

Ventilation for buildings — Instrumentation requirements for air velocity measurements in ventilated spaces

The European Standard EN 13182:2002 has the status of a
British Standard

ICS 23.120

National foreword

This British Standard is the official English language version of EN 13182:2002.

The UK participation in its preparation was entrusted to Technical Committee RHE/2, Air distribution and air diffusion, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

NOTE In preparing the EN for publication as a British Standard, it was noticed that there were typographical errors in the text. On page 7, in Figure 1, under the column headed “Upper response frequency” the figures “ $\leq 1,0$ ” and “1,0” should both read “ $\geq 1,0$ ”. Similarly, on page 11, in Table 4, under the column headed “Upper response frequency”, the figures “ $> 1,0$ Hz” should both read “ $\geq 1,0$ ”. These errors will be rectified in a future corrigendum.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 11 October 2002

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 19 cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

© BSI 11 October 2002

ISBN 0 580 40564 8

English version

Ventilation for buildings - Instrumentation requirements for air velocity measurements in ventilated spaces

Ventilation des bâtiments - Prescription d'instrumentation
pour les mesures de vitesses d'air dans des espaces
ventilés

Lüftung von Gebäuden - Gerätetechnische Anforderungen
für Messungen der Luftgeschwindigkeit in belüfteten
Räumen

This European Standard was approved by CEN on 27 December 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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Contents

	page
Foreword	3
Introduction	4
1 Scope	4
2 Normative references	4
3 Terms, definitions and symbols	4
4 Main characteristics of air flow patterns	6
4.1 General	6
4.2 Zone A	6
4.3 Zone B	6
4.4 Zone C	6
5 Relevant parameters	8
6 Requirements for velocity probe	9
6.1 Velocity and temperature range	9
6.2 Upper response frequency limit	9
6.3 Directional sensitivity	9
6.4 Influence of natural convection	11
6.5 Influence of ambient air temperature	11
6.6 Influence of air density	12
6.7 Dimensions	12
7 Signal processing requirements for air velocity measurements	12
7.1 General	12
7.2 Sampling rate and measuring period	13
7.3 Determination of mean value	15
7.4 Determination of standard deviation	15
7.5 Determination of turbulence intensity	15
8 Calibration	15
8.1 Instrument manufacturers	15
8.1.1 General	15
8.1.2 Accuracy	15
8.2 Recalibration by the user	17
Bibliography	19

Foreword

This document EN 13182 has been prepared by Technical Committee CEN/TC 156 "Ventilation for buildings", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2002, and conflicting national standards shall be withdrawn at the latest by October 2002.

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

Introduction

European Standards exist which deal with the evaluation of local air velocity in ventilated spaces. This parameter is important in the assessment of comfort¹⁾. It is determined in the assessment of air terminal device performance in the laboratory¹⁾ and in the site situation (in a building) where comparisons are required in relation to specified values¹⁾.

This standard provides a common basis for the instrumentation requirements for all the above applications.

The characteristics of instruments can vary according to their measuring and signal processing principles, their construction, and the way in which they are used. It is important that the users compare the quality of the instruments available in the market at any given time and a check is made that they conform to the requirements of this European Standard.

1 Scope

This European Standard specifies the main characteristics of air velocity measuring devices. This includes requirements for thermal velocity probes, recalibration and the signal processing of measurements in a ventilated space, including those in the air jet and in the occupied zone. Other types of velocity measuring devices should fulfil the performance parameters stated but appropriate calibration techniques should not necessarily be used which are described in this standard.

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 amendment 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).

CR 12792, *Ventilation for buildings – Symbols and terminology*.

EN 27726, *Thermal environments - Instruments and methods for measuring physical quantities (ISO 7726:1985)*.

3 Terms, definitions and symbols

For the purposes of this European Standard the terms, definitions and symbols in CR 12792 apply together with those given in Table 1.

¹⁾ See Bibliography.

Table 1 – Symbols

Symbol	Quantity	Unit
f	Frequency	Hz
f_{up}	Upper frequency	Hz
N	Total number of samples	
n	Speed of rotation	rad·s ⁻¹
n_r	Sampling rate	s ⁻¹
Δp	Pressure drop	Pa
R	Radius	m
s_v	Standard deviation of velocity	m·s ⁻¹
T_u	Turbulence intensity	%
θ	Air temperature	°C
U	Output signal	V
U_v	Output signal of velocity	V
U_t	Output signal of temperature	V
v	Air velocity	m·s ⁻¹
$\bar{v}$	mean air velocity	m·s ⁻¹
v_i	Instantaneous air velocity	m·s ⁻¹
v_o	Reference air velocity	m·s ⁻¹
v_α	Air velocity reading at yaw angle	m·s ⁻¹
v_β	Air velocity reading at roll angle	m·s ⁻¹
v_{true}	True air velocity	m·s ⁻¹
Δv	Deviation of air velocity	m·s ⁻¹
α	Angle of yaw	°
β	Rotational angle (roll angle)	°
τ	Time	s