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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

CONTENTS

ANSI/ASHRAE Standard 127-2007
Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners

NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at http://www.ashrae.org.

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

ANSI/ASHRAE Standard 127 was first published in 1988 and revised in 2001. This revision of the standard makes some significant changes to the 2001 edition. The major revisions and the rationale for them are summarized in the following paragraphs.

Definitions

The definition of coefficient of performance (COP) *has been rewritten to clarify that it is based upon net cooling capacity. Although this rating factor was always based upon net capacity, it is now clear that the efficiency is based upon the same value.*

A definition for sensible COP (SCOP) *has been added and subsequently used as the basis for all energy-efficiency ratings. This recognizes that the primary load in a computer and data processing room (CDPR) is a sensible load. As new loads are added to the space, these new loads are 100% sensible. A typical CDPR room today is 90% sensible and that ratio is increasing. In data processing rooms, units with too much latent capacity waste energy.*

A definition for adjusted sensible COP (ASCOP) *has also been added. Data processing equipment typically operates year round, and so a method for documenting a seasonal efficiency rating based on the climate data for a particular city has been established.*

Rating Requirements

The primary rating point (the Full Cooling Test A of Table 1) has been redefined at 23.9°C/45 RH (75°F/45 RH) verses the prior revision rating point of 22°C/50 RH (71.6°F/ 50 RH). The change was made to align the test conditions with the recommendations published in ASHRAE's Thermal Guidelines for Data Processing Environments*. In addition, test points are defined in Table 1 for establishment of the ASCOP.*

The system static pressure requirements (Section 5.1.4.5) have been adjusted as well as the physical unit arrangement required for testing in order to better reflect the three different types of units found in CDPR rooms. The orientation of a down-flow raised floor plenum CDPR unit during test has been defined according to how units are typically installed in actual applications.

Other key changes are as follows: standards for the testing and rating of the humidification and dehumidification systems have been added or clarified (Section 5.5), a minimum MERV rating for the air filters has been established (Section 5.6), a standard method for the test and rating of the noise emitted by the units has been established (Section 5.9), and the tolerance of the unit rating verses the test results has been tightened (Section 5.11).

The project committee is appreciative of the contributions Mukesh Khattar made in revising this standard.

1. PURPOSE

The purpose of the standard is to establish a uniform set of requirements for rating computer and data processing room (CDPR) unitary air conditioners.

2. SCOPE

This standard applies to classes of unitary equipment that are used to air condition a computer room and data processing equipment. This standard does not apply to the rating of individual assemblies, such as condensing units or direct expansion fan-coil units, for separate use.

3. DEFINITIONS

computer and data processing room (CDPR) unitary air conditioner: a computer and data processing room unitary air conditioner consisting of one or more factory-made assemblies, which include a direct expansion evaporator or chilled-water cooling coil, an air-moving device, and air-filtering devices. The air conditioner may include a compressor, condenser, humidifier, or reheating function. Where direct expansion equipment is provided in more than one assembly and the separate assemblies are to be used together, the requirements of rating outlined in this standard are based upon the use of matched assemblies. The functions of a CDPR air conditioner, either alone or in combination with a cooling and heating plant, are to provide air filtration, circulation, cooling, reheating, and humidity control.

cooling system energy coefficient of performance (COP): a ratio calculated by dividing the net total cooling capacity in watts by the total power input in watts (excluding reheaters and humidifiers) at any given set of rating conditions. The net total cooling capacity is the total gross capacity minus the energy dissipated into the cooled space by the blower system.

sensible coefficient of performance (SCOP): a ratio calculated by dividing the net sensible cooling capacity in watts by the total power input in watts (excluding reheaters and humidifiers) at any given set of rating conditions. The net sensible cooling capacity is the gross sensible capacity minus the energy dissipated into the cooled space by the fan system. (This is further explained in Section 5.1.)

adjusted sensible coefficient of performance (ASCOP): a SCOP value that provides a consistent evaluation of the energy efficiency of a unit operated in different ambient temperatures. It is calculated by the method defined in Section 5.2.

fluid economizer: a system configuration potentially available when an external fluid cooler is utilized for heat rejection. It utilizes a separate cooling coil within the unit for cooling and the cooled fluid returning from the external fluid cooler to provide cooling much like a chilled-water unit (i.e., without the use of compressors). This process is sometimes referred to as *free cooling*.