STANDARD

ANSI/ASHRAE Standard 198-2013

Method of Test for Rating DX-Dedicated Outdoor Air Systems for Moisture Removal Capacity and Moisture Removal Efficiency

Approved by the ASHRAE Standards Committee on January 26, 2013; by the ASHRAE Board of Directors on January 29, 2013; and by the American National Standards Institute on January 30, 2013.

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© 2013 ASHRAE ISSN 1041-2336

Approved American National Standard
ANSI
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NOTE

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

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FOREWORD

ASHRAE Standard 198 is a Method of Test (MOT) standard for use in factory performance testing of dedicated outdoor system units that contain a vapor compression cycle refrigeration system. It was developed primarily as a method of test to be used in conjunction with rating procedures such as the Air Conditioning, Heating and Refrigeration Institute's proposed AHRI 920. Rated airflow rates, air temperature and humidity, and other conditions to be tested are indicated in such rating standards.

Dedicated outdoor air system (DOAS) units are used for conditioning 100% outdoor air for space ventilation. A wide variety of designs are possible. In addition to the vapor compression cycle refrigeration system, the units that this standard applies to may include other types of technology that increase the moisture removal, cooling, and heating capacity of the device through heat exchange in the primary air or through recovery of exhaust air energy. The method of test intends to allow for measurement of the critical inputs and outputs of the machine without regard for the configuration or components included.

There are a variety of modes that the targeted systems may be operated in. Additionally, control algorithms employed to determine these modes vary greatly as well. This MOT can be applied to any of these modes, although each should be considered as a separate and distinct test. It is the intention that system be set for fully automatic operation at each test condition with adjustments only where the standard controls allow for user adjustment of parameters, such as supply air or zone temperature control. These adjustments are expected to be made before the start of each distinct test based on the parameters to be tested. Minimal intervention is expected during the testing as to best simulate the typical operating conditions in the field during year-round operation of the equipment.

1. PURPOSE

This standard prescribes test methods for rating direct-exchange dedicated outdoor air systems (DX-DOAS) units.

2. SCOPE

This method of test applies to air-cooled, water-cooled, or water-source factory-assembled DX-DOAS products that condition 100% outdoor air and may include factory assembled preconditioning device(s). Units containing water coils requiring a supply of water supplied by a liquid chiller located outside of the unit are not covered by this standard. This standard is not to be used to rate stand-alone preconditioning or energy-recovery devices.

These test methods do not specify methods of establishing ratings that involve factors such as manufacturing tolerances and quality control procedures.

3. DEFINITIONS

All terms in this document follow the standard industry definitions in the current edition of *ASHRAE Terminology of Heating, Ventilation, Air Conditioning, & Refrigeration*[1] unless otherwise defined in this section.

coefficient of performance (COP) heat pump, heating: a ratio of the rate of heat delivered in watts (W) to the total energy input in watts (W), under designated operating conditions, and expressed in watts/watts (W/W) and excluding supplementary resistance heat.

> ***standard coefficient of performance (COP):*** a ratio of the capacity to power input obtained at standard rating conditions, heating.

conditioned space**:** that part of a building that is either humidified and/or dehumidified and/or heated and/or cooled for the comfort of occupants.

DX dedicated outdoor air systems unit (DX-DOAS): a type of air-cooled, water-cooled, or water-source factory-assembled product that is capable of dehumidifying 100% outdoor air to a low dew point, and may be capable of controlling the dry-bulb temperature of the dehumidified air to the designed supply air temperature. This conditioned outdoor air may be delivered directly or indirectly to the conditioned space(s). It may precondition outdoor air prior to DX cooling by incorporating an enthalpy wheel, sensible wheel, desiccant wheel, plate heat exchanger, heat pipes, or other heat or mass transfer apparatus. The product may also include a supplemental heating system for use when outdoor air requires heating beyond the capability of the refrigeration system and/or other heat transfer apparatus.

> ***DOAS functions:*** primary functions may include dehumidification, cooling, heating, ventilation, or outdoor air filtration. Additional secondary functions, such as odor control and other contaminant removal, may be included.

exhaust air: air removed from the conditioned space and discharged to outside the building by means of mechanical or natural ventilation systems.

ground source heat pump (GSHP): term applied to a variety of systems that use ground, groundwater, or surface water as a heat source and sink.

> ***ground-coupled heat pump (GCHP):*** closed-loop system consisting of a reversible vapor compression cycle that is linked to a closed ground heat exchanger buried in soil.
>
> ***groundwater heat pump (GWHP):*** open-loop system, which uses groundwater, pumped directly from wells or aquifer to water coils that are integral to or secondary to the heat pump. The water is returned to a secondary well or aquifer after use.