

## Enforcement Policy Statement: Commercial HVAC Equipment

Issued January 30, 2015

The U.S. Department of Energy (DOE), Office of General Counsel, Office of the Assistant General Counsel for Enforcement (Office of Enforcement) issues the following policy statements regarding Departmental testing of commercial air conditioners and heat pumps subject to test procedures and energy conservation standards found at 10 C.F.R. Part 431, Subpart F.

Nothing in these policy statements should be construed to indicate that DOE will decline to test a basic model of commercial air conditioner or heat pump. These policies are designed to ensure that each basic model has a commercially available version eligible for DOE testing. That is, each basic model includes a model either without the features listed herein or that is eligible for testing with the feature(s).

In an exercise of its enforcement discretion, under specific conditions, the Office of Enforcement will not perform assessment testing pursuant to 10 C.F.R. § 429.104, verification testing pursuant to 10 C.F.R. § 429.70(c)(5), or enforcement testing pursuant to 10 C.F.R. § 429.110 on certain units of commercial air conditioners and heat pumps, as described below. DOE will not test a unit with one of the following features (for the specified equipment type) if the manufacturer distributes in commerce an otherwise identical unit that does not have that feature.

### Small,<sup>1</sup> Large, and Very Large, Air-Cooled, Water-Cooled, and Evaporatively-Cooled Commercial Package Air Conditioners and Heat Pumps

**Economizer.** An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

**Ventilation Energy Recovery System (VERS).** An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment.

**Coated Coil(s).** A coated coil is an optional coil that is selected to provide excellent resistance and durability to corrosive effects of alkalis, acids, alcohols, petroleum, seawater, salty air, and other corrosive environments. Typical processes include, baked phenolic, cathodic epoxy type

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<sup>1</sup> Small, air-cooled commercial package air conditioners and heat pumps include air conditioners and heat pumps that are air-cooled with less than 65,000 Btu/h cooling capacity and are 3-phase. Air conditioners and heat pumps that are air-cooled with less than 65,000 Btu/h cooling capacity and are single-phase are consumer products and are not subject to this enforcement policy.

electrodisposition coating or thermoset vinyl coating that is bonded after coil is assembled covering the coil; tubes, headers and fin surface. Coils can be assembled from fin stock that has been coated prior to the fin stamping process. Corrosion durability shall be confirmed through testing per ASTM B117 or ASTM G85 Salt Spray test to a minimum of 500 hours.

Process Heat Recovery/Reclaim Coils/Thermal Storage. A heat exchanger located inside the equipment that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid.

Dehumidification Components. An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. Liquid desiccant system, desiccant wheels.

Indoor or Outdoor Fan Motor with Variable Frequency Drive (VFD). A device connected electrically between the equipment's power supply connection and the fan motor that can vary the frequency of power supplied to the motor to allow variation of the motor's rotational speed.

Compressor with Variable Frequency Drive (VFD). A device connected electrically between the equipment's power supply connection and the compressor that can vary the frequency of power supplied to the compressor to allow variation of the compressor's rotational speed.

Steam/Hydronic Heat Options. A heat exchanger located inside the equipment that heats the equipment's supply or outdoor air using heat delivered by steam or hot water. \*Subject to enforcement policy provided that the otherwise identical model has electric resistance heating. If only hydronic heat options are available, the hydronic heat model must be tested and rated.

Hot Gas Reheat. A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.

Powered Exhaust/Powered Return Air. Powered exhaust is provided by a fan that transfers directly to the outdoors a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. Powered return air is provided by a fan that draws building air into the equipment.

Hot Gas Bypass. A method to adjust the cooling delivered by the equipment in which some portion of the hot high-pressure refrigerant from the discharge of the compressor(s) is diverted from its normal flow to the outdoor coil and is instead allowed to enter the indoor coil to modulate the capacity of a refrigeration circuit or to prevent evaporator coil freezing. The group noted that this would need to be revisited in the case of a switch to a part load metric.

Sound Traps/Sound Attenuator. An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes

immediately after entering the equipment for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range.

Fire, Smoke and/or Isolation Dampers. A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. Such a damper may be rated by an appropriate test laboratory according to the appropriate safety standard, such as UL 555 or UL555S.

Desuperheaters. A heat exchanger that provides water heating external to the unit with the hot refrigerant gas from the compressor.

Indirect or Indirect/Direct Evaporative Cooling of Outdoor Air Supply. Water is used to cool Outdoor Air Supply (OAS) without adding moisture to the airstream using a heat exchanger with dry and wet side. This is referred to as “indirect” evaporative cooling. In very dry climates moisture can be added by a “direct” evaporative section to further reduce the OAS dry bulb temperature.

Evaporative Pre-cooling of Condenser Intake Air. Water is evaporated into the air entering the air cooled condenser to lower the dry bulb temperature and thereby increase efficiency of the refrigeration cycle.

#### Water-Source Heat Pump Features

All of the features listed above for All Small/Large/Very Large Commercial Packaged Air Conditioning Equipment and Heating Equipment, and:

Condenser Pumps/Valves/Fittings. Additional components in the water circuit for water control or filtering.

Electric Heaters. Provides additional heat using an electric resistance heater.

Condenser Water Reheat. A heat exchanger is located downstream of the indoor coil that heats the supply air during cooling operation using water from the condenser coil in order to increase the ratio of moisture removal to cooling capacity provided by the equipment

#### Single Package Vertical Air Conditioner and Heat Pump (SPVU) Features

Economizer. An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

Ventilation Energy Recovery System (VERS). An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment.

Dehumidification Components. An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. Liquid desiccant system, desiccant wheels.

Steam/Hydronic Heat Options. A heat exchanger located inside the equipment that heats the equipment's supply or outdoor air using heat delivered by steam or hot water. \*Subject to enforcement policy provided that the otherwise identical model has electric resistance heating. If only hydronic heat options are available, the hydronic heat model must be tested and rated.

Hot Gas Reheat. A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.

Powered Exhaust/Powered Return Air. Powered exhaust is provided by a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. Powered return air is provided by a fan that draws building air into the equipment.

Hot Gas Bypass. A method to adjust the cooling delivered by the equipment in which some portion of the hot high-pressure refrigerant from the discharge of the compressor(s) is diverted from its normal flow to the outdoor coil and is instead allowed to enter the indoor coil to modulate the capacity of a refrigeration circuit or to prevent evaporator coil freezing.

Sound Traps/Sound Attenuator. An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes immediately after entering the equipment for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range.

Fire, Smoke and/or Isolation Dampers. A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. Such a damper may be rated by an appropriate test laboratory according to the appropriate safety standard, such as UL 555 or UL555S.

### Computer Room Air Conditioner (CRAC) Features

Economizer. An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

Dehumidification Components. An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. Liquid desiccant system, desiccant wheels.

Hot Gas Reheat. A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.

Fire, Smoke and/or Isolation Dampers. A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. Such a damper may be rated by an appropriate test laboratory according to the appropriate safety standard, such as UL 555 or UL555S.

#### Variable Refrigerant Flow (VRF) Multi-Split Air Conditioner and Heat Pump Features

Economizer. An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

Coated Coil(s). A coated coil is an optional coil that is selected to provide excellent resistance and durability to corrosive effects of alkalies, acids, alcohols, petroleum, seawater, salty air, and other corrosive environments. Typical processes include, baked phenolic, cathodic epoxy type electrodisposition coating or thermoset vinyl coating that is bonded after coil is assembled covering the coil; tubes, headers and fin surface. Coils can be assembled from fin stock that has been coated prior to the fin stamping process. Corrosion durability shall be confirmed through testing per ASTM B117 or ASTM G85 Salt Spray test to a minimum of 500 hours.

Steam/Hydronic Heat Options. A heat exchanger located inside the equipment that heats the equipment's supply or outdoor air using heat delivered by steam or hot water. \*Subject to enforcement policy provided that the otherwise identical model has electric resistance heating. If only hydronic heat options are available, the hydronic heat model must be tested and rated.

Dehumidification Components. An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. Liquid desiccant system, desiccant wheels.

In addition, DOE is adopting the following policies with respect to motors used in commercial HVAC equipment:

1) For all small, large, and very large, air-cooled, water-cooled, and evaporatively-cooled commercial packaged air conditioners and heat pumps, water-source heat pumps, SPVUs, and CRACs, the DOE test procedure specified in Subpart F for the given equipment types does not require ducting on the condenser side for testing. Consequently, DOE will test a unit with the standard condenser fan/motor assembly that is offered for sale by the manufacturer for unducted condenser applications. DOE notes that the standard condenser-side motor and any associated drive that was used in determining the certified rating must be described in the

supplemental pdf that is part of the certification for these equipment types. If the manufacturer does not offer models with standard motors for unducted configurations, then this provision does not apply, and DOE will test any high static condenser fan/motor assembly that is offered for sale by the manufacturer.

For the purposes of this policy, a *high static condenser fan/motor assembly* is an assembly designed for external ducting of condenser air that provides greater pressure rise and has a higher rated motor horsepower than the condenser fan provided as a standard component with the equipment.

2) For all small, large, and very large, air-cooled, water-cooled, and evaporatively-cooled commercial packaged air conditioners and heat pumps, water-source heat pumps, SPVUs, and CRACs, when selecting a unit of a basic model for DOE-initiated testing, if the basic model includes a variety of high static indoor blowers or oversized motor options, DOE will test a unit that has a standard indoor fan assembly (as described in the supplemental pdf that is part of the manufacturer's certification, including information about the standard motor and associated drive that was used in determining the certified rating). This policy only applies where (a) the manufacturer distributes in commerce a model in the basic model with the standard indoor fan assembly (i.e., standard motor and drive), and (b) all models in the basic model have a motor with the same or better relative efficiency performance as the standard motor included in the test unit as described in a separate guidance document. If the manufacturer does not offer models with the standard motor identified in the supplemental PDF or offers models with high static motors that do not comply with the comparable efficiency guidance, DOE will test any indoor fan assembly offered for sale by the manufacturer.

For the purposes of this policy, a *high static indoor blower or oversized motor* is an indoor fan assembly, including a motor, that drives the fan and can deliver higher external static pressure than the standard indoor fan assembly sold with the equipment.

This document presents enforcement policies regarding commercial air conditioning and heating equipment only. It does not create or remove any rights or duties and does not affect any other aspect of EPCA or DOE regulations. Furthermore, the Department expects to revise this policy statement as the regulations are modified through informal rulemaking.