ANSI/AHRI Standard 275

2010 Standard for

Application of Outdoor Unitary Equipment A-Weighted Sound Power Ratings

Approved by ANSI on 4 January 2011

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IMPORTANT

SAFETY RECOMMENDATIONS

It is strongly recommended that the product be designed, constructed, assembled and installed in accordance with nationally recognized safety requirements, appropriate for products covered by this standard.

AHRI, as a manufacturer's trade association, uses its best efforts to develop standards, employing state-of-the-art and accepted industry practices. However, AHRI does not certify or guarantee safety of any products, components or systems designed, tested, rated, installed or operated in accordance with these standards or that any test conducted under its standards will be non-hazardous or free from risk.

Note:

This Standard supersedes AHRI Standard 275-2009.

This version of the standard differs from that of 2009 in the following ways:

- The 2008 edition of AHRI Standard 270 is now used for the rating.

Per AHRI Standard 270, the tone adjusted A-Weighted Sound Power Level has been replaced with an overall A-Weighted Sound Power Level.

Note: Although this standard is meant as an application for equipment rated per AHRI Standard 270, other standards that provide rating(s) similar to AHRI Standard 270 may be able to use the methodology, techniques and procedures described within this standard.

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APPLICATION OF OUTDOOR UNITARY EQUIPMENT A-WEIGHTED SOUND POWER RATINGS

Section 1. Purpose

1.1 *Purpose*. The purpose of this standard is to establish for outdoor unitary equipment: definitions, procedures for estimating A-Weighted Sound Pressure Levels from the A-Weighted Sound Power Ratings, and recommended application practices.

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 outdoor sections of factory-made air-conditioning and heat pump equipment with cooling capacities up to 40kW, as in the scope of AHRI Standards 210/240 and 340/360 when rated in accordance with AHRI Standard 270.

Section 3. Definitions

All terms in this document will follow the standard industry definitions established in the current edition of ASHRAE *Terminology of Heating, Ventilation, Air Conditioning and Refrigeration*, unless otherwise defined in this section.

3.1 *Air-Source Unitary Heat Pump.* One or more factory-made assemblies which normally include an indoor conditioning coil(s), compressor(s), and outdoor coil(s), including means to provide a heating function. When such equipment is provided in more than one assembly, the separated assemblies shall be designed to be used together, and the requirements of rating outlined in the standard are based upon the use of matched assemblies.

3.1.1 *Functions.* They shall provide the function of air heating with controlled temperature and may include the functions of air-cooling, air-circulating, air-cleaning, dehumidifying or humidifying.

3.2 *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.

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

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

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

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

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3.4 "Shall," "Should," "Recommended," or "It Is Recommended." "Shall," "should," "recommended," or "it is recommended" shall be interpreted as follows:

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

3.4.2 *Should, Recommended, or It Is Recommended*. "Should," "recommended," or "it is recommended" is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.5 *Sound Power Level, L_w*. Ten times the logarithm to the base ten of the ratio of the sound power radiated by the source to a reference sound power, expressed in decibels (dB). The reference sound power used in this standard is 1 picowatt (pW).

3.5.1 *A-Weighted Sound Power Level, L_{wA}*. For the purposes of this standard it is the unit's AHRI 270 A-Weighted Sound Power Level Rating(s).

3.6 *Sound Pressure Level, L_p*. Twenty times the logarithm to the base ten of the ratio of a given sound pressure to a reference sound pressure of 20 μPa, expressed in decibels (dB).

3.6.1 *A-Weighted Sound Pressure Level L_{pA}* . The measured level obtained with a sound level meter using its A-weighting network or the level as calculated per this standard. The meter shall meet the requirements of ANSI Standards S1.4.

3.7 *Sound Level Rating(s).* The Sound Power Level(s) of the equipment when rated in accordance with AHRI Standard 270.

3.7.1 *Standard Sound Rating*. The Sound Power Level(s) of the equipment when rated at Standard Rating Conditions in accordance with AHRI Standard 270.

3.7.2 *Application Sound Rating*. The Sound Power Level(s) of the equipment when rated in accordance with AHRI Standard 270 at conditions other than Standard Rating Conditions.

3.8 *Unitary Air-Conditioner*. One or more factory-made assemblies which normally include an evaporator or cooling coil(s), compressor(s) and condenser(s). Where such equipment is provided in more than one assembly, the separated assemblies are to be designed to be used together, and the requirements of rating outlined in this standard are based upon the use of these assemblies in operation together.

3.8.1 *Functions*. Either alone or in combination with a heating plant, the functions are to provide air-circulation, air cleaning, cooling with controlled temperature and dehumidification, and may optionally include the function(s) of heating and/or humidifying.

Section 4. Procedure for Estimating A-Weighted Sound Pressure Level(s)

4.1 *Introduction*. AHRI Standard 270 establishes a method of rating outdoor unitary equipment in terms of Sound Power Level(s). AHRI Standard 275 provides the methodology for estimating the A-Weighted Sound Pressure Level at a given location resulting from outdoor unitary equipment. The application is dependent not only upon the equipment's A-Weighted Sound Power Level rating but also upon several significant factors related to the application of the equipment. These factors include equipment location, barrier shielding, sound path, and distance as described in 4.1.1 through 4.1.4 and Tables 1-4. Quantitative values for each of these factors and the equipment's A-Weighted Sound Power Level rating are then used to estimate the A-Weighted Sound Pressure Level at a given location.

4.1.1 *Equipment Location Factor*. This factor takes into consideration the effect of walls and other reflective surfaces adjacent to the equipment. Factors for typical equipment locations are given in Table 1 and described with sketches.

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