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ANSI/ASHRAE Standard 127-2020
Method of Testing for Rating Air-Conditioning Units Serving Data Center (DC) and Other Information Technology Equipment (ITE) Spaces

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

ASHRAE Standard 127 is intended as a recognized resource to guide testing for rating of both existing and emerging cooling technologies that support DC and ITE systems. Regulatory agencies and industry advocates control precise efficiency ratings and performance requirements for identified product types. These requirements evolve with time and magnitude of installed base. This document serves to provide overarching test methodologies for DC and ITE cooling technologies, regardless of their state of adoption, to support rapid product evolution.

Changes in the 2020 edition include modification of title, purpose, and scope (TPS), as well as extensive changes to Section 3, "Definitions, Section 4, "Classification," and Section 5, "Rating Requirements." The original TPS was determined to be limiting given the evolution of cooling technologies currently being adopted for data centers and information technology equipment spaces. Revisions include the addition of new cooling types (e.g., row-based cooling, rear rack door heat exchanger, and others). Substantial effort was given to Normative Appendix E, which provides illustrations of additional types of cooling technologies now included within the scope of this standard. These illustrations are not intended to be limiting.

Performance conditions and declaration requirements specified herein are for guidance in the absence of conditions from an applicable rating standard, such as AHRI 1360.

1. PURPOSE

The purpose of the standard is to establish a uniform set of test requirements for rating air-conditioning units that are applied in data center (DC) and other information technology equipment (ITE) spaces.

2. SCOPE

2.1 This standard applies to classes of air-conditioning units that are used to air condition data center (DC) and other information technology equipment (ITE) spaces. Such units must be able to be tested using an air enthalpy method and facilitate heat transfer across at least one heat exchanger.

2.2 Exclusions

a. Rating of individual assemblies, such as condensing units
b. Cooling heat exchangers within ITE products
c. Heat-operated equipment (e.g., adsorption and absorption devices)
d. Vapor compression variable-refrigerant flow serving multiple evaporators
e. Source cooling equipment (e.g., chiller units for either water or refrigerant)

3. DEFINITIONS

application rating: a rating based on tests performed at application rating conditions (i.e., conditions other than standard rating conditions). Application ratings do not require retesting but can be extrapolated from standard rating tests. Application ratings are not required but may be published at the manufacturer's option (see Section 5.8).

computer and data processing room air conditioner (CDPR): a computer and data processing room air conditioner consisting of one or more factory-made assemblies that include a direct-expansion (DX) evaporator or chilled-water/refrigerant cooling coil and air-moving device(s). The air conditioner may include compressor(s), condenser(s), humidifier, air-filtering devices, and/or reheating function. Where DX 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 on the use of matched assemblies. The functions of a CDPR, either alone or in combination with a cooling and heating plant, are to provide air filtration, circulation, cooling, reheating, and/or humidity control if the necessary options are included.