INTERNATIONAL STANDARD

ISO 16494

> First edition 2014-11-01

Heat recovery ventilators and energy recovery ventilators — Method of test for performance

ilateu.
nergie — Ventilateurs-récupérateurs de chaleur et ventilateurs-récupérateurs





nroduced or utilized 'te internet or an or ISO's mem' All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office Case postale 56 • CH-1211 Geneva 20 Tel. + 41 22 749 01 11 Fax + 41 22 749 09 47 E-mail copyright@iso.org Web www.iso.org

Published in Switzerland

Contents			Page
Fore	word		v
1	Scop	ne	1
2	^ ·	native references	
3	Terms and definitions		
4	Symbols and abbreviated terms		
	Airflow test		
5	5.1 5.2 5.3	General conditions Ducted heat recovery ventilators and energy recovery ventilators Unducted heat recovery ventilators and energy recovery ventilators	6 6
6	Tracer gas tests		9
	6.1	General conditions	9
	6.2	Temperature conditions	
	6.3 6.4	Preconditions Airflow conditions	
	6.5	Unit operating voltage and frequency	
	6.6	Tracer gas measurement methods	
7	Determination of efficiency		
	7.1	General conditions	
	7.2	Temperature and humidity conditions: inlets to ventilator Preconditions	10
	7.3	Preconditions Airflow conditions	
	7.4 7.5		
	7.5 7.6	Static pressure conditions: ducted heat and energy recovery ventilators	
	7.0	Unit operating voltage and frequency	
	7.8	Thermal performance measurement	11
8	Perf	ormance calculations	11
	8.1	Performance calculations: ducted ventilators	
	8.2	Performance calculations: unducted ventilators	
	8.3	Unit Exhaust Air Transfer Ratio (UEATR)	11
	8.4	Net supply airflow	12
	8.5	Gross effectiveness	13
	8.6	Coefficient of energy (COE) Effective work (EW)	14
	8.7	Effective work (EW)	15
9	Test	results	16
Anne	ex A (n	ormative) Airflow measurement method for both ducted and unducted ventilators	17
Anne	ex B (n	ormative) Decay method for measurement of net supply airflow	19
Anne	ex C (no	ormative) Unit exhaust air transfer ratio measurement methods	21
Anne	ex D (n	ormative) Thermal performance measurement	25
Anne	ex E (in	formative) Example data collection and reporting sheets	28
Anne	ex F (no	ormative) Required instrument uncertainty	36
Anne	ex G (in desi	formative) Construction of plenums for connection to inlets or outlets not gned for connection of ductwork	37
Bibli	iogranl	ıv	38

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 86, Refrigeration and air-conditioning, Subcommittee SC 6, Testing and rating of air-conditioners and heat pumps.

Heat recovery ventilators and energy recovery ventilators — Method of test for performance

1 Scope

This International Standard prescribes a method of testing the ventilation and energy related performance of heat recovery ventilators (HRVs) and energy recovery ventilators (ERVs) that do not contain any supplemental heating (except for defrost), cooling, humidification or dehumidification components.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3966:2008, Measurement of fluid flow in closed conduits — Velocity area method using Pitot static tubes

ISO 5167-1:2003, Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements

ISO 5801:2007, *Industrial fans* — *Performance testing using standardized airways*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

outdoor airflow

OA

volume of outside air entering the ventilator

Note 1 to entry: Indicated in Figure 1 as 1.

Note 2 to entry: Also referred to as 'entering supply air'.

3.2

supply airflow

SA

outside air after passing through the ventilator

Note 1 to entry: Indicated in Figure 1 as 2.

Note 2 to entry: Also referred to as 'leaving supply air'.

3.3

return (extract) airflow

RA

indoor air entering the ventilator

Note 1 to entry: Indicated in Figure 1 as 3.

Note 2 to entry: Also referred to as 'entering exhaust air'.