



SLOVENSKI STANDARD
SIST EN 60315-4:1999

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Methods of measurement on radio receivers for various classes of emission -- Part 4: Receivers for frequency-modulated sound broadcasting emissions (IEC 60315-4:1997)

Methods of measurement on radio receivers for various classes of emission -- Part 4: Receivers for frequency-modulated sound broadcasting emissions

Meßverfahren für Funkempfänger für verschiedene Sendearten -- Teil 4: Empfänger für frequenzmodulierte Ton-Rundfunksendungen

Méthodes de mesure applicables aux récepteurs radioélectriques pour diverses classes d'émission -- Partie 4: Récepteurs pour émissions de radiodiffusion en modulation de fréquence

Ta slovenski standard je istoveten z: EN 60315-4:1998

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33.160.20 Radijski sprejemniki Radio receivers

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en

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ICS 33.160.20

Descriptors: Radio equipment, radiocommunications, receivers, frequency modulation, radio frequencies, measurements, characteristics, sensitivity, signal to noise ratio, parasitic signals, selectivity, distortion, intermodulation, test results, presentation

English version

**Methods of measurement on radio receivers for various classes of emission
 Part 4: Receivers for frequency-modulated sound broadcasting emissions
 (IEC 60315-4:1997)**

Méthodes de mesure applicables aux
 récepteurs radioélectriques pour
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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.

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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 100A/58/FDIS, future edition 2 of IEC 60315-4, prepared by SC 100A, Multimedia end-user 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 60315-4 on 1998-01-01.

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) 1998-10-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1998-10-01

This part 4 of EN 60315 is to be used in conjunction with HD 560.1 S1.

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 annexes A, B, C and D are informative.

Annex ZA has been added by CENELEC.

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Endorsement notice
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The text of the International Standard IEC 60315-4:1997 was approved by CENELEC as a European Standard without any modification.

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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 60098	1987	Analogue audio disk records and reproducing equipment	HD 337 S3	1989
IEC 60268-1	1985	Sound system equipment Part 1: General	HD 483.1 S2 ¹⁾	1989
IEC 60268-3	1988	Part 3: Amplifiers	HD 483.3 S2 ²⁾	1992
IEC 60315-1	1988	Methods of measurement on radio receivers for various classes of emission Part 1: General considerations and methods of measurement, including audio-frequency measurements	HD 560.1 S1	1990
IEC 60315-3	1989	Part 3: Receivers for amplitude-modulated sound-broadcasting emissions	HD 560.3 S1	1992
IEC 60315-7	1995	Part 7: Methods of measurement on digital satellite radio (DSR) receivers	EN 60315-7	1995
IEC 60315-9	1996	Part 9: Measurement of the characteristics relevant to radio data system (RDS) reception	EN 60315-9	1996
IEC 60651	1979	Sound level meters	EN 60651	1994
IEC 61260	1995	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	1995
CISPR 16-1	1993	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	-	-

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

2) HD 483.3 S2 includes A1:1990 and A2:1991 to IEC 60268-3.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 20 ³⁾	1996	Limits and methods of measurement of immunity characteristics of sound and television broadcast receivers and associated equipment	-	-
ITU-R Recommendation 468-4	1990	Measurement of audio-frequency noise voltage level in sound broadcasting (Vol. X-1)	-	-
ITU-R Recommendation 559-2	1990	Objective measurement of radio-frequency protection ratios in LF, MF and HF broadcasting	-	-

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3) Instead of CISPR 20:1996, EN 55020:1994 + A11:1996 + corr. Dec. 1997, *Electromagnetic immunity of broadcast receivers and associated equipment*, applies.

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INTERNATIONALE
INTERNATIONAL
STANDARD**

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1997-11

**Méthodes de mesure applicables aux récepteurs
radioélectriques pour diverses classes d'émission –**

**Partie 4:
Récepteurs pour émissions de radiodiffusion
en modulation de fréquence**

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**Methods of measurement on radio receivers for
various classes of emission –**

**Part 4:
Receivers for frequency-modulated
sound broadcasting emissions**

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International Electrotechnical Commission
Telefax: +41 22 919 0300

3, rue de Varembé Geneva, Switzerland
IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**METHODS OF MEASUREMENT ON RADIO RECEIVERS FOR
VARIOUS CLASSES OF EMISSION –**

**Part 4: Receivers for frequency-modulated
sound broadcasting emissions**

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 reports or guides and they are accepted by the National Committees in that sense.
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- 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 60315-4 has been prepared by IEC subcommittee 100A: Multimedia end-user equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 1982 and constitutes a technical revision.

This part of IEC 60315 shall be read in conjunction with IEC 60315-1.

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

FDIS	Report on voting
100A/58/FDIS	100A/60/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.

Annexes A, B, C and D are for information only.

IEC 60315 consists of the following parts under the general title: Methods of measurement on radio receivers for various classes of emission:

- Part 1: 1988, General considerations and methods of measurement, including audio-frequency measurements
- Part 3: 1989, Receivers for amplitude – modulated sound broadcasting emissions
- Part 4: 1997, Receivers for frequency – modulated sound broadcasting emissions
- Part 5: 1971, Specialized radio-frequency measurements – Measurement on frequency-modulated receivers of the response to impulsive interference
- Part 6: 1991, General purpose communication receivers
- Part 7: 1995, Methods of measurement on digital satellite radio (DSR) receivers
- Part 8: 1975, Radio-frequency measurements on professional receivers for frequency-modulated telegraphy systems
- Part 9: 1996, Measurement of the characteristics relevant to radio data system (RDS) reception

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METHODS OF MEASUREMENT ON RADIO RECEIVERS FOR VARIOUS CLASSES OF EMISSION –

Part 4: Receivers for frequency-modulated sound broadcasting emissions

1 General

1.1 Scope

This part of IEC 60315 applies to radio receivers and tuners for the reception of frequency-modulated sound-broadcasting emissions with rated maximum system deviations of ± 75 kHz and ± 50 kHz in ITU Band 8. It deals mainly with methods of measurement using radio-frequency signals applied to the antenna terminals of the receiver. The measurements and specified conditions of test are selected to permit the comparison of results obtained by different observers and on other receivers. Performance requirements are not specified in this standard.

Radiation and immunity tests and requirements are not included since these are described in CISPR 13 and CISPR 20.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60315. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 60315 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60098: 1987, *Analogue audio disk records and reproducing equipment*

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

IEC 60268-3: 1988, *Sound system equipment – Part 3: Amplifiers*

IEC 60315-1: 1988, *Methods of measurement on radio receivers for various classes of emission – Part 1: General considerations and methods of measurement, including audio-frequency measurements*

IEC 60315-3: 1989, *Methods of measurement on radio receivers for various classes of emission – Part 3: Receiver for amplitude-modulated sound-broadcasting emissions*

IEC 60315-7: 1995, *Methods of measurement on radio receivers for various classes of emission – Part 7: Methods of measurement on digital satellite radio (DSR) receivers*

IEC 60315-9: 1996, *Methods of measurement on radio receivers for various class of emission – Part 9: Measurement of the characteristics relevant to Radio Data System (RDS) reception*

IEC 60651: 1979, *Sound level meters*

IEC 61260: 1995, *Electroacoustics – Octave-band and fractional-octave-band filters*

CISPR 16-1: 1993, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus*

CISPR 20: 1996, *Limits and methods of measurement of immunity characteristics of sound and television broadcast receivers and associated equipment*

ITU-R Recommendation 468-4: 1990: *Measurement of audio-frequency*

ITU-R Recommendation 559-2: 1990: *Objective measurement of radio-frequency protection ratios in LF, MF and HF broadcasting*

1.3 Definitions

For the purposes of this part of IEC 60315, the following definitions apply.

1.3.1

carrier frequency

the mean value of the instantaneous frequency or the frequency generated in the absence of modulation. With a perfect modulation system in which no d.c. component and no non-linear distortion are involved, the two values are the same

1.3.2

instantaneous frequency deviation

the difference between the instantaneous frequency of the modulated radio-frequency signal and the carrier frequency

1.3.3

peak frequency deviation

the peak value of the instantaneous frequency deviation

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1.3.4

peak-to-peak deviation

twice the peak frequency deviation

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NOTE 1 – To avoid confusion between "peak frequency deviation" and "peak-to-peak frequency deviation", peak-to-peak deviation is expressed as, for example, ± 50 kHz.

NOTE 2 – "Peak-to-peak frequency deviation" is generally abbreviated to "deviation" in this standard.

1.3.5

rated maximum system deviation

the maximum peak-to-peak frequency deviation (see 1.3.4) specified for the system under consideration

1.3.6

modulation factor

the ratio of the peak-to-peak deviation of the signal to the rated maximum system deviation, usually expressed as a percentage

NOTE – This definition arises by direct analogy with the case of amplitude modulation.

1.3.7

–3 dB limiting level

the input signal level at which the audio-frequency output voltage level is 3 dB below the value at a specified high r.f. input signal level, preferably 80 dB(fW)

1.3.8

amplification reserve

the attenuation in decibels of the volume control when adjusted to produce rated (distortion-limited) output voltage or power, with a specified high r.f. input signal level, preferably 80 dB(fW)

NOTE – This characteristic is undefined for a receiver or tuner without a volume control.

1.3.9**deviation sensitivity**

the value of deviation required to produce rated (distortion-limited) output voltage or power with the volume control set at maximum and a specified high r.f. input signal level, preferably 80 dB(fW)

1.3.10**ultimate signal-to-noise ratio**

the value of signal-to-noise ratio for r.f. input signal levels sufficiently high that no further increase in signal-to-noise ratio occurs when the input signal level is increased

1.3.11**stereo threshold**

the r.f. input signal level at which the stereo decoder begins to operate

NOTE – A marked decrease in signal-to-noise ratio is usual at this signal level unless signal-strength dependent cross-talk circuits are included.

1.3.12**stereo indicator threshold**

the input signal level at which the visual indicator shows that the receiver is operating in the stereo mode

NOTE – This level may or may not be identical to the stereo threshold.

1.3.13**muting threshold**

the input signal level at which the muting circuits allow the a.f. output signal to appear at the output terminals

NOTE – The threshold may be different for increasing and decreasing signal levels. This hysteresis is usually intentional as it prevents unsatisfactory operation with r.f. input signals at or near the threshold level.

1.3.14**muting attenuation**

the reduction in a.f. output, selectively measured at 1 kHz, due to an input signal modulated at 1 kHz at rated maximum system deviation, when muting occurs

1.3.15**50 dB quieting sensitivity**

the r.f. input signal level at which an increase in a.f. output of 50 dB occurs under defined conditions (see 2.3) when the modulation is changed from none (except the pilot-tone if the measurement is to be made in stereo mode) to the standard value of deviation (see 1.4.2.1)

1.4 Standard measuring conditions**1.4.1 Measurements at audio-frequency output terminals****1.4.1.1 Standard audio-frequency output level**

Standard audio-frequency output level is the reference output level for audio-frequency measurements and shall be 10 dB below the rated output voltage or power. Alternatively, a stated value of output voltage or power selected from 500 mV, 1 W, 500 mW, 50 mW, 5 mW or 1 mW may be used (see IEC 60315-1).