

**Air conditioners, heat pumps
and dehumidifiers with
electrically driven
compressors —
Measurement of airborne
noise —
Determination of the sound
power level**

ICS 17.140.20; 91.140.30

Committees responsible for this Draft for Development

The preparation of this Draft for Development was entrusted to Technical Committee RHE/17, Testing of heat pumps and air conditioners, upon which the following bodies were represented:

- British Gas plc
- British Refrigeration Association
- Building Services Research and Information Association
- Chartered Institution of Building Services Engineers
- Department of the Environment (Building Research Establishment)
- Electricity Association
- Heating and Ventilating Contractors' Association
- HEVAC Association
- Institution of Refrigeration
- Institution of Mechanical Engineers

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Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of ENV 12102	3

National foreword

This Draft for Development has been prepared by Technical Committee RHE/17 and is the English language version of ENV 12102 : 1996, published by the European Committee for Standardization (CEN). ENV 12102 : 1996 was produced as a result of international discussions in which the UK took an active part.

Cross-references

Publication referred to	Corresponding British Standard
EN 23741 : 1991	BS 4196 <i>Sound power levels of noise sources</i> Part 1 : 1991 <i>Precision methods for determination of sound power levels for broad-band sources in reverberation rooms</i>
EN 23742 : 1991	Part 2 : 1991 <i>Precision methods for determination of sound power levels for discrete-frequency and narrow-band sources in reverberation rooms</i>
EN ISO 3744 : 1995	BS EN ISO 3744 : 1995 <i>Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane</i>
EN ISO 9614-1 : 1995	BS EN 9614-1 <i>Acoustics — Determination of sound power levels of noise sources using sound intensity</i> Part 1 : 1995 <i>Measurement at discrete points</i>
ISO 3745 : 1977	BS 4196 <i>Sound power levels of noise sources</i> Part 5 : 1981 <i>Precision methods for determination of sound power levels for sources in anechoic and semi-anechoic room</i>

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature for the reasons given in the ENV foreword. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the European organization responsible for its conversion to a European Standard. A review of this publication will be initiated not later than 2 years after its publication by the European organization so that a decision can be taken on its status at the end of its three-year life. The commencement of the review period will be notified by an announcement in *BSI Update*.

According to the replies received by the end of the review period, the responsible BSI Committee will judge whether to support the conversion into a European Standard, to extend the life of the prestandard or to withdraw it.

Comments should be sent in writing to the Secretary of BSI Technical Committee RHE/17 at 389 Chiswick High Road, London W4 4AL giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ENV title page, pages 2 to 16, an inside back cover and a back cover.

ICS 91.140.30

Descriptors: Buildings, air conditioning, ventilation, aeraulic pipes, components, from specifications, dimensions, installation, cleaning, maintenance

English version

Air conditioners, heat pumps and dehumidifiers with electrically driven compressors — Measurement of airborne noise — Determination of the sound power level

Climatiseurs, pompes à chaleur et déshumidificateurs avec compresseur entraîné par moteur électrique — Mesure de bruit aérien émis — Détermination du niveau de puissance acoustique

Luftkonditionierer, Wärmepumpen und Entfeuchter mit elektrisch angetriebenen Verdichtern — Messung der Luftschallemissionen — Bestimmung des Schalleistungspegels

This European Prestandard (ENV) was approved by CEN on 1996-01-26 as a prospective standard for provisional application. The period of validity of the ENV is limited initially to three years. After three years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached..

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 113, Heat pumps and air conditioning units, the secretariat of which is held by AFNOR.

Following the results of CEN enquiry on prEN 255-7, *Heat pumps — Heat pump units with electrically driven compressors — Part 7: Heat pump units and heat pumps for heating sanitary hot water — Measurement of airborne noise — Determination of sound power level*, CEN/BT 5 decided to issue document as an ENV for the following reasons:

- enlargement of the scope to air conditioners and dehumidifiers;
- measurement procedure for the ducted sound component of a device to be developed;
- all possible installations configurations of indoor units to be taken into account (e.g. installation in double ceiling).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Contents

	Page
1	Scope
2	Normative references
3	Designation
4	Definitions and symbols
5	Measuring instruments
6	Object to be measured
7	Operation of the unit
7.1	Operating temperature conditions
8	Methods of installing different kinds of units for determining sound power levels
8.1	Review of installation methods for the reverberation method
8.2	Methods of installation for the free field over a reflecting plane and sound intensity methods
9	Installation of the unit
9.1	Installation of the unit for the reverberation method
9.2	Installation of the heat pump for the free field over a reflecting plane method
10	Test procedure
11	Precision and uncertainty of measurement results
12	Test report
12.1	Unit specification
12.2	Operating conditions and installation
12.3	Acoustical environment conditions
12.4	Measurement instruments
12.5	Measured values and results, including operating points, and with separate data for each type of installations (see clause 8)

1 Scope

This European Prestandard establishes requirements for determining, in accordance with a standardized procedure, the noise (parameter: sound power level) emitted into the surrounding air by air conditioners, heat pumps or dehumidifiers with electrically driven compressors.

The frequency range used in this prestandard is 125 Hz to 4000 Hz. Three methods for determining the sound power levels are specified in order to avoid unduly restricting existing facilities and experience. The first method is based on reverberant room measurement (see EN 23741, EN 23742 and prEN ISO 3743-2); the second is based on measurements in an essentially free field over a reflecting plane (see EN ISO 3744 and ISO 3745); and the third method is based on sound intensity measurement (see EN ISO 9614-1).

It is emphasized that this measurement standard only refers to airborne noise. This standard is applicable to air conditioners and/or heat pumps defined in accordance with prEN 255 and prEN 814, and for dehumidifiers in accordance with prEN 810.

2 Normative references

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 or 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.

prEN 255	<i>Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors — Heating mode</i>
prEN 814	<i>Air conditioners and heat pumps with electrically driven compressors — Cooling mode</i>
prEN 810	<i>Dehumidifiers with electrically driven compressors- Rating tests, marking, requirements and technical data</i>
EN 23741	<i>Acoustics — Determination of sound power levels of noise sources — Precision methods for broad-band sources in reverberation rooms (ISO 3741 : 1988)</i>
EN 23742	<i>Acoustics — Determination of sound power levels of noise sources — Precision methods for discrete-frequency and narrow band sources in reverberation rooms (ISO 3742 : 1988)</i>

prEN ISO 3743-2	<i>Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 2: Methods for special reverberation test rooms (ISO 3743-2 : 1994)</i>
EN ISO 3744	<i>Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744 : 1994)</i>
EN ISO 9614-1	<i>Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discreet points (ISO 9614-1 : 1993)</i>
ISO 3745	<i>Acoustics — Determination of sound power levels of noise sources — Precision methods for anechoic and semi-anechoic rooms</i>

3 Designation

The designation of sound power measurement for air conditioners, heat pumps and dehumidifiers in accordance with this standard is: Sound Power Measurement ENV 12102.

4 Definitions and symbols

Definitions and symbols of prEN 255-1, prEN 814-1 and prEN 810 apply.

L_W	Sound power level, in dB, for the housing of the compact units with or without ducts.
L_{Wd}	Sound power level, in dB, for the proportion of sound radiating by the openings of the ducts for the compact units with ducts.
L_{Wi}	Sound power level, in dB, for the housing of the indoor component of split units with or without ducts.
L_{Wo}	Sound power level, in dB, for the housing of the outdoor component of split units with or without ducts.
L_{Wdi}	Sound power level, in dB, for the proportion of sound radiated by the openings of the ducts of the indoor component of split units with ducts.
L_{Wdo}	Sound power level, in dB, for the proportion of sound radiated by the openings of the ducts of the outdoor component of split units with ducts.