
Elektroakustične naprave – 4. del: Mikrofoni (IEC 60268-4:2004)*

Sound system equipment - Part 4: Microphones (IEC 60268-4:2004)

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**Sound system equipment
Part 4: Microphones
(IEC 60268-4:2004)**

Equipements pour systèmes
électroacoustiques
Partie 4: Microphones
(CEI 60268-4:2004)

Elektroakustische Geräte
Teil 4: Mikrofone
(IEC 60268-4:2004)

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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 100/721/FDIS, future edition 3 of IEC 60268-4, prepared by 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 60268-4 on 2004-03-01.

This European Standard supersedes EN 60268-4:1999

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) 2004-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60268-4:2004 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 60574-1	NOTE	Harmonized as HD 369.1 S1:1978 (not modified)
IEC 61672-1	NOTE	Harmonized as EN 61672-1:2003 (not modified)

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60065 (mod)	2001	Audio, video and similar electronic apparatus - Safety requirements	EN 60065	2002
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 60268-3	2000	Part 3: Amplifiers	EN 60268-3 + corr. January	2000 2002
IEC 60268-5	2003	Part 5: Loudspeakers	EN 60268-5	2003
IEC 60268-11	1987	Part 11: Application of connectors for the interconnection of sound system components	HD 483.11 S3 ³⁾	1993
IEC 60268-12	1987	Part 12: Application of connectors for broadcast and similar use	EN 60268-12 ⁴⁾	1995
IEC 60574-3	1983	Audiovisual, video and television equipment and systems Part 3: Connectors for the interconnection of equipment in audio-visual systems	HD 369.3 S1	1986
IEC 60914	1988	Conference systems - Electrical and audio requirements	HD 549 S1	1989
IEC 61000-4-2	1995	Electromagnetic compatibility (EMC) Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	1995

¹⁾ HD 483.1 S2 includes A1:1988 to IEC 60268-1.

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

³⁾ HD 483.11 S3 includes A1:1989 + A2:1991 to IEC 60268-11.

⁴⁾ EN 60268-12 includes A1:1991 to IEC 60268-12.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-3	2002	Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	2002
IEC 61265	1995	Electroacoustics - Instruments for measurement of aircraft noise - Performance requirements for systems to measure one-third-octave band sound pressure levels in noise certification of transport-category aeroplanes	EN 61265	1995
IEC 61938	1996	Audio, video and audiovisual systems - Interconnections and matching values - Preferred matching values of analogue signals	EN 61938 + corr. February	1997 1997
ISO 354	2003	Acoustics - Measurement of sound absorption in a reverberation room	EN ISO 354	2003

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Third edition
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Sound system equipment –

Part 4: Microphones

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SOUND SYSTEM EQUIPMENT –**Part 4: Microphones**

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 60268-4 has been prepared by IEC Technical Committee 100: Audio, video and multimedia systems and equipment.

This third edition cancels and replaces the second edition published in 1997, and constitutes a technical revision.

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

FDIS	Report on voting
100/721/FDIS	100/750/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.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

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

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SOUND SYSTEM EQUIPMENT –

Part 4: Microphones

1 Scope

This part of IEC 60268 specifies methods of measurement for the electrical impedance, sensitivity, directional response pattern, dynamic range and external influences of sound system microphones, and also gives recommendations as to characteristics to be specified.

It applies to sound system microphones for all applications for speech and music. It does not apply to measurement microphones, but it does apply to each audio channel of microphones having more than one channel, for example for stereo or similar use. It is also applicable to flush-mounted microphones and to the analogue characteristics of microphones with digital audio output.

For the purposes of this International Standard, a microphone includes all such devices as transformers, pre-amplifiers, or other elements that form an integral part of the microphone, up to the output terminals specified by the manufacturer.

NOTE The characteristics specified in this standard do not completely describe the subjective response of the microphone. Further work is necessary to find new definitions and measurement procedures for a later replacement by objective characteristics of at least some of the subjective descriptions use to describe microphone performance.

2 Normative references

SIST EN 60268-4:2004

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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*

IEC 60268-3:2000, *Sound system equipment – Part 3: Amplifiers*

IEC 60268-5:2003, *Sound system equipment – Part 5: Loudspeakers*

IEC 60268-11:1987, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60268-12:1987, *Sound system equipment – Part 12: Application of connectors for broadcast and similar use*

IEC 60574-3:1983, *Audiovisual, video and television equipment and systems – Part 3: Connectors for the interconnection of equipment in audiovisual systems*

IEC 60914:1988, *Conference systems – Electrical and audio requirements*

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2002, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61265:1995, *Electroacoustics – Instruments for measurement of aircraft noise – Performance requirements for systems to measure one-third-octave-band sound pressure levels in noise certification of transport-category aeroplanes*

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

ISO 354:2003, *Acoustics – Measurement of sound absorption coefficients in a reverberant room*

3 General conditions

3.1 General

Special reference is made to IEC 60268-1, concerning:

- units and system of measurement;
- frequencies of measurement;
- quantities to be specified and their accuracy (see also 4.7);
- marking (see also 6.1);
- ambient conditions;
- filters, networks and measuring instruments for noise specification and measurement;
- individual specifications and type specifications;
- graphical presentation of characteristics;
- scales for graphical presentation;
- personal safety and prevention of spread of fire;
- method of producing a uniform alternating magnetic field;
- search coils for measuring the magnetic field strength,

and to IEC 61938 concerning powering of microphones.

3.2 Measurement conditions

3.2.1 Introduction

For convenience in specifying how microphones shall be set up for measurement, a set of conditions has been defined in this recommendation under the title of "rated conditions".

Three ratings are basic to the formulation of these concepts:

- rated impedance (see 9.2);
- rated power supply (see 8.1);
- rated sensitivity (see 10.3.1).

To obtain the correct conditions for measurement, the above mentioned ratings shall be taken from the specifications supplied by the manufacturer of the equipment.

The term "rated" applied to other characteristics relates to the specification or measurement of the particular characteristic under rated conditions or under conditions unambiguously connected to them. This applies, for example, to the following two characteristics:

- rated output voltage;
- rated equivalent sound pressure level due to inherent noise.

Methods of measurement are given in this standard for electrical impedance, sensitivity, directional pattern, dynamic range and external influences. Where alternative methods are given, the chosen method shall be specified.

3.2.2 Rated conditions

The microphone is understood to be working under rated conditions when the following conditions are fulfilled:

- the microphone shall operate at no-load condition (see 9.2);
- if the microphone needs a power supply, this shall be the rated power supply;
- the microphone (except a close-talking microphone) shall be placed in a free sound field, the waves having zero degree incidence with respect to the reference direction;
- the undisturbed sound pressure (in the absence of the microphone) in the sound field at the reference point of the microphone shall be sinusoidal and set at a level of 0,3 Pa (84 dB SPL)
- for close-talking microphones, the microphone shall be placed at a stated distance, no more than 25 mm from the artificial mouth, and the undisturbed sound pressure in the sound field at the reference point of microphone shall be sinusoidal and set at a level of 3 Pa (104 dB SPL).
- if a special microphone needs a different measurement level, this shall be stated in the technical data together with the reason for this. Levels related to the normal reference level of 94 dB by multiples of 10 dB are preferred;
- controls, if any, shall be set to the position recommended by the manufacturer;
- in the absence of a clear reason to the contrary, the measurement frequency shall be 1000 Hz (see IEC 60268-1);
- the ambient pressure, the relative humidity and the ambient temperature shall be within the limits given in IEC 60268-1, and shall be stated.

NOTE 1 The ITU/T has published Recommendation P.51 which includes the specification of an artificial mouth. An artificial mouth conforming to that Recommendation should be used wherever possible.

NOTE 2 An artificial voice which emits a signal simulating that emitted by noise should be used for measuring pressure-gradient close-talking microphones to ensure that nasal sounds are adequately reproduced. The absence of such sounds in the reproduction may give rise to unnatural speech quality.

NOTE 3 Limitations of the measurement site or the measurement equipment may also require the use of other than the given measurement sound pressure levels. This is acceptable only if any change in performance between the level used and the reference level are known with the necessary accuracy for the relevant characteristics.

4 Particular conditions

4.1 Pre-conditioning

A microphone with preamplifier shall be switched on for the period of time specified by the manufacturer, before measurements are made, to allow the components to reach the stationary temperature for rated conditions. If the manufacturer specifies no period, a period of 10 s shall be allowed for stabilization. If the microphone contains a vacuum tube or other heating device the time shall be 10 min.