AHRI Standard 840 I-P (2021)

2021 Standard for

Performance Rating of Unit Ventilators

AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

we make life better®

2311 Wilson Boulevard, Suite 400
Arlington, VA 22201, USA
www.ahrinet.org
PH 703.524.8800
FX 703.562.1942

AVA Documents
Document Sharing Hub

Full document details: AHRI Standard 840-2021 R2021 - Performance Rating of Unit Ventilators

IMPORTANT

SAFETY DISCLAIMER

AHRI does not set safety standards and does not certify or guarantee the safety of any products, components or systems designed, tested, rated, installed or operated in accordance with this standard/guideline. It is strongly recommended that products be designed, constructed, assembled, installed and operated in accordance with nationally recognized safety standards and code requirements appropriate for products covered by this standard/guideline.

AHRI uses its best efforts to develop standards/guidelines employing state-of-the-art and accepted industry practices. AHRI does not certify or guarantee that any tests conducted under its standards/guidelines will be non-hazardous or free from risk.

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

AHRI Certification Program Disclaimer

AHRI Standards are developed independently of AHRI Certification activities and may have scopes that include products that are not part of the AHRI Certification Program. The scope of the applicable AHRI Certification Program can be found on AHRI's website at www.ahrinet.org.

Price $10.00 (M) $20.00 (NM)
Printed in U.S.A.

©Copyright 2021, by Air-Conditioning, Heating, and Refrigeration Institute
Registered United States Patent and Trademark Office

Documents
Document Sharing Hub
Full document details: AHRI Standard 840-2021 R2021 - Performance Rating of Unit Ventilators

TABLE OF CONTENTS

SECTION		PAGE
Section 1.	Purpose	1
Section 2.	Scope	1
Section 3.	Definitions	1
Section 4.	Classifications	2
Section 5.	Test Requirements	2
Section 6.	Rating Requirements	4
Section 7.	Minimum Data Requirements for Published Ratings	5
Section 8.	Operating Requirements	5
Section 9.	Marking and Nameplate Data	6
Section 10.	Conformance Conditions	6

TABLES

Table 1.	Airflow Testing Conditions	3
Table 2.	Standard Rating Conditions for Unit Ventilators	4
Table 3.	Minimum Data Requirements for Published Ratings	5

FIGURES

Figure 1.	Standard Ventilation Rate Test Set-up	3

APPENDICES

Appendix A.	References - Normative	7
Appendix B.	References - Informative	8
Appendix C.	Test Provisions for Hydronic Fan-coil Unit Ventilators - Normative	9

Documents
Document Sharing Hub

Full document details: AHRI Standard 840-2021 R2021 - Performance Rating of Unit Ventilators

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 430 (I-P).

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.

Documents
Document Sharing Hub
Full document details: AHRI Standard 840-2021 R2021 - Performance Rating of Unit Ventilators

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 0.075 lb/ft^3 that approximates dry air at 70 °F at a barometric pressure of 29.92 in Hg.

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, cfm.

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 airflow 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 0.50 in H_2O. 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 3000 cfm or less.

3.6.1 *Air-source Self-contained Unit Ventilators*. Any unit ventilator that also meets the definition of Packaged Terminal Air-conditioner or Packaged Terminal Heat pump as defined in AHRI 310/380.

3.6.2 *DX Fan-coil Unit Ventilators.* Any unit ventilator that also meets the definition of Indoor Unit, Air Handler as defined in AHRI 210/240.

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

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 ANSI/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.

Documents
Document Sharing Hub
Full document details: AHRI Standard 840-2021 R2021 - Performance Rating of Unit Ventilators