

DEPARTMENT OF ENERGY**[Case No. CAC-015]****Energy Conservation Program for Certain Industrial Equipment: Decision and Order Granting a Waiver to Mitsubishi Electric and Electronics USA, Inc. From the Department of Energy Commercial Package Water-Source Heat Pump Test Procedure****AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.**ACTION:** Decision and Order.

SUMMARY: This notice publishes the U.S. Department of Energy's (DOE) Decision and Order in Case No. CAC-015, which grants a waiver to Mitsubishi Electric and Electronics USA, Inc. (Mitsubishi) from the existing DOE test procedure for commercial package water-source heat pumps. DOE is granting this waiver because these water-source multi-split heat pumps, like the air-source multi-split heat pumps that have been granted similar waivers, are too complex to test using the DOE test procedure. As a condition of this waiver, Mitsubishi must test and rate the energy consumption of the water-source WR2 and WY series models (from its CITY MULTI Variable Refrigerant Flow Zoning line of commercial package heat pump equipment) according to the alternate test procedure set forth in this notice.

DATES: This Decision and Order is effective December 15, 2009.

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SUPPLEMENTARY INFORMATION: In accordance with Title 10 of the Code of Federal Regulations (10 CFR) 431.401(f)(4), DOE gives notice of the issuance of its Decision and Order, as set forth below. In this Decision and Order, DOE grants Mitsubishi a waiver for specified models of its WR2 and WY series water-source multi-split products from the existing commercial package water-source heat pump test procedure under 10 CFR 431.96 (the International

Organization for Standardization (ISO) Standard 13256-1 (1998) that is incorporated by reference in 10 CFR 431.95(b)(3)). The waiver is subject to a condition requiring Mitsubishi to test and rate the specified models from its CITY MULTI Variable Refrigerant Flow Zoning (VRFZ) line of commercial package water-source heat pump equipment according to the alternate test procedure described in this notice. Today's Decision and Order prohibits Mitsubishi from making any representations concerning the energy efficiency of these products unless such products have been tested consistent with the provisions and restrictions in the alternate test procedure as set forth in the Decision and Order below, and such representations fairly disclose the results of such testing. Distributors, retailers, and private labelers are held to the same standard when making representations regarding the energy efficiency of these products. (42 U.S.C. 6314(d))

Issued in Washington, DC, on December 8, 2009.

Cathy Zoi,*Assistant Secretary, Energy Efficiency and Renewable Energy.***Decision and Order**

In the Matter of: Mitsubishi Electric and Electronics USA, Inc. (Mitsubishi). (Case No. CAC-015).

Background

Title III of the Energy Policy and Conservation Act (EPCA) sets forth a variety of provisions concerning energy efficiency, including Part A-1, which establishes an energy efficiency program titled "Certain Industrial Equipment," which includes commercial air-conditioning equipment, packaged boilers, water heaters, and other types of commercial equipment. (42 U.S.C. 6311-6317) The statute specifically includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part A-1 authorizes the Secretary of Energy (the Secretary) to prescribe test procedures that are reasonably designed to produce results which measure energy efficiency, energy use, or estimated annual operating costs, and that are not unduly burdensome to conduct. (42 U.S.C. 6314(a)(2))

Section 343(a)(4)(A) of EPCA provides that the test procedures for commercial package air-conditioning and heating equipment shall be those generally accepted industry testing or rating procedures developed or recognized by

the Air-Conditioning and Refrigeration Institute (ARI) or by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), as referenced in ASHRAE/Illuminating Engineering Society (IES) Standard 90.1 and in effect on June 30, 1992. (42 U.S.C. 6314(a)(4)(A)) Further, under section 343(a)(4)(B) of EPCA, if the industry test procedure or rating procedure is amended, the Secretary must amend the test procedure for the product as necessary to be consistent with the amended industry procedure, unless the Secretary determines that the amended test procedure would not meet the statutory requirements set forth in 42 U.S.C. 6314(a)(2) and (3). (42 U.S.C. 6314(a)(4)(B))

The test procedures for commercial central air conditioners and heat pumps are codified in DOE's regulations at 10 CFR 431.96, Table 1, which directs manufacturers of commercial package water-source air-conditioning and heating equipment to use the appropriate procedure when measuring the energy efficiency of those products. The appropriate standard for Mitsubishi's WR2 and WY series water-source multi-split equipment is ISO Standard 13256-1 (1998), "Water-source heat pumps—Testing and rating for performance—Part 1: Water-to-air and brine-to-air heat pumps," for measuring the energy efficiency of small commercial package water-source heat pumps with capacities <135,000 British thermal units/hour (Btu/hr). (The cooling capacity of Mitsubishi's WR2 and WY series models of its CITY MULTI VRFZ line of commercial package water-source heat pump equipment fall within the range of 65,000 Btu/hr to 135,000 Btu/hr and are, therefore, covered under 10 CFR 431.96, which requires testing under ISO Standard 13256-1 (1998)). This standard is incorporated by reference at 10 CFR 431.95(b)(3).

DOE notes that these products also have the ability to connect multiple outdoor units together to create larger capacity systems, up to 240,000 Btu/hr. Connecting two of the smallest capacity (72,000 Btu/h) outdoor units results in a system capacity of 144,000 Btu/h, which is above the maximum 135,000 Btu/h covered by the DOE test procedure. Multiple-outdoor-unit equipment is therefore not covered by this waiver because the resulting system capacities are outside the capacity range of the DOE test procedure for water-source central air conditioners and central air conditioning heat pumps. This waiver only covers systems with nominal cooling capacities less than

135,000 Btu/hr, which does not include any combined units.

DOE's regulations allow a person to seek a waiver for a particular basic model from the test procedure requirements for covered commercial equipment, when the petitioner's basic model contains one or more design characteristics which prevent testing according to the prescribed test procedures, or if the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 431.401(a)(1). A waiver petition must include any alternate test procedures known to the petitioner to evaluate characteristics of the basic model in a manner representative of its energy consumption. 10 CFR 431.401(b)(1)(iii). The Assistant Secretary for Energy Efficiency and Renewable Energy (Assistant Secretary) may grant a waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 431.401(f)(4). Waivers remain in effect pursuant to the provisions of 10 CFR 431.401(g).

The waiver process also allows any interested person who has submitted a petition for waiver to file an application for interim waiver of the applicable test procedure requirements. 10 CFR 431.401(a)(2). The Assistant Secretary will grant an interim waiver if it is determined that the applicant will experience economic hardship if the application for interim waiver is denied, if it appears likely that the petition for waiver will be granted, and/or the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver. 10 CFR 431.401(e)(3). An interim waiver remains in effect for 180 days or until DOE issues its determination on the petition for waiver, whichever occurs first, and may be extended by DOE for an additional 180 days, if necessary. 10 CFR 431.401(e)(4).

On October 30, 2006, Mitsubishi submitted a Petition for Waiver and an Application for Interim Waiver from the above test procedures applicable to its water-source WR2 and WY series models from its CITY MULTI VRFZ line of commercial package heat pump equipment. Mitsubishi seeks a waiver from the applicable test procedures because the design characteristics of these models prevent testing according to the currently prescribed test procedures. Like the air-source multi-splits, this equipment can connect more indoor units than test laboratories can

physically test at one time, and it is not practical to test all of the potentially available combinations.

On April 9, 2007, DOE published Mitsubishi's Petition for Waiver for commercial package water-source heat pumps in the **Federal Register**. 72 FR 17533 (April 9, 2007). In the April 9, 2007 notice, DOE also granted Mitsubishi's Application for Interim Waiver, because DOE determined that the conditions required for grant of an interim waiver had been satisfied. DOE had already granted waivers to Mitsubishi for its lines of R22 CITY MULTI VRFZ and R410A CITY MULTI VRFZ products, which are similar to the water-source CITY MULTI VRFZ products at issue here. 69 FR 52660 (August 27, 2004); 72 FR 17528 (April 9, 2007). As DOE has stated in the past, in those instances where the likely success of the Petition for Waiver has been demonstrated, based upon DOE having granted a waiver for a similar product design, it is in the public interest to have similar products tested and rated for energy consumption on a comparable basis. In the April 9, 2007 notice, DOE also published for comment an alternate test procedure for the Mitsubishi products that are the subject of its waiver request.

On July 30, 2008, Mitsubishi submitted an updated list of models and a request for an extension of the Interim Waiver for the City Multi VRFZ water-source heat pumps that are the subject of this waiver. Since Mitsubishi's submission of its petition for waiver in October 2006, it developed additional basic models in the WR2 and WY product lines. These are similar to the basic models listed in Mitsubishi's Petition for Waiver, but they have different capacities and the ability to connect multiple outdoor units to create larger capacity systems. Mitsubishi's July 30, 2008 petition to extend its Interim Waiver also contains a modification to the alternate test procedure published April 9, 2007. 72 FR 17533. It contains a proposed, new definition of the term "tested combination." This proposed definition is the same as the one in AHRI 1230-2009, "Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment," which is incorporated in the alternate test procedure specified in this Decision and Order.

DOE received one comment on the Mitsubishi petition from Daikin AC (Americas), Inc. (Daikin), which supported Mitsubishi's waiver request.

Assertions and Determinations

Mitsubishi's Petition for Waiver

As noted above, DOE granted to Mitsubishi waivers from test procedures for its air-source CITY MULTI VRFZ models of residential and commercial package air-conditioning and heating equipment in 2004 and 2007. 69 FR 52660 (August 27, 2004); 72 FR 17528 (April 9, 2007). Due to equipment modifications to accommodate its water-source models, Mitsubishi submitted a Petition for Waiver and Application for Interim Waiver that requested a similar waiver from the existing test procedures for its WR2 and WY Series models of CITY MULTI VRFZ line of commercial package heat pump equipment with a rated capacity from 65,000 Btu/hr to <135,000 Btu/hr.

Mitsubishi provided several assertions to substantiate its Petition for Waiver. Mitsubishi asserted that the design characteristics of its WR2 and WY series models of CITY MULTI VRFZ line of commercial package heat pump equipment, which use water as a heat source and heat sink, preclude testing according to the test procedures currently prescribed at 10 CFR 431.96 for the same reasons that its R22 and R410A models of air-source commercial package heat pump equipment were granted waivers at 69 FR 52660 (August 27, 2004) and 72 FR 17528 (April 9, 2007), respectively. The water-source CITY MULTI VRFZ systems, like the air-source systems, can connect more indoor units (up to 19) than the test laboratories can physically test at one time; in addition, there are 58 different indoor models that can be used in the different combinations. As a result, Mitsubishi asserted that it is not practical to test all of the potentially available combinations of indoor and outdoor units, which could number "well over 1,000,000 combinations for each outdoor unit." 72 FR 17533, 17535 (April 9, 2007). Because of the inability to test products with so many indoor units, testing laboratories will not be able to test many of the system combinations. Mitsubishi also asserted that the test procedures at 10 CFR 431.96 do not provide (1) direction for determining what combinations of outdoor and indoor units should be tested in the circumstance where a multitude of different combinations are possible; and (2) a mechanism for sampling component combinations.

Mitsubishi also stated that many of the benefits of its water-source CITY MULTI VRFZ systems (e.g., variable refrigerant control and distribution, zoning diversity, part-load operation, and simultaneous heating and cooling)

are not credited under the current test procedures. Thus, Mitsubishi asserted that the current test procedure for the energy efficiency ratio (EER) does not capture the energy savings of VRFZ equipment. The same issue was raised by Mitsubishi in its Petition for Waiver for its R22 CITY MULTI systems. In response, DOE stated that “[w]hile this assertion is true * * * the full load EER energy efficiency descriptor is the one mandated by EPCA for these products (42 U.S.C. 6313(a)(1)(c)), and the relevant energy performance is the peak load efficiency, not the seasonal energy savings.” 69 FR 52660, 52662 (August 27, 2004). A waiver can only be granted if a test procedure does not fairly represent the peak load energy consumption characteristics which EER measures.

In summary, the bases for today’s Decision and Order are: (1) The inability of a laboratory to test the multitude of CITY MULTI VRFZ systems, and (2) the lack of a method for predicting the performance of untested combinations. DOE finds, as it did in the 2004 and 2007 decisions, that “the basic model contains one or more design characteristics which * * * prevent testing of the basic model according to the prescribed test procedures.” 69 FR 52660 (August 27, 2004); 72 FR 17528 (April 9, 2007). DOE believes that given the similarities of these products and the problems associated with testing under the applicable test procedure, the same reasoning underlying DOE’s granting of these two earlier waivers is applicable to the water-source systems that are the subject of today’s Decision and Order. Therefore, DOE finds that a waiver of the test procedures at 10 CFR 431.96 is appropriate.

To enable Mitsubishi to make energy efficiency representations for its specified water-source WR2 and WY series models from its CITY MULTI VRFZ line of commercial package heat pump equipment, DOE also requires use of the alternate test procedure described below as a condition of Mitsubishi’s waiver.

DOE’s Alternate Test Procedure

Under EPCA, a manufacturer may not make any representation with respect to the energy consumption or cost of energy consumed by its equipment, unless such equipment has been tested in accordance with the applicable test procedure and the representation fairly discloses the results of such testing. (42 U.S.C. 6314(d)) Therefore, to provide a basis from which Mitsubishi, or any manufacturer covered by a test procedure waiver for multi-split central air-conditioning equipment, can make

valid and comparable energy efficiency representations, DOE provided an alternate test procedure in an earlier Mitsubishi Decision & Order which was published in the **Federal Register** at 72 FR 17528 (April 9, 2007).

Mitsubishi’s July 30, 2008 petition to extend its Interim Waiver contains a modification to the alternate test procedure published in the April 9, 2007 petition. 72 FR 17533. It contains a proposed, new definition of the term “tested combination.” This proposed definition is the same as the one in AHRI 1230–2009, “Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment.” This definition allows for systems with multiple outdoor units and has other differences for systems with nominal cooling capacities greater than 150,000 Btu/h. For the waiver under consideration here, however, which does not apply to systems with multiple outdoor units, nor to systems with cooling capacities greater than 135,000 Btu/h, the only necessary change in the definition of “tested combination” is the reference to “capacity,” which DOE changes for purposes of this waiver to “nominal cooling capacity.”

The alternate test procedure permits Mitsubishi to designate a “tested combination” for each model of water-source WR2 and WY CITY MULTI VRFZ outdoor unit. In addition, the indoor unit that is designated as part of the tested combination must meet certain requirements. For example, the tested combination must have from two to five indoor units, so that the system can be tested in available test facilities.

The alternate test procedure also permits Mitsubishi to represent the energy efficiency for a non-tested combination in two ways: (1) At an energy efficiency level determined under a DOE-approved alternative rating method; or (2) at the efficiency level of the tested combination using the same outdoor unit.

DOE believes that permitting Mitsubishi to make energy efficiency representations for non-tested combinations through use of this alternate test procedure is reasonable because the outdoor unit is the principal efficiency driver. Further, DOE believes that the applicable test procedure at 10 CFR 431.96 tends to rate such equipment conservatively, because it does not account for the simultaneous heating and cooling capability of variable refrigerant flow zoning, which is more efficient than requiring all zones either to be heated or cooled. Further, the multi-zoning feature of such equipment, which enables it to cool

only those sections of a building that require cooling, will use less energy than if the unit is operated to cool the entire building or a comparatively large area within a building in response to a single thermostat. Additionally, the current test procedure for commercial equipment requires full load testing, which creates an artificial disadvantage for such products, because they are optimized for best efficiency when operating at less than full load. In fact, these products normally operate at part-load conditions. In view of the foregoing, DOE believes the alternate test procedure will provide a conservative basis for assessing the energy efficiency for such equipment.

With regard to laboratory testing, some of the difficulties associated with the existing test procedure are avoided by the alternate test procedure’s requirements for choosing the indoor units to be used in the manufacturer-specified tested combination. For example, in addition to limiting the number of indoor units, another requirement is that all of the indoor units must be subject to meeting the same minimum external static pressure. This requirement allows the test laboratory to manifold the outlets from each indoor unit into a common plenum that supplies air to a single airflow measuring apparatus. This requirement eliminates situations in which some of the indoor units are ducted and some are non-ducted. Without this requirement, the laboratory must evaluate the capacity of a subgroup of indoor coils separately, and then sum the separate capacities to obtain the overall system capacity. This would require that the test laboratory be equipped with multiple airflow measuring apparatuses (which is unlikely), or that the test laboratory connect its one airflow measuring apparatus to one or more common indoor units until the contribution of each indoor unit has been measured.

Based on the discussion above, DOE believe that the testing problems described above would prevent testing of Mitsubishi’s WR2 and WY series models from its CITY MULTI VRFZ water-source line according to the test procedures prescribed in 10 CFR Part 431.

Consultations With Other Agencies

DOE consulted with Federal Trade Commission (FTC) staff concerning the Mitsubishi Petition for Waiver. The FTC staff had no objections to issuing a waiver to Mitsubishi.

Conclusion

After careful consideration of all the material that Mitsubishi submitted, the comment received from Daikin, and consultation with FTC staff, it is ordered that:

(1) The Petition for Waiver submitted by Mitsubishi Electric and Electronics USA, Inc. (Mitsubishi) (Case No. CAC-015) is hereby granted as set forth in the paragraphs below.

(2) Mitsubishi shall not be required to test or rate the below-listed water-source WR2 and WY series models of its CITY MULTI Variable Refrigerant Flow Zoning (VRFZ) line of commercial package heat pump equipment on the basis of the applicable test procedure at 10 CFR 431.96, which incorporates by reference ISO 13256-1 (1998).

(3) Mitsubishi shall be required to test and rate the below-listed water-source WR2 and WY series models of its CITY MULTI VRFZ equipment according to the alternate test procedure as set forth in section (4), "Alternate test procedure."

CITY MULTI Variable Refrigerant Flow Zoning System Outdoor Equipment

WY-Series (PQHY) 208/230-3-60 and 460-3-60 split-system, water-sourced, variable-speed heat pumps with individual model nominal cooling capacities of 72,000, 96,000, 108,000 and 120,000 Btu/h.

WR2-Series (PQRY) 208/230-3-60 and 460-3-60 split-system, water-sourced, variable-speed heat pumps with heat recovery and with individual model nominal cooling capacities of 72,000, 96,000, 108,000 and 120,000 Btu/h.

CITY MULTI Variable Refrigerant Flow Zoning System Indoor Equipment

P*FY models, ranging from 6,000 to 48,000 Btu/h, 208/230-1-60 and from 72,000 to 120,000 Btu/h, 208/230-3-60 split system variable-capacity air conditioner or heat pump.

PCFY Series—Ceiling Suspended—with capacities of 12/18/24/30/36 MBtu/h.

PDFY Series—Ceiling Concealed Ducted—with capacities of 06/08/12/15/18/24/27/30/36/48 MBtu/h.

PEFY Series—Ceiling Concealed Ducted (Low Profile)—with capacities of 06/08/12/18/24 MBtu/h.

PEFY Series—Ceiling Concealed Ducted (Alternate High Static Option)—with capacities of 15/18/24/27/30/36/48/54/72/96 MBtu/h.

PEFY-F Series—Ceiling Concealed Ducted (100% OA Option)—with capacities of 30/54/72/96/120 MBtu/h.

PFFY Series—Floor Standing (Concealed)—with capacities of 06/08/12/15/18/24 MBtu/h.

PFFY Series—Floor Standing (Exposed)—with capacities of 06/08/12/15/18/24 MBtu/h.

PKFY Series—Wall-Mounted—with capacities of 06/08/12/18/24/30 MBtu/h.

PLFY Series—4-Way Airflow Ceiling Cassette—with capacities of 12/18/24/30/36 MBtu/h.

PMFY Series—1-Way Airflow Ceiling Cassette—with capacities of 06/08/12/15 MBtu/h.

(4) Alternate test procedure.

(A) Mitsubishi shall be required to test its water-source WR2 and WY series models of its CITY MULTI VRFZ equipment according to those test procedures for commercial package air conditioners and heat pumps prescribed at 10 CFR Part 431.96, except that:

(i) Mitsubishi shall test a "tested combination" selected in accordance with the provisions of subparagraph (B) of this paragraph. For every other system combination using the same outdoor unit as the tested combination, Mitsubishi shall make representations concerning the WR2 and WY CITY MULTI equipment covered in this waiver according to the provisions of subparagraph (C) below.

(B) *Tested combination.* The term "tested combination" means a sample basic model comprised of units that are production units, or are representative of production units, of the basic model being tested. For the purposes of this waiver, the tested combination shall have the following features:

(1) The basic model of a variable refrigerant flow system used as a tested combination shall consist of an outdoor unit that is matched with between two and five indoor units.

(2) The indoor units shall—

(i) Represent the highest sales model family, or another indoor model family if the highest sales model family does not provide sufficient capacity (see ii);

(ii) Together, have a nominal cooling capacity between 95 percent and 105 percent of the nominal cooling capacity of the outdoor unit;

(iii) Not, individually, have a nominal cooling capacity that is greater than 50 percent of the nominal cooling capacity of the outdoor unit;

(iv) Operate at fan speeds that are consistent with the manufacturer's specifications; and

(v) All be subject to the same minimum external static pressure requirement while being configurable to produce the same static pressure at the exit of each outlet plenum when

manifolded as per section 2.4.1 of 10 CFR Part 430, Subpart B, Appendix M.

(C) *Representations.* In making representations about the energy efficiency of its WR2 and WY CITY MULTI VRFZ equipment, for compliance, marketing, or other purposes, Mitsubishi must fairly disclose the results of testing under the DOE test procedure, doing so in a manner consistent with the provisions outlined below:

(i) For WR2 and WY CITY MULTI VRFZ combinations tested in accordance with this alternate test procedure, Mitsubishi may make representations based on these test results.

(ii) For WR2 and WY CITY MULTI VRFZ combinations that are not tested, Mitsubishi may make representations based on the testing results for the tested combination and which are consistent with either of the two following methods:

(a) Representation of non-tested combinations according to an Alternative Rating Method (ARM) approved by DOE; or

(b) Representation of non-tested combinations at the same energy efficiency level as the tested combination with the same outdoor unit.

(5) This waiver shall remain in effect from the date of issuance of this Decision and Order consistent with the provisions of 10 CFR 431.401(g).

(6) This waiver is conditioned upon the presumed validity of statements, representations, and documentary materials provided by the petitioner. This waiver may be revoked or modified at any time upon a determination that the factual basis underlying the petition is incorrect, or DOE determines that the results from the alternate test procedure are unrepresentative of the basic models' true energy consumption characteristics.

Issued in Washington, DC, on December 8, 2009.

Cathy Zoi,
Assistant Secretary, Energy Efficiency and Renewable Energy.

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