

# Ventilation i bygninger – Ydeevneprøvning af komponenter/produkter til boligventilation – Del 4: Aerodynamisk, elektrisk og akustisk ydeevne for envejs ventilationsenheder

Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 4: Aerodynamic, electrical power and acoustic performance of unidirectional ventilation units

A large, thin, black curved line that starts at the bottom left, rises to a peak in the middle, and then descends towards the bottom right, spanning across the lower half of the page.

**DANSK STANDARD**  
Danish Standards Association

Göteborg Plads 1  
DK-2150 Nordhavn  
Tel: +45 39 96 61 01  
dansk.standard@ds.dk  
www.ds.dk

# DS/EN 13141-4:2021

København

DS projekt: M326353

ICS: 91.140.30

**Første del af denne publikations betegnelse er:**

**DS/EN, hvilket betyder, at det er en europæisk standard, der har status som dansk standard.**

**Denne publikations overensstemmelse er:**

**IDT med: EN 13141-4:2021**

**DS-publikationen er på engelsk.**

**Denne publikation erstatter: [DS/EN 13141-4:2011](#)**

---

## **DS-publikationstyper**

Dansk Standard udgiver forskellige publikationstyper.

Typen på denne publikation fremgår af forsiden.

Der kan være tale om:

### **Dansk standard**

- standard, der er udarbejdet på nationalt niveau, eller som er baseret på et andet lands nationale standard, eller
- standard, der er udarbejdet på internationalt og/eller europæisk niveau, og som har fået status som dansk standard

### **DS-information**

- publikation, der er udarbejdet på nationalt niveau, og som ikke har opnået status som standard, eller
- publikation, der er udarbejdet på internationalt og/eller europæisk niveau, og som ikke har fået status som standard, fx en teknisk rapport, eller
- europæisk præstandard

### **DS-håndbog**

- samling af standarder, eventuelt suppleret med informativt materiale

### **DS-hæfte**

- publikation med informativt materiale

Til disse publikationstyper kan endvidere udgives

- tillæg og rettelsesblade

## **DS-publikationsform**

Publikationstyperne udgives i forskellig form som henholdsvis

- fuldtekstpublikation (publikationen er trykt i sin helhed)
- godkendelsesblad (publikationen leveres i kopi med et trykt DS-omslag)
- elektronisk (publikationen leveres på et elektronisk medie)

## **DS-betegnelse**

Alle DS-publikationers betegnelse begynder med DS efterfulgt af et eller flere præfikser og et nr., fx **DS 383**, **DS/EN 5414** osv. Hvis der efter nr. er angivet et **A** eller **Cor**, betyder det, enten at det er et **tillæg** eller et **rettelsesblad** til hovedstandard, eller at det er indført i hovedstandard.

DS-betegnelse angives på forsiden.

## **Overensstemmelse med anden publikation:**

Overensstemmelse kan enten være IDT, EQV, NEQ eller MOD

- **IDT:** Når publikationen er identisk med en given publikation.
- **EQV:** Når publikationen teknisk er i overensstemmelse med en given publikation, men præsentationen er ændret.
- **NEQ:** Når publikationen teknisk eller præsentationsmæssigt ikke er i overensstemmelse med en given standard, men udarbejdet på baggrund af denne.
- **MOD:** Når publikationen er modificeret i forhold til en given publikation.

EUROPEAN STANDARD

EN 13141-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2021

ICS 91.140.30

Supersedes EN 13141-4:2011

English Version

Ventilation for buildings - Performance testing of  
components/products for residential ventilation - Part 4:  
Aerodynamic, electrical power and acoustic performance  
of unidirectional ventilation units

Ventilation des bâtiments - Essais de performance  
des composants/produits pour la ventilation  
des logements - Partie 4 : Performance  
aérodynamique, de puissance électrique et acoustique  
des unités de ventilation simple flux

Lüftung von Gebäuden - Leistungsprüfungen  
von Bauteilen/Produkten für die Lüftung  
von Wohnungen - Teil 4: Aerodynamische,  
elektrische und akustische Leistung von  
unidirektionalen Lüftungsgeräten

This European Standard was approved by CEN on 25 January 2021.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

# Contents

Page

European foreword	4
Introduction	5
<b>1 Scope</b>	<b>7</b>
<b>2 Normative references</b>	<b>7</b>
<b>3 Terms and definitions</b>	<b>10</b>
<b>4 Symbols and abbreviations</b>	<b>12</b>
<b>5 Performance testing of aerodynamic characteristics</b>	<b>13</b>
5.1 External leakages	13
5.1.1 Test installation	13
5.1.2 Test procedure	13
5.2 Air flow/pressure performance	15
5.2.1 General	15
5.2.2 Test Installation	16
5.2.3 Test procedure	17
5.3 Air flow sensitivity	20
5.4 Indoor/outdoor airtightness	20
<b>6 Energy</b>	<b>21</b>
6.1 Performance testing of electrical power	21
6.1.1 Testing method	21
6.1.2 Electrical power input at reference and maximum air volume flow	21
6.1.3 Assessment of part load energy efficiency (optional)	21
6.2 Operable mode	21
6.3 Standby mode	21
<b>7 Performance testing of acoustic characteristics</b>	<b>22</b>
7.1 General	22
7.2 Noise radiated through the casing of the unit $L_{Wc}$	24
7.2.1 General	24
7.2.2 Test Installation	24
7.2.3 Measurements	25
7.3 Radiated sound power level in the indoor or outdoor space – $L_{Wi}$ and $L_{Wo}$	25
7.3.1 General	25
7.3.2 Test Installation	26
7.3.3 Measurements	27
7.4 In-duct sound power level of the unit	28
7.4.1 General	28
7.4.2 Test Installation	28
7.4.3 Measurements	29
7.5 Airborne sound insulation	30
7.5.1 General	30
7.5.2 Test Installation	30
7.5.3 Measurements	30
<b>8 Test results</b>	<b>31</b>
8.1 Test report	31
8.2 Product specifications	31
8.3 Leakages	31
8.4 Air flow/pressure curve	31
8.5 Air flow sensitivity for non-ducted ventilation units	31
8.6 Indoor/outdoor airtightness for non-ducted ventilation units	32
8.7 Energy	32
8.8 Acoustic characteristics	32

<b>Annex A (normative) Connection box(es) .....</b>	<b>34</b>
<b>Annex B (normative) Evaluation of maximum air volume flow and pressure.....</b>	<b>36</b>
<b>Annex C (normative) Examples for the evaluation of reference pressure.....</b>	<b>37</b>
<b>Annex D (informative) Assessment of part load energy efficiency .....</b>	<b>38</b>
<b>Bibliography .....</b>	<b>42</b>

## European foreword

This document ([EN 13141-4:2021](#)) 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 2021, and conflicting national standards shall be withdrawn at the latest by October 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes [EN 13141-4:2011](#).

In addition to a number of editorial revisions, the following main changes have been made with respect to [EN 13141-4:2011](#):

- the scope has been changed, and concerns now all unidirectional ventilation units (ducted or non-ducted units, supply or exhaust units), excluding cowls with fans (see [EN 13141-5](#));
- the terms and definitions have been updated in accordance with the parameters used in the document;
- performance testing of aerodynamic characteristics clause includes new testing of external leakages;
- description of the connection box has been moved in a normative annex;
- determination of the maximum and reference air flow has been added;
- assessment of part load energy efficiency has been moved in an informative annex;
- tests of air flow sensitivity and indoor/outdoor airtightness have been added;
- in the energy part, the characterization of SPI has been added;
- the whole acoustic clause has been reorganized and references to acoustic standard updated;
- testing of noise radiated by the casing for ducted units has been added;
- testing of radiated sound power in the indoor or outdoor space and the airborne sound insulation of non-ducted units have been added;
- the safety clause has been deleted;
- a new clause dealing with all test results has been created.

A list of all parts in the [EN 13141 series](#), published under the general title *Ventilation for buildings — Performance testing of components/products for residential ventilation* can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

This document specifies methods for the performance testing of components used in residential ventilation systems to establish the performance characteristics as identified in [EN 13142:2021 \[1\]](#).

This document incorporates many references to other European and International Standards, especially on characteristics other than the aerodynamic characteristics, for instance on acoustic characteristics.

In most cases, some additional tests or some additional conditions are given for the specific use in residential ventilation systems.

This document can be used for the following applications:

- laboratory testing;
- attestation purposes.

The position of this document in the field of standards for the mechanical building services is shown in [Figure 1](#).

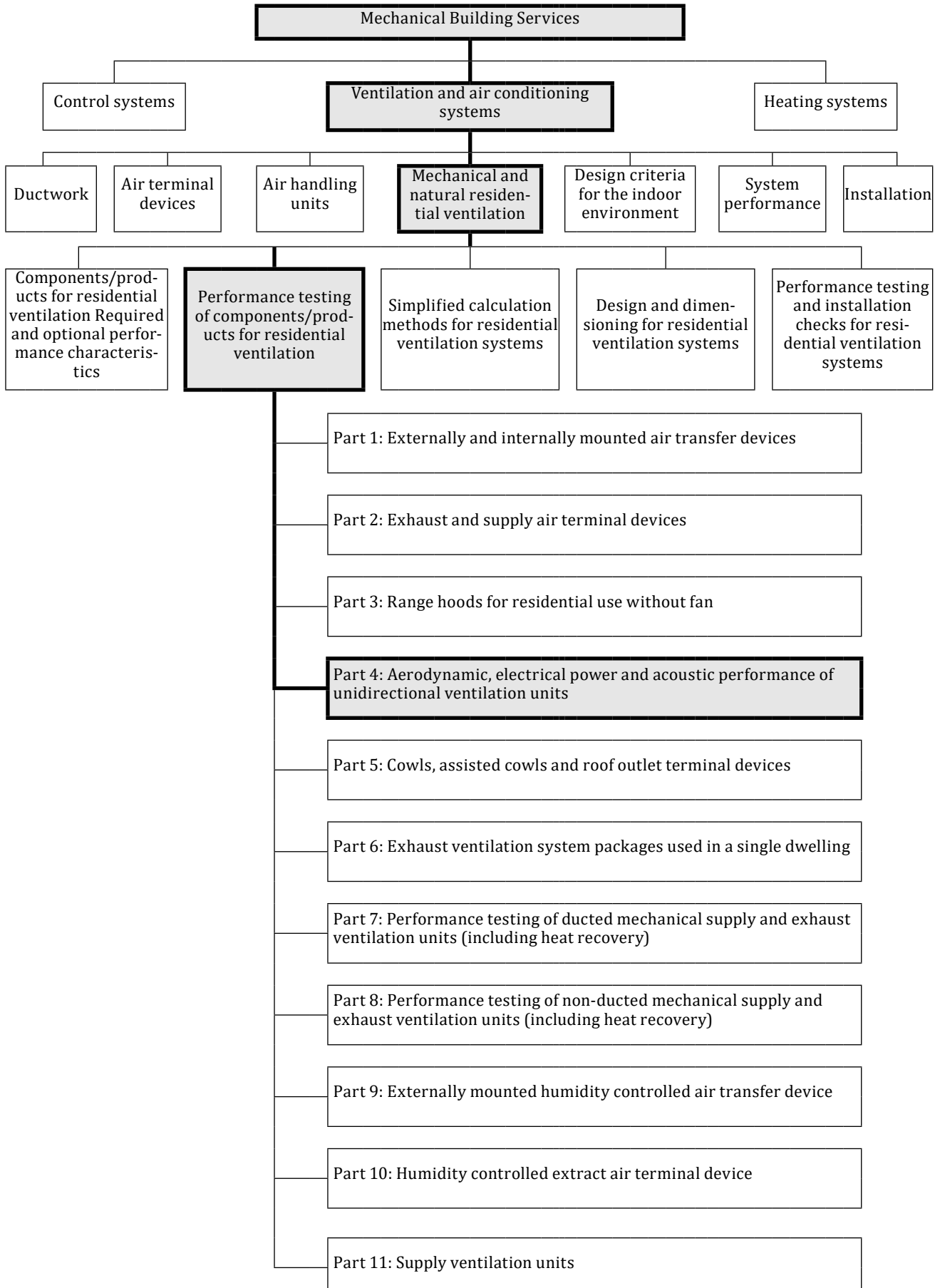


Figure 1 — Position of EN 13141-4 in the field of the mechanical building services



# Ventilation for buildings – Performance testing of components/products for residential ventilation –

## Part 4:

# Aerodynamic, electrical power and acoustic performance of unidirectional ventilation units

## 1 Scope

This document specifies aerodynamic, acoustic and electrical power performance test methods for unidirectional ventilation units used in residential ventilation systems.

This document is applicable to ventilation units:

- installed on a wall or in a window without any duct, A category;
- installed in the upstream of a duct, B category;
- installed in the downstream of a duct, C category;
- installed in a duct, or with duct connection upstream and downstream, D category;
- with one or several inlets/outlets;
- installed in a system with a heat pump for domestic hot water or water for cooling or heating;
- which can be used for supply or exhaust.

This document does not apply to:

- fan assisted cowls which are tested according to [EN 13141-5](#);
- mechanical supply and exhaust units which are tested according to [EN 13141-7:2021](#) or [prEN 13141-8:2021](#).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[EN 12792](#), *Ventilation for buildings — Symbols, terminology and graphical symbols*

[EN ISO 717-1](#), *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation (ISO 717-1)*

[EN ISO 5801:2017](#), *Industrial fans — Performance testing using standardized airways (ISO 5801:2017)*

[EN ISO 5135](#), *Acoustics — Determination of sound power levels of noise from air-terminal devices, air-terminal units, dampers and valves by measurement in a reverberation room (ISO 5135)*

[EN ISO 5136](#), *Acoustics — Determination of sound power radiated into a duct by fans and other air-moving devices — In-duct method (ISO 5136)*

[EN ISO 10140-1](#), *Acoustics — Laboratory measurement of sound insulation of building elements — Part 1: Application rules for specific products (ISO 10140-1)*

[EN ISO 10140-2](#), *Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation (ISO 10140-2)*

[EN ISO 10140-5](#), *Acoustics — Laboratory measurement of sound insulation of building elements — Part 5: Requirements for test facilities and equipment (ISO 10140-5)*

[EN ISO 16890 \(all parts\)](#), *Air filters for general ventilation (ISO 16890 (all parts))*

[ISO 13347-2](#), *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 2: Reverberant room method*

[ISO 13347-3](#), *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 3: Enveloping surface methods*

[ISO 13347-4](#), *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 4: Sound intensity method*