

ANSI/AHRI Standard 350

2015 Standard for Sound Performance Rating of Non-ducted Indoor Air- conditioning and Heat Pump Equipment



Approved by ANSI on July 15, 2016



we make life better™

2111 Wilson Boulevard, Suite 500
Arlington, VA 22201, USA
www.ahrinet.org
PH 703.524.8800
FX 703.562.1942

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 350-2008.

Foreword

- This standard references the sound intensity test method defined in ANSI/AHRI Standard 230, as an alternate method of test to the reverberation room test method defined in ANSI/AHRI Standard 220 for determination of sound power ratings.
- Provisions for addressing Concealed versus Exposed Equipment test configurations have been added.

TABLE OF CONTENTS

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

TABLES

Table 1. Reproducibility in the Determination of Non-ducted Equipment Sound Power Levels.....	5
-----------------------------------------------------------------------------------------------	---

FIGURES

Figure 1. Location of Equipment in the Test Room	3
--------------------------------------------------------	---

APPENDICES

Appendix A. References – Normative	7
Appendix B. References – Informative	8
Appendix C. Examples of Various Types of Exposed and Concealed Equipment – Informative.....	9

FIGURES FOR APPENDICES

Figure C1. Exposed Sill Unit	9
Figure C2. Exposed Vertical Stack Unit	9
Figure C3. Exposed Horizontal Fan Coil Unit.....	10
Figure C4. Concealed Sill Unit	11
Figure C5. Concealed Vertical Stack Unit	11
Figure C6. Concealed Horizontal Fan Coil Unit.....	12
Figure C7. Concealed Vertical Stack Unit Test Setup – 5cm x 10cm Studs Cladded with 1.3cm Thick Drywall	13
Figure C8. Concealed Horizontal Stack Unit Test Setup – Cladded with 1.3cm Thick Drywall	13

SOUND PERFORMANCE RATING OF NON-DUCTED INDOOR AIR-CONDITIONING AND HEAT PUMP EQUIPMENT

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish for Non-ducted Indoor Air-conditioning and Heat Pump Equipment definitions; test requirements; rating requirements; minimum data requirements for Published Ratings; 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 the indoor portions of factory-made Non-ducted Air-conditioning and Heat Pump Equipment as defined in ANSI/AHRI Standards 210/240, 340/360, 310/380, 440 and 1230. Products covered include but are not limited to: fan coils, air-source unitary heat pumps as well as unitary air-conditioners, water-source heat pumps, packaged terminal equipment, and variable refrigerant flow (VRF) systems.

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>) unless otherwise defined in this section.

3.1 *Concealed Equipment.* Non-ducted Indoor Air-conditioning and Heat Pump Equipment that is designed to be located outside of the occupied space such that the casing radiated noise is acoustically isolated from the inlet and discharge sound. Refer to Appendix C for examples of various types of Concealed Equipment configurations.

3.2 *Exposed Equipment.* Non-ducted Indoor Air-conditioning and Heat Pump Equipment that is in the occupied space such that the casing radiated noise is included with the inlet and discharge sound. Refer to Appendix C for examples of various types of Exposed Equipment configurations.

3.3 *Hertz (Hz).* A unit of frequency equal to one cycle per second.

3.4 *Non-ducted Indoor Air-conditioning and Heat Pump Equipment.* For the purposes of this standard, non-ducted equipment communicates with the occupied space by free delivery and inlet or through enclosed airways with lengths less than 1 effective duct diameter.

3.5 *Octave Band.* A band of sound covering a range of frequencies such that the highest is twice the lowest. The Octave Bands used in this standard are those defined in ANSI/ASA Standard S1.11.

3.6 *One-third Octave Band.* A band of sound covering a range of frequencies such that the highest frequency is the cube root of two times the lowest frequency. The One-third Octave Bands used in this standard are those defined in ANSI/ASA Standard S1.11.

3.7 *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.