AHRI Standard 841 SI (2021)

2021 Standard for

Performance Rating of Unit Ventilators

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IMPORTANT

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Note:
This standard supersedes AHRI Standard 841 SI (2015).
See AHRI Standard 840 I-P (2021) for I-P ratings.

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PERFORMANCE RATING OF UNIT VENTILATORS

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish, for Unit Ventilators: definitions; classifications; test requirements; rating requirements; minimum data requirements for Published Ratings; operating requirements; marking and nameplate data; and conformance conditions.

1.1.1 *Intent.* This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors, and users.

1.1.2 *Review and Amendment.* This standard is subject to review and amendment as technology advances.

Section 2. Scope

2.1 *Scope.* This standard applies to Unit Ventilators, defined in Section 3.6.

2.2 *Exclusions.* This standard does not apply to equipment as defined in the following standards:

2.2.1 This standard does not apply to room air-conditioners, which are covered in AHAM Standard RAC-1 and/or ANSI Standard Z234.1 (withdrawn).

2.2.2 This standard does not apply to central-station air-handling units, which are covered in AHRI Standard 431 (SI).

2.2.3 This standard does not apply to variable refrigerant flow multi-split air conditioners and multi-split heat pumps, which are covered in AHRI Standard 1230 (I-P).

Section 3. Definitions

All terms in this document will follow the standard industry definitions in the *ASHRAE Terminology* website (https://www.ashrae.org/resources--publications/free-resources/ashrae-terminology) and in AHRI Standard 210/240, AHRI Standard 310/380, AHRI Standard 390, and ISO Standard 13256-1.

3.1 *Published Rating.* A statement of the assigned values of those performance characteristics, under stated Rating Conditions, by which a unit may be chosen to fit its application. These values apply to all units of like nominal size and type (identification) produced by the same manufacturer. As used herein, the term Published Rating includes the rating of all performance characteristics shown on the unit or published in specifications, advertising or other literature controlled by the manufacturer, at stated Rating Conditions.

3.1.1 *Application Rating.* A rating based on tests performed at application rating conditions (other than Standard Rating Conditions.)

3.1.2 *Standard Rating.* A rating based on tests performed at Standard Rating Conditions.

3.2 *Rating Conditions.* Any set of operating conditions under which a single level of performance results and which causes only that level of performance to occur.

3.2.1 *Standard Rating Conditions.* Rating Conditions used as the basis of comparison for performance characteristics.

3.2.2 *Application Rating Conditions.* Rating Conditions that are not the Standard Rating Conditions.

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3.3 *"Shall" or "Should".* "Shall" or "should" shall be interpreted as follows:

3.3.1 *Shall.* Where "shall" or "shall not" is used for a provision specified, that provision is mandatory if compliance with the standard is claimed.

3.3.2 *Should.* "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.4 *Standard Air.* Air weighing 1.20 kg/m^3 that approximates dry air at 21° C at a barometric pressure of 101.3 kPa.

3.5 *Standard Ventilation Rate.* The outdoor airflow to be provided in the breathing zone to dilute contaminates generated by space occupants and contents of the building contaminates, m^3/s.

3.6 *Unit Ventilator.* A factory-made assembly, equipped with outside air ventilation and return air dampers capable of introducing ventilation air of at least 80% of rated air flow of Standard Air, while also having the capability to provide any combination of the following functions: humidity control, heating, cooling, and filtering of air. The source of humidity control, heating or cooling supplementary to that from ventilation air, may be remote or an integral part of the unit itself. This equipment is designed for free delivery of air into a room but may be applied with minimal ductwork having a static resistance not exceeding 0.125 kPa. This equipment can be either vertical floor standing or horizontally mounted, in or adjacent to the space it serves. This equipment is provided with air capacities of 1.415 m^3/s or less.

3.6.1 *DX Fan-coil Unit Ventilators.* Any unit ventilator that also meets the definition of Indoor Unit, Air Handler as defined in AHRI Standard 211/241.

3.6.2 *Hydronic Fan-coil Unit Ventilators.* Any unit ventilator that meets the definition of Hydronic Fan-coil per Appendix C, section C1.5

3.6.3 *Air-source Self-contained Unit Ventilators.* Any equipment as defined in AHRI Standard 310/380 with ventilation capabilities as defined in Section 3.6. Any unit ventilator that also meets the definition of Packaged Terminal Air-conditioner or Packaged Terminal Heat pump as defined in AHRI 310/380.

3.6.4 *Single Package Vertical Unit Ventilators.* Any unit ventilator that also meets the definition of a Single Packaged Vertical Air-Conditioner or Single Packaged Vertical Heat Pump as defined in AHRI 390.

3.6.5 *Water-source Self-contained Unit Ventilators.* Any unit ventilator that also meets the definition of a water-to-air heat pump or brine-to-air heat pump as defined in ISO 13256-1.

Section 4. Classifications

4.1 *Methods of Classification.* Unit ventilators shall be classified according to the following:

4.1.1 *By Unit Type*.

4.1.1.1 DX Fan-coil Unit Ventilators.
4.1.1.2 Hydronic Fan-coil Unit Ventilators.
4.1.1.3 Air-source Self-contained Unit Ventilators.
4.1.1.4 Single Package Vertical Unit Ventilators.
4.1.1.5 Water-source Self-contained Unit Ventilators.

Section 5. Test Requirements

5.1 *Testing Requirements*. All ratings shall be verified by tests conducted in accordance with ASHRAE Standard 79.

5.1.1 *Room Air Test*. The room air test shall be conducted with the ventilation air inlet opening sealed so that no airflow enters the unit except from the room side. The airflow rate shall be the value measured from flowmeter No. 1 as depicted in Figure 1 and as indicated in Table 1.

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