SLOVENSKI STANDARD
oSIST prEN 13141-7:2018

01-oktober-2018

Prezračevanje stavb - Preskušanje lastnosti sestavnih delov/izdelkov za prezračevanje stanovanjskih stavb - 7. del: Preskušanje lastnosti mehanskih kanalnih dovodnih in odvodnih enot (vključno z enotami za vračanje toplote)

Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 7: Performance testing of ducted mechanical supply and exhaust ventilation units (including heat recovery)

Lüftung von Gebäuden - Leistungsprüfungen von Bauteilen/Produkten für die Lüftung von Wohnungen - Teil 7: Leistungsprüfung von mechanischen Zuluft und Ablufteinheiten (einschließlich Wärmerückgewinnung)

Ventilation des bâtiments - Essais de performance des composants/produits pour la ventilation des logements - Partie 7 : Essais de performance des centrales double flux (y compris la récupération de chaleur)

Ta slovenski standard je istoveten z: **prEN 13141-7**

ICS:

91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems

oSIST prEN 13141-7:2018 **en,fr,de**

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English Version

Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 7: Performance testing of ducted mechanical supply and exhaust ventilation units (including heat recovery)

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 156.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 13141-7:2018) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13141-7:2010.

In addition to a number of editorial revisions, the following main changes have been made with respect to EN 13141-7:2010:

— terms and definitions as well as the symbols and abbreviations have been updated in accordance with the parameters used in the document;

— new categories of heat exchanger have been added;

— general requirements of the static pressure distribution have been added in 7.1;

— the reference of the internal and external leakage rates has been changed to the reference air volume flow;

— requirements to convert the measured values to standard conditions have been added in 7.2.2.1;

— determination of the static pressure difference, maximum air flow and reference air flow has been added;

— the formulas to calculate the temperature ratios have been changed;

— the wet bulb temperature for the cold climate test has been changed;

— Annex D, giving examples for the evaluation of maximum air volume flow and pressure, has been added;

— Annex E giving examples for the evaluation of reference pressure has been added;

— the description of the connection box has been moved to Annex F.

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.

Introduction

This document specifies methods for the performance testing of components used in residential ventilation systems to establish the performance characteristics as identified in prEN 13142.

This document does not contain any information on ductwork and fittings, which are covered by other European Standards.

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.

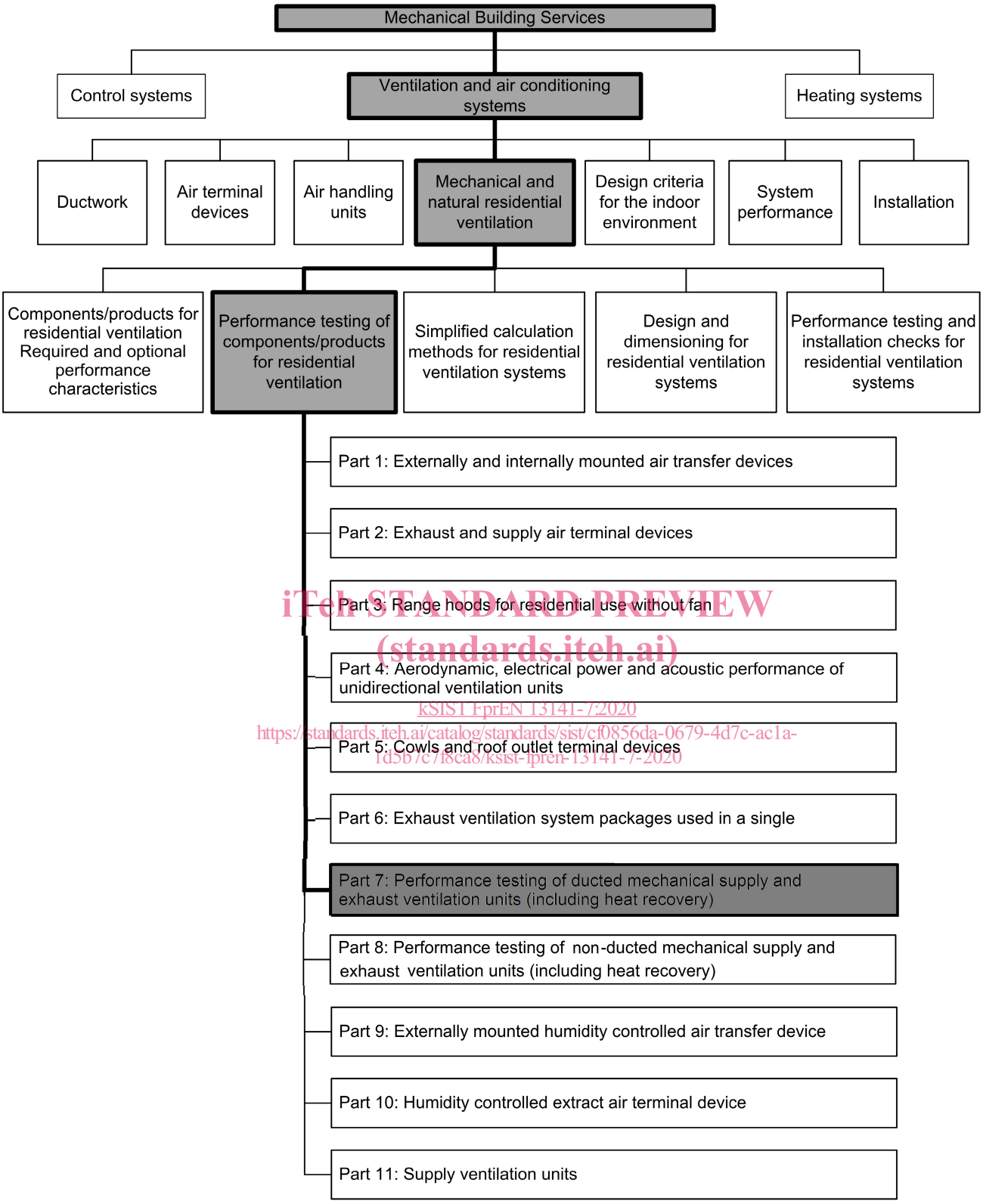

Figure 1 — Position of EN 13141-7 in the field of the mechanical building services

1 Scope

This document specifies the laboratory test methods and test requirements for the testing of aerodynamic, thermal, acoustic and electrical performance characteristics of ducted mechanical supply and exhaust ventilation units intended for single family houses.

This document is applicable to unit that contain at least, within one or more casing:

— fans for mechanical supply and exhaust;

— air filters;

— air-to-air heat exchanger and/or air-to-air heat pump for air heat recovery;

— control system.

Such unit can be provided in more than one assembly, the separate assemblies of which are designed to be used together.

The different possible arrangements of heat recovery, heat exchangers and/or heat pumps are described in Annex A.

This document does not deal with non-ducted units.

This document does not cover ventilation systems that may also provide water space heating and hot water.

This document does not cover units including combustion engine, driven compression heat pumps and absorption heat pumps.

Electrical safety requirements are given in EN 60335-2-40 and EN 60335-2-80.

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 306, *Heat exchangers - Methods of measuring the parameters necessary for establishing the performance*

EN 12792, *Ventilation for buildings - Symbols, terminology and graphical symbols*

EN 14511 (all parts), *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling*

EN 14511-3, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 3: Test methods*

EN 14511-4, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 4: Requirements*

EN ISO 3741, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for reverberation test rooms (ISO 3741)*

EN ISO 3743-1, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for small movable sources in reverberant fields - Part 1: Comparison method for a hard-walled test room (ISO 3743-1)*

EN ISO 3743-2, *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)*

EN ISO 3744, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane (ISO 3744)*

EN ISO 3745, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for anechoic rooms and hemi-anechoic rooms (ISO 3745)*

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 5801, *Fans - Performance testing using standardized airways (ISO 5801)*

EN ISO 9614-1, *Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 1: Measurement at discrete points (ISO 9614-1)*

EN ISO 9614-2, *Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning (ISO 9614-2)*

EN ISO 9614-3, *Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 3: Precision method for measurement by scanning (ISO 9614-3)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 5801 and EN 12792 and the following apply.

ISO and IEC maintain terminological databases for the use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO online browsing platform: available at http://www.iso.org/obp

3.1
external leakage
q_{ve}
leakage to or from the air flowing inside the casing of the unit to or from the surrounding air

3.2
internal leakage
q_{vi}
leakage inside the unit between the exhaust and the supply air flows

3.3
transfer ratio
R_s
mass transfer of the discharged air to a zone (in Figure 2: from key 4 (extract) to key 5 (supply)) that is actually recirculated air from the same zone, due to internal leakage and external casing leakage

3.4
filter bypass leakage
air bypass around filter cells

3.5
maximum air volume flow at zero pressure
$q_{vmax,0}$
measured air volume flow corresponding to the maximum achievable fan curve setting of the unit, at minimum static pressure difference $p_{s,ext}$, which corresponds to 0 Pa static fan pressure p_{fs}

3.6
declared maximum air volume flow
$q_{vmax,d}$
maximum air volume flow of the unit declared by the manufacturer

3.7
maximum air volume flow
q_{vmax}
air volume flow corresponding to the maximum achievable fan curve setting of the unit at the pressure p_{qvmax}, either declared or measured

Note 1 to entry: If the supply and exhaust air volume flows are different, then the maximum air volume flow is equal to the smaller of the two air volume flows.

3.8
declared minimum air volume flow
$q_{vmin,d}$
minimum air volume flow of the unit at the reference pressure declared by the manufacturer

Note 1 to entry: If the supply and exhaust air volume flows are different, then the minimum air volume flow is equal to the higher of the two air volume flows.

3.9
reference air volume flow
q_{vref}
air volume flow corresponding to the reference pressure

Note 1 to entry: To determine reference air volume flow, see 7.2.2.3, Table 10.

3.10
fan pressure
p_f
pressure increase induced by the ventilation unit given as difference between the total pressures at the unit outlet and the unit inlet

[SOURCE: EN ISO 5801:2008, 3.38]

Note 1 to entry: In case of similar cross-section areas of the inlet and outlet, the total pressure difference is equal to the static pressure difference.

3.11
static fan pressure
p_{fs}
pressure increase induced by the ventilation unit given as difference between the static pressure at the unit outlet and the total pressure at the unit inlet

[SOURCE: EN ISO 5801:2008, 3.40]

3.12
static pressure difference
$p_{s,ext}$
pressure increase induced by the ventilation unit given as difference between the static pressures at the unit outlet and the unit inlet

Note 1 to entry: Static pressure difference is used to determine the maximum air volume flow, the reference air volume flow and the minimum air volume flow.

3.13
pressure at maximum air volume flow
p_{qvmax}
static pressure difference corresponding to the maximum air volume flow

3.14
reference pressure
p_{ref}
static pressure difference corresponding to the reference air volume flow

3.15
temperature ratio
η_θ
temperature difference between inlet and outlet of one of the air flows divided by the temperature difference between the inlets of both air flows

3.16
humidity ratio
η_x
difference of water content between inlet and outlet of one of the air flows divided by the difference of water content between the inlets of both air flows

3.17
electrical power input
P_E
average over all electrical power input to the equipment within a defined interval of time for standard air conditions obtained from the power input of the fans; controller(s), compressor(s), safety devices of the equipment(s) excluding additional electrical heating devices not used for defrosting

Note 1 to entry: P_E is expressed in watts.

3.18
maximum electrical power input
$P_{E,max}$
electrical power input at maximum air volume flow q_{vmax} and its corresponding pressure p_{qvmax}

3.19
electrical power input at the reference volume flow
$P_{E,ref}$
electrical power input at reference air volume flow q_{vref} and reference pressure p_{ref}

4 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in EN 12792 and in Table 1 apply.

Table 1 — Symbols

Symbol	Designation	Unit
c	concentration of tracer gas	ppm
D	diameter of the measurement duct (see Figure 3)	m
D_{h1}, D_{h2}	Hydraulic diameters of the connecting duct (see Figure 3)	m
L_W	sound power level	dB
L_{WA}	A-weighted sound power level	dB
P_E	electrical power input	W
$P_{E,ref}$	electrical power input at the reference volume	W
$P_{E,max}$	maximum electrical power input	W
p_E	static pressure difference	Pa
p_f	fan pressure	Pa
p_{fs}	static fan pressure	Pa
p_{qvmax}	pressure at maximum air volume flow	Pa
p_{ref}	reference pressure	Pa
$p_{s,ext}$	static pressure difference	Pa
q_m	mass air flow rate	$kg.s^{-1}$ or $kg\ h^{-1}$ or $g.s^{-1}$
q_v	air volume flow	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
q_{vmax}	maximum air volume flow	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
$q_{vmax,d}$	declared maximum air volume flow	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
$q_{vmax,0}$	maximum air volume flow at 0 pressure	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
q_{vref}	reference air volume flow	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
q_{vd}	declared maximum air volume flow rate	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
q_{ve}	external leakage air volume flow rate	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
q_{vi}	internal leakage air volume flow rate	$m^3.s^{-1}$ or $m^3\ h^{-1}$ or $l.s^{-1}$
R	transfer ratio	%
R_s	transfer ratio	—
v	air velocity in the measurement duct (see Figure 3)	$m.s^{-1}$
θ	air temperature	°C