ISO 16494-1:2022-06 (E)

Heat recovery ventilators and energy recovery ventilators - Method of test for performance - Part 1: Development of metrics for evaluation of energy related performance

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 Symbols and abbreviated terms 6
4.1 Symbols 6
4.2 Subscripts 7

5 General test requirements 8
5.1 Test apparatus 8
5.2 Installation 8
5.3 Static pressure 8
5.4 Temperature 8
5.5 Concentration 8
5.6 Power input 8
5.7 Instrument calibration 8

6 Airflowtests 9
6.1 General conditions 9
6.1.1 General 9
6.1.2 Temperature conditions 9
6.1.3 Speed control settings 9
6.1.4 Unit operating voltage and frequency 9
6.2 Ducted heat recovery ventilators and energy recovery ventilators 9
6.2.1 Airflows measured 9
6.2.2 Static pressure conditions 9
6.2.3 Airflow measurement methods for ducted heat recovery and energy recovery ventilators 11
6.3 Unducted heat recovery ventilators and energy recovery ventilators 12
6.3.1 Airflow measured 12
6.3.2 Static pressure conditions 12
6.3.3 Airflow measurement methods for unducted heat recovery and energy recovery ventilators 12

7 Tracer gas tests 12
7.1 General conditions 12
7.2 Temperature conditions 12
7.3 Preconditions 12
7.4 Airflow conditions 12
7.5 Unit operating voltage and frequency 12
7.6 Tracer gas measurement methods 12

8 Determinationofefficiency 13
8.1 General conditions 13
8.2 Temperature and humidity conditions: inlets to ventilator 13
8.3 Preconditions 13

8.4 Airflow conditions 13
8.4.1 Required rating point 13
8.4.2 Alternate rating points 14
8.5 Static pressure conditions: ducted heat and energy recovery ventilators 14
8.6 Static pressure conditions: unducted heat and energy recovery ventilators 14
8.7 Unit operating voltage and frequency 14
8.8 Thermal performance measurement 14

9 Performance calculations 14
9.1 Performance calculations: ducted ventilators 14

9.2 Performance calculations: unducted ventilators 14
9.3 Unit exhaust air transfer ratio (UEATR) 15
9.4 Net supply airflow 15
9.4.1 Net supply airflow: ducted units 15
9.4.2 Net supply airflow: unducted units 15
9.5 Gross effectiveness, ... 16
9.6 Coefficient of energy (COE) 17
9.6.1 Coefficient of energy: ducted ventilators, CCOE,ducted 17
9.6.2 Coefficient of energy: unducted ventilators, CCOE,unducted 17
9.7 Effective work (EW) 18

10 Test results 19

Annex A (informative) Airflow measurement methods for both ducted and unducted ventilators -- Test equipment 20

Annex B (normative)Decaymethodformeasurementofnetsupplyairflow 21

Annex C (informative) Unit exhaust air transfer ratio measurement methods 23

Annex D (informative) Thermal performance measurement 27

Annex E (informative) Example data collection and reporting sheets 31

Annex F (normative) Required instrument uncertainty 38

Annex G (informative) Construction of plenums for connection to inlets or outlets not designed for connection of ductwork 39

Bibliography 40