SLOVENSKI STANDARD

SIST EN 60118-2:2004

julij 2004

Hearing aids - Part 2: Hearing aids with automatic gain control circuits (IEC 60118-2:1983 + A1:1993)

ICS 11.180.15

Referenčna številka
SIST EN 60118-2:2004(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60118-2

November 1995

UDC 534.773.2:621.395.92:621.395.665:620.1:621.317.6

Supersedes HD 450.2 S1:1984

Descriptors: Electromedical device, hearing aid, automatic gain control, definitions, measurement procedures

English version

Hearing aids
Part 2: Hearing aids with automatic gain control circuits
(IEC 118-2:1983 + A1:1993)

Appareils de correction auditive
Partie 2: Appareils de correction auditive comportant des commandes automatiques de gain
(CEI 118-2:1983 + A1:1993)

Hörgeräte
Teil 2: Hörgeräte mit automatischer Verstärkungsregelung
(IEC 118-2:1983 + A1:1993)

This European Standard was approved by CENELEC on 1994-03-08. CENELEC 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 CENELEC member.

This European Standard 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, 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

Ref. No. EN 60118-2:1995 E

Foreword

The text of the International Standard IEC 118-2:1983, prepared by IEC TC 29, Electroacoustics, was approved by CENELEC as HD 450.2 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 60118-2 on 1994-03-08.

The text of amendment 1:1993 to the International Standard IEC 118-2:1983 was submitted to the formal vote and was approved by CENELEC as amendment A1 to EN 60118-2 on 1994-03-08 without any modification.

Having first withheld the publication of EN 60118-2 and its A1, the Technical Board of CENELEC has allowed on 1995-09-20 the circulation of the definitive version of EN 60118-2 with incorporation of its amendment A1.

The following dates were 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) 1996-07-01
- latest date by which the national standards conflicting with the European Standard have to be withdrawn (dow) 1996-07-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 118-2:1983 + A1:1993 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding 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 (including amendments).

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

Publication	Year	Title	EN/HD	Year
IEC 118-0	1983	Hearing aids Part 0: Measurement of electroacoustical characteristics	EN 60118-0	1993
IEC 118-1	1983	Part 1: Hearing aids with induction pick-up coil input	HD 450.1 S1[1]	1984
IEC 118-6	1984	Part 6: Characteristics of electrical input circuits for hearing aids	HD 450.6 S1	1986
IEC 263	1982	Scales and sizes for plotting frequency characteristics and polar diagrams	-	-
IEC 268-8	1973	Sound system equipment Part 8: Automatic gain control devices	-	-

1) HD 450.1 S1 is superseded by EN 60118-1:1995, which is based on IEC 118-1:1995.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
118-2

Deuxième édition
Second edition
1983-01

Appareils de correction auditive

Deuxième partie: Appareils de correction auditive comportant des commandes automatiques de gain

Hearing aids

Part 2: Hearing aids with automatic gain control circuits

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site http: //www.iec.ch

IEC Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE J

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HEARING AIDS

Part 2: Hearing aids with automatic gain control circuits

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.

PREFACE TO THE FIRST EDITION

This standard has been prepared by IEC Technical Committee No. 29: Electroacoustics.

Work was started at the meeting held in Moscow in 1974.

The first draft was discussed at the meeting held in Gaithersburg in 1976. As a result of this meeting, a draft, Document 29(Central Office)107, was submitted to the National Committees for approval under the Six Months' Rule in September 1976.

The following countries voted explicitly in favour of publication:

Australia	Germany	Spain
Belgium	Italy	Sweden
Canada	Japan	Switzerland
Czechoslovakia	Netherlands	Turkey
Denmark	Norway	United Kingdom
Egypt	Romania	United States of America
France	South Africa (Republic of)	

PREFACE TO THE SECOND EDITION

This second edition comprises the first edition, issued in 1979, and editorial amendments which are due to the issuing of IEC Publication 118-0 (1983).

Other IEC publications quoted in this standard:

Publications Nos. 118-0: Hearing Aids, Part 0: Measurement of Electroacoustical Characteristics.

268-8: Sound System Equipment, Part 8: Automatic Gain Control Devices.

HEARING AIDS

Part 2: Hearing aids with automatic gain control circuits

---

1. Scope

1.1 This standard applies to the hearing aids of any type with automatic gain control (AGC) circuits.

This standard gives uniform methods for specifying dynamic and static performance characteristics of hearing aids with AGC circuits together with the relevant methods of measurement for these characteristics.

This standard is confined to a description of the different characteristics and the relevant methods of measurement. It does not attempt to specify performance requirements.

1.2 This standard includes devices which have compression and/or limiting properties with respect to the envelope of the input signal. Devices which control the long-term average output level are also included.

a) AGC is employed to obtain compression, or the reduction of the dynamic range of the sound at the output, with the object of preserving the integrity of the input waveform.

b) AGC circuits instead of clipping devices are often used for limiting purposes.

A limiting effect occurs when the input/output characteristic flattens out at higher input levels. Limiting action is mainly used as a means of preventing excessive output sound from the hearing aid from reaching the listener's ear.

1.3 This standard does not include:

a) Expanders.

b) Clipping devices, which cut off the signal peaks above a certain level; such devices differ basically from AGC circuits, which, in a steady state, tend to preserve the waveform of the input signal.

Note. – An AGC circuit with very short recovery time may cause considerable distortion, especially in the low-frequency range. This should be given special attention.

2. Object

2.1 The purpose of this standard is to facilitate measurements of certain characteristics of hearing aids with AGC circuits that are not described elsewhere in IEC Publication 118-0: Hearing Aids, Part 0: Measurement of Electroacoustical Characteristics, and which are considered necessary for a physical description of the function of the automatic gain control.

2.2 In general, the methods of measurement recommended are those which are considered to be the most directly related to the characteristics. This does not exclude the use of other stated methods which will give equivalent results.

3. Conditions

3.1 *General conditions*

Reference is made to IEC Publication 268-8: Sound System Equipment, Part 8: Automatic Gain Control Devices.

Measurements other than those described herein and that are stated in IEC Publication 118-0 can be performed in accordance with that publication, but with AGC operating, provided the operating conditions are stated.

3.2 Although a pure-tone input signal of 1600 Hz or 2500 Hz when appropriate, is specified for various measurements throughout this standard, it is intended that pure-tone signals of other frequencies or signals of other spectral compositions may be used in addition, where they would provide important information.

3.3 Throughout this standard, all sound pressure levels are referred to 20 μPa.

4. Explanation of terms

4.1 *Automatic gain control (AGC)*

A means in a hearing aid by which the gain is automatically controlled as a function of the magnitude of the envelope of the input signal or other signal parameter.

Note. – Throughout this standard, reference is made to the use of acoustic inputs. However, where appropriate, additional measurements may be made with an electromagnetically induced input.

4.2 *Steady-state input/output graph*

The graph illustrating the output sound pressure level as a function of the input sound pressure level for a specified frequency, both expressed in decibels on identical linear scales (Figure 1, page 16).

4.3 *Lower AGC limit or AGC threshold*

The input sound pressure level which, when applied to the hearing aid, gives a reduction in the gain of 2 ± 0.5 dB with respect to the gain in the linear mode (Figure 1).

4.4 *Compression ratio (between specified input sound pressure level values)*

Under steady-state conditions, the ratio of an input sound pressure level difference to the corresponding output sound pressure level difference, both expressed in decibels (Figure 1).

4.5 *Dynamic output characteristics*

The output sound pressure envelope shown as a function of time when an input sound signal of a predetermined frequency and level is modulated by a square envelope pulse with a predetermined pulse amplitude (Figure 2, page 17).