SLOVENSKI STANDARD
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Elektroakustične naprave - 3. del: Ojačevalniki (GMT) (IEC 60268-3:2013)

Sound system equipment -- Part 3: Amplifiers (GMT) (IEC 60268-3:2013)

Elektroakustische Geräte - Teil 3: Verstärker (IEC 60268-3:2013)

Equipements pour systèmes électroacoustiques - Partie 3: amplificateurs (CEI 60268-3:2013)

Ta slovenski standard je istoveten z: EN 60268-3:2013

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33.160.10 Ojačevalniki Amplifiers

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EUROPEAN STANDARD

NORME EUROPÉENNE

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ICS 33.160.10

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Sound system equipment - Part 3: Amplifiers

(IEC 60268-3:2013)

Equipements pour systèmes électroacoustiques - Partie 3: amplificateurs (CEI 60268-3:2013)

Elektroakustische Geräte - Teil 3: Verstärker (IEC 60268-3:2013)

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 100/2010A/CDV, future edition 4 of IEC 60268-3, prepared by IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60268-3:2013.

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)	2014-02-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-05-28

This document supersedes EN 60268-3:2000.

EN 60268-3:2013 includes the following significant technical changes with respect to EN 60268-3:2000:

– rated condition of multi-channel amplifier is expanded;

– arrangement for the D-class amplifier is added;

– method of measurement for output power (distortion-limited) is expanded;

– Annex B is newly added.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60268-3:2013 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 60268-5:2003	NOTE	Harmonised as EN 60268-5:2003 (not modified).
IEC 61606 series	NOTE	Harmonised in EN 61606 series.

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 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 60065 (mod) + corr. August + A1 (mod) + A2 (mod)	2001 2002 2005 2010	Audio, video and similar electronic apparatus - Safety requirements	EN 60065 + corr. August + A1 + A2 + A11 + A12	2002 2007 2006 2010 2008 2011
IEC 60268-1 + A1 + A2	1985 1988 1988	Sound system equipment - Part 1: General	HD 483.1 S2	1989
IEC 60268-2 + A1	1987 1991	Sound system equipment - Part 2: Explanation of general terms and calculation methods	HD 483.2 S2	1993
IEC 60417	Data-base	Graphical symbols for use on equipment	-	-
IEC 61000-4-13 + A1	2002 2009	Electromagnetic compatibility (EMC) - Part 4-13: Testing and measurement techniques - Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests	EN 61000-4-13 + A1	2002 2009
IEC 61000-4-17 + A1 + A2	1999 2001 2008	Electromagnetic compatibility (EMC) - Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test	EN 61000-4-17 + A1 + A2	1999 2004 2009
IEC 61000-4-29	2000	Electromagnetic compatibility (EMC) - 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
IEC 61938	1996	Audio, video and audiovisual systems - Interconnections and matching values - Preferred matching values of analogue signals	EN 61938 + corr. February	1997 1997

IEC 60268-3

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Sound system equipment –
Part 3: Amplifiers

Équipements pour systèmes électroacoustiques –
Partie 3: Amplificateurs

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SOUND SYSTEM EQUIPMENT –

Part 3: Amplifiers

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 60268-3 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This fourth edition cancels and replaces the third edition published in 2000. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

– rated condition of multi-channel amplifier is expanded;
– arrangement for the D-class amplifier is added;
– method of measurement for output power (distortion-limited) is expanded;
– Annex B is newly added.

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

FDIS	Report on voting
100/2010A/CDV	100/2066/RVC

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 in the IEC 60268 series, published under the general title *Sound system equipment*, can be found on the IEC website.

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

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 [4][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

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 60065:2001, *Audio, video and similar electronic apparatus – Safety requirements*
Amendment 1:2005
Amendment 2:2010

IEC 60268-1:1985, *Sound system equipment – Part 1: General*
Amendment 1:1988
Amendment 2:1988

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

IEC 60417, *Graphical symbols for use on equipment.* Available from: http://www.graphical-symbols.info/equipment

IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests*
Amendment 1:2009

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1 Numbers in square brackets refer to the Bibliography.

IEC 61000-4-17:1999, *Electromagnetic Compatibility (EMC) – Part 4-17: Testing and measurement techniques – Ripple on d.c. input power port immunity test*
Amendment 1:2001
Amendment 2:2008

IEC 61000-4-29:2000, *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*

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 Overview

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 1 Multi-channel amplifiers can be specified with any number of channels driven, or all channels. See Annex B. The input signal can be applied simultaneously to all inputs of similar channels.

c) the output terminals are terminated with the rated load impedance;

NOTE 2 For the measurement of Class D amplifiers, the low pass filter can be connected between the analyser and the rated load impedance. The low pass filter (analogue) is given in IEC 61606-1 (see Figure 2).

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.

Figure 1 shows block diagrams of amplifiers with some rated conditions stated.

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.

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.