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Edition 1.0 2021-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Assistive listening devices and systems for active assisted living – Part 1: General

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Dispositifs et systèmes d'aide à l'audition pour l'assistance à l'autonomie à domicile – Partie 1: Généralités

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ASSISTIVE LISTENING DEVICES AND SYSTEMS FOR ACTIVE ASSISTED LIVING –

Part 1: General

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IEC 63087-1 has been prepared by Technical Area 16: Active Assisted Living (AAL), wearable electronic devices and technologies, accessibility and user interfaces of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
100/3601/FDIS	100/3623/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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- reconfirmed,
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INTRODUCTION

AAL (Active Assisted Living) aims to improve the quality of users lives. The user is any person of any age who uses or benefits from AAL products, services and systems. IEC has created the Systems Committee AAL which is tasked to develop systems standards taking into account the following: products, services and systems, safety, security and privacy.

The TC 100 title items, audio, video and multimedia devices and systems provide various services to users; however, some of users may have difficulties of hearing, viewing and sensing because of their age or some other reasons. As the number of such users is increasing, IEC meets these needs with the philosophy of AAL.

The legacy standardization work focuses on providing quality and functions to the ordinary user; this document specifies the requirement for providing audio quality and functionalities to the users who have some difficulties with hearing and listening.

Personal listening systems are used to improve the perception and audibility of a range of sound sources when listening in non-ideal situations. Examples of these include listening to a television when not seated close to it, following a discussion in a meeting, engaging in a one-to one conversation, or in other applications where programme material is available such as transport, theatre or education environments where provision for access enables users to overcome the presence of competing background noise.

Personal listening systems are widely used by those with normal hearing, but in some instances by those who have a mild hearing loss, but either do not consider that they need a hearing aid, or do not meet health-care criteria for hearing aid provision.

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Unlike hearing aids, which are classified as medical devices and require an appropriately trained and competent hearing aid professional to assess an individual's hearing and select and fit a suitable device, personal listening systems are not provided for by current regulatory requirements. Requirements for hearing aid performance are specified within the IEC 60118 series and aspects relating to hearing aid safety are specified in the relevant parts of the IEC 60601 series.

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Changes in regulatory restrictions on the marketing of devices intended to assist hearing lead to the need to create an electroacoustic performance standard (including the related methods of measurement) for personal listening systems. This document specifies basic requirement for personal listening systems, establishes a control on their maximum sound pressure level output and establishes defines recommended performance in other respects, including frequency response, distortion and internally generated noise.

This document only makes provision for the electroacoustic performance of personal listening systems which relate to their input and output. Products which physically resemble modern hearing aids and which are entirely worn on or in the ear are also excluded from the scope of this document.

This document is intended to co-ordinate with IEC TC 100 activity on the accessibility of audio sources.

ASSISTIVE LISTENING DEVICES AND SYSTEMS FOR ACTIVE ASSISTED LIVING –

Part 1: General

1 Scope

This part of IEC 63087 specifies requirements, and the associated methods of measurement, for the electroacoustic performance of personal listening systems.

This document specifies requirements for the provision of assistive listening in audio, video and multimedia systems and equipment. The requirements are of different kinds, because of the diversity of the hardware concerned. Existing IEC standards for methods of measurement are normatively referenced if they exist. Methods of measurement and performance requirements are specified in IEC 63087-2[1].

This document does not apply to hearing aids. Also excluded are devices entirely worn on or in the ear, which cannot be measured independently.

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2 Normative references

There are no normative references in this document.

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
product
piece of equipment, possibly comprising several objects that work together, which is typically acquired by a member of the general public as a single purchase

EXAMPLE 1 A television receiver.

EXAMPLE 2 A radio headphone kit, comprising headphones, transmitter and power supply.

Note 1 to entry: The term 'product' is used to improve clarity, as the term 'equipment' is considered to be rather 'technical'.

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1 Under preparation.

3.2
personal listener
product relaying an acoustic input signal to an acoustic output transducer, for listening purposes

Note 1 to entry: A system will at least comprise a microphone, an electrotechnical amplifier and earphones or headphones.

Note 2 to entry: Additional items can be included, such as a neck loop for use with hearing aids, or a magnetic pick-up coil for use with hearing-loop systems.

3.3
assistive listening
listening with assistance of technologies

3.4
hearing aid
portable instrument intended to assist the hearing of persons with impaired hearing, usually consisting of a microphone, amplifier and earphone or bone vibrator

Note 1 to entry: A hearing aid is a medical device selected and fitted by an appropriately trained and competent hearing aid professional.

4 General

4.1 Assistive listening devices and systems

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Assistive listening systems consist of dedicated listening devices and audio amplifiers.

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4.2 Sources of audio for assistive listening

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No such list can be exhaustive, but the major sources are listed in Table 1, with the applicable IEC 'methods of measurement' standard, if it exists, and an applicable performance standard, if it exists. The list is intended to be updated as new sources qualify for inclusion.

Table 1 – Sources of audio for assistive listening

Product or system	'Methods of measurement' standard	Applicable 'interoperability standard' [a]
Radio receiver	IEC 60315-4	IEC 61938
Television receiver	IEC 60107-1 and IEC 60107-2	IEC 61938
Video player	IEC 60268-3	IEC 61938
Personal music player	IEC 60268-3	IEC 61938
Smart phone and its expansion system	IEC 61606-3	IEC 61938
PC, tablet	IEC 61606-3	IEC 61938
Home audio system	IEC 60268-3	IEC 61938
Car audio system	IEC 60268-3	IEC 61938
Sound reinforcement system	IEC 60268-3	IEC 61938
Microphone	IEC 60268-4	IEC 61938
Intercommunication system	IEC 60268-3	IEC 61938
Audio over IP system	EBU Tech 3326	

[a] IEC 61938 gives recommended electrical interface characteristics for the connection of assistive listening devices as accessories.

4.3 Dedicated assistive listening systems

Table 2 gives a non-exclusive list of such systems, but the list is intended to be updated as new systems qualify for inclusion.

Table 2 – Dedicated assistive listening systems

Type of system	Applicable standards	Notes
Hearing-loop system	IEC 60118-4, IEC 62489-1, IEC TR 63079	Studied by IEC TC29. Include methods of measurement and performance requirements.
Personal listener	IEC 63087-2	Standard to include methods of measurement and performance requirements. Product includes microphone, amplifier and earpieces. Can include input from any system type, and or output to telecoil or other method as applicable.
Infra-red system	IEC 60914[2]	This was a TC 100 standard, but not dedicated to assistive listening. Includes infra-red headphones.
Radio system (VHF)		Includes radio headphones.
Wireless system (2,4 GHz and similar)		Includes wireless headphones.
Audio vibration system		'Body sonic' is an example.
Sound field system	IEC 62777	With directional loudspeaker or parametric sound system.

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5 Requirements in the context of accessibility and ease of use

5.1 Requirements for products and systems under the control of the user

5.1.1 General requirements

These requirements apply generally, but one or more might be inapplicable in some cases. The manufacturer shall be prepared to justify any deviation.

- Designs shall take into account that users might have impaired vision and manual dexterity, in addition to hearing impairment.
- Rotary controls are more suitable than push-buttons or touch controls with a visual display.
- Voice control; voice or sound information or instruction.
- Controls shall be labelled in words, not only symbols; overlays or adhesive labels can be provided for labelling in different languages.
- Alpha-numeric characters shall be at least 3 mm high (x-height) and strongly contrast with their background.

  NOTE Black text in a sans-serif font on any light-coloured background can usually be read easily.
- Controls of functionality shall be easy and less complexity.

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2 This document was withdrawn.

5.1.2 Considerations for specific products and systems under the control of the user

5.1.2.1 Radio receivers

Radio receivers shall provide, in addition to any other audio signal format, a single channel of acceptable 'mono' composition, either digital or analogue, suitable for connection to an assistive listening accessory.

NOTE A two-channel 'stereo' signal might be provided as well, but the demand for stereo in the hearing-impaired community is low, because many have very different impairments in the two ears.

5.1.2.2 Television receivers

Television receivers shall provide, in addition to any other audio signal format, a single channel of acceptable 'mono' composition and support a dedicated audio channel for narration, either digital or analogue, suitable for connection to an assistive listening accessory. A dedicated channel for narration or commentary is available in some multichannel audio systems; it is applicable to a part of the mono composition.

NOTE A two-channel 'stereo' signal might be provided as well, but the demand for stereo in the hearing-impaired community is low, because many have very different impairments in the two ears.

5.1.2.3 Video players

It is the same as television receivers, in addition slower audio playback capability in accordance with slow-motion video playback is useful functionality.

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5.1.2.4 Personal music player

Personal music player shall provide a single channel of acceptable 'mono' composition, tone control functionality and dedicated loudness control functionality.

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5.1.2.5 Smart phone and its expansion system

Smart phone and its expansion system shall provide a single channel of acceptable 'mono' composition, tone control functionality and dedicated loudness control functionality.

5.1.2.6 Home audio system

Home audio system shall provide a single channel of acceptable 'mono' composition, tone control functionality and dedicated loudness control functionality. Multichannel audio system should provide a dedicated channel for narration or commentary.

5.1.2.7 Intercommunication system

Intercommunication system shall provide tone control functionality and dedicated loudness control functionality.

5.2 Requirements for products and systems not under the control of the user

5.2.1 General requirements

It is essential that staff responsible for such products and systems can easily check whether the product or system is in operation, because field experience over many years shows that there is a major failing in this respect. It is preferable that users can also make this check, without having to approach staff.