

1996 STANDARD for

AIR-CONDITIONING AND HEAT PUMP EQUIPMENT INCORPORATING POTABLE WATER HEATING DEVICES



Standard 290

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.

ARI, as a manufacturers' trade association, uses its best efforts to develop standards employing state-of-the-art and accepted industry practices. However, ARI 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 tests conducted under its standards will be non-hazardous or free from risk.

ARI CERTIFICATION PROGRAM PROVISIONS

Scope of the Certification Program

The Certification Program includes air-conditioning and heat pump equipment incorporating refrigerant to potable water heating devices.

Certified Ratings

The following Certification Program ratings are verified by test:

1. Cooling capacity, Btu/h [W]
2. Heating capacities, Btu/h [W]
3. Seasonal energy efficiency ratio (SEER), Btu/h/W [W/W]
4. Heating seasonal performance factor (HSPF), Btu/h/W [W/W]
5. Combined performance factors (CPF's)

Note:

This is a new standard.

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AIR-CONDITIONING AND HEAT PUMP EQUIPMENT INCORPORATING POTABLE WATER HEATING DEVICES

Section 1. Purpose

1.1 Purpose. The purpose of this standard is to establish the following, for air-conditioning and heat pump equipment incorporating refrigerant to potable water heating devices: definitions; classifications; requirements for testing and rating; minimum data required for published ratings; operating requirements, marking and nameplate data; and conformance conditions.

This standard is supplemental to ARI Standard 210/240, *Unitary Air-Conditioning and Air-Source Heat Pump Equipment*, for the purpose of evaluating the water heating and/or combined space conditioning and water heating capability of this equipment.

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 air-conditioners and heat pumps or matched assemblies defined in 3.2, 3.12, and 3.18 incorporating factory or field supplied refrigerant to potable water heating devices. This standard applies to all ratings of the air-conditioner or heat pump when used in combination with a water heating device.

This standard applies to air-source, electrically-driven, mechanical compression type systems rated less than 65,000 Btu/h [19,000 W] as covered in ARI Standard 210/240.

2.2 Exclusions. This standard does not apply to the testing and rating of individual condensing units, coils or water heating devices for separate use.

Section 3. Definitions

3.1 Definitions. All terms in this document will 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.

3.2 Air-Source Unitary Heat Pump. An air-source unitary heat pump consists of one or more factory-made assemblies which normally include an indoor conditioning coil, compressor(s) and outdoor coil, including means to provide a heating function, and may optionally include a cooling 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.

3.2.1 Functions. Unitary heat pumps shall provide the function of heating with controlled temperature, and may include the functions of air-cooling, air-circulating, air-cleaning, dehumidifying or humidifying.

3.3 Combined Appliance. An assembly consisting of an air conditioner or heat pump, a potable water heating device, an electric water heater, and if required, a potable water pump. The assembly provides both space conditioning and potable water heating. The water heater resistive elements and the potable water heating device both contribute to heating potable water.

3.4 Combined Performance Factor (CPF). CPF is the seasonal coefficient of performance associated with meeting both the space conditioning and potable water heating loads of the combined appliance.

Specific CPF's will be designated by CCPF = combined cooling performance factor, which covers the cooling season, and by CHPF = combined heating performance factor, which covers the heating season.

3.5 Double Mode COOL & WH unit. A combined appliance that operates with the condenser fan or pump off for 12 minutes or more when providing combined space cooling and water heating during the primary simulated use test.

3.6 Double Mode DWH unit. A combined appliance that, when operating in a DWH mode, uses the indoor coil as the evaporator during the cooling season and the outdoor coil or water loop condenser as the evaporator during the space heating season. During the cooling season, Double Mode DWH units provide space cooling and dehumidification regardless of the indoor air dry bulb and wet bulb temperatures.