AS 1259.1—1990

Australian Standard®

Sound level meters

Part 1: Non–integrating

This Australian Standard was prepared by Committee AV/2, Acoustics, Instrumentation and Measurement Technique. It was approved on behalf of the Council of Standards Australia on 24 January 1990 and published on 7 May 1990.

The following interests are represented on Committee AV/2:

Association of Consulting Engineers Australia

Australian Acoustical Society

Australian and New Zealand Environment Council

Civil Aviation Authority

Confederation of Australian Industry

CSIRO, Division of Building, Construction and Engineering

CSIRO, National Measurement Laboratory

Department of Occupational Health Safety and Welfare, W.A.

Department of Industrial Relations and Employment, N.S.W.

National Acoustic Laboratories

National Association of Testing Authorities

National Occupational Health and Safety Commission

University of Queensland

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PREFACE

This Standard was prepared by the Standards Australia Committee on Acoustics—Instrumentation and Measurement Techniques to supersede AS 1259–1982, *Sound level meters* and is one of a series of two which deals with sound level meters, the series being arranged as follows:

Part 1: Non–integrating (this Standard)

Part 2: Integrating–averaging

This Standard is devoted to the non–integrating sound level meters and is technically equivalent to IEC 651, *Sound level meters*, with which it corresponds in all essential details, and includes the requirements of D–weighting specified in IEC 537, *Frequency weighting for the measurement of aircraft noise (D–weighting)*. An Annex giving brief details of important deviations of this Standard from IEC 651 is provided.

Part 2 of the Standard is devoted to the integrating–averaging sound level meters and is technically identical to IEC 804, *Integrating–averaging sound level meters* and incorporates *IEC Amendment No 1 of September 1989 to the IEC 804.*

The Standard provides for four types of sound level meters, viz. Types 0 and 1 intended for laboratory and precision use; Type 2, intended for general field applications; and Type 3, primarily intended for field noise survey applications.

The sound level meters have one or more frequency–weighting characteristics designated A, B, and C, and one or more time–weighting characteristics designated S, F and I and P.

Owing to the complexity of operation of the human ear, it is not possible at present to design an objective noise measuring apparatus for all types of noise, to give results which are absolutely comparable in respect of some characteristic of the noise such as loudness or annoyance which can be obtained by subjective assessment.

However, it is considered essential that an apparatus by which sounds can be measured under closely defined conditions be standardized so that results obtained by users of such apparatus are always reproducible within stated tolerances.

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STANDARDS AUSTRALIA

Australian Standard
Acoustics–Sound level meters

Part 1: Non-integrating

1 SCOPE. This Standard specifies requirements for sound level meters for the measurement of certain frequency-weighted and time-weighted sound pressure levels.

This Standard specifies the following characteristics of sound level meters:

(a) Directional characteristics.

(b) Frequency-weighting characteristics.

(c) Time-weighting, detector and indicator characteristics.

(d) Sensitivity to various environments.

It also sets out electrical and acoustical procedures to verify compliance with the characteristics specified and describes the method for absolute sensitivity calibration.

2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS
1099 Basic environmental testing procedures for electrotechnology

1633 Acoustics–Glossary of terms and related symbols

2533 Acoustics–Preferred frequencies for measurements

2659 Guide to the use of sound measuring equipment
2659.1 Part 1:Portable sound level meters

IEC
537 Frequency weighting for the measurement of aircraft noise (D-weighting)

3 DEFINITIONS. For the purpose of this standard, the definitions in AS 1633 and the following apply:

3.1 Weighted sound pressure level (in decibels (dB))–20 times the logarithm to the base 10 of the ratio of a weighted sound pressure to the reference sound pressure. The sound pressure is weighted in accordance with one of the frequency weightings A, B, C or D and is time-weighted in accordance with characteristic S, F, I or P, the frequency weightings and time weightings being as specified in this Standard. The reference sound pressure is 20 μPa and does not depend on the frequency weighting or the time weighting.

3.2 Crest factor (of a signal)–the ratio of the peak value to the r.m.s. value measured over a specified time interval, the instantaneous values of the signal being measured with respect to the arithmetic mean value.

3.3 Primary indicator range (of a sound level meter)–a specified range of the indicator for which the sound level meter readings are within particularly close tolerances on level linearity as specified in Clause 8.9 and Clause 8.10.

3.4 Level linearity–the relationship when the reading of the sound level meter is a linear function of the level of the input signal, within stated tolerances.

3.5 Reference direction–the direction of sound incidence specified by the manufacturer to be used for determination of the absolute sensitivity, the directional characteristics and the frequency weighting of a sound level meter.

3.6 Reference frequency–a frequency, specified by the manufacturer, in the range 200 Hz to 1000 Hz to be used for calibration of the absolute sensitivity of a sound level meter.

3.7 Reference sound pressure level–a sound pressure level, specified by the manufacturer, to be used for calibration of the absolute sensitivity of the sound level meter.

3.8 Reference range (of a sound level meter)–a range, specified by the manufacturer, for calibration purposes.

3.9 Tone burst–an integral number of cycles of a sine wave starting and ending at a zero crossing.