ANSI/AHRI Standard 390

2003 Standard for

Performance Rating of Single Package Vertical Air-Conditioners And Heat Pumps

Approved American National Standard

ANSI

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IMPORTANT

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Note:

This standard supersedes ARI 390-2001.

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PERFORMANCE RATING OF SINGLE PACKAGE VERTICAL AIR-CONDITIONERS AND HEAT PUMPS

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish, for Single Package Vertical Air-Conditioners and Heat Pumps: 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 factory-assembled commercial or industrial Single Package Vertical Air-Conditioner and Heat Pump equipment as defined in Section 3.

2.1.1 *Applicability.* AHRI Standard 210/240 (formerly ARI Standard 210/240) and AHRI Standard 340/360 (formerly ARI Standard 340/360) shall not apply to commercial or industrial equipment covered by this Standard.

2.1.2 *Energy Source.* This standard applies to electrically operated, vapor-compression refrigeration systems.

2.1.3 *Installation.* The Single Package Vertical Air-Conditioner and Heat Pump is intended for ducted or non-ducted installation with field or factory supplied grilles.

Section 3. Definitions

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

3.1 *Coefficient of Performance (COP).* A ratio of Cooling/Heating Capacity in watts [W] to the power input values in watts [W] at any given set of Rating Conditions expressed in watts/watt [W/W]. For heating *COP,* supplementary resistance heat shall be excluded.

3.1.1 *Standard Coefficient of Performance.* A ratio of the capacity to power input value obtained at Standard Rating Conditions.

3.2 *Cooling Capacity.* The capacity associated with the change in air enthalpy which includes both the Latent and Sensible Capacities expressed in Btu/h [W].

3.2.1 *Latent Capacity.* Capacity associated with a change in humidity ratio.

3.2.2 *Sensible Capacity.* Capacity associated with a change in dry-bulb temperature.

3.3 *Defrost Range.* Ambient conditions such that a heat pump operating in the heating mode will develop frost on the outdoor coil to the extent that temperature ranges/tolerances specified in Table 4 of ANSI/ASHRAE Standard 37 will be exceeded.

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3.4 *Energy Efficiency Ratio (EER).* A ratio of the Cooling Capacity in Btu/h to the power input values in watts at any given set of Rating Conditions expressed in Btu/(W·h).

3.4.1 *Standard Energy Efficiency Ratio.* A ratio of the capacity to power input value obtained at Standard Rating Conditions.

3.5 *Heating Capacity.* The capacity associated with the change in dry-bulb temperature expressed in Btu/h [W].

3.6 *Integrated Part-Load Value (IPLV).* A single number part-load efficiency figure of merit calculated per the method described in this standard.

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.

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

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

3.8 *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.

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

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

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

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

3.10 *Single Package Vertical Air-Conditioner (SPVAC).* A type of air-cooled small or large commercial package air conditioning and heating equipment; factory assembled as a single package having its major components arranged vertically, which is an encased combination of cooling and optional heating components. This equipment is intended for exterior mounting on, adjacent interior to, or through, an outside wall; and is powered by single or three phase current. It may contain separate indoor grille(s), outdoor louvers, various ventilation options, indoor free air discharge, ductwork, wall plenum or sleeve. Heating components may include electrical resistance, steam, hot water, gas or no heat, but may not include reverse cycle refrigeration as a heating means.

3.10.1 *SPVAC Functions. SPVAC,* either alone or in combination with a heating plant, shall provide air-circulation, air-cleaning, cooling with controlled temperature and dehumidification, and may optionally include the function of heating and possible humidifying and ventilation.

3.11 *Single Package Vertical Heat Pump (SPVHP).* A SPVAC that utilizes reverse cycle refrigeration as its primary heat source, with secondary supplemental heating by means of electrical resistance, steam, hot water or gas.

3.12 *Standard Air.* Air weighing 0.075 lb/ft^3 [1.2 kg/m^3] which approximates dry air at 70°F [21°C] and at a barometric pressure of 29.92 in Hg [101.3 kPa].

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