipment – Part 3: Amplifiers*

IEC 60268-10:1991, *Sound system equipment – Part 10: Peak programme level meters*

IEC 61672-1:2013, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 62489-1:2010, *Electroacoustics – Audio-frequency induction-loop systems for assisted hearing – Part 1: Methods of measuring and specifying the performance of system components*

#### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

##### 3.1

##### **reference magnetic field strength level**

level of 0 dB referred to a magnetic field strength of 400 mA/m