

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 | Terms and definitions | 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 | Airflow tests | 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 | Determination of efficiency | 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) | Decay method for measurement of net supply airflow | 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 |