# IEC 61252

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# FINAL VERSION

# VERSION FINALE

## Electroacoustics – Specifications for personal sound exposure meters

**Electroacoustique – Spécifications des exposimètres acoustiques individuels**

IEC 61252:1993-06+AMD1:2000-10+AMD2:2017-04 CSV(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# ELECTROACOUSTICS –

# SPECIFICATIONS FOR PERSONAL SOUND EXPOSURE METERS

## FOREWORD

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**This Consolidated version of IEC 61252 bears the edition number 1.2. It consists of the first edition (1993-06) [documents 29(CO)162 and 29(CO)168], its amendment 1 (2000-10) [documents 29/457/FDIS and 29/471/RVD] and its amendment 2 (2017-04) [documents 29/910/CDV and 29/936/RVC]. The technical content is identical to the base edition and its amendments.**

**This Final version does not show where the technical content is modified by amendments 1 and 2. A separate Redline version with all changes highlighted is available in this publication.**

International Standard IEC 61252 has been prepared by IEC technical committee 29: Electroacoustics.

Specifications in this International Standard for personal sound exposure meters are consistent, insofar as practical, with comparable specifications in IEC 60804 for integrating sound level meters. The four principal technical differences from the specifications in the 1985 issue of IEC 60804 are:

a) sound exposure is measured and displayed rather than equivalent-continuous frequency-weighted sound pressure level or sound exposure level;

b) accuracy of squaring and integrating short-duration signals is specified by measurement of the sound exposure of a sequence of repeated constant-amplitude, 1 ms and 10 ms duration, 4 kHz tonebursts rather than by measurement of the response to single 4 kHz tonebursts of varying amplitudes with durations ranging from 1 ms to 1 s, each single toneburst being accompanied by a continuous, in-phase, low-level, 4 kHz background signal;

c) specifications for a personal sound exposure meter include a limitation on the difference between the sound exposure indicated in response to positive-going and negative-going unipolar pulses; and

d) requirements are not specified for the directional response of the microphone of a personal sound exposure meter intended to be worn on a person.

This International Standard includes two informative annexes. Annex A provides a table of selected sound exposures and corresponding normalized 8-h-average sound levels. Annex B describes recommendations for tests to verify the performance of a personal sound exposure meter.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

# INTRODUCTION

According to this International Standard, a personal sound exposure meter is intended to measure sound exposure as the time integral of the square of the instantaneous A-frequency-weighted sound pressure. This operating principle underlies the measurement of sound exposure level according to IEC 60804. It is the "equal-energy exchange rate" whereby a doubling (or halving) of the integration time of a constant sound level yields a two-fold increase (or decrease) of sound exposure. Similarly, an increase (or decrease) of 3 dB in a constant input sound level for a constant integration time yields a doubling (or halving) of the sound exposure.

Noise dose meters usually have been designed to indicate noise dose as a percentage of a legal limit. The limit and its definition vary from country to country and are subject to change. To facilitate international comparison of sound exposure records with numerical values of convenient magnitude, this International Standard specifies an instrument that indicates sound exposure in pascal-squared hours. An indication of sound exposure with a unit other than pascal-squared hours is permitted provided the manufacturer specifies a procedure for converting the indication to pascal-squared hours, for example, a display of "dose" as a fraction or a percentage of a specified sound exposure in pascal-squared hours.

The principal application for a personal sound exposure meter is the measurement of sound exposure in the vicinity of a person's head; e.g., for assessment of potential hearing impairment according to Standards such as ISO 1999. The microphone of a personal sound exposure meter may be worn on the shoulder, collar, or other location close to one ear. For many practical situations, such as in a factory where the sound-incidence angle may vary widely during the course of workday, the sound exposure indicated by an instrument worn on a person is likely to be different from that which would be measured in the absence of the person. The influence of the person wearing a personal sound exposure meter should be considered when estimating the sound exposure that would have been measured with the person absent.

# ELECTROACOUSTICS –

# SPECIFICATIONS FOR PERSONAL SOUND EXPOSURE METERS

## 1 Scope

**1.1** Sound exposure is a physical measure that accounts for both the sound pressure and its duration, at a given location, through an integral-over-time of the square of instantaneous frequency-weighted sound pressure.

**1.2** This International Standard is applicable to instruments for measurement of A-frequency-weighted sound exposure resulting from steady, intermittent, fluctuating, irregular, or impulsive sounds. Instruments complying with the specifications of this International Standard are intended to be worn on a person to measure sound exposure. Measurements of sound exposure in the workplace may be useful for determinations of occupational noise exposure, in accordance with ISO 1999 and ISO 9612.

**1.3** This International Standard specifies acoustical and electrical performance requirements for personal sound exposure meters of one accuracy grade. The accuracy grade corresponds to that for an integrating sound level meter which complies with the Type 2 requirements of IEC 60804 for an A-weighted sound pressure level range from 80 dB to 130 dB and a nominal frequency range from 63 Hz to 8 kHz.

**1.4** Tolerances on deviations of an instrument's performance from specified design goals represent the performance capabilities of practical instruments. Personal sound exposure meters are required to operate within the tolerances of this International Standard over specified ranges of environmental conditions.

## 2 Normative references

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

IEC 60050(801):1984, *Advance edition of the International Electrotechnical Vocabulary, Chapter 801, Acoustics and electroacoustics*

IEC 60651:1979, *Sound level meters*

IEC 60801-2:1984, *Electromagnetic compatibility for industrial-process measurement and control equipment – Part 2: Electrostatic discharge requirements*

IEC 60801-3:1984, *Electromagnetic compatibility for industrial-process measurement and control equipment – Part 3: Radiated electromagnetic field requirements*

IEC 60804:1985, *Integrating-averaging sound level meters*

IEC 60942:1988, *Sound calibrators*