



SLOVENSKI STANDARD
SIST EN 60268-3:2003

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SIST HD 483.3 S2:1999

Sound system equipment - Part 3: Amplifiers (IEC 60268-3:2000)

Sound system equipment -- Part 3: Amplifiers

Elektroakustische Geräte -- Teil 3: Verstärker

Equipements pour systèmes électroacoustiques -- Partie 3: Amplificateurs

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EUROPEAN STANDARD

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Sound system equipment
Part 3: Amplifiers
(IEC 60268-3:2000)

Equipements pour systèmes
électroacoustiques
Partie 3: Amplificateurs
(CEI 60268-3:2000)

Elektroakustische Geräte
Teil 3: Verstärker
(IEC 60268-3:2000)

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This European Standard was approved by CENELEC on 2000-11-01. 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.

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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 100C/147/FDIS, future edition 3 of IEC 60268-3, prepared by SC 100C, Audio, video and multimedia subsystems and equipment, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60268-3 on 2000-11-01.

This European Standard supersedes HD 483.3 S2:1992.

This EN 60268-3 is to be used in conjunction with HD 483.1 S2:1989 and HD 483.2 S2:1993.

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) 2001-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-11-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annex A is informative.

Annex ZA has been added by CENELEC.

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Endorsement notice

SIST EN 60268-3:2003

The text of the International Standard IEC 60268-3:2000 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 60098 | NOTE: Harmonized as HD 337 S3:1989 (not modified). |
| IEC 60268-5 | NOTE: Harmonized, together with A1:1993, as EN 60268-5:1996 (not modified). |
| IEC 61606 | NOTE: Harmonized as EN 61606:1997 (not modified). |

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60065 (mod)	1998	Audio, video and similar electronic apparatus - Safety requirements	EN 60065 + corr. June	1998 1999
IEC 60268-1	1985	Sound system equipment Part 1: General	HD 483.1 S2 ¹⁾	1989
IEC 60268-2	1987	Part 2: Explanation of general terms and calculation methods	HD 483.2 S2 ²⁾	1993
IEC 60417-1	1998	Graphical symbols for use on equipment Part 1: Overview and application	EN 60417-1	1999
IEC 61000-4-17	1999	Electromagnetic compatibility (EMC) Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test	EN 61000-4-17	1999
IEC 61000-4-29	2000	Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests	EN 61000-4-29	2000

1) HD 483.1 S2 includes A1:1998 to IEC 60268-1.

2) HD 483.2 S2 includes A1:1991 to IEC 60268-2.

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INTERNATIONAL STANDARD

IEC 60268-3

Third edition
2000-08

Sound system equipment –

Part 3: Amplifiers

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SOUND SYSTEM EQUIPMENT –

Part 3: Amplifiers

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60268-3 has been prepared by subcommittee 100C: Audio, video and multimedia subsystems and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This third edition cancels and replaces the second edition published in 1988, amendment 1 (1990) and amendment 2 (1991), and constitutes a technical revision.

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

FDIS	Report on voting
100C/147/FDIS	100C/165/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 3.

This part of IEC 60268 shall be used in conjunction with IEC 60268-1 (1985) and IEC 60268-2 (1987).

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

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

A bilingual version of this standard may be issued at a later date.

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SOUND SYSTEM EQUIPMENT –

Part 3: Amplifiers

1 Scope

This part of IEC 60268 applies to analogue amplifiers, and the analogue parts of analogue/digital amplifiers, which form part of a sound system for professional or household applications. It specifies the characteristics which should be included in specifications of amplifiers and the corresponding methods of measurement.

NOTE The methods of measurement for digital amplifiers and similar equipment are given in IEC 61606. [6]¹⁾

In general, the specified methods of measurement are those which are seen to be most directly related to the characteristics. This does not exclude the use of other methods which give equivalent results.

In general, the methods are based on the simplest measuring equipment which can provide useful results. This does not exclude the use of more complex equipment which can give higher accuracy and/or allow automatic measurement and recording of results.

Rated conditions and standard measuring conditions are specified in order to allow measurements to be reliably repeated.

2 Normative references standards.iteh.ai

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60268. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60268 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60065:1998, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60268-1:1985, *Sound system equipment – Part 1: General*

IEC 60268-2:1987, *Sound system equipment – Part 2: Explanation of general terms and calculation methods*
Amendment 1 (1991)

IEC 60417-1:1998, *Graphical symbols for use on equipment – Part 1: Overview and application*

IEC 61000-4-17:1999, *Electromagnetic Compatibility (EMC) – Part 4-17: Testing and measurement techniques – Ripple on d.c. input power port immunity test – Basic EMC Publication*

IEC 61000-4-29, *Electromagnetic Compatibility (EMC) – Part 4-29: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations on d.c. input power ports, immunity tests – Basic EMC Publication*²⁾

¹⁾ Numbers in square brackets refer to the bibliography.

²⁾ To be published.

IEC 61938:1996, *Audio, video and audiovisual systems – Interconnections and matching values – Preferred matching values of analogue signals*

3 Conditions

3.1 Rated conditions and standard measuring conditions

3.1.1 Introduction

For convenience in specifying how amplifiers shall be set up for measurement, sets of conditions are specified in this standard, under the titles of rated conditions and standard measuring conditions.

A full explanation of the term "rated" is given in IEC 60268-2.

The rated conditions for amplifiers are:

- rated power supply voltage;
- rated source impedance;
- rated source e.m.f.;
- rated load impedance;
- rated total harmonic distortion, or rated (distortion-limited) output voltage or power;
- rated mechanical and climatic conditions.

NOTE 1 Total harmonic distortion and (distortion-limited) output voltage or power are interdependent. Both cannot be taken as rated conditions simultaneously because normally a given sample amplifier produces less than rated total harmonic distortion at rated output voltage or power.

NOTE 2 If the power supply frequency is critical, it is also a rated condition.

To obtain the correct conditions for measurements, the values for the above-mentioned rated conditions shall be taken from the manufacturer's specification. These values themselves are not subject to measurement but they constitute the basis for measuring the other characteristics.

Methods of measurement for these other characteristics are given in this standard and the manufacturer is either required or permitted to state 'rated values' for these characteristics in the specification of the equipment. These include

- rated voltage gain;
- rated distortion limited output voltage or power (when not adopted as a rated condition);
- rated signal-to-noise ratio;
- rated equivalent noise source e.m.f.

3.1.2 Rated conditions

An amplifier, considered as a four-terminal network with regard to a specified pair of input terminals and a specified pair of output terminals, shall be understood to be working under rated conditions when the following conditions are fulfilled:

- a) the amplifier is connected to its rated power supply;
- b) the source e.m.f. is connected in series with the rated source impedance to the input terminals;

NOTE For an amplifier having several identical channels, the input signal should be applied simultaneously to all corresponding pairs of input terminals.

- c) the output terminals are terminated with the rated load impedance;
- d) the terminals which are not used during the measurement are terminated, if necessary, as specified by the manufacturer;

- e) the source e.m.f. is a sinusoidal voltage equal to the rated source e.m.f. at an appropriate frequency. Unless there is a special reason to the contrary, this frequency shall be the standard reference frequency of 1 000 Hz according to IEC 60268-1.

Such a reason could be that the standard reference frequency is outside or near the limit of the effective frequency range of the amplifier;

- f) the volume control, if any, is set to such a position that the rated distortion-limited output voltage appears at the output terminals;
- g) the tone controls, if any, are set to a specified position to give the specified frequency response, generally the flat frequency response;
- h) the balance control(s), if any, is (are) set to the mechanical central position;
- i) the rated mechanical and climatic conditions according to IEC 60268-1 are complied with.

Amplifiers for which the rated distortion-limited output power exceeds the rated temperature-limited output power are likely to be subject to overheating when operated under rated conditions for an extended period of time. For these amplifiers, rated conditions shall be maintained for no longer than can be tolerated by the amplifier.

3.1.3 Standard measuring conditions

These are obtained by bringing the amplifier under rated conditions (see 3.1.2) and then reducing the source e.m.f. to a level of -10 dB referred to the rated source e.m.f.

3.2 Other conditions

If supplementary data of the amplifier are presented, applying to other than the rated or standard measuring conditions, for example at different frequencies or at different settings of controls, then the conditions shall be fully defined in the presentation. These conditions shall, if possible, be chosen according to the recommendations made in the relevant clauses of this standard.

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The procedures for supplementary measurements may be derived from the measurement procedures given for the standard conditions. If special precautions are necessary to ensure accuracy, these shall be indicated together with the measurement procedure involved.

4 Classes of operation

Class A: in which the current in each active device supplying the load current is greater than zero throughout each cycle of the signal for all values of load current up to and including the value determined by the rated output power or voltage and the rated load impedance.

Class B: in which the current in each active device supplying the load current is equal to zero for exactly one-half of each cycle of load current.

NOTE In common usage, the term Class B is extended to the case where current flows for slightly more than one half-cycle.

Class AB: in which the current in at least one of the active devices supplying the load current is zero for some part of each cycle of load current for some range of values of load current not exceeding the value defined by the rated output power or voltage and the rated load impedance.

NOTE At sufficiently low signal levels, a Class AB amplifier usually operates in Class A.

Class D: in which the current in each active device supplying the load is switched from zero to a maximum value by a carrier signal, modulation of which conveys the useful signal.

NOTE Other classes of operation have been commercialized but no formal definitions of such classes have been submitted for standardization.