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[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 431

[EERE-2017-BT-TP-0020]

RIN 1904-AD94

Energy Conservation Program: Test Procedure for Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Final rule.

SUMMARY: The U.S. Department of Energy ("DOE") is publishing a final rule to amend its test procedures for single package vertical air conditioners and single package vertical heat pumps, collectively referred to as single package vertical units ("SPVUs"). DOE is incorporating by reference the most recent version of the relevant industry test standard, AHRI 390-2021, and amending certain provisions for representations for SPVUs. DOE is also establishing definitions for "single-phase single package vertical air conditioners with cooling capacity less than 65,000 Btu/h" and for "single-phase single package vertical heat pumps with cooling capacity less than 65,000 Btu/h" to distinguish such equipment from certain residential central air conditioners and heat pumps.

DATES: The effective date of this rule is **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. The final rule changes will be mandatory for product testing starting [**INSERT DATE 360 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***]. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register

on [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***].

ADDRESSES: The docket, which includes *Federal Register* notices, public meeting attendee lists and transcripts, comments, and other supporting documents/materials, is available for review at *www.regulations.gov* under docket number EERE–2017–BT–TP–0020. All documents in the docket are listed in the *www.regulations.gov* index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at *www.regulations.gov/docket?D=EERE-2017-BT-TP-0020*. The docket web page contains instructions on how to access all documents, including public comments, in the docket.

For further information on how to review the docket contact the Appliance and Equipment Standards Program staff at (202) 287-1445 or by e-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

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SUPPLEMENTARY INFORMATION:

DOE maintains a previously approved incorporation by reference and incorporates by reference the following industry standards into parts 429 and 431:

AHRI Standard 390 (I-P)-2021 "Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps," copyright 2021 (AHRI 390-2021).

ANSI/ASHRAE Standard 37-2009, "Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment," ASHRAE approved June 24, 2009 (ANSI/ASHRAE 37-2009).

ANSI/ASHRAE Standard 41.2-1987 (RA 92), "Standard Methods For Laboratory Airflow Measurement," ANSI-reaffirmed April 22, 1992.

Copies of AHRI 390-2021 can be obtained from the Air-conditioning, Heating, and Refrigeration Institute (AHRI), 2311 Wilson Blvd., Suite 400, Arlington, VA 22201, (703) 524–8800, or by going to *www.ahrinet.org/search-standards.aspx.* Copies of ANSI/ASHRAE Standard 37-2009 and ANSI/ASHRAE 41.2-1987 (RA 92) can be obtained from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), 180 Technology Parkway NW, Peachtree Corners, GA 30092, (404) 636-8400, or by going to *www.ashrae.org/.* (ASHRAE standards co-published with American National Standards Institute (ANSI).)

See section IV.N of this document for a further discussion of these standards.

Table of Contents

I. Authority and Background
    A. Authority
    B. Background
II. Synopsis of the Final Rule
III. Discussion
    A. Scope of Applicability
    B. Updates to Industry Standards
        1. AHRI 390
        2. ASHRAE 37
    C. Energy Efficiency Descriptor
        1. Efficiency Metrics
        2. Low Temperature Heating Test
        3. Fan Energy Use
    D. Test Method
        1. External Static Pressures
        2. Defrost Energy Use
    E. Configuration of Unit Under Test
        1. Background
        2. Approach for Exclusion of Certain Components
        3. Specific Components for Exclusion
    F. Represented Values
        1. Multiple Refrigerants
        2. Cooling Capacity
    G. Effective and Compliance Dates
    H. Test Procedure Costs
IV. Procedural Issues and Regulatory Review
    A. Review Under Executive Orders 12866 and 13563
    B. Review Under the Regulatory Flexibility Act
    C. Review Under the Paperwork Reduction Act of 1995
    D. Review Under the National Environmental Policy Act of 1969
    E. Review Under Executive Order 13132
    F. Review Under Executive Order 12988
    G. Review Under the Unfunded Mandates Reform Act of 1995
    H. Review Under the Treasury and General Government Appropriations Act, 1999
    I. Review Under Executive Order 12630
    J. Review Under Treasury and General Government Appropriations Act, 2001
    K. Review Under Executive Order 13211
    L. Review Under Section 32 of the Federal Energy Administration Act of 1974
    M. Congressional Notification

N. Description of Materials Incorporated by Reference
V. Approval of the Office of the Secretary

I. Authority and Background

Single package vertical air conditioners ("SPVACs") and single package vertical heat pumps ("SPVHPs"), collectively referred to as single package vertical units ("SPVUs"), are a category of small, large, and very large commercial package air conditioning and heating equipment. (42 U.S.C. 6311(1)(B)-(D); 42 U.S.C. 6313(a)(10)) Accordingly, SPVUs are included in the list of "covered equipment" for which the U.S. Department of Energy ("DOE") is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6311(1)(B)-(D)) DOE's energy conservation standards and test procedures for SPVUs are currently prescribed at title 10 of the Code of Federal Regulations ("CFR") subpart F of part 431, §§431.97 and 431.96, respectively. The following sections discuss DOE's authority to establish test procedures for SPVUs and relevant background information regarding DOE's consideration of test procedures for this equipment.

A. Authority

The Energy Policy and Conservation Act, as amended ("EPCA"), [1] authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C[2] of EPCA, added by Pub. L. 95-619, Title IV, section 441(a), established the Energy Conservation Program for

[1] All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Pub. L. 116-260 (Dec. 27, 2020), which reflect the last statutory amendments that impact Parts A and A-1 of EPCA.
[2] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1.

Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. This equipment includes SPVUs, the subject of this document. (42 U.S.C. 6311(1)(B)-(D))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA specifically include definitions (42 U.S.C. 6291; 42 U.S.C. 6311), test procedures (42 U.S.C. 6293; 42 U.S.C. 6314), labeling provisions (42 U.S.C. 6294; 42 U.S.C. 6315), energy conservation standards (42 U.S.C. 6295; 42 U.S.C. 6313), and the authority to require information and reports from manufacturers (42 U.S.C. 6296; 42 U.S.C. 6316).

The Federal testing requirements consist of test procedures that manufacturers of covered equipment must use as the basis for: (1) certifying to DOE that their equipment complies with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6316(b); 42 U.S.C. 6296), and (2) making other representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE uses these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA.

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6316(a) and 42 U.S.C. 6316(b); 42 U.S.C. 6297). DOE may, however, grant waivers of Federal preemption for particular State laws

or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6316(b)(2)(D))

Under 42 U.S.C. 6314, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered equipment. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect energy efficiency, energy use or estimated annual operating cost of a given type of covered equipment during a representative average use cycle (as determined by the Secretary) and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2))

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered equipment, including SPVUs, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle. (42 U.S.C. 6314(a)(1)) In addition, if the Secretary determines that a test procedure amendment is warranted, the Secretary must publish proposed test procedures in the *Federal Register,* and afford interested persons an opportunity (of not less than 45 days' duration) to present oral and written data, views, and arguments on the proposed test procedures. (42 U.S.C. 6314(b)) If DOE determines that test procedure revisions are not appropriate, DOE must publish its determination not to amend the test procedures. (42 U.S.C. 6314(a)(1)(A)(ii))

The U.S. Department of Energy ("DOE") is also undertaking this rulemaking in part in response to updates to the relevant industry standard. As discussed earlier in this document, SPVUs are a category of commercial package air conditioning and heating equipment. EPCA requires the DOE test procedures for commercial package air conditioning and heating equipment to be the generally accepted industry testing procedure developed or recognized by the Air-Conditioning, Heating, and Refrigeration Institute ("AHRI") or by the American Society of Heating, Refrigerating and Air-Conditioning Engineers ("ASHRAE"), as referenced in ASHRAE Standard 90.1, "Energy Standard for Buildings Except Low-Rise Residential Buildings" (ASHRAE Standard 90.1). (42 U.S.C. 6314(a)(4)(A)) EPCA further requires that each time the referenced industry test procedure is amended in ASHRAE Standard 90.1, DOE must amend its test procedure to be consistent with the industry update, unless DOE determines in a rulemaking that there is clear and convincing evidence that the updated update industry test procedure would not be representative of an average use cycle or would be unduly burdensome to conduct. (42 U.S.C. 6314(a)(4)(B)(C)) While ASHRAE Standard 90.1 itself has not been updated, the test procedure referenced in 90.1 for SPVUs, AHRI Standard 390-2021, "Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps" ("AHRI 390-2021"), has been updated. DOE is considering the updated AHRI 390-2021 under its lookback review.

DOE is publishing this final rule in satisfaction of the 7-year review requirement specified in EPCA. (42 U.S.C. 6314(a)(1)(A))

B. Background

DOE's existing test procedures for SPVUs are set forth at 10 CFR 431.96. The Federal test procedure currently incorporates ANSI/AHRI Standard 390-2003 ("ANSI/AHRI 390-2003"), "Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps," (omitting section 6.4), and it also includes additional provisions in paragraphs (c) and (e) of 10 CFR 431.96 that provide for an optional break-in period and additional provisions for equipment set-up, respectively. DOE established its test procedure for SPVUs in a final rule for commercial heating, air conditioning, and water heating equipment published in the *Federal Register* on May 16, 2012. 77 FR 28928, 28932. ANSI/AHRI 390-2003 was the SPVU test procedure referenced in the edition of ASHRAE Standard 90.1 current at that time; ANSI/AHRI 390-2003 remains the test procedure referenced by ASHRAE Standard 90.1.

On June 24, 2021, AHRI published updates to its test procedure for SPVUs as AHRI 390-2021. Among other things, AHRI 390-2021 maintains the existing efficiency metrics—energy efficiency ratio ("EER") for cooling mode and coefficient of performance ("COP") for heating mode—but it also added a seasonal metric that includes part-load cooling performance – the integrated energy efficiency ratio ("IEER") metric. AHRI 390-2021 also includes additional specifications regarding the test methods and conditions.

DOE published a notice of proposed rulemaking ("NOPR") on January 14, 2022, presenting DOE's proposals to amend the SPVU test procedure ("January 2022 NOPR"). 87 FR 2490. In the January 2022 NOPR, DOE proposed to amend the test procedures for

SPVUs to incorporate by reference AHRI 390-2021. DOE proposed to add a new appendix G, "Uniform test method for measuring the energy consumption of single package vertical air conditioners and single package vertical heat pumps," ("appendix G") that would include the relevant test procedure requirements for SPVUs for measuring the existing efficiency metrics: (1) EER for cooling mode and (2) COP for heating mode. DOE also proposed to add a new appendix G1 that would include the relevant test procedure requirements for SPVUs for measuring with the updated efficiency metrics: (1) IEER for cooling mode and (2) COP for heating mode. 87 FR 2490, 2492.

Additionally, DOE proposed to define in 10 CFR 431.92 "single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h" and "single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h" as subsets of the broader SPVAC and SPVHP equipment category, in order to clarify what kind of single-phase equipment with cooling capacity less than 65,000 Btu/h was contemplated in the broader definitions of SPVAC and SPVHP established by Congress and what classifies as a consumer product instead. Single-phase equipment meeting these definitions would be subject to the applicable commercial equipment energy conservation standards for SPVACs and SPVHPs, while single-phase products not meeting these definitions would properly be classified as CAC and subject to the applicable consumer products energy conservation standards. 87 FR 2490, 2492.

DOE held a public meeting related to the January 2022 NOPR on February 9, 2022 ("NOPR public meeting"). DOE received comments in response to the January 2022 NOPR from the interested parties listed in Table II.1.

Table II.1 List of Commenters with Written Submissions in Response to the January 2022 NOPR

Commenter(s)	Reference in this Final Rule	Document No. in Docket	Commenter Type
Appliance Standards Awareness Project, American Council for an Energy-Efficiency Economy, New York State Energy Research and Development Authority, and the Natural Resources Defense Council	Joint Efficiency Advocates	14	Efficiency / Environmental Advocate
Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison; collectively, the California Investor-Owned Utilities	CA IOUs	13	Utility
Lennox International	Lennox	12	Manufacturer
GE Appliances, a Haier Company	GE	15	Manufacturer
Friedrich Air Conditioning	Friedrich	18	Manufacturer
Northwest Energy Efficiency Alliance	NEEA	16	Efficiency / Environmental Advocate
Air-Conditioning Heating and Refrigeration Institute[3]	AHRI	17	Trade Association

A parenthetical reference at the end of a comment quotation or paraphrase provides the location of the item in the public record.[4]

[3] AHRI's comment was received 6 days after the comment submission deadline. DOE will generally not consider late-filed comments, but if DOE considers one late comment, it will consider all late comments. DOE considered the late comment in this case primarily because of the short duration between the comment's filing and the close of the comment period.

[4] The parenthetical reference provides a reference for information located in the docket of DOE's rulemaking to develop test procedures for SPVUs. (Docket No. EERE-2017-BT-TP-0020, which is maintained at *www.regulations.gov*). The references are arranged as follows: (commenter name, comment docket ID number, page of that document).

II. Synopsis of the Final Rule

In this final rule, DOE is amending the test procedure for SPVUs to incorporate by reference AHRI 390-2021. DOE is establishing a new appendix G that includes the relevant test procedure requirements for SPVUs for measuring the existing efficiency metrics: (1) EER for cooling mode and (2) COP for heating mode. DOE is also establishing a new appendix G1 that includes the relevant test procedure requirements for SPVUs for measuring the updated efficiency metrics, (1) IEER for cooling mode and (2) COP for heating mode. Appendix G1 provides the test procedure for representations based on IEER, and will be mandatory only at such time as compliance is required with amended energy conservation standards based on IEER should DOE adopt standards using such metrics. In conjunction, DOE is amending table 1 to 10 CFR 431.96 to identify the newly added appendices G and G1 as the applicable test procedures for testing SPVUs.

Additionally, DOE is defining "single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h" and "single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h" as subsets of the broader SPVAC and SPVHP equipment category. Single-phase equipment meeting these definitions are subject to the applicable energy conservation standards for SPVACs and SPVHPs, whereas single-phase products not meeting these definitions would properly be classified as central air conditioners ("CACs") and subject to the applicable energy conservation standards for CACs.

The adopted amendments are summarized in Table II.1 compared to the test procedure provision prior to the amendment, as well as the reason for the adopted change.

Table II.1 Summary of Changes in the Amended Test Procedure

Current DOE TP	Amended TP	Attribution
Incorporates by reference ANSI/AHRI 390-2003 (excluding section 6.4)	Incorporates by reference AHRI 390-2021, which includes the following changes. - Includes a new energy efficiency descriptor, IEER, which incorporates part-load performance. - Provides direction and accompanying definitions for determining whether a unit is tested as a ducted or non-ducted unit. - Directs that the outdoor air-side attachments used for testing must be specified by the manufacturer in the supplemental testing instructions. - Includes refrigerant charging instructions for cases where they are not provided by the manufacturer. - Specifies tolerances for achieving the rated airflow and/or minimum external static pressure ("ESP") during testing and specifies how to set indoor airflow if airflow and ESP tolerances cannot be simultaneously met. - Incorporates specifications for measuring outdoor air conditions. - Requires data be recorded at equal intervals of 5 minutes or less over a 30-minute measurement period. - Clarifies that test results for outdoor air enthalpy method are based on results without test apparatus connected. - Defines the term "manufacturer's installation instructions" and includes hierarchy of precedence if multiple instructions are included.	Adopt industry test procedure.
Only includes definitions for the equipment categories; "Single Package Vertical Air Conditioner" and "Single Package Vertical Heat Pump"	Includes additional definitions: "single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h" and "single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h."	Explicitly delineate SPVUs from other covered products.
Does not include provisions for certain components.	Provides instructions for testing SPVUs with certain specific components. This includes: - a list of specific components that must be present for testing, specified in 10 CFR 429.43; - provisions for testing units with certain specific components, specified in appendix G1.	Establish provisions for testing with certain components.

DOE has determined that the amendments would not be unduly burdensome. Furthermore, DOE has determined that the amended test procedure in appendix G as

described in section III of this final rule would not alter the measured efficiency of SPVUs or require retesting solely as a result of DOE's adoption of the amendments to the test procedure. Use of the updated industry test procedure provisions in appendix G1 and the related amendments to representation requirements in 10 CFR 429.43 will not be required until the compliance date of any amended standards denominated in terms of IEER. Additionally, DOE has determined that the amendments would not increase the cost of testing. Discussion of DOE's actions are addressed in detail in section III of this final rule.

The effective date for the amended test procedures adopted in this final rule is 30 days after publication of this document in the *Federal Register*. Representations of energy use or energy efficiency must be based on testing in accordance with the amended test procedures beginning 360 days after the publication of this final rule.

III. Discussion

A. Scope of Applicability

EPCA, as amended by the Energy Independence and Security Act of 2007 ("EISA 2007"), Pub. L. 110–140 (Dec. 19, 2007), defines "single package vertical air conditioner" and "single package vertical heat pump" at 42 U.S.C. 6311(22) and (23), respectively. In particular, single package vertical air conditioners can be single- or three-phase; must have major components arranged vertically; must be an encased combination of components; and must be intended for exterior mounting on, adjacent interior to, or through an outside wall. Single package vertical heat pumps are single package vertical air conditioners that use reverse cycle refrigeration as their primary heat

source and may include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas. DOE codified the statutory definitions into its regulations at 10 CFR 431.92. Additionally, EPCA established initial equipment classes for SPVUs, including those with a capacity less than 65,000 Btu/h based on phase. (42 U.S.C. 6313(a)(10)(A)(i)-(ii) and (v)-(vi))

DOE currently defines an SPVAC as air-cooled commercial package air conditioning and heating equipment that: (1) is factory-assembled as a single package that: (i) has major components that are arranged vertically; (ii) is an encased combination of cooling and optional heating components; and (iii) is intended for exterior mounting on, adjacent interior to, or through an outside wall; (2) is powered by a single-or 3-phase current; (3) may contain 1 or more separate indoor grilles, outdoor louvers, various ventilation options, indoor free air discharges, ductwork, well plenum, or sleeves; and (4) has heating components that may include electrical resistance, steam, hot water, or gas, but may not include reverse cycle refrigeration as a heating means. 10 CFR 431.92. Additionally, DOE defines an SPVHP as a single package vertical air conditioner that: (1) uses reverse cycle refrigeration as its primary heat source; and (2) may include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas. *Id.* The Federal test procedures are applicable to SPVUs with a cooling capacity less than 760,000 Btu/h. (42 U.S.C. 6311(8)(D)(ii))

In the January 2022 NOPR, DOE explained that reading the definitions of SPVUs and CACs[5] in isolation, certain single-phase air conditioners and heat pumps with cooling capacity less than 65,000 Btu/h and with their components arranged vertically could be understood to be SPVUs, as opposed to CACs. 87 FR 2490, 2493-2494. However, DOE had previously explained that the definitions of SPVUs and CACs under EPCA must be read in the context of DOE's authority to regulate certain consumer products (covered products) and certain industrial equipment (covered equipment); under EPCA a product cannot be both covered equipment and a covered product as the definition of covered equipment excludes covered products. 79 FR 78613, 78625 (Dec. 30, 2014). "Covered products" are certain consumer products explicitly set forth in the statute, as well as consumer products that have been classified as a covered product under 42 U.S.C. 6292(b). EPCA defines "consumer product," in part, as an article which, to any significant extent, is distributed in commerce for personal use or consumption by individuals. (42 U.S.C. 6291(1)(B)) As discussed in the January 2022 NOPR, CACs are covered products, and a product can only be classified as an SPVU, and, therefore, industrial equipment under EPCA, if it does not meet the definition of any covered product, including CACs. 87 FR 2490, 2494.

To clarify the distinction between SPVUs as industrial equipment and CACs as covered consumer products, DOE proposed in the January 2022 NOPR to add specific definitions for "single-phase single package vertical air conditioner with cooling capacity

[5] EPCA defines a "central air conditioner" as a product, other than a packaged terminal air conditioner, which is powered by single-phase electric current, air-cooled, rated below 65,000 Btu per hour, is not contained within the same cabinet as a furnace with a rated capacity above 225,000 Btu per hour, and is a heat pump or a cooling only unit. (42 U.S.C. 6291(21))

less than 65,000 Btu/h" and "single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h" to explicitly identify those design characteristics specific to models that are not of a type distributed in commerce for personal use or consumption by individuals, and therefore are not consumer products or CACs. The current definitions of SPVAC and SPVHP at 10 CFR 431.92 allow for both wall-mounted and floor-mounted units, and either may use single-phase or three-phase power. DOE proposed in the January 2022 NOPR to include certain characteristics as part of these definitions in order to evidence that this equipment should be properly classified as covered equipment and SPVUs rather than covered products and CACs, and that they would likely not be of a type distributed to any significant extent in commerce for personal use or consumption by individuals. Specifically, DOE preliminarily determined that weatherization, or in the case of non-weatherized units, the presence of optional air ventilation provisions, represent key design characteristics that indicate use in commercial applications. DOE did not identify any products intended for consumer applications with these design characteristics. 87 FR 2490, 2493-2495.

DOE proposed to define these new terms as follows:

Single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h means air-cooled commercial package air conditioning and heating equipment that meets the criteria in paragraphs (1)(i) through (iv) of the definition of a single package vertical air conditioner (at 10 CFR 431.92); that is single-phase; has a cooling capacity less than 65,000 Btu/h, and that:

(1) Is weatherized, determined by a model being denoted for "Outdoor Use" or marked as "Suitable for Outdoor Use" on the equipment nameplate; or

(2) Is non-weatherized and is a model that has optional ventilation air provisions available. When such ventilation air provisions are present on the unit, the unit must be capable of drawing in and conditioning outdoor air for delivery to the conditioned space at a rate of at least 400 cubic feet per minute, as determined in accordance with §429.134(x)(3), while the equipment is operating with the same drive kit and motor settings used to determine the certified efficiency rating of the equipment (as required for submittal to DOE by §429.43(b)(4)(xi)). 87 FR 2490, 2495.

Single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h means air-cooled commercial package air conditioning and heating equipment that meets the criteria in paragraphs (1)(i) through (ii) of the definition of a single package vertical heat pump; that is single-phase; has a cooling capacity less than 65,000 Btu/h, and that:

(1) Is weatherized, determined by a model being denoted for "Outdoor Use" or marked as "Suitable for Outdoor Use" on the equipment nameplate; or

(2) Is non-weatherized and is a model that has optional ventilation air provisions available. When such ventilation air provisions are present on the unit, the unit must be capable of drawing in and conditioning outdoor air for delivery to the conditioned space at a rate of at least 400 cubic feet per minute, as determined in accordance with §429.134(x)(3), while the equipment is operating with the same drive kit and motor

settings used to determine the certified efficiency rating of the equipment (as required for submittal to DOE by §429.43(b)(4)(xii)). 87 FR 2490, 2495.

DOE also proposed to amend the definitions of "single package vertical air conditioner" and "single package vertical heat pump" to state that those definitions include the equipment within the newly proposed definitions of SPVACs and SPVHPs, respectively, with cooling capacity less than 65,000 Btu/h. 87 FR 2490, 2495.

In regard to determining if a unit is capable of providing 400 CFM of outdoor air, DOE proposed to include provisions in 10 CFR 429.134 that specify the method of measurement of the maximum outdoor ventilation airflow rate. DOE proposed to specify that the outdoor ventilation airflow rate should be set up and measured in accordance with ASHRAE 41.2-1987, "Standard Methods for Laboratory Airflow Measurement," and Section 6.4 of ASHRAE 37-2009. DOE also proposed specifications to clarify how these provisions are applied to measure the outdoor ventilation airflow rate. 87 FR 2490, 2495. As discussed in the January 2022 NOPR, DOE preliminarily determined that units for commercial applications provide sufficient ventilation airflow to meet commercial building ventilation requirements and specify ventilation airflow as low as 400 CFM. DOE preliminarily determined that units for consumer applications, including multi-family applications, typically have little or no capability for ventilation, with ventilation airflow only as high as 120 CFM. Therefore, DOE proposed 400 CFM as the characteristic applicable to SPVUs. 87 FR 2490, 2494-2495. For models meeting the proposed amended SPVU definitions, DOE is able to conclude from these characteristics

that such units are properly categorized as SPVUs and that they are unlikely to serve or be distributed in commerce for personal use or consumption as covered products.

In response to the proposed definitions in the January 2022 NOPR, Lennox commented that a critical factor for them and the HVAC industry is to ensure current products and new entries into the market are classified consistently across manufacturers. Lennox stated they generally supported DOE's effort to ensure current equipment and new entries into the market are classified consistently across manufacturers, and generally supported the distinguishing definitions proposed in the January 2022 NOPR. (Lennox, No. 12, p. 1) Furthermore, they stated that the distinguishing characteristics of outdoor ventilation airflow rate in cubic feet per minute ("CFM") and weatherization are conceptually acceptable as long as characteristics like CFM thresholds are reasonably set and appropriately characterize the equipment. (Lennox, No. 12, p. 2)

The CA IOUs commented that they agreed with DOE's conclusion that certain single-phase products currently classified as SPVUs satisfy the regulatory definition of consumer CAC, and supported the clarification that those products should be rated as CACs. The CA IOUs commented that manufacturer literature and website review confirms the installation of such products in consumer applications such as apartments, condominiums, and student and senior housing, and that these applications are no different from the installations for space-constrained consumer products. CA IOUs stated that DOE's proposed approach facilitates consistency in the treatment of products intended for residential use. (CA IOUs, No. 13, pp. 1-2) CA IOUs also supported DOE's proposal to designate certain single-phase equipment as commercial and industrial

equipment, but urged DOE to test such equipment with a cooling capacity less than 65,000 Btu/h using AHRI Standard 210/240-2023. (CA IOUs, No. 13, p. 2) They stated that the proposed definitions would otherwise be inconsistent with DOE's treatment of other single-package consumer products with a cooling capacity less than 65,000 Btu/h that are optionally capable of providing commercial levels of ventilation air or are weatherized, and urged DOE to follow DOE precedents and use AHRI Standard 210/240-2023. They recognized that energy conservation standards set for this equipment in a subsequent rulemaking may need to be different than other equipment, but noted that using the same test procedure for all products that compete in the market would enable consumer comparison of the efficiency metrics. (CA IOUs, No. 13, p. 2)

Friedrich opposed DOE's proposed definitions requirement that units must have the ability to provide a minimum of 400 CFM of outdoor air to qualify as an SPVU. (Friedrich, No. 18, p. 1) Friedrich commented that it is their understanding that this proposed requirement is irrespective of whether the unit is weatherized or non-weatherized. Friedrich commented that the proposed 400 CFM outdoor air requirement would be between 61 to 114 percent of the application supply airflow for their equipment, and that conditioning outdoor air that makes up such a large portion of the supply air will lead to higher energy consumption for those commercial sites, a decrease in occupancy comfort, and possibly humidity issues. Friedrich opposed DOE's statement that it identified each unit on the market as meeting this outdoor ventilation airflow requirement, noting that one of their specific product lines was not considered. (Friedrich, No. 18, pp. 1-2) Friedrich stated that their affected units have been tested according to AHRI 390 since 2005. They commented that their units are installed in

hotels and other commercial locations within a closet, and that these installations typically have short discharge ducts, which is different from CACs. They stated that the exterior wall is designed with a large cutout area for the heat exchangers of these equipment. (Friedrich, No. 18, p. 2) Friedrich commented that this change will result in a change in minimum efficiency, and the current installed base will be left without a replacement option. They stated that this would necessitate a substantial change to building infrastructure because SPVAC and SPVHP replacements' unit size and method are designed into the building, and these substantial changes may compromise the integrity of building structure. (Friedrich, No. 18, p. 3)

Friedrich also opposed DOE's classification of the primary market for SPVUs in its review of the ventilation requirements specified in ANSI/ASHRAE Standard 62.1-2019, "Ventilation for Acceptable Indoor Air Quality" as excluding hotels and motels. Friedrich stated that one of its model lines is installed in hotels, hospitality, and other light commercial lodging locations in conjunction with Dedicated Outdoor Air Systems ("DOAS") to meet ASHRAE Standard 62.1-2019 ventilation requirements. (Friedrich, No. 18, p. 2)

AHRI questioned the proposed outdoor ventilation airflow requirement, noting that some standards (including California's Title 24 and ASHRAE 90.1) are looking to lower the threshold of economizing requirements for exterior-mounted products installed in buildings that are three stories or higher to 33,000 Btu/h. (Public Meeting Transcript, No. 11, p. 13) The CA IOUs commented that Title 24 does not require equipment that serves dwelling units to include an economizer, noting that requirements for multifamily

buildings have been moved to Subchapter 11 Multifamily Buildings - Performance and Prescriptive Compliance Approaches and provides an exception for systems serving dwelling units. They further commented that Draft Addendum to ASHRAE 90.1-2019 will not require indoor equipment with a cooling capacity of less than 54,000 Btu/h to include an economizer. This proposal reduces the system cooling capacity threshold for economizing to 33,000 Btu/h from 54,000 Btu/h, but only for "fan-cooling units located outside the building." (CA IOUs, No. 13, p. 4)

GE stated that DOE has neither the authority nor the justification to redefine the SPVU product class, and that DOE cannot and should not create a separate product class for SPVUs with cooling capacity below 65,000 Btu/h. (GE, No. 15, p. 2) Further, GE commented that the definition of SPVU is set by statute and that DOE has identified no authority that permits it to modify this statutory definition through regulation. GE also commented that the definition of SPVUs is included in ASHRAE 90.1 which is recognized by EPCA as the industry standard for commercial products. They noted that the presence of SPVUs in ASHRAE 90.1 strongly indicates SPVUs are commercial, not consumer products. GE also commented that SPVUs with cooling capacity under 65,000 BTU/hr are marketed and sold as commercial products into commercial buildings, including hotels, dormitories, nursing homes and other medical care facilities, and senior housing communities. GE provided marketing material for their equipment and stated that it demonstrates that these products are marketed for commercial use. (GE, No. 15, p. 2) GE also commented that DOE should not change a product class definition through a test procedure rulemaking. GE stated that should DOE make the change it is proposing, it should do so only through a standards rulemaking and that to do otherwise, DOE would

be effectively establishing new efficiency standards for existing products without EPCA's statutorily mandated 5-year compliance period. (GE, No. 15, p. 2)

AHRI characterized DOE's proposal as to define single-phase SPVAC and SPVHPs with cooling capacity less than 65,000 Btu/h as one reclassifying single-phase SPVAC and SPVHPs as space constrained consumer central air conditioners and heat pumps, and disagreed with this proposal because SPVUs are classified as a type of commercial air conditioner under EPCA. (AHRI, No. 17, p. 5) AHRI noted that EPCA defines industrial equipment as any article of equipment of certain specified types that consumes, or is designed to consume, energy, which is distributed to any significant extent for industrial and commercial use, and which is not a covered product as defined, without regard to whether such article is in fact distributed in commerce for industrial or commercial use. AHRI said that the definition for SPVUs created by Congress in 2007 was the definition in AHRI 390-2003, and that Congress in choosing this definition meant to adopt AHRI's definition as it was implemented by AHRI in testing and certifying SPVU models under AHRI 390-2003. (AHRI, No. 17, pp. 5-6). AHRI further contended that DOE should recognize that the models AHRI lists in its directory are SPVUs as they have their components arranged vertically and meet the definition of AHRI 390-2003, and that they are not consumer products or CACs. (AHRI, No. 17, p. 6)

AHRI asserted that SPVUs fall squarely within the purview of ASHRAE 90.1, which did not amend the definition to exclude any subset of the broader SPVAC and SPVHP categories. (AHRI, No. 17, p. 6) AHRI noted that what it calls smaller SPVUs are often designed to be installed through-the-wall in hotels, apartments, dormitories, and

multi-family residential buildings, but disagreed that these applications could lead to these units being classified as consumer products. AHRI commented that the scope of ASHRAE 90.1, which is the minimum energy code for commercial buildings, covers multifamily structures of more than three stories as well as hotels and dormitories. AHRI stated that it is to be expected that certain SPVUs and other HVAC products listed in ASHRAE 90.1 would be used in these commercial applications covered by ASHRAE 90.1. AHRI noted that many SPVUs are sold in the same applications as packaged terminal equipment and DOE is not now questioning the use of package terminal equipment in these commercial applications. They further stated that a key distinction between SPVUs and residential products is that they are not sold directly to consumers, and that SPVUs are incorporated into the design of the building and usable spaces therein. AHRI continued that SPVUs are sold to commercial entities that build, own, or operate the building, and that these entities also own and maintain the products. AHRI said that consumers are not directly involved in the selection of the units or in the sale transactions, which would be the case for a "consumer product." (AHRI, No. 17, p. 7)

AHRI contended that the products in question listed in its Directory meet the EPCA definition of SPVUs and AHRI maintains that DOE cannot recategorize a subset of products on assertions that those may be occasionally misapplied in the field. AHRI commented that DOE has not provided evidence of what AHRI categorizes as SPVUs being applied in any substantial number in single-family homes, or multi-family homes below three stories. AHRI also stated that for products marketed toward multifamily buildings over three stories, some manufacturers have chosen to rate certain product lines to AHRI Standard 210/240 because these product lines appear to have multi-stage

compressors that do not benefit from efficiency distinction using a full-load performance method, such as AHRI Standard 390-2003. AHRI stated that now that AHRI 390-2021 has published and includes a part-load efficiency metric, they expect manufacturers to no longer have reason to use the part-load performance of another industry test standard to market products effectively. (AHRI, No. 17, pp. 7-8)

AHRI commented that the definition of "space constrained product" at 10 CFR 430.2 cannot accommodate the full range of units at issue due to the definition's maximum capacity cap of 30,000 Btu/h. Therefore, AHRI stated that DOE's proposal would split product lines into part residential and part commercial. AHRI noted that these proposed definitions would subject products between 30,000 and 65,000 Btu/h to the substantially higher efficiencies and regional standards of CACs. AHRI commented that definitionally, space-constrained residential products must be, "currently usually installed in single-family homes," but that no one contends that these products are installed in single family homes. Further, AHRI questioned how SPVUs, which were established as a commercial category in 2007, would meet the portion of the space-constrained products definition that limits inclusion to product types that were available for purchase in the United States as of December 1, 2000. (AHRI, No. 17, pp. 8-9)

DOE presents the relevant history here in support of DOE's determination regarding the differentiation between CACs and SPVUs.

In an energy conservation standards NOPR for CACs, DOE stated that it understood that SPVUs are not distributed for personal use or consumption by

individuals, and therefore are commercial equipment. 65 FR 59589, 59610 (Oct. 5, 2000). As a result, this equipment would have been subject to standards for commercial package air conditioning and heating equipment. *Id.* In the subsequent final rule published on January 22, 2001, DOE established a separate CAC class for space-constrained products, which included through-the-wall ("TTW") products but did not establish standards for them, and announced an intent to go through a rulemaking for space-constrained products. 66 FR 7169, 7196–7197. In 2004, DOE amended the CAC standards, establishing separate standards for space constrained products and TTW products, with the standards specific for TTW products applicable only to products manufactured prior to January 23, 2010. For products manufactured after January 23, 2010, the standards for space constrained products applied to these TTW air conditioners and heat pumps. 69 FR 50997, 50998 (Aug. 17, 2004).

Beginning in 2002, ASHRAE first classified SPVU as a separate equipment class, through addendum "d" to ASHRAE 90.1-2001 and, later, addendum "b" to ASHRAE 90.1-2004. DOE reviewed these changes but took no action because SPVU equipment was subject to standards for commercial package air conditioning and heating equipment, and EPACT 2005 (Pub. L. 109-58) had limited DOE's authority for this equipment. 72 FR 10038, 10046-10047 (Mar. 7, 2007). In 2007, Congress established definitions and equipment classes specific for SPVUs (through the EISA 2007; Pub. L. 110-140), which DOE codified in 2009. (74 FR 12058 (Mar. 23, 2009)) Compliance with these SPVU standards was required starting January 1, 2010.

In early 2011, ASHRAE put forward proposed addendum "i" to ASHRAE 90.1-2010 to increase its efficiency standards for SPVU while establishing separate equipment classes with less-stringent efficiency levels for nonweatherized space constrained single-package vertical units. This proposal was formally incorporated into ASHRAE 90.1-2013. In an April 2014 Notice of Data Availability ("April 2014 NODA") for certain industrial equipment including SPVUs, DOE, upon its review of the market of what ASHRAE Standard 90.1 classified in a new equipment class for SPVUs used in space-constrained applications as "nonweatherized space constrained single-package vertical unit[s]," identified certain models of SPVUs in the AHRI Directory categorized as "space constrained" that were previously classified by DOE as TTW CAC. 79 FR 20114, 20122–23 (April 11, 2014). DOE noted that it is in this TTW CAC product class that DOE expressly contemplated residential space-constrained units, including those models previously classified as TTW that manufacturers were then attempting to classify as SPVUs. *Id.* The re-classification of these models by manufacturers was made despite no apparent changes in technology or features, or any other indication that would demonstrate that commercial classification became more appropriate than residential classification. *Id.* DOE explained that to the extent that a unit meets the definition of "central air conditioner" (*see* 42 U.S.C. 6291(21); 10 CFR 430.2), a consumer product, it is excluded from the definition of industrial equipment, (*see* 42 U.S.C. 6311(2)(A)(iii)), and therefore cannot be covered equipment. 79 FR 20114, 20123. DOE concluded that allowing models of a product type sold for personal use to instead be classified as commercial equipment simply because it is also of a type sold for commercial or

industrial uses would allow those products to evade DOE's standards for consumer products and be contrary to EPCA. *Id.*

DOE defined and established standards for space constrained CACs, including TTW units, prior to EISA 2007, which established standards specific to SPVU. 69 FR 50997, 50998. There is no indication that the SPVU provisions in EISA 2007's amendments to EPCA reclassified or were intended to reclassify products that were previously covered as covered products (*i.e.*, space constrained and TTW CAC) as commercial equipment; instead, the new provisions intended to establish a new class for a different type of commercial equipment.

In response to GE's and Friedrich's assertions that the product lines referenced in their comments are commercial equipment, and AHRI's comments regarding the differentiation between commercial equipment and consumer products, DOE reiterates that EPCA defines "consumer product" and "industrial equipment" as mutually exclusive. Specially, EPCA defines "industrial equipment" as any article of equipment of certain specified types that consumes or is designed to consume energy, which is distributed in commerce to any significant extent for industrial and commercial use, and *which is not a covered product as defined in 42 U.S.C. 6291(2)*, without regard to whether such article is in fact distributed in commerce for industrial or commercial use. (42 U.S.C. 6311(2)(A) (emphasis added)) A covered product is a consumer product of a type specified in 42 U.S.C. 6292. EPCA defines "consumer product" as any article: (1) of a type that consumes or is designed to consume energy, and, to any significant extent, is distributed in commerce for personal use or consumption by individuals, (2) without

regard to whether such article of such type is in fact distributed in commerce for personal use or consumption by an individual. (42 U.S.C. 6291(1)) EPCA specifies that CACs are covered consumer products. (42 U.S.C. 6292(3))

As noted, the definition of "consumer product" is not limited to products used in single-family homes, and instead covers products that, in part, are distributed in commerce for *personal use or consumption by individuals*. *Id.* (emphasis added). As discussed in the January 2022 TP NOPR, products serving a household, including a household in a multi-family building, are for personal use by individuals and are serving consumer applications rather than commercial or industrial applications. 87 FR 2490, 2494.

In addition, based on the similarities between units distributed for use in multi-family applications and those units distributed for commercial lodging applications referenced by GE and Friedrich, DOE finds that such units may still be of a type distributed in commerce for personal or individual use and therefore may be regulated as consumer products. (*See* 42 U.S.C. 6291(1)(B)) These products are only offered in single-phase electrical configurations, are non-weatherized, serve individual rooms, and are designed to be installed in closets or other enclosures through an opening in the exterior wall, with supply air ducts to distribute conditioned air to the occupied space. These products meet the definition of CACs, and have characteristics too similar to other CACs to allow clear distinction between commercial and consumer use. They are therefore of a type distributed in commerce for personal or individual use, and such products are consumer products. DOE also recognizes that the definition of space

constrained products specifies, in part, that such products are substantially smaller than those of other units that are currently usually installed in site-built single-family homes and of a similar cooling capacity, and, if a heat pump, heating capacity. 10 CFR 430.2. The definition, however, does not require space constrained products to be installed in single-family homes, but references products installed in such applications for comparative purposes.

Additionally, based on review of product literature, DOE identified multiple model lines with similar design as equipment cited by GE that included installation instructions for townhouse type applications or model lines with marketing literature[6] showing three-story multi-family apartment buildings in addition to commercial lodging applications.[7] In addition, DOE noted that the marketing literature for the Friedrich Vert-I-Pak model line cited in their comments also indicates that it is intended for both commercial lodging and multi-family apartment building applications. (Docket No. EERE-2017-BT-TP-0020-0019) The use and marketing of these units for townhomes and multifamily housing indicates that these products are used for individual households' use and consumption. DOE considers this information to be evidence that these products are

[6] *See* Docket No. EERE-2017-BT-TP-0020-0021, Docket No. EERE-2017-BT-TP-0020-0022, Docket No. EERE-2017-BT-TP-0020-0023, and Docket No. EERE-2017-BT-TP-0020-0024 for examples of products that were previously incorrectly certified but are now correctly certified. See Docket No. EERE-2017-BT-TP-0020-0019 and Docket No. EERE-2017-BT-TP-0020-0020 for Friedrich and GE literature showing similar marketing literature as these products.

[7] DOE notes that ASHRAE 90.1-2019 defines "low-rise residential buildings" as single-family houses, multifamily structures of three stories or fewer above grade, manufactured houses (mobile homes), and manufactured houses (modular).

distributed in commerce to a significant extent for personal use or consumption by individuals.

In response to Friedrich's understanding of the requirement for 400 CFM of outdoor ventilation air applying to both weatherized and non-weatherized SPVUs, DOE notes that the outdoor air ventilation requirement would only apply to non-weatherized units. DOE does not agree with Friedrich's assertion that DOE did not consider all SPVUs available on the market to determine the 400 CFM outdoor ventilation air requirement. As discussed, DOE reviewed the product literature for Friedrich's Vert-I-Pak model line and considers these to be CACs, as they meet the definitions of consumer product and CAC.

DOE also disagrees with Friedrich's assertion that CACs are not installed with unducted intake and short discharge duct lengths, and that DOE's revised definition of SPVU would leave the market without replacement options. DOE has identified several units from multiple manufacturers with similar design to Friedrich's Vert-I-Pak model line (and GE's Zoneline model line, referenced in their comments) and that are marketed towards multi-family, hotel, and hospitality; that are correctly certified as a space-constrained CAC using DOE's appendix M and AHRI Standard 210/240-2023 ("AHRI 210/240-2023"), "Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment. (*See* Docket No. EERE-2017-BT-TP-0020-0021, Docket No. EERE-2017-BT-TP-0020-0022, Docket No. EERE-2017-BT-TP-0020-0023, and Docket No. EERE-2017-BT-TP-0020-0024).

AHRI commented that making this change through the test procedure rulemaking is inappropriate. (AHRI, No. 17, p. 8) AHRI stated that the economic impacts to manufacturers and their customers that would ensue from this proposed change to the method of determination for represented efficiency would be enormous, and a complete rulemaking analysis under 42 U.S.C. 6295(p) is first required to assess technological feasibility and economic justification. (AHRI, No. 17, p. 8) AHRI also commented that the proposed test method for validating the outdoor testing ventilation airflow has not been vetted, and time to research this method or other options was not afforded to stakeholders given the comment period's length and the significant number of overlapping rulemakings impacting manufacturers of air conditioning products. AHRI characterized DOE's proposal as a significant recategorization that should occur over a longer timeframe than under a test procedure NOPR and its comment period. Additionally, AHRI commented that an SPVU's primary function is cooling and heating and AHRI is not aware of any field applications where an SPVU is used primarily for ventilation. (AHRI, No. 17, p. 8-9)

In regards to AHRI's and GE's comment that the definition change should be done through the standards rulemaking, DOE notes that it is not re-categorizing any existing equipment. DOE is re-iterating its long-standing application of the space constrained product definition, the CAC definition, and the SPVU definition, and codifying additional SPVU definitions to better clarify the application of these definitions. The new definitions do not reclassify any products; DOE has concluded that any products not meeting the definition finalized by this rule should have previously been properly classified, and would continue to be classified, as consumer products because

they are distributed in commerce for personal use or consumption. As a result, an energy conservation standards rulemaking is not required to adopt these definitions.

With regards to AHRI's concern about the impact of changes to California's Title 24 and ASHRAE 90.1, DOE notes, consistent with the CA IOU comments, that the revised requirements for economizing apply only to outdoor mounted units. As a result, DOE does not expect this design requirement to impact the products it considers to be CACs. The provisions would require indoor equipment with a cooling capacity of less than 54,000 Btu/h to include an economizer and that the proposal reducing the system cooling capacity threshold for economizing to 33,000 Btu/h from 54,000 Btu/h only applies to "fan-cooling units located outside the building." Therefore, DOE believes that the outdoor ventilation airflow threshold remains a distinguishing characteristic to distinguish SPVUs from consumer products.

In regards to AHRI's comment that some manufacturers have chosen to rate certain product lines marketed toward multifamily buildings over three stories to AHRI 210/240-2023 and DOE's appendix M because they incorporate multi-stage compressors, DOE first notes that, in addition to making representations using these test standards, manufacturers are certifying compliance for these products as space-constrained CACs. As discussed, these products that are being correctly certified as space-constrained CACs are similar in design to the products currently being misclassified as SPVUs. DOE also notes that the definitions of SPVU and CAC and applicable test procedures are not dependent on technology options for improving efficiency of the product. Products are

explicitly categorized based on the definitions provided in 10 CFR parts 430 and 431, and not based on the test procedures that provide the most benefit.

In response to AHRI's comment that SPVUs are not primarily used for ventilation, DOE recognizes that the primary function of an SPVU is for cooling and/or heating. The proposed definition identifies characteristics of equipment intended to distinguish SPVU from consumer products, but does not change the application of the equipment. Further, DOE has found that all SPVUs available on the market that include an outdoor ventilation option publish ventilation airflow rates, so DOE anticipates this is common industry practice.

For the reasons previously discussed, DOE has determined that the definitions proposed in the January 2022 NOPR for "single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h" and "single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h" are appropriate to explicitly delineate such equipment from certain covered consumer products. These definitions will not reclassify any existing products, and are intended to prevent the misclassification of consumer products as industrial equipment, specifically SPVUs. In addition, the methods proposed in the January 2022 NOPR for determining if a unit is capable of providing 400 CFM of outdoor air are based on the industry standard test methods for measuring airflow and DOE considers them to be consistent with industry practice. As a result, DOE is adopting these definitions in 10 CFR 431.92 and provisions for determining the outdoor ventilation airflow rate in 10 CFR 429.134 in this final rule.

B. Updates to Industry Standards

1. AHRI 390

In the January 2022 NOPR, DOE proposed to incorporate by reference AHRI 390-2021, which maintains the existing full-load cooling mode metric, EER, and adds the seasonal cooling metric, IEER. More specifically, DOE proposed to add a new appendix G that would include the relevant test procedure requirements for SPVUs for measuring efficiency using the existing efficiency metrics (*i.e.*, EER for cooling mode and COP for heating mode) and to add a new appendix G1 that would incorporate the provisions for measuring efficiency using IEER and COP. 87 FR 2496.

In response to the NOPR, Lennox and NEEA commented that they support the incorporation of AHRI 390-2021. (Lennox, No. 11, p. 2; NEEA, No. 16, pp. 1-2) The CA IOUs urged DOE to follow its precedent for other commercial and industrial equipment by requiring testing to AHRI 210/240-2023 on all SPVUs with a cooling capacity of less than 65,000 Btu/h. They stated that using the same test procedure for all products that compete in the market would enable consumer comparison of the efficiency metrics. CA IOUs commented that this path would also benefit manufacturers, since using AHRI Standard 210/240-2023 would reduce the testing burden for manufacturers of single-speed products, as the basic models would be subject to two cooling tests instead of four. Furthermore, they stated it will allow manufacturers to provide cold-climate heat pump data if they offer products that can operate as heat pumps at 5ºF. (CA IOUs, No. 13, pp. 2-3)

AHRI commented that AHRI 390-2021 is a solid test procedure and supported its use for calculating IEER. (AHRI, No. 17, p. 10) In the public meeting AHRI noted that the new industry test procedure incorporates part-load performance, which they stated is a necessary step for regulation due to developments in these products. (Public Meeting Transcript, No. 11, p. 16) In the public meeting AHRI stated that they did not dispute DOE's authority to consider test procedure changes under the lookback provisions in EPCA, but noted that if there is a deviation between the test procedure cited in ASHRAE 90.1 and the DOE test procedure, it would create challenges and confusion in the marketplace with different efficiency metrics and test procedures. (Public Meeting Transcript, No. 11, pp. 17-19) AHRI stated in their comment however that DOE must follow the statutorily mandated process and only adopt a revised test method after it has been adopted by ASHRAE 90.1. (AHRI, No. 17, p. 3) Further, AHRI commented that DOE lacks the authority to adopt a test procedure edition not cited in ASHARE 90.1. *Id.* AHRI stated that waiting to harmonize will establish consistent energy efficiency levels and design requirements between ASHRAE Standard 90.1 and the Federal requirements as well as comparable metrics. *Id.* AHRI further asserted that in order for DOE to deviate from ANSI/AHRI 390-2003, the Department would need to propose and justify by clear and convincing evidence each amendment made to arrive at a test procedure equivalent to AHRI 390-2021, which AHRI conceded would be unnecessarily onerous. (AHRI, No. 17, pp. 3-4, 8-10)

During the public meeting, AHRI noted that they are working to evaluate a crosswalk between EER and IEER, but that there is no consistent correlation between the metrics. AHRI also noted that they are also evaluating the impact of the new test

procedure on the heating metric, COP. AHRI noted that this work is being conducted in support of the ASHRAE 90.1 process. (Public Meeting Transcript, No. 11, pp. 17-19)

In response to AHRI, DOE has the authority to adopt AHRI 390-2021 in this rulemaking under the authority and in satisfaction of EPCA's 7-year-lookback review requirement for test procedures. (42 U.S.C. 6314(a)(1)(A)). With respect to small, large, and very large commercial package air conditioning and heating equipment (of which SPVUs are a category), EPCA directs that the test procedures shall typically be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)). But if the industry test procedure referenced in Standard 90.1 is determined by DOE to not meet the representativeness and undue burden requirements in 42 U.S.C. 6314(a)(2) and (3) by clear and convincing evidence, DOE must then establish an amended test procedure that meets EPCA's requirements. However, the industry test procedure currently referenced in Standard 90.1 is AHRI 390-2003, because Standard 90.1 has not yet been updated to reference AHRI 390-2021. The 42 U.S.C. 6314(a)(4) review has not been triggered. Therefore, DOE is not undertaking this rulemaking under 42 U.S.C. 6314(a)(4) but under its lookback review duty in 42 U.S.C. 6314(a)(1)(A)

Under its 7-year-lookback review DOE must also ensure that test procedures established are reasonably designed to produce test results which reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle and are not unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) DOE is directed during its 7-year-lookback review to evaluate whether an amended test

procedure would more accurately or fully comply with those requirements, and if DOE determines an amended test procedure would do so, then DOE is required to prescribe such test procedures for the product class. 42 U.S.C. 6314(a)(1)(A). A test procedure may not be reasonably representative because more representative test procedures are available. And a test procedure that was reasonably representative in the past may become unreasonably representative when newly available test procedures allow for better, more complete measurements. DOE's lookback review ensures that DOE is not bound to an industry test procedure that has gone without updating for too long and is no longer representative of current equipment. While AHRI acknowledged DOE's lookback review authority in the public meeting, their submitted comment does not mention DOE's lookback review and therefore only engaged with the review process under 42 U.S.C. 6314(a)(4)(A). AHRI stated in its written comment that DOE is mandated to adopt an industry test procedure only after that test procedure is adopted in Standard 90.1, but identified no such mandate within the statute itself. And the lookback review language at issue here was added to EPCA in EISA 2007, well after the relevant Standard 90.1 test procedure language was added in 1992. *Compare* Sec. 302 of EISA 2007, Pub. L. 110-140, 121 STAT. 1552 (Dec. 19, 2007) *with* Sec. 121 of The Energy Policy Act of 1992, Pub. L. 106-486, 106 STAT. 2808 (Oct. 24, 1992). Therefore, the most natural reading of the two together is that Congress intended to add the lookback review to those triggers for review of test procedures that already existed. The language of the lookback review applies generally, to all covered equipment. Rather than tie DOE's hands to an outdated test procedure in the manner the industry commenters suggest, EPCA compels DOE to use due diligence to review the totality of relevant and available information before

settling on appropriate energy conservation standards and test procedures. DOE finds here that AHRI 390-2003 no longer meets EPCA's requirements because AHRI 390-2021 is more representative without incurring undue burden, as discussed.

In this instance, the industry test procedure referenced in ASHRAE Standard 90.1, AHRI 390-2003, has since been superseded. DOE acknowledges that DOE has previously stated that it will only consider an update to ASHRAE Standard 90.1 that modifies the referenced industry test procedure to be a trigger under that provision of the statute, as opposed to an update of just the industry test procedure itself. (*See e.g.*, 86 FR 35668, 35676 (July 7, 2021)). DOE stands by that position regarding what constitutes a triggering event in the context of ASHRAE equipment and does not consider the provisions in 42 U.S.C. 6314(a)(4) to have been triggered. However, that does not preclude DOE from considering the updated version of the industry test procedure (*i.e.*, AHRI 390-2021) when reviewing DOE's test procedures under EPCA's lookback provision. Not only does DOE have discretion to do so, but it has a statutory duty to do so, in order to ensure that its test procedures produce results that are representative of an average use cycle and are not unduly burdensome to conduct.

DOE agrees also that the approach envisioned by AHRI, where for a 90.1 test procedure found to not meet EPCA's requirements DOE must go amendment-by-amendment and presumably line-by-line to alter to make it meet EPCA's requirements, would lead to an overly onerous process. It would be far too difficult to compile clear and convincing evidence for every minute adjustment in isolation of the test procedure as a whole. However, DOE does not agree with AHRI that EPCA requires this unreasonable

approach and instead interprets EPCA as allowing DOE to amend a TP in a more reasonable manner considering the whole of the test procedure in order to best meet the requirements of EPCA where industry has failed to do so. DOE also notes that AHRI contemplated the process through which DOE is reviewing updates to an industry test procedure under Standard 90.1, but in this final rule DOE is proceeding under its lookback review.

As supported by many of the comments that DOE received, including from AHRI itself, DOE has determined that the test methods specified in AHRI 390-2021 would produce test results that better reflect energy efficiency of SPVUs during a representative average use cycle than the current DOE test procedure and AHRI 390-2003. As discussed in section III.C and in the January 2022 NOPR, DOE notes that the IEER metric included in AHRI 390-2021 is representative of the cooling efficiency for SPVUs on an annual basis and is more representative than the current EER metric, which only captures the system performance at a single, full-load operating point. DOE also notes that the other test procedure changes incorporated in this final rule better ensure accurate and repeatable measurements, and ensure that representative test conditions are maintained during testing. These changes include:

Providing direction for determining whether a unit is tested as a ducted or non-ducted unit.

Directing that the outdoor air-side attachments used for testing must be specified by the manufacturer in the supplemental testing instructions.

Including refrigerant charging instructions for cases where they are not provided by the manufacturer.

Specifying tolerances for achieving the rated airflow and/or minimum external static pressure ("ESP") during testing and specifies how to set indoor airflow if airflow and ESP tolerances cannot be simultaneously met.

Incorporating specifications for measuring outdoor air conditions.

Clarifying that test results for outdoor air enthalpy method are based on results without test apparatus connected.

Defining the term "manufacturer's installation instructions" and including hierarchy of precedence if multiple manufacturer installation instructions are included.

Accordingly, for the foregoing reasons, DOE is incorporating by reference AHRI 390-2021 into the DOE test procedure for SPVUs.

DOE recognizes that adopting AHRI 390-2021 as the Federal test procedure for SPVUs may create some disharmony between the Federal test procedure and the test procedure currently specified in ASHRAE Standard 90.1 for a period of time. However, such disharmony is likely to be brief given the anticipated adoption of AHRI 390-2021 in the near future noted by commenters. Such a situation is preferable to the alternative where DOE would need to reinitiate another rulemaking once Standard 90.1's reference

is updated, which would be after this statutorily-required lookback proceeding, in order to amend the Federal test procedure to adopt AHRI 390-2021 -- precisely the same test procedure available for consideration now. Because DOE is able to consider and adopt AHRI 390-2021 under its lookback provision, this situation and potential waste of resources is avoided and a more stable regulatory environment is created.

DOE notes that commenters' concern regarding a crosswalk and potential market confusion from having Federal standards rely on different metrics than the efficiency levels specified in the current version of ASHRAE Standard 90.1 relate to the energy conservation standards for SPVUs, which DOE is addressing in a separate standards rulemaking. Finally, DOE notes that manufacturers are not required to use the IEER test method outlined in appendix G1 to make representations until 360 days after issuance of this final rule, and they are not required to use the test procedure to certify compliance with any energy conservation standards for SPVUs based on IEER until the compliance date established for such standards. Until the time that IEER is required for compliance, appendix G, which retains the EER metric, will be required to determine compliance with current standards for SPVUs.

With regards to the CA IOUs recommendation that DOE incorporate by reference AHRI 210/240-2023 for SPVUs <65,000 Btu/h cooling capacity, DOE notes that AHRI 390-2021 was explicitly developed to represent the energy use of SPVU equipment, including efficiency metrics that are based on operating conditions specific to SPVU applications (*i.e.*, modular classrooms, modular offices, and telecommunication shelters) while AHRI 210/240-2023 was not. Because AHRI 390-2021 more accurately represents

installations of SPVUs and is therefore more representative for determining the energy use of SPVUs, DOE is not incorporating by reference AHRI 210/240-2023 as the test procedure for SPVUs.

Accordingly, for the foregoing reasons, DOE is incorporating by reference AHRI 390-2021 into the Federal test procedure SPVUs because it is reasonably designed to produce results that are representative of the energy efficiency of that covered equipment during an average use cycle and is not unduly burdensome to conduct.

2. ASHRAE 37

ANSI/ASHRAE 37-2009, a method of test for many categories of air conditioning and heating equipment, is referenced by AHRI 390-2021 for testing SPVUs. In particular, Appendix E of AHRI 390-2021 specifies the method of test for SPVUs, including the use of specified provisions of ANSI/ASHRAE 37-2009. Consistent with AHRI 390-2021, DOE proposed in the January 2022 NOPR to incorporate by reference ANSI/ASHRAE 37-2009 in its test procedure for SPVUs. Specifically, DOE proposed to utilize the applicable sections of ANSI/ASHRAE 37-2009 – all sections except sections 1, 2, and 4. DOE also proposed that in the event of any conflicts between the DOE test procedure, AHRI 390-2021, and ASHRAE 37-2009, the DOE test procedure takes highest precedence, followed by AHRI 390-2021, followed by ASHRAE 37-2009. 87 FR 2490, 2496. DOE did not receive any comments regarding this proposal. For the reasons discussed, DOE is incorporating by reference ANSI/ASHRAE 37-2009 in this final rule along with the provisions regarding the order of precedence in the event of conflicts between the DOE test procedure, AHRI 390-2021, and ASHRAE 37-2009.

C. Energy Efficiency Descriptor

1. Efficiency Metrics

In the January 2022 NOPR, DOE proposed to incorporate by reference AHRI 390-2021, which maintains the existing full-load cooling mode metric, EER[8], and heating mode metric, COP[9], and adds the seasonal cooling metric, IEER. Specifically, DOE proposed to add a new appendix G that would include the relevant test procedure requirements for SPVUs for measuring efficiency using the existing efficiency metrics (*i.e.*, EER for cooling mode and COP for heating mode) and to add a new appendix G1 that would incorporate the provisions for measuring efficiency using IEER and COP. In the January 2022 NOPR, DOE stated that it considers the IEER metric, which includes test conditions and weighting factors for the four load levels representing 100, 75, 50, and 25 percent of full-load capacity, representative of the cooling efficiency for SPVUs on an annual basis, and more representative than the current EER metric. DOE requested comment on its proposal to adopt IEER for SPVUs. 87 FR 2490, 2497-2498.

Lennox supported using AHRI 390-2021 for calculating IEER. They also stated that IEER is more representative of an average use cycle and how products operate in field applications, because EER only considers full load operation while IEER considers four load levels including part load operation. (Lennox, No. 11, p. 2) NEEA supported DOE's proposed adoption of IEER as a regulated metric as it provides a more accurate representation of total energy consumption than EER alone, because it measures part load

[8] EER is the ratio of the produced cooling effect of the SPVU to its net work input, expressed in Btu/watt-hour, and measured at standard rating conditions.
[9] COP is the ratio of the produced heating effect of the SPVU to its net work input, when both are expressed in identical units of measurement, and measured at standard rating conditions.

energy consumption, but noted the limitations of the IEER metric—it does not capture energy consumption during other modes of operation such as ventilation or economizing. (NEEA No. 16, p. 2).

The Joint Efficiency Advocates supported adopting IEER as the efficiency metric in appendix G1. However, they expressed concern that the weighting factors in the calculation of IEER may underweight performance at higher outdoor temperatures and urged DOE to ensure that the calculation adequately represents seasonal efficiency. The Joint Efficiency Advocates commented that calculating the weighting factors solely based on operating hours does not take into account that an hour of operation at a higher outdoor temperature is providing more cooling and consuming more energy than an hour of operation at a lower outdoor temperature. (Joint Efficiency Advocates, No. 14, pp. 1-2) The Joint Efficiency Advocates also stated that SPVU product literature indicates installations in hotels, multifamily dwellings, and permanent classrooms, and encouraged DOE to investigate whether the weighting factors are representative of SPVU installations. (Joint Efficiency Advocates, No. 14, p. 2)

Regarding the test conditions and weighting factors, DOE notes that the test conditions for each of the Standard Rating Conditions in AHRI 390-2021 were developed in a similar manor as AHRI Standard 340/360-2022 ("AHRI 340/360-2022"), Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment, and was based on modeling buildings in which SPVUs are installed (modular schools, modular office, and telecommunication shelters), utilizing weather data from 15 climate zones. DOE finds these building types appropriate and will not consider

additional building types at this time, as per the Joint Efficiency Advocates comments, because applications such as hotels and multi-family homes are common for the CAC products that are currently being misclassified as SPVUs as discussed in section III.A. of this document.

Additionally, the weighting factors in AHRI 390-2021 were developed to represent the number of hours per year spent at each test condition. AHRI 390-2021 requires that a unit is tested at each of the four Standard Rating Conditions when determining the IEER metric, and that the performance of the unit at each test point (including part-load) is incorporated into the IEER metric. While individual equipment performance at part-load may vary between different model lines, each unit is tested under the same Standard Rating Conditions that produce results of SPVU efficiency during operation under representative conditions. DOE notes that this aligns with the approach taken for other small, large, and very large commercial package air conditioning and heating equipment (*e.g.*, the IEER metric specified in AHRI 340/360).

AHRI commented that no correlation has been established between the EER and IEER metrics. AHRI stated they plan to collect one year of AHRI certification data and will submit a proposed addendum to ASHRAE 90.1 using IEER. AHRI commented their support the adoption of AHRI 390-2021 and the use of IEER as the federally regulated metric only after ASHRAE 90.1 adopts the new procedure and new efficiency metrics. Additionally, they stated no testing was conducted to analyze the impact of test procedure changes on the heating metric, COP. (AHRI, No. 17, pp. 3, 10)

Per AHRI's comments that they support the adoption of AHRI 390-2021 and the use of IEER as the federally regulated metric only after ASHRAE 90.1 adopts the new procedure and new efficiency metrics, DOE notes the discussion in section III.B.I of this document. Any future energy conservation standards based on IEER would evaluate differences in the measured energy efficiency based on the IEER metric relative to EER (i.e., by developing an appropriate "crosswalk," as necessary), and would consider data and/or analysis that compares the ratings of SPVUs under the two metrics. DOE would also welcome any data showing differences in testing of the heating metrics, but is not aware that any of the changes made in AHRI 390-2021 would cause a change to the heating rating of SPVUs.

For the reasons previously discussed, DOE has determined that at this time, the test conditions and weighting factors represent the industry consensus standard are appropriate for determining the representative performance of SVPU units, and that the resulting IEER values are based on up-to-date weather data and operation hours. DOE recognizes that comments provided by the Joint Efficiency Advocates are informative and may suggest the need for DOE to investigate further the approach used to calculate SPVU performance in a future rulemaking. However, without further information, DOE continues to conclude that the test conditions and weighting factors in AHRI 390-2021 produce results reflecting the energy efficiency of SPVUs during a representative average use cycle. Therefore, DOE is adopting the test conditions and weighting factors in AHRI 390-2021.

The CA IOUs recommended that DOE reconsider the name IEER to avoid confusion for consumers because the IEER weighting factors in AHRI Standard 390-2021 are different from other commercial equipment, specifically AHRI Standard 340/360-2007, "Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment", and AHRI Standard 1230-2010, "Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment". The CA IOUs recommended DOE consider renaming the part-load cooling efficiency metric for SPVUs to "SPVU annual cooling efficiency." They stated that this change would allow end-users to compare and select equipment based on regulated efficiency metrics and remove any added ambiguity on weighting factors. (CA IOUs, No. 13, p. 3)

Regarding CA IOU's comment on renaming the IEER metric, the differences in IEER metrics between AHRI 390-2021 as compared to AHRI 340/360-2022 or AHRI 1230-2021 better reflect typical operation and performance of SPVUs. In particular, the weighting factors and temperature conditions were developed specifically to represent SPVU applications. DOE notes that AHRI 390-2021 maintains the IEER name and that changing the name from "IEER" might spawn unnecessary confusion by suggesting that there is some significant difference as to how that term is used in the context of the amended Federal test procedure as compared to AHRI 390-2021. DOE also notes that there is no significant overlap in the applications of CUACs or VRFs and SPVUs such that there would be confusion to potential customers. Therefore, DOE concludes that there is not a need to deviate from the metric name "IEER" specified in AHRI 390-2021. Consequently, DOE is adopting the IEER metric measured per AHRI 390-2021 in the

Federal test procedure for SPVUs, as proposed. Further, DOE is adopting the proposed revisions to the definition for IEER at 10 CFR 431.92 to distinguish between the test procedures for ACUACs and VRFs and SPVUs.

2. Low Temperature Heating Test

In the January 2022 NOPR, DOE noted that the heating mode test used to calculate COP and determine compliance with standards for SPVHPs is conducted at 47 °F outdoor air dry-bulb temperature and 43 °F outdoor air wet-bulb temperature, and is designated as the "Full Load Standard Rating Capacity Test, Heating" in Table 3 of AHRI 390-2021. 87 FR 2490, 2498. In the January 2022 NOPR, DOE proposed to allow manufacturers to make voluntary representations at the optional "Low Temperature Operation" condition in Table 3 of AHRI 390-2021. That test is based on an outdoor air dry-bulb temperature of 17 °F and outdoor air wet-bulb temperature of 15 °F. DOE proposed to specify in appendices G and G1 that the low temperature operation heating mode test conditions specified in Table 3 of AHRI 390-2021 are optional. This addition was made to clarify that additional representations for SPVHPs at a lower temperature condition are optional, but that if such representations are made, they must be based on testing conducted in accordance with the DOE test procedure using the specified low temperature operation heating mode test conditions in addition to those made at the full-load standard heating conditions. DOE requested comment from interested parties on this proposal. 87 FR 2490, 2498.

In response to the January 2022 NOPR, Lennox, the Joint Efficiency Advocates, and AHRI supported allowing optional representations of the low temperature condition.

(Lennox, No. 12, p. 2; Joint Efficiency Advocates, No. 14, p. 1; AHRI, Public Meeting Transcript, No. 11, p. 19) Lennox commented that COP representations at low temperatures are important performance characteristic, and stated the representations are already being made by manufacturers. (Lennox, No. 12, pp. 2-3)

The CA IOUs and NEEA recommended that DOE require the testing and reporting of heating COP at the Low Temperature Operation test condition. (CA IOUs, No. 13, p. 3; NEEA, No. 16, p. 3) NEEA commented that both AHRI 210/240-2023 and AHRI 340/360-2022 require heating mode testing at multiple conditions for all heat pump units. (NEEA, No. 16, pp. 3-4) NEEA noted that requiring this optional test would provide additional information on cold weather performance for consumers, and that the market share of SPVHPs at 20-30 percent was significant enough to investigate low ambient temperature test condition, despite AHRI's conclusion to the contrary. Further, the CA IOUs suggested that if the unit is not tested at 17 ºF to assign a default COP of 1.0 to the SVPHP basic model. The CA IOUs commented that DOE should publish the value in DOE's compliance certification database ("CCD") for SPVUs to account for auxiliary energy solely supplied by an electric resistance element. (CA IOUs, No. 13, p. 3)

The CA IOUs and the Joint Efficiency Advocates both commented that DOE should create an additional optional heating test at 5 ºF outdoor dry bulb / 3 ºF outdoor wet bulb. (CA IOUs, No. 13, p. 3; Joint Efficiency Advocates, No. 14, p. 3) The CA IOUs commented that this would allow manufacturers to certify cold-climate SPVHPs, which are already distributed in commerce, to meet existing cold climate specifications in the Northeast region. They commented this test would be consistent with the H4 heating

mode tests outlined in appendix M1 to subpart B of 10 CFR part 430 (*i.e.*, the test procedure for CACs) and is consistent with the optional heating mode test for single phase SPVUs less than 65,000 Btu/h deemed by DOE to be consumer products in the NOPR. (CA IOUs, No. 13, p. 3) The Joint Efficiency Advocates commented that Northeast Energy Efficiency Partnerships ("NEEP") has published a cold climate SPVHP specification that sets a minimum COP at 5 °F, and it is reasonable to expect that an increasing number of manufacturers will test and report cold climate performance. Further, they stated that adding an optional 5 °F test point to the SPVU test procedure will help ensure that any representations that manufacturers make about low-temperature performance will be based on a standardized test procedure. They encouraged DOE to allow both optional COP values at 17 °F and 5 °F to be reported and made available in the public DOE CCD for SPVUs. (Joint Efficiency Advocates, No. 14, p. 3)

In response to requests for an optional 5 °F heating test, DOE understands this test to be common for other cold-climate equipment. DOE notes that no such test is included in the industry test procedure, AHRI 390-2021. At this time, DOE is not aware of any cold-climate SPVUs. Based on DOE's review, all units that have reported to the NEEP specification discussed by commenters meet the definition of consumer products and are therefore currently misclassified as SPVUs. Through a review of SPVU market literature, DOE was unable to find any cold-climate units available on the market. For these reasons, DOE is not including an optional 5 °F heating test at this time.

In response to comments requesting that DOE make the 17 °F test required, DOE first notes that AHRI 390-2021 only requires testing at the full-load heating test condition

of 47 °F and that DOE's current heating mode standards for SPVUs are based on this full-load heating test condition. AHRI 390-2021 includes the low temperature heating test as an optional test. DOE notes that this is the same approach used in AHRI 340/360-2021. Any required representations for other test conditions would necessitate the establishment of standards for said representations. DOE is not proposing to regulate the COP measured at the 17 °F test at this time and, consistent with AHRI 390-2021, is adopting this as an optional test in this final rule.

In response to comments that the low temperature heating performance should be made available in the CCD, because DOE is not proposing to regulate COP measured at 17F, requiring reporting of performance for low temperature heating performance is not necessary. DOE will address any amended reporting requirements as necessary based on optional representations of low temperature performance for SPVUs through a separate rulemaking.

3. Fan Energy Use

As part of a request for information published on July 20, 2018, DOE requested comment on whether changes to the SPVU test procedure are needed to properly characterize a representative average use cycle, including changes to more accurately represent fan energy use in field applications. 83 FR 34499, 34503. DOE also requested information as to the extent that accounting for the energy use of fans in commercial equipment such as SPVUs would be additive of other existing accountings of fan energy use. *Id.* The Appliance Standards and Rulemaking Federal Advisory Committee ("ASRAC") Commercial and Industrial Fans and Blowers Working Group ("Working

Group") had previously provided recommendations regarding the energy conservation standards, test procedures, and efficiency metrics for commercial and industrial fans and blowers in a term sheet. (Docket No. EERE-2013-BT-STD-0006-0179 at p. 1) Specifically, recommendation #3 discussed the need for DOE's test procedures and related efficiency metrics to account more fully for the energy consumption of fan use in regulated commercial air-conditioning equipment. (Docket No. EERE-2013-BT-STD-0006-0179 at pp. 3-4) The Working Group recommended that DOE consider revising efficiency metrics that include energy use of supply and condenser fans to include the full energy consumption of those fans during all relevant operating modes, including ventilation and part-load operation, in the next round of test procedure rulemakings. The Working Group included SPVUs in its list of regulated equipment for which fan energy use should be considered. (Docket No. EERE-2013-BT-STD-0006-0179 at pp. 3-4, 16)

In the January 2022 NOPR, DOE preliminarily concluded that it did not have sufficient information regarding the operation of fans outside of mechanical heating and cooling during an average use cycle (*e.g.*, economizing, ventilation) specific to SPVU installations as would allow it to consider changing the existing efficiency metric(s) to include this aspect of energy use. DOE stated also that it lacked sufficient information on the number of units capable of operating in these modes, total energy use in these operating modes, and information regarding the frequency of operation of these modes during field conditions. 87 FR 2490, 2499.

In response to the January 2022 NOPR, NEEA commented that IEER for SPVUs does not capture energy consumption during other modes of operation, such as

ventilation or economizing. They stated that DOE's previous market analysis assumed that 65 percent of these units are installed in spaces that require regular ventilation (*e.g.*, modular offices and classrooms). NEEA noted that some SPVU equipment is promoted for use in buildings that require significant ventilation, and that prior DOE analyses have found that most SPVUs are installed in spaces requiring regular ventilation. NEEA noted that their previous research has shown that commercial HVAC units can spend up to 30 percent of operating time in ventilation-only modes. They stated that DOE should continue researching ways to account for energy consumption during ventilation-only modes in an occupied space. Otherwise, they asserted, the metrics do not capture the full energy saving potential of features such as efficient fans and economizers. (NEEA, No. 16, p. 2)

The Joint Efficiency Advocates similarly urged DOE to more fully capture fan energy use in the SPVU test procedure. They expressed concern that by not capturing fan energy use outside of cooling for ACs or heating and cooling for heat pumps (*e.g.*, for ventilation or supplementary heating), the test procedure may significantly underestimate fan energy consumption. The Joint Efficiency Advocates noted as an example that EPA recommends that outdoor air be supplied continuously during occupied hours to maintain good indoor air quality in portable classrooms. The Joint Efficiency Advocates also commented that failing to capture fan energy use in these additional operational modes could result in inaccurate relative rankings of equipment. Therefore, they urged DOE to capture fan energy use outside of cooling mode for ACs and outside heating and cooling modes for heat pumps to ensure the test procedures are representative of an average energy use cycle. (Joint Efficiency Advocates, No. 14, pp. 2-3)

DOE maintains that it does not have sufficient information at this time regarding the operation of fans outside of mechanical heating and cooling during an average use cycle (*e.g.*, economizing, ventilation) specific to SPVU installations as would allow it to consider changing the existing efficiency metric(s) to include this aspect of energy use. DOE notes that NEEA's research was not specific to SPVUs, so the conclusions with regards to how much HVAC equipment operate in fan only modes may not be relevant. In particular, NEEA's research revolved around furnaces installed in retail stores and warehouses located in Winnipeg, Montreal, and Toronto, while SPVUs are installed in smaller modular buildings and in more diverse climate profiles. Therefore, energy consumption modeling specific to SPVUs and in climate regions more representative of SPVU installations would likely be significantly different. Per NEEA's comment, DOE's previous analysis acknowledges that SPVUs are commonly installed in locations requiring ventilation (*i.e.,* modular offices and classrooms), and DOE maintains that is the case. DOE recognizes that the current metrics for SPVUs do not include fan energy use during all relevant operation modes. Provisions to measure fan energy use when there is no heating or cooling being provided, and when performing ancillary functions (*e.g.*, economizing, ventilation, filtration, and auxiliary heat), are not included in the industry test standard, AHRI 390-2021. However, DOE's previous analysis did not include sufficient information on the number of units capable of operating in these modes, total energy use in these operating modes, and information regarding the frequency of operation of these modes during field conditions and DOE maintains that it still lacks this information, which the Department would need to be able to determine whether such testing would be appropriate for SPVUs and to develop a metric

representing the national average fan operating hours for SPVUs. If additional information becomes available as would allow DOE to consider incorporation of fan energy use during other relevant SPVU operating modes for all relevant building types into the test method and metric for SPVUs, DOE may consider such information in a future rulemaking.

D. Test Method

In DOE's existing regulations, table 1 to 10 CFR 431.96 specifies the applicable industry test procedure for each category of commercial package air conditioning and heating equipment, and it identifies additional testing requirements that also apply. In this final rule, DOE is reorganizing subpart F to 10 CFR part 431 so that the test procedure requirements for SPVUs are included in separate appendices (appendix G and G1). DOE is also amending Table 1 to 10 CFR 431.96 to identify only the applicable appendix to use for testing SPVUs (appendix G or G1), and as an additional consequence of this change 10 CFR 431.96 would no longer include any additional test requirements for SPVUs.

1. External Static Pressures

In the January 2022 NOPR, DOE noted that AHRI 390-2021 maintained the same minimum ESP requirements as specified in ANSI/AHRI 390-2003. DOE stated that it does not have data indicating that these minimum ESP requirements are unrepresentative of field operation for ducted SPVUs. DOE also noted that SPVUs are typically installed in smaller modular buildings with different duct configurations than other equipment (*e.g.*, CACs, other categories of commercial package air-conditioning and heating

equipment). Based on this, DOE proposed not to revise the ESP requirements in the DOE test procedure for SPVUs but to instead remain consistent with AHRI 390-2021. 87 FR 2490, 2503.

In response to the NOPR, the Joint Efficiency Advocates commented that by maintaining the existing ESP requirements (which were unchanged in the update from AHRI 390-2003 to AHRI 390-2021) the proposed test procedures may significantly underestimate fan energy consumption by specifying ESP requirements that are too low and not representative of field installations. They stated that virtually all ducted SPVUs are tested at a minimum ESP between 0.1 and 0.2 inches of water column ("in. w.c."). Further, they commented that while the duct runs may typically be short in SPVU installations, testing any ducted unit at an ESP of 0.1 is unrealistic. They noted that DOE found that for CACs filter foulant and evaporator coil fouling alone contribute 0.2 in. w.c. of ESP. Therefore, they asserted that the proposed test procedure would likely underestimate fan power consumption and that DOE should investigate more representative ESP values. (Joint Efficiency Advocates, No. 14, pp. 1-2)

NEEA commented that DOE and efficiency advocates had previously acknowledged inconsistencies among the various minimum ESP values used for testing across different HVAC equipment. NEEA also pointed out that DOE's analysis of field CAC installations showed that filter and evaporator coil foulant alone contributed 0.2 in. w.c. of ESP, regardless of the installed ductwork. NEEA asserted that no in-field operation data was provided to support the current ESP values that are maintained in AHRI 390-2021. NEEA supported DOE's request for additional ESP data and

recommended pursuing further research to validate whether the ESP values in AHRI 390-2021 and proposed in the NOPR are representative of average field installations. NEEA also encouraged DOE to continue evaluating other components known to affect energy consumption in these units. (NEEA, No. 16, pp. 2-3)

AHRI commented that they agreed that with DOE's statement that SPVUs are typically installed in smaller modular buildings with different duct configurations. AHRI also agreed that minimum ESP requirements for other equipment may not be relevant for SPVUs. They stated the majority of this equipment is not used in ducted applications and that Table 2 of AHRI 390-2021 ESPs are representative of the short duct runs that are occasionally applied and are very conservative for those products applied without supply ducts. AHRI commented that these products are installed adjacent to exterior walls, so discharge ductwork is very short. AHRI supported DOE's tentative proposal to not revise the ESP requirements. (AHRI, No. 17, p. 11)

In response to NEEA and the Joint Efficiency Advocates, DOE maintains that it does not have data indicating that these minimum ESP requirements are unrepresentative of field operation for ducted SPVUs. DOE notes that minimum ESP requirements and studies of field installations for other equipment (*e.g.*, CACs) may not be relevant for SPVUs. Particularly, this research was used in a February 2017 CAC test procedure final rule to help determine the representative minimum statics for CACs. 82 FR 1426, 1447. DOE notes that for conventional equipment generally installed in single family homes with significant ductwork, the representative minimum ESP was determined to be 0.5 in. H_2O. However, in the same NOPR, DOE also determined that certain types of CACs

with short ducts (*i.e.*, low static CACs) had different representative minimum statics, 0.1 in. H_2O, so filters and evaporator foulant do not account for 0.2 in. H_2O in all circumstances, per NEEA's suggestion. *Id.* DOE maintains that SPVUs are typically installed in smaller modular buildings with different duct configurations than other types of equipment (*i.e.*, conventional CACs), and would therefore necessitate a similar field research study to determine if the current minimum statics are unrepresentative for SPVUs. Based on this, DOE is not revising the ESP requirements in the DOE test procedure for SPVUs and is instead maintaining the ESP requirements consistent with AHRI 390-2021 at this time.

2. Defrost Energy Use

In the January 2022 NOPR, DOE noted that AHRI 390-2021 does not include provisions for measuring defrost energy for SPVHPs. Consistent with ANSI/AHRI 390-2003, AHRI 390-2021, and DOE's test procedures for other commercial heat pumps, DOE did not propose to include provisions for including the defrost energy of SPVHPs. DOE noted that it lacked sufficient information on the number of SPVHP installations by building type and geographical region, as well as information regarding the frequency of operation of defrost cycles or representative low ambient conditions during field use and the annual heating and cooling loads in those installations. That information would be needed to determine whether such testing conditions would be appropriate for SPVUs and to develop a metric representing the national average for SPVUs. DOE requested comment and data on the number of SPVHP installations by building type and geographical region and the annual heating and cooling loads for such buildings. DOE

also requested data on the frequency of operation of defrost cycles and representative low ambient conditions for those buildings and installations. 87 FR 2490, 2505.

AHRI commented that the Guidehouse presentation[10] includes detailed information regarding building types and climate zones analyzed to determine the appropriate IEER coefficients for this equipment which could be extrapolated to determine installations by building types. AHRI noted that certain applications will require defrost, but not all, and that defrost is an operation cycle to protect the outdoor coil. They continued that the cycle is only triggered during heating season, and the frequency and time of the defrost cycle is generally programmed at the factory. Further, they noted that defrost cycling is a function of both outside coil temperature and compressor pressure: (1) if outdoor coil temperature is sensed below a set temperature (typically 32 deg F) for a set time period (60 minutes is typical factory default), the defrost cycle is triggered; or (2) when the low pressure setpoint threshold for refrigerant entering the compressor is crossed due to frost on the coils, the defrost cycle will also be triggered. They stated the cycle for defrost operation starts with the compressor operation switching from heating to cooling to heat outside coil for defrosting, and that this cycle is typically run for approximately 10 minutes. Finally, AHRI commented that the return to normal heat pump operation after defrost operation will typically cease when the outdoor coil temperature rises above the thaw temperature setpoint or when the set time period has expired, whichever comes first. (AHRI, No. 17, pp. 11-12)

[10] The Guidehouse presentation is included in an appendix to AHRI's comment and was presented during the AHRI 390 working group developing the new industry standard.

NEEA supported DOE's continued research around defrost energy consumption.(NEEA, No. 16, pp. 2-3) While DOE appreciates further incite into the process of defrost cycles provided by AHRI, DOE did not receive any additional information on defrost energy use and therefore DOE maintains that it lacks sufficient information at this time on the number of SPVHP installations by building type and geographical region, as well as information regarding the frequency of operation of defrost cycles or representative low ambient conditions during field use and the annual heating and cooling loads in those installations, which would be needed to determine whether such testing conditions would be appropriate for SPVUs and to develop a metric representing the national average for SPVUs. Given the lack of data and that the industry test procedure, AHRI 390-2021, does not include provisions for measuring defrost energy for SPVHPs, DOE is not including provisions for measuring the defrost energy of SPVHPs in the DOE test procedure at this time.

E. Configuration of Unit Under Test

1. Background and Summary

SPVUs are sold with a wide variety of components, including many that can optionally be installed on or within the unit both in the factory and in the field. In all cases, these components are distributed in commerce with the SPVU, but can be packaged or shipped in different ways from the point of manufacturer for ease of transportation. Some optional components may affect a model's measured efficiency when tested to the DOE test procedure adopted in this final rule, and others may not. DOE is handling SPVU components in two distinct ways in this final rule to help

manufacturers better understand their options for developing representations for their differing product offerings.

First, the treatment of some components is specified by the test procedure to limit their impact on measured efficiency. For example, a fresh air damper must be set in the closed position and sealed during testing, resulting in a measured efficiency that would be similar or identical to the measured efficiency for a unit without a fresh air damper.

Second, for certain components not directly addressed in the DOE test procedure, this final rule provides more specific instructions on how each component should be handled for the purposes of making representations in part 429. Specifically, these instructions provide manufacturers clarity on how components should be treated and how to group individual models with and without optional components for the purposes of representations, in order to reduce burden. DOE is adopting these provisions in part 429 to allow for testing of certain individual models that can be used as a proxy to represent the performance of equipment with multiple combinations of components. DOE is adopting provisions expressly allowing certain models to be grouped together for the purposes of making representations and allowing the performance of a model without certain optional components to be used as a proxy for models with any combinations of the specified components, even if such components would impact the measured efficiency of a model. Steam/hydronic heat coils are an example of such a component. The efficiency representation for a model with a steam/hydronic heat coil is based on the

measured performance of the SPVU as tested without the component installed because the steam/hydronic heat coil is not easily removed from the SPVU for testing.[11]

2. Approach for Exclusion of Certain Components

a. Proposals

Appendix F of AHRI 390-2021 provides discussion of components which would not be considered in representations, and provides instructions, either to neutralize their impact during testing, or for determining representations for individual models with such components based on other individual models that do not include them.

Instead of referencing Appendix F of AHRI 390-2021, DOE tentatively determined in the January 2022 NOPR that it would be necessary to include related provisions in the proposed appendix G1 test procedure and in the proposed representation requirements at 10 CFR 429.43. 87 FR 2490, 2508. DOE noted that this revised approach would provide more detailed direction and clarity between test procedure provisions (i.e., how to test a specific unit) and certification and enforcement provisions (e.g., which model to test). Specifically, DOE proposed to include provisions for certain specific components to limit their impact on measured efficiency during testing. 87 FR 2490, 2507-2508. Additionally, DOE proposed representation requirements in 10 CFR 429.43(a)(4) that explicitly allowed representations for individual models with certain components to be based on testing for individual models without those components—the proposal included a table listing the components for which these provisions would apply

[11] Note that in certain cases, as explained further in section III.E.2.d, the representation may have to be based on an individual model with a steam/hydronic coil.

(Desiccant Dehumidification Components, Air Economizers, Ventilation Energy Recovery System ("VERS"), Steam/Hydronic Heat Coils, Hot Gas Reheat, Fire/Smoke/Isolation Dampers, Powered Exhaust/Powered Return Air Fans, Hot Gas Bypass). 87 FR 2490, 2507-2508, 2517. Finally, DOE proposed specific product enforcement provisions in 10 CFR 429.134 indicating that DOE would conduct enforcement testing on individual models that don't include the components listed in the aforementioned table, except in certain circumstances. 87 FR 2490, 2507-2508.

b. General Comments

In response to the January 2022 NOPR, Lennox supported DOE's proposal, noting that the approach would allow testing a unit without one of the listed optional features if a manufacturer distributes in commerce an otherwise identical unit without the optional feature. (Lennox, No. 12, p. 3)

AHRI commented their support of the proposed set up and test provisions for specific components. (AHRI, No. 17, p. 12) AHRI also recommended that the DOE Enforcement Policy be modified to exclude SPVUs to prevent confusion (AHRI, Public Meeting Transcript, No. 11, pg. 25 -26) AHRI noted that the STI may need to include instructions for the component. They asserted that it would be important to indicate that efficiency ratings were developed without specific components, if also offered for sale by the manufacturer, even if it is included as a factory-installed option. (AHRI, No. 17, pp. 12-13) No comments received specifically addressed the general restructuring of the provisions in the regulations.

In this final rule, DOE is adopting its proposals in the January 2022 NOPR for exclusion of certain components, with some additional simplifications to further improve clarity. The different aspects of the provisions are described in the following sections.

c. Test Provisions of 10 CFR part 431 Appendix G1

DOE is adopting test provisions at 10 CFR part 431 appendix G1 section 4 to prescribe how certain components must be configured for testing, as proposed in the January 2022 NOPR. Specifically, DOE is requiring in appendix G1 that steps be taken during unit setup and testing to limit the impacts on the measurement of these components:

- Desiccant Dehumidification Components
- Air Economizers
- Fresh Air Dampers
- Hail Guards
- Power Correction Capacitors
- Ventilation Energy Recovery System (VERS)
- Barometric Relief Dampers
- UV Lights
- Steam/Hydronic Heat Coils
- Hot Gas Reheat
- Sound Traps/Sound Attenuators
- Fire/Smoke/Isolation Dampers

The components are listed and described in Table 4.1 in section 4 of the new appendix G1, and test provisions for them are provided in the table.

d. Representation Provisions of 10 CFR 429.43

As discussed, in the January 2022 NOPR, DOE proposed representation requirements in 10 CFR 429.43(a)(4) that explicitly allowed representations for individual models with certain components to be based on testing for individual models without those components—the proposal included a table[12] listing the components for which these provisions would apply (Desiccant Dehumidification Components, Air Economizers, Ventilation Energy Recovery System (VERS), Steam Hydronic Heat Coils, Hot Gas Reheat, Fire/Smoke/Isolation Dampers, Powered Exhaust/Powered Return Air Fans, Sound Traps/Sound Attenuators, Hot Gas Bypass). 87 FR 2490, 2507-2508, 2517. In this final rule, DOE is making two clarifications to the representation requirements as proposed in the January 2022 NOPR.

First, DOE is specifying that the basic model representation must be based on the least-efficient individual model that is a part of the basic model, and clarifying how this long-standing basic model provision interacts with the component treatment in §429.43 that this final rule adopts. Adoption of this clarification in the regulatory text is consistent with the January 2022 NOPR, in which DOE noted that in some cases, individual models may include more than one of the specified components or there may be individual models within a basic model that include various dehumidification

[12] In the January 2022 NOPR, this Table was referred to as "Table 1", but due to the publication of other test procedure actions, from this point forward, it will be referred to as "table 3 of 10 CFR 429.43".

components that result in more or less energy use. 87 FR 2490, 2507-2508. In such cases, DOE stated that the represented values of performance must be representative of the individual model with the lowest efficiency found within the basic model. *Id.* DOE believes regulated entities may benefit from clarity in the regulatory text as to how the least efficient individual model within a basic model provision works with the component treatment for SPVUs. The amendments in this final rule explicitly state that the exclusion of the specified components from consideration in determining basic model efficiency in certain scenarios is an exception to basing representations on the least efficient individual model within a basic model. In other words, the components listed in §429.43 are not being considered as part of the representation under DOE's regulatory framework if certain conditions are met as discussed in the following paragraphs and thus, their impact on efficiency is not reflected in the representation. In this case, the basic model's representation is generally determined by applying the testing and sampling provisions to the least efficient individual model in the basic model that does not have a component listed in §429.43.

Second, DOE is also clarifying instructions for instances where individual models within a basic model may have more than one of the specified components and there may be no individual model without any of the specified components. DOE is adopting the concept of an "otherwise comparable model group" ("OCMG") instead of using the proposed "otherwise identical" provisions. DOE relies on the term "comparable" as opposed to "identical" to indicate that components that impact energy consumption as measured by the applicable test procedure are the relevant components to consider for the purpose of representations. Differences such as unit color and presence of utility outlets

would therefore not warrant separate OCMGs. DOE developed a document of examples to illustrate the approach proposed in this NOPR for determining represented values for SPVUs with specific components, and in particular the OCMG concept. *See* EERE-2017-BT-TP-0020.

An OCMG is a group of individual models within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure other than the specific components listed in table 3 of §429.43. An OCMG may include individual models with any combination of such specified components, including no specified components, and an OCMG can be one individual model. Because every model within each OCMG is within the definition of the basic model, a basic model can be composed of multiple OCMGs. Each OCMG represents a unique combination of components that affect energy consumption, as measured according to the applicable test procedure, other than the specified components listed in table 3 of §429.43—this means that a new combination of such components requires the creation of a new OCMG. For example, a manufacturer might include two tiers of control system within the same basic model, in which one of the control systems has sophisticated diagnostics capabilities that require a more powerful control board with a higher wattage input. SPVU individual models with the "standard" control system would be part of OCMG A, while individual models with the "premium" control system would be part of a different OCMG B, since the control system is a component that affects energy consumption and is not one of the specified exempt components listed in table 3 of §429.43. However, OCMG A and OCMG B both may include individual models with different combinations of steam/hydronic coils, sound traps, and VERS preheat. Both

OCMGs may include any combination of characteristics that do not affect the efficiency measurement, such as paint color.

The OCMG is used to identify which individual models are used to determine a represented value for the basic model. Specifically, only the individual model(s) with the least number (which could be zero) of the specific components listed in table 3 of §429.43 is considered when identifying the individual model. This clarifies which individual models are exempted from consideration for determination of represented values in the case of an OCMG with multiple specified components and no individual models with zero specific components listed in table 3 of §429.43. Models with a number of specific components listed in table 3 of §429.43 greater than the model(s) with the least number in the OCMG are exempted from consideration. In the case that the OCMG includes an individual model with no specific components listed in table 3 of §429.43, then all individual models in the OCMG with any specified components would be exempted from consideration. Among the remaining non-exempted models, the least efficient individual model across the OCMGs would be used to determine the representation of the basic model. In the case where there are multiple individual models within a single OCMG with the same non-zero least number of specified components, the least efficient of these would be considered.

The use of the OCMG concept results in representations being based on the same individual models as the approach proposed in the January 2022 NOPR, *i.e.*, the represented values of performance are representative of the individual model(s) with the lowest efficiency found within the basic model, excluding certain individual models with

the specific components listed in table 3 of §429.43. However, the approach as adopted in this final rule is structured to more explicitly address individual models with more than one of the specific components listed in table 3 of §429.43, as well as instances in which there is no comparable model without any of the specified components.

AHRI commented in response to the NOPR that one item already included in the DOE Enforcement Policy for Small, Large, and Very Large, Air-Cooled, Water-Cooled, and Evaporatively-Cooled Commercial Package Air Conditioners and Heat Pumps that should be considered for inclusion is coated coils. They stated that the description of this component in the DOE Enforcement Policy is adequate, but that coated coils should not be specified for test units, as units are always available without coating. (AHRI, No. 17, p. 12)

In response to AHRI's comment that coated coils should be included, DOE is excluding coated coils from the specific components list specified in 10 CFR 429.43 because DOE has tentatively concluded that the presence of coated coils does not result in a significant impact to performance of SPVUs, and, therefore, models with coated coils should be rated based on performance of models with coated coils present (rather than based on performance of an individual model within an OCMG without coated coils).

e. Enforcement Provisions of 10 CFR 429.134

In the January 2022 NOPR DOE sought to address SPVUs that include specified excluded components both in the requirements for representation (*i.e.*, 10 CFR 429.43)

and in the equipment specific enforcement provisions for assessing compliance (*i.e.*, 10 CFR 429.134). 87 FR 2490, 2507-2508.

Instruction on which units to test for the purpose of representations are addressed in 10 CFR 429.43. DOE has determined that including parallel enforcement provisions in 10 CFR 429.134 would be redundant and potentially cause confusion because DOE would select for enforcement only those individual models that are the basis for making basic model representations as specified in 10 CFR 429.43. Therefore, in this final rule DOE is providing the requirements for making representations of SPVU that include the specified components in 10 CFR 429.43, and is not including parallel direction in the enforcement provisions of 10 CFR 429.134 established in this final rule. However, DOE is finalizing the provision that allows enforcement testing of alternative individual models with specific components, if DOE cannot obtain for test the individual models without the components that are the basis of representation.

F. Represented Values

1. Multiple Refrigerants

In the January 2022 NOPR, DOE noted that some commercial package air conditioning and heating equipment may be sold with more than one refrigerant option, and that DOE has identified at least one commercial package air conditioning and heating equipment manufacturer that provides two refrigerant options under the same model number. 87 FR 2490, 2508-2509. DOE noted that the use of a refrigerant that requires different hardware (such as R-407C as compared to R-410A) would represent a different basic model, and according to the current CFR, separate representations of energy

efficiency are required for each basic model. DOE also noted that some refrigerants (such as R-422D and R-427A) would not require different hardware, and a manufacturer may consider them to be the same basic model. In the January 2022 NOPR, DOE requested comment on a proposal to specify that a manufacturer must determine the represented values for that basic model based on the refrigerant(s) — among all refrigerants listed on the unit's nameplate — that result in the lowest cooling efficiency. *Id.*

In response to the NOPR, Lennox and AHRI supported DOE's proposal. (Lennox, No. 12, p. 3; AHRI, No. 17, p. 13) The CA IOUs commented that they support the multiple refrigerants proposal. They asserted that this would provide the marketplace with the most conservative assessment of equipment performance, while limiting test and reporting burden for manufacturers. However, they urged DOE to allow optional representations for more efficient refrigerants. The CA IOUs commented that DOE should allow manufacturers the option to publish additional ratings for equipment with different refrigerants and highlight equipment with similar components that can reliably operate with better-performing refrigerants. They commented that the ratings for commercial refrigeration equipment include more than one refrigerant. Finally, they suggested listing each refrigerant's global warming potential alongside the performance information. (CA IOUs, No. 13, p. 4)

In response to the CA IOUs comment concerning optional representations for an SPVU basic model that would reflect individual models using more-efficient refrigerants, the basic model definition for an SPVU requires the same or comparably performing

compressor(s) in order for two units to be considered the same basic model. 10 CFR 431.92(3). Therefore, if a manufacturer offers individual models that have different refrigerants necessitating different compressors, then the manufacturer must certify each model that uses a different refrigerant as a distinct basic model number and must determine separate represented values for each basic model. As discussed in the January 2022 NOPR, DOE identified at least one commercial package air conditioning and heating equipment manufacturer that provides two refrigerant options under the same model number. 87 FR 2490, 2508. However, DOE understands that SPVUs are typically designed for use with only a single type of refrigerant and are incompatible with other refrigerants. DOE is not aware of any cases of SPVUs that are designed to operate with interchangeable refrigerants, and the CA IOUs did not identify the existence of any such systems in their comment.

As discussed in section III.E.2 of this final rule, DOE is generally clarifying in 10 CFR 429.43(a)(3)(iii)(A) that representations for a SPVU basic model must be based on the least efficient individual model(s) distributed in commerce within the basic model (with the exception specified in 10 CFR 429.43(a)(3)(iii)(A) for certain individual models with the components listed in table 3 to §429.43(a)(3)(iii)(A); this list does not include different refrigerants). Therefore, upon further consideration, DOE has determined that the content of the proposal in the January 2022 NOPR regarding multiple refrigerants is included and clarified in the provision adopted at 10 CFR 429.43(a)(3)(iii)(A), and that the refrigerant-specific provisions proposed in the January 2022 NOPR at 10 CFR 429.43(a)(3) would be redundant. As such, in this final rule, DOE is not adopting the refrigerant specific language proposed in the January 2022 NOPR.

In regard to the CA IOUs' suggestion that the GWP of each refrigerant be listed along with the performance information, it is unclear whether this suggestion was intended to propose changes to DOE's representation or certification requirements for SPVUs, or whether this suggestion was directed at manufacturers for inclusion in their marketing materials. The GWP values for refrigerants are determined by the United Nations Environment Programme (UNEP) Intergovernmental Panel on Climate Change (IPCC) and are publicly available[13]. Further, the CA IOUs did not provide any rationale for DOE to include refrigerant GWP in its regulations for SPVUs. Therefore, DOE is not making any changes to the representation or certification requirements for SPVUs related to refrigerant GWP values.

2. Cooling Capacity

For SPVUs, cooling capacity determines equipment class, which in turn determines the applicable energy conservation standard. 10 CFR 431.97. In the January 2022 NOPR, DOE noted that while cooling capacity is a required represented value for SPVUs, DOE does not currently specify provisions for SPVUs regarding how close the represented value of cooling capacity must be to the tested or alternative energy-efficiency determination method ("AEDM") simulated cooling capacity, or whether DOE will use measured or certified cooling capacity to determine equipment class for

[13] The IPCC periodically conducts assessment reports that can impact the numerical values of GWP for each refrigerant. Also, the IPCC provides GWP values over different time horizons (i.e., 50, 100, and 500 years) to reflect the relative warming potential of refrigerants compared to CO_2 for the same time spans. The GWP values provided by the fourth assessment report and for the 100-year time horizon "AR4-100yr" GWP values are most commonly used in international and inter-agency processes, such as the Kigali Amendment to the Montreal Protocol and the American Innovation and Manufacturing "AIM" Act. GWP values from the fourth assessment report can be found at *https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html*.

enforcement testing. DOE proposed to add to its regulations the following provisions regarding cooling capacity for SPVUs: (1) a requirement that the represented cooling capacity be between 95 percent and 100 percent of the tested or AEDM-simulated cooling capacity; and (2) an enforcement provision stating that DOE would use the mean of measured cooling capacity values from testing, rather than the certified cooling capacity, to determine the applicable standards. 87 FR 2490, 2509.

AHRI supported DOE's proposal that the represented cooling capacity be between 95 percent and 100 percent of the tested or AEDM-simulated cooling capacity. However, AHRI commented that DOE's proposed enforcement provision of using the mean of measured cooling capacity values from testing to determine the applicable standards, rather than the certified cooling capacity, is different from other commercial equipment. (Public Meeting Transcript, No. 11, p. 31)

AHRI recommended DOE apply enforcement provisions similar to those for the enforcement provisions for PTACs, which specifies in paragraph (e) of 10 CFR 429.134 that if the certified cooling capacity is found to be "valid" based on the 5 percent allowance to the tested mean, the reported certified value of cooling capacity is used in the next steps of decision making rather than just the mean itself. AHRI noted that this five percent allowance is also present today for portable air conditioners, water heaters, and dehumidifiers. AHRI stated that using just the mean of the measurement(s) to determine the applicable standard with which the model must comply is too restrictive and does not follow precedence set by similar products. (AHRI, No. 17, p. 13)

DOE acknowledges the enforcement provisions for PTACs specified in paragraph (e) of 10 CFR 429.134 are different than the enforcement provisions for commercial package air-conditioning and heating equipment. DOE notes that the efficiency standards for PTACs are linearly variable with capacity (*i.e.*, a change in PTAC capacity changes the minimum efficiency required). This is significantly different than for SPVUs, which has standards based on equipment classes that are differentiated based on fixed capacity thresholds. DOE notes that the provisions proposed in the January 2022 NOPR are consistent with the current enforcement provisions for commercial package air-conditioning and heating equipment (*See* paragraph (g) of 10 CFR 429.134), which have similar capacity thresholds for equipment classes and also have fixed efficiency standards within each class. To maintain consistency with the approach used for other commercial air conditioning and heating equipment with equipment classes based on fixed capacity thresholds, DOE is adopting the enforcement provisions specifying that DOE would use the mean of measured cooling capacity values from testing to determine the applicable standards.

G. Effective and Compliance Dates

The effective date for the adopted test procedure amendment will be 30 days after publication of this final rule in the *Federal Register*. EPCA prescribes that all representations of energy efficiency and energy use, including those made on marketing materials and product labels, must be made in accordance with an amended test procedure, beginning 360 days after publication of the final rule in the *Federal Register*. (42 U.S.C. 6314(d)(1)) To the extent the modified test procedure adopted in this final rule is required only for the evaluation and issuance of updated efficiency standards,

compliance with the amended test procedure does not require use of such modified test procedure provisions until the compliance date of updated standards.

H. Test Procedure Costs

In the January 2022 NOPR, DOE tentatively determined that the proposed amended test procedures for SPVUs would be representative of an average use cycle and would not be unduly burdensome for manufacturers to conduct. DOE noted that the proposed test procedure in appendix G for measuring EER and COP would not increase testing costs per unit compared to the current DOE test procedure. 87 FR 2490, 2509.

DOE also noted in the January 2022 NOPR that the proposed test procedure provisions regarding IEER in appendix G1 would not be mandatory unless and until DOE adopts energy conservation standards that specify IEER as the regulatory metric and compliance with such standards is required. Given that most SPVU manufacturers are AHRI members and that DOE is referencing the prevailing industry test procedure, DOE stated that it expects manufacturers will already be testing using the IEER test method. Based on this, DOE determined that the proposed test procedure amendments would not be expected to increase the testing burden on most SPVU manufacturers. Additionally, DOE determined that the test procedure amendments, if finalized, would not require manufacturers to redesign any of the covered equipment, would not require changes to how the equipment is manufactured, and would not impact the utility of the equipment. 87 FR 2490, 2509-2510.

In the January 2022 NOPR, DOE requested comment on its understanding of the impact the test procedure proposals in the NOPR, specifically on DOE's conclusion that manufacturers would not increase testing burden on SPVU manufacturers. 87 FR 2490, 2510. Lennox noted that industry was preparing to transition to AHRI 390-2021, and agreed that the proposed test procedure would not unduly increase test burden as compared to AHRI 390-2021 when fully implemented. (Lennox, No. 12 at p. 3)

Consistent with what DOE determined in the January 2022 NOPR, DOE has determined that by incorporating by reference the revised industry test standard, AHRI 390-2021, the test procedure DOE is establishing (appendices G and G1) is consistent with the industry standard and will not add undue industry test burden or incur any additional tests costs.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Orders 12866 and 13563

Executive Order ("E.O.") 12866, "Regulatory Planning and Review," as supplemented and reaffirmed by E.O. 13563, "Improving Regulation and Regulatory Review, 76 FR 3821 (Jan. 21, 2011), requires agencies, to the extent permitted by law, to (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential

economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public. DOE emphasizes as well that E.O. 13563 requires agencies to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible. In its guidance, the Office of Information and Regulatory Affairs ("OIRA") in the Office of Management and Budget ("OMB") has emphasized that such techniques may include identifying changing future compliance costs that might result from technological innovation or anticipated behavioral changes. For the reasons stated in the preamble, this final regulatory action is consistent with these principles.

Section 6(a) of E.O. 12866 also requires agencies to submit "significant regulatory actions" to OIRA for review. OIRA has determined that this final regulatory action does not constitute a "significant regulatory action" under section 3(f) of E.O. 12866. Accordingly, this action was not submitted to OIRA for review under E.O. 12866.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.) requires preparation of a final regulatory flexibility analysis (FRFA) for any final rule where the agency was first required by law to publish a proposed rule for public comment, unless the agency

certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website: *www.energy.gov/gc/office-general-counsel.*

DOE reviewed this final rule under the provisions of the Regulatory Flexibility Act and the policies and procedures published on February 19, 2003.

For manufacturers of SPVU equipment, the SBA considers a business entity to be small business if, together with its affiliates, it employs less than a threshold number of workers specified in 13 CFR part 121. SPVU manufacturers, who produce the equipment covered by this rule, are classified under NAICS code 333415, "Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing." In 13 CFR 121.201, the SBA sets a threshold of 1,250 employees or fewer for an entity to be considered as a small business for this category. This employee threshold includes all employees in a business's parent company and any other subsidiaries.

DOE identified manufacturers using DOE's CCD for SPVUs,[14] the California Energy Commission's Modernized Appliance Efficiency Database System ("MAEDbS"),[15] and prior rulemakings. Additionally, DOE used publicly-available information and subscription-based market research tools (*e.g.,* reports from Dun & Bradstreet[16]) to determine headcount, revenue, and geographic presence of the small businesses. DOE screened out companies that do not meet the definition of "small business" or are foreign-owned and operated.

As noted in the January 2022 NOPR, DOE initially identified a total of eight companies that manufacture or private label SPVUs in the United States. Of these eight companies, DOE identified two as domestic small businesses. 87 FR 2490, 2511. Based on further analysis, DOE revised its count to five manufacturers of SPVUs, of which one was identified as a domestic small business.

DOE received a comment from AHRI that the following companies could be small business SPVU manufacturers: Bard Manufacturing Company, Marvair, Systemair, Temspec, and United CoolAir (AHRI, No. 17, pg. 14) DOE identified Bard Manufacturing Company as a domestic small business in its Regulatory Flexibility Analysis. The remaining companies listed by AHRI were not considered in the Regulatory Flexibility Analysis due to the headcount of their business's parent company

[14] DOE's Compliance Certification Database is available at: *www.regulations.doe.gov/ccms* (last accessed April 29, 2022).
[15] California Energy Commission's MAEDbS is available at *cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx* (last accessed April 29, 2022).
[16] Dun & Bradstreet reports are available at: *app.dnbhoovers.com* (last access April 29, 2022).

and any other subsidiaries, due to foreign ownership, or due to the fact that they do not offer equipment that meet the definition of a SPVU.

In this final rule, DOE (1) incorporates by reference AHRI 390-2021, (2) establishes the definitions for single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h" and "single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h," and (3) includes provisions for testing when certain components are present.

Based on review of AHRI 390-2021, DOE determined that the proposed test procedure in appendix G for measuring EER and COP would not increase testing costs per unit compared to the current DOE test procedure. Additionally, DOE determined that the proposed test procedure in appendix G1 for measuring IEER and COP would be unlikely to significantly increase burden, given that most SPVU manufacturers are AHRI members, and that DOE is referencing the prevailing industry test procedure that was established for use in AHRI's certification program. Furthermore, the sole identified small business that manufacturers SPVUs is an AHRI member. Lastly, DOE determined that the amended test procedure would not require manufacturers to redesign any of the covered equipment, would not require changes to how the equipment is manufactured, and would not impact the utility of the equipment.

While DOE assumed that all SPVU manufacturers will be using the industry test procedure, AHRI 390-2021, DOE determined the potential re-rating cost for the small business. This small business would only incur re-rating costs if not using the AHRI

390-2021 test procedure to test their SPVU models. DOE estimated the cost for this small business to re-rate all models to be $30,200 while making use of an AEDM. DOE estimates this to be less than 1 percent of revenue for the small manufacturer.

As noted, DOE has determined that manufacturers would only incur additional testing burden should they not already be testing to current industry practice indicated by AHRI 390-2021. Should the sole small business not be testing to AHRI 390-2021, DOE determined the potential cost impacts on the small business to represent less than 1 percent of annual revenue. Therefore, on the basis of the de minimis compliance burden, DOE certifies that this final rule does not have a "significant economic impact on a substantial number of small entities," and that the preparation of a FRFA is not warranted. DOE will transmit a certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b).

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of SPVUs must certify to DOE that their products comply with any applicable energy conservation standards. To certify compliance, manufacturers must first obtain test data for their products according to the DOE test procedures, including any amendments adopted for those test procedures. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including SPVUs. (*See generally* 10 CFR part 429.) The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This

requirement has been approved by OMB under OMB control number 1910-1400. Public reporting burden for the certification is estimated to average 35 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

D. Review Under the National Environmental Policy Act of 1969

In this final rule, DOE establishes test procedure amendments that it expects will be used to develop and implement future energy conservation standards for SPVUs. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq*.) and DOE's implementing regulations at 10 CFR part 1021. Specifically, DOE has determined that adopting test procedures for measuring energy efficiency of consumer products and industrial equipment is consistent with activities identified in 10 CFR part 1021, appendix A to subpart D, A5 and A6. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," 64 FR 43255 (August 4, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have federalism implications. The Executive order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE examined this final rule and determined that it will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of this final rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity; (2) write regulations to

minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that executive agencies make every reasonable effort to ensure that the regulation (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this final rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 ("UMRA") requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Pub. L. 104-4, sec. 201 (codified at 2 U.S.C. 1531). For a regulatory action resulting in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of $100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also

requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed "significant intergovernmental mandate," and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820; also available at *www.energy.gov/gc/office-general-counsel*. DOE examined this final rule according to UMRA and its statement of policy and determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure of $100 million or more in any year, so these requirements do not apply.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This final rule will not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights" 53 FR 8859 (March 18, 1988), that this regulation will not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). Pursuant to OMB Memorandum M-19-15, Improving Implementation of the Information Quality Act (April 24, 2019), DOE published updated guidelines which are available at *www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf*. DOE has reviewed this final rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB, a Statement of Energy Effects for any significant energy action. A "significant energy action" is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use if the regulation is

implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

This regulatory action is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91; 42 U.S.C. 7101), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. (15 U.S.C. 788; "FEAA") Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission ("FTC") concerning the impact of the commercial or industry standards on competition.

The modifications to the test procedure for SPVUs adopted in this final rule incorporates testing methods contained in certain sections of the following commercial standards: AHRI 390-2021, ANSI/ASHRAE 37-2009, and ANSI/ASHRAE 41.2-1987 (RA 92). DOE has evaluated these standards and is unable to conclude whether it fully

complies with the requirements of section 32(b) of the FEAA (*i.e.*, whether it was developed in a manner that fully provides for public participation, comment, and review.) DOE has consulted with both the Attorney General and the Chairman of the FTC about the impact on competition of using the methods contained in these standards and has received no comments objecting to their use.

M. Congressional Notification

As required by 5 U.S.C. 801, DOE will report to Congress on the promulgation of this rule before its effective date. The report will state that it has been determined that the rule is not a "major rule" as defined by 5 U.S.C. 804(2).

N. Description of Materials Incorporated by Reference

DOE incorporates by reference the following standards:

AHRI 390-2021. Specifically, the test procedure codified by this final rule references sections 3 (except 3.1, 3.2, 3.5, 3.12, and 3.15), 5 (except section 5.8.5), 6 (except 6.1.1, 6.2, 6.3, 6.4, and 6.5), appendices A, D, and E of the industry test method. AHRI 390-2021 is an industry-accepted test procedure for measuring the performance of SPVUs. AHRI 390-2021 is available online at *www.ahrinet.org/search-standards.aspx*.

ANSI/ASHRAE 37-2009. This is an industry-accepted test procedure for measuring the performance of electrically driven unitary air-conditioning and heat pump equipment. ANSI/ASHRAE 37-2009 is available on ANSI's website at

https://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2FASHRAE+Standard+37-2009.

ANSI/ASHRAE 41.2-1987 (RA 92). This is an industry-accepted test procedure for consistent measurement procedures for use in the preparation of other ASHRAE standards. Procedures described are used in testing air-moving, air-handling, and air-distribution equipment and components. ANSI/ASHRAE 41.2-1987 (RA 92) is available on ANSI's website at *https://webstore.ansi.org/Standards/ASHRAE/ANSIASHRAE411987RA92*.

The following standards were previously approved for incorporation by reference in the locations where they appear in the regulatory text: AHRI 210/240-2008, AHRI 340/360-2007, AHRI 1230-2010, AHRAE 127-2007, and ISO Standard 13256-1.

V. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this final rule.

List of Subjects

10 CFR Part 429

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements, Small businesses.

10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, and Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on November 21, 2022, by Francisco Alejandro Moreno, Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on November 21, 2022.

FRANCISCO MORENO

Digitally signed by FRANCISCO MORENO
Date: 2022.11.21 09:05:57 -05'00'

Francisco Alejandro Moreno
Acting Assistant Secretary for
Energy Efficiency and Renewable Energy

For the reasons stated in the preamble, DOE amends 10 CFR parts 429 and 431, as amended at 87 FR 63860 (Oct. 20, 2022) as set forth below:

PART 429 – CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT

1. The authority citation for part 429 continues to read as follows:

Authority: 42 U.S.C. 6291–6317; 28 U.S.C. 2461 note.

2. Amend §429.4 by:

a. Redesignating paragraphs (c)(2) and (c)(3) as paragraphs (c)(3) and (c)(4);

b. Adding new paragraph (c)(2);

c. Redesignating paragraphs (d) through (f) as paragraphs (e) through (g); and

d. Adding new paragraph (d).

The revisions and additions read as follows.

§429.4 Materials incorporated by reference.

* * * * *

(c) * * *

(2) AHRI Standard 390 (I-P)-2021, ("AHRI 390-2021"), *2021 Standard for Performance Rating of Single Package Vertical Air-conditioners And Heat Pumps*, IBR approved for §429.134**.**

* * * * *

(d) *ASHRAE.* The American Society of Heating, Refrigerating and Air-Conditioning Engineers. 180 Technology Parkway NW, Peachtree Corners, GA 30092; (404) 636-8400, *www.ashrae.org.*

(1) ANSI/ASHRAE Standard 37-2009 ("ASHRAE 37-2009"), "*Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment*", ASHRAE approved June 24, 2009; IBR approved for §429.134.

(2) ANSI/ASHRAE 41.2-1987 (RA 92), "*Standard Methods For Laboratory Airflow Measurement*", ANSI reaffirmed April 22, 1992; IBR approved for §429.134.

* * * * *

3. Amend § 429.43 by adding paragraph (a)(3)(iii) to read as follows:

§429.43 Commercial heating, ventilating, air conditioning (HVAC) equipment.

(a) * * *

(3) * * *

(iii) Single Package Vertical Units. When certifying to standards in terms of IEER, the following provisions apply.

(A) Individual model selection:

(1) Representations for a basic model must be based on the least efficient

individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic model, except as provided in paragraph (a)(3)(iii)(A)(*2*) of this section for individual models that include components listed in table 3 to paragraph (a)(3)(iii)(A) of this section. For the purpose of this paragraph, "otherwise comparable model group" means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96 other than those listed in table 3 to paragraph (a)(3)(iii)(A) of this section. An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 3 (or none of the components listed in table 3). An otherwise comparable model group may consist of only one individual model.

(2) For a basic model that includes individual models distributed in commerce with components listed in table 3 to paragraph (a)(3)(iii)(A) of this section, the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 3 included in individual models of the group. Testing under this paragraph shall be consistent with any component-specific test provisions specified in section 4 of appendix G1 to subpart F of 10 CFR part 431.

Table 3 to Paragraph (a)(3)(iii)(A) – Specific Components for Single Package Vertical Units

Component	Description

Desiccant Dehumidification Components	An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants.
Air Economizers	An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid 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.
Steam/Hydronic Heat Coils.	Coils used to provide supplemental heating.
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/Isolation Dampers	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.
Powered Exhaust/Powered Return Air Fans	A powered exhaust fan is 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. A powered return fan is a fan that draws building air into the equipment.
Sound Traps/Sound Attenuators	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.
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.

(B) The represented value of cooling capacity must be between 95 percent and 100 percent of the mean of the capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of

the net sensible cooling capacity output simulated by the AEDM as described in paragraph (a)(2) of this section.

(C) Represented values must be based on performance (either through testing or by applying an AEDM) of individual models with components and features that are selected in accordance with section 4 of appendix G1 to subpart F of 10 CFR part 431.

* * * * *

4. Amend § 429.134 by adding paragraph (x) to read as follows:

§429.134 Product-specific enforcement provisions.

* * * * *

(x) *Single package vertical air conditioners and heat pumps*. The following provisions apply for assessment and enforcement testing of models subject to standards in terms of IEER.

(1) *Verification of cooling capacity*. The cooling capacity of each tested unit of the basic model will be measured pursuant to the test requirements of appendix G1 to subpart F of 10 CFR part 431. The mean of the measurement(s) will be used to determine the applicable standards for purposes of compliance.

(2) *Specific Components*. If a basic model includes individual models with components listed at table 3 to §429.43(a)(3)(iii)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components

within an otherwise comparable model group (as defined in §429.43(a)(3)(iii)(A)(*1*)), DOE may test any individual model within the otherwise comparable model group.

(3) *Validation of outdoor ventilation airflow rate.* The outdoor ventilation airflow rate in cubic feet per minute ("CFM") of the basic model will be measured in accordance with ASHRAE 41.2-1987 and Section 6.4 of ASHRAE 37-2009 (both incorporated by reference, see §429.4). All references to the inlet shall be determined to mean the outdoor air inlet.

(i) The outdoor ventilation airflow rate validation shall be conducted at the conditions specified in Table 3 of AHRI 390-2021 (incorporated by reference, see §429.4), Full Load Standard Rating Capacity Test, Cooling, except for the following: (A)The outdoor ventilation airflow rate shall be determined at 0 in. H_2O external static pressure with a tolerance of -0.00/+0.05 in. H_2O.

(ii) When validating the outdoor ventilation airflow rate, the outdoor air inlet pressure shall be 0.00 in. H_2O, with a tolerance of -0.00/+0.05 in. H_2O when measured against the room ambient pressure.

PART 431 – ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

5. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291-6317; 28 U.S.C. 2461 note.

6. Amend §431.92 by:

a. Revising the definitions for “Integrated energy efficiency ratio, or IEER”, "Single package vertical air conditioner", and "Single package vertical heat pump"; and

b. Adding definitions for “Single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h” and “Single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h” in alphabetical order.

The revisions and additions read as follows:

§431.92 Definitions concerning commercial air conditioners and heat pumps.

* * * * *

Integrated energy efficiency ratio, or IEER, means a weighted average calculation of mechanical cooling EERs determined for four load levels and corresponding rating conditions, expressed in Btu/watt-hour. IEER is measured per appendix A to this subpart for air-cooled small (≥65,000 Btu/h), large, and very large commercial package air conditioning and heating equipment, measured per appendix D1 to this subpart for variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 Btu/h), and measured per appendix G1 to this subpart for single package vertical air conditioners and single package vertical heat pumps.

* * * * *

Single package vertical air conditioner means:

(1) Air-cooled commercial package air conditioning and heating equipment that—

(i) Is factory-assembled as a single package that—

(A) Has major components that are arranged vertically;

(B) Is an encased combination of cooling and optional heating components; and

(C) Is intended for exterior mounting on, adjacent interior to, or through an outside wall;

(ii) Is powered by a single-or 3-phase current;

(iii) May contain 1 or more separate indoor grilles, outdoor louvers, various ventilation options, indoor free air discharges, ductwork, well plenum, or sleeves; and

(iv) Has heating components that may include electrical resistance, steam, hot water, or gas, but may not include reverse-cycle refrigeration as a heating means; and

(2) Includes single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h, as defined in this section.

Single package vertical heat pump means:

(1) A single package vertical air conditioner that —

(i) Uses reverse-cycle refrigeration as its primary heat source; and—

(ii) May include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas;

(2) Includes single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h, as defined in this section.

Single-phase single package vertical air conditioner with cooling capacity less than 65,000 Btu/h means air-cooled commercial package air conditioning and heating equipment that meets the criteria in paragraphs (1)(i) through (iv) of the definition for a single package vertical air conditioner; that is single-phase; has a cooling capacity less than 65,000 Btu/h, and that:

(1) Is weatherized, determined by a model being denoted for "Outdoor Use" or marked as "Suitable for Outdoor Use" on the equipment nameplate; or

(2) Is non-weatherized and is a model that has optional ventilation air provisions available. When such ventilation air provisions are present on the unit, the unit must be capable of drawing in and conditioning outdoor air for delivery to the conditioned space at a rate of at least 400 cubic feet per minute, as determined in accordance with §429.134(x)(3) of this chapter, while the equipment is operating with the same drive kit and motor settings used to determine the certified efficiency rating of the equipment (as required for submittal to DOE by §429.43(b)(4)(xi) of this chapter).

Single-phase single package vertical heat pump with cooling capacity less than 65,000 Btu/h means air-cooled commercial package air conditioning and heating equipment that meets the criteria in paragraphs (1)(i) through (ii) of the definition for a single package vertical heat pump; that is single-phase; has a cooling capacity less than 65,000 Btu/h, and that:

(1) Is weatherized, determined by a model being denoted for "Outdoor Use" or marked as "Suitable for Outdoor Use" on the equipment nameplate; or

(2) Is non-weatherized and is a model that has optional ventilation air provisions available. When such ventilation air provisions are present on the unit, the unit must be capable of drawing in and conditioning outdoor air for delivery to the conditioned space at a rate of at least 400 cubic feet per minute, as determined in accordance with §429.134(x)(3) of this chapter, while the equipment is operating with the same drive kit and motor settings used to determine the certified efficiency rating of the equipment (as required for submittal to DOE by §429.43(b)(4)(xii) of this chapter).

* * * * *

7. Amend §431.95 by revising paragraphs (b)(4) and (c)(2).

The revisions and additions read as follows.

§431.95 Materials incorporated by reference.

* * * * *

(b) * * *

(4) AHRI Standard 390(I-P)-2021 ("AHRI 390-2021"), *2021 Standard for Performance Rating of Single Package Vertical Air- Conditioners and Heat Pumps*, copyright 2021; (AHRI 390-2021), IBR approved for appendices G and G1 to this subpart.

* * * * *

(c) * * *

(2) ANSI/ASHRAE Standard 37-2009, ("ANSI/ASHRAE 37-2009*"), Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment*, ASHRAE approved June 24, 2009, IBR approved for §431.96 and appendices A, B, D1, G, and G1 to this subpart.

* * * * *

8. Amend §431.96 by:

a. Revising paragraph (b)(1);

b. Revising table 1 to paragraph (b); and

c. Revising paragraph (c).

The revisions read as follows:

§431.96 Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps.

* * * * *

(b) * * * (1) Determine the energy efficiency and capacity of each category of covered equipment by conducting the test procedure(s) listed in table 1 to this paragraph (b) along with any additional testing provisions set forth in paragraphs (c) through (g) of this section and appendices A through G1 to this subpart, that apply to the energy efficiency descriptor for that equipment, category, and cooling capacity. The omitted

sections of the test procedures listed in table 1 to this paragraph (b) must not be used. For equipment with multiple appendices listed in table 1, consult the notes at the beginning of those appendices to determine the applicable appendix to use for testing.

* * * * *

Table 1 to Paragraph (b)—Test Procedures for Commercial Air Conditioners and Heat Pumps

Equipment type	**Category**	**Cooling capacity or moisture removal capacity[2]**	**Energy efficiency descriptor**	**Use tests, conditions, and procedures[1] in**	**Additional test procedure provisions as indicated in the listed paragraphs of this section**
Small Commercial Package Air-Conditioning and Heating Equipment	Air-Cooled, 3-Phase, AC and HP	<65,000 Btu/h	SEER and HSPF	AHRI 210/240-2008 (omit section 6.5)	None.
	Air-Cooled AC and HP	≥65,000 Btu/h and <135,000 Btu/h	EER, IEER, and COP	Appendix A to this subpart	None.
	Water-Cooled and Evaporatively-Cooled AC	<65,000 Btu/h	EER	AHRI 210/240-2008 (omit section 6.5)	Paragraphs (c) and (e).
		≥65,000 Btu/h and <135,000 Btu/h	EER	AHRI 340/360-2007 (omit section 6.3)	Paragraphs (c) and (e).
	Water-Source HP	<135,000 Btu/h	EER and COP	ISO Standard 13256-1 (1998)	Paragraph (e).
Large Commercial	Air-Cooled AC and HP	≥135,000 Btu/h and	EER, IEER and COP	Appendix A to this subpart	None.

Package Air-Conditioning and Heating Equipment		<240,000 Btu/h			
	Water-Cooled and Evaporatively-Cooled AC	≥135,000 Btu/h and <240,000 Btu/h	EER	AHRI 340/360-2007 (omit section 6.3)	Paragraphs (c) and (e).
Very Large Commercial Package Air-Conditioning and Heating Equipment	Air-Cooled AC and HP	≥240,000 Btu/h and <760,000 Btu/h	EER, IEER and COP	Appendix A to this subpart	None.
	Water-Cooled and Evaporatively-Cooled AC	≥240,000 Btu/h and <760,000 Btu/h	EER	AHRI 340/360-2007 (omit section 6.3)	Paragraphs (c) and (e).
Packaged Terminal Air Conditioners and Heat Pumps	AC and HP	<760,000 Btu/h	EER and COP	Paragraph (g) of this section	Paragraphs (c), (e), and (g).
Computer Room Air Conditioners	AC	<65,000 Btu/h	SCOP	ASHRAE 127-2007 (omit section 5.11)	Paragraphs (c) and (e).
		≥65,000 Btu/h and <760,000 Btu/h	SCOP	ASHRAE 127-2007 (omit section 5.11)	Paragraphs (c) and (e).
Variable Refrigerant Flow Multi-split Systems	AC	<65,000 Btu/h (3-phase)	SEER	ANSI/AHRI 1230-2010 (omit sections 5.1.2 and 6.6)	Paragraphs (c), (d), (e), and (f).
Variable Refrigerant Flow Multi-split Systems, Air-cooled	HP	<65,000 Btu/h (3-phase)	SEER and HSPF	ANSI/AHRI 1230-2010 (omit sections 5.1.2 and 6.6)	Paragraphs (c), (d), (e), and (f)

Variable Refrigerant Flow Multi-split Systems, Air-cooled	AC and HP	≥65,000 Btu/h and <760,000 Btu/h	EER and COP	Appendix D to this subpart[3]	None.
		≥65,000 Btu/h and <760,000 Btu/h	IEER and COP	Appendix D1 to this subpart[3]	None.
Variable Refrigerant Flow Multi-split Systems, Water-source	HP	<760,000 Btu/h	EER and COP	Appendix D to this subpart[3]	None.
		<760,000 Btu/h	IEER and COP	Appendix D1 to this subpart[2]	None.
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps	AC and HP	<760,000 Btu/h	EER and COP	Appendix G to this subpart[3]	None.
			EER, IEER, and COP	Appendix G1 to this subpart[3]	None.
Direct Expansion-Dedicated Outdoor Air Systems	All	<324 lbs. of moisture removal/hr	ISMRE2 and ISCOP2	Appendix B to this subpart	None.

[1]Incorporated by reference; see §431.95.

[2] Moisture removal capacity applies only to direct expansion-dedicated outdoor air systems.

[3] For equipment with multiple appendices listed in this table 1, consult the notes at the beginning of those appendices to determine the applicable appendix to use for testing.

(c) Optional break-in period for tests conducted using AHRI 210/240-2008, AHRI 1230-2010, and ASHRAE 127-2007. Manufacturers may optionally specify a "break-in" period, not to exceed 20 hours, to operate the equipment under test prior to conducting the test method specified by AHRI 210/240-2008 or ASHRAE 127-2007 (incorporated by reference; see §431.95). A manufacturer who elects to use an optional compressor break-in period in its certification testing should record this information (including the duration) in the test data underlying the certified ratings that is required to be maintained under 10 CFR 429.71.

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Appendix E to Subpart F of Part 431 [Reserved]

9. Reserve appendix E to subpart F of part 431.

Appendix F to Subpart F of Part 431 [Reserved]

10. Reserve appendix F to subpart F of part 431.

11. Add appendix G to subpart F of part 431 to read as follows:

Appendix G to Subpart F of Part 431—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF SINGLE PACKAGE VERTICAL AIR CONDITIONERS AND SINGLE PACKAGE VERTICAL HEAT PUMPS

Note: Prior to [**INSERT DATE 360 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**] manufacturers must use the results of testing under either this appendix or §431.96 as it appeared in the 10 CFR parts 200-499 edition revised as of January 1, 2021, to determine compliance with the relevant standard from §431.97 as that standard appeared in the January 1, 2021, edition of 10 CFR parts 200-499. On or after [**INSERT DATE 360 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**] manufacturers must use the results of testing generated under this appendix to demonstrate compliance with the relevant standard from §431.97 as that standard appeared in the January 1, 2021, edition of 10 CFR parts 200-499.

Beginning [**INSERT DATE 360 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**], if manufacturers make voluntary representations with respect to the integrated energy efficiency ratio (IEER) of single packaged vertical air conditioners and single package vertical heat pumps, such representations must be based on testing conducted in accordance with appendix G1 of this subpart.

For any amended standards for single packaged vertical air conditioners and single package vertical heat pumps based on IEER published after January 1, 2021, manufacturers must use the results of testing under appendix G1 to determine compliance. Representations related to energy consumption must be made in accordance with the appropriate appendix that applies (*i.e.*, this appendix or appendix G1) when determining compliance with the relevant standard. Manufacturers may also use appendix G1 to certify compliance with any amended standards prior to the applicable compliance date for those standards.

1. Incorporation by Reference.

DOE incorporated by reference in §431.95 the entire standard for AHRI 390-2021 and ASHRAE 37-2009. However, only certain enumerated provisions of AHRI 390-2021 and ANSI/ASHRAE 37-2009 are required or excluded as listed in this section 1. To the extent there is a conflict between the terms or provisions of a referenced industry standard and this appendix, the appendix provisions control, followed by AHRI 390-2021, followed by ANSI/ASHRAE 37-2009.

1.1. Only the following provisions of AHRI 390-2021 apply:

(a) Section 3 – Definitions (omitting sections 3.1, 3.2, 3.5, 3.12, and 3.15)

(b) Section 5 – Test Requirements (omitting section 5.8.5)

(c) Section 6 – Rating Requirements (omitting sections 6.1.1 and 6.2 through 6.5)

(d) Appendix A. "References – Normative"

(e) Appendix D. "Indoor and Outdoor Air Condition Measurement – Normative"

(f) Appendix E. "Method of Testing Single Package Vertical Units – Normative"

1.2. All provisions of ANSI/ASHRAE 37-2009 apply except for the following provisions:

(a) Section 1 – Purpose

(b) Section 2 – Scope

(c) Section 4 – Classifications

2. General. Determine cooling capacity (Btu/h) and energy efficiency ratio (EER) for all single package vertical air conditioners and heat pumps and coefficient of performance (COP) for all single package vertical heat pumps, in accordance with the specified sections of AHRI 390-2021 "Performance Rating of Single Package Vertical Air-conditioners And Heat Pumps" and the specified sections of ANSI/ASHRAE 37-2009 "Methods of Testing for Rating Electronically Driven Unitary Air-Conditioning and Heat-Pump Equipment". Only identified provisions of AHRI 390-2021 are applicable and certain sections of ANSI/ASHRAE 37-2009 are inapplicable, as set forth in section 1 of this appendix. In addition, the instructions in section 3 of this appendix apply to determining EER and COP. Any subsequent amendment to a referenced document by a standard-setting organization will not affect the test procedure in this appendix, unless and until the test procedure is amended by DOE. Material is incorporated as it exists on the date of the approval, and a notice of any change in the incorporation will be published in the *Federal Register*.

3. Test Conditions. The "Standard Rating Full Load Capacity Test, Cooling" conditions for cooling mode tests and "Standard Rating Full Load Capacity Test, Heating" conditions for heat pump heating mode tests specified in Table 3 of section 5.8.3 of section 5.8.3 of AHRI 390-2021 shall be used.

3.1.Optional Representations. Representations of COP for single package vertical heat pumps made using the "Low Temperature Operation, Heating" condition specified in Table 3 of AHRI 390-2021 are optional and are determined according to the applicable provisions in section 1 of this appendix.

3.2. [Reserved]

15. Add appendix G1 to subpart F of part 431 to read as follows:

Appendix G1 to Subpart F of Part 431—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF SINGLE PACKAGE VERTICAL AIR CONDITIONERS AND SINGLE PACKAGE VERTICAL HEAT PUMPS

Note: Beginning [**INSERT DATE 360 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**], if manufacturers make voluntary representations with respect to the integrated energy efficiency ratio (IEER) of single packaged vertical air conditioners and single package vertical heat pumps, such representations must be based on testing conducted in accordance with this appendix.

Manufacturers must use the results of testing under this appendix to determine compliance with any amended standards for single packaged vertical air conditioners and single package vertical heat pumps based on IEER provided in §431.97 that are published after January 1, 2021. Representations related to energy consumption must be made in accordance with the appropriate appendix that applies (*i.e.*, appendix G or this appendix) when determining compliance with the relevant standard. Manufacturers may also use this appendix to certify compliance with any amended standards prior to the applicable compliance date for those standards.

1. Incorporation by Reference

DOE incorporated by reference in §431.95 the entire standard for AHRI 390-2021 and ASHRAE 37-2009. However, only certain enumerated provisions of AHRI 390-2021 and ANSI/ASHRAE 37-2009 are required or excluded as listed in this section 1. To the extent there is a conflict between the terms or provisions of a referenced industry standard and this appendix, the appendix provisions control, followed by AHRI 390-2021, followed by ANSI/ASHRAE 37-2009.

1.1. Only the following provisions of AHRI 390-2021 apply:

(a) Section 3 – Definitions (omitting sections 3.1, 3.2, 3.5, 3.12, and 3.15)

(b) Section 5 – Test Requirements (omitting section 5.8.5)

(c) Section 6 – Rating Requirements (omitting sections 6.1.1 and 6.3 through 6.5)

(d) Appendix A. "References – Normative"

(e) Appendix D. "Indoor and Outdoor Air Condition Measurement – Normative"

(f) Appendix E. "Method of Testing Single Package Vertical Units – Normative"

1.2. All provisions of ANSI/ASHRAE 37-2009 apply except for the following provisions:

(a) Section 1 – Purpose

(b) Section 2 – Scope

(c) Section 4 – Classifications

2. General. Determine cooling capacity (Btu/h) and integrated energy efficiency ratio (IEER) for all single package vertical air conditioners and heat pumps and coefficient of performance (COP) for all single package vertical heat pumps, in accordance with the specified sections of AHRI 390-2021 "Performance Rating of Single Package Vertical Air-conditioners And Heat Pumps" and the specified sections of ANSI/ASHRAE 37-2009 "Methods of Testing for Rating Electronically Driven Unitary Air-Conditioning and Heat-Pump Equipment". Only identified provisions of AHRI 390-2021 and ANSI/ASHRAE 37-2009 are applicable, as set forth in section 1 of this appendix. In addition, the instructions in section 4 of this appendix apply to determining IEER and COP. Any subsequent amendment to a referenced document by a standard-setting organization will not affect the test procedure in this appendix, unless and until the test procedure is amended by DOE. Material is incorporated as it exists on the date of the approval, and a notice of any change in the incorporation will be published in the *Federal Register*.

3. Test Conditions. The "Part-Load Standard Rating Conditions" conditions for cooling mode tests and "Standard Rating Full Load Capacity Test, Heating" conditions for heat

pump heating mode tests specified in Table 3 of section 5.8.3 of AHRI 390-2021 shall be used.

3.1. Optional Representations. Representations of COP for single package vertical heat pumps made using the "Low Temperature Operation, Heating" condition specified in Table 3 of section 5.8.3 of AHRI 390-2021 are optional and are determined according to the applicable provisions in section 1.1 of this appendix.

4. Set-Up and Test Provisions for Specific Components. When testing an SPVU that includes any of the features listed in table 4.1, test in accordance with the set-up and test provisions specified in Table 4.1 to this appendix.

Table 4.1. Test Provisions for Specific Components

Component	Description	Test Provisions
Desiccant Dehumidification Components	An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants.	Disable desiccant dehumidification components for testing.
Air Economizers	An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid or cold weather.	For any air economizer that is factory-installed, place the economizer in the 100% return position and close and seal the outside air dampers for testing. For any modular air economizer shipped with the unit but not factory-installed, do not install the economizer for testing.
Fresh Air Dampers	An assembly with dampers and means to set the damper position in a closed and one open position to allow air to be drawn into the equipment when the indoor fan is operating.	For any fresh air dampers that are factory-installed, close and seal the dampers for testing. For any modular fresh air dampers shipped with the unit but not factory-installed, do not install the dampers for testing.

Hail Guards	A grille or similar structure mounted to the outside of the unit covering the outdoor coil to protect the coil from hail, flying debris and damage from large objects.	Remove hail guards for testing.
Power Correction Capacitors	A capacitor that increases the power factor measured at the line connection to the equipment.	Remove power correction capacitors for testing.
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.	For any VERS that is factory-installed, place the VERS in the 100% return position and close and seal the outside air dampers and exhaust air dampers for testing, and do not energize any VERS subcomponents (*e.g.*, energy recovery wheel motors). For any VERS module shipped with the unit but not factory-installed, do not install the VERS for testing.
Barometric Relief Dampers	An assembly with dampers and means to automatically set the damper position in a closed position and one or more open positions to allow venting 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.	For any barometric relief dampers that are factory-installed, close and seal the dampers for testing. For any modular barometric relief dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
UV Lights	A lighting fixture and lamp mounted so that it shines light on the indoor coil, that emits ultraviolet light to inhibit growth of organisms on the indoor coil surfaces, the condensate drip pan, and/other locations within the equipment.	Turn off UV lights for testing.

Steam/Hydronic Heat Coils.	Coils used to provide supplemental heating.	Test with steam/hydronic heat coils in place but providing no heat.
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.	De-activate refrigerant reheat coils for testing so as to provide the minimum (none if possible) reheat achievable by the system controls.
Sound Traps/Sound Attenuators	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.	Removable sound traps/sound attenuators shall be removed for testing. Otherwise, test with sound traps/attenuators in place.
Fire/Smoke/Isolation Dampers	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.	For any fire/smoke/isolation dampers that are factory-installed, set the dampers in the fully open position for testing. For any modular fire/smoke/isolation dampers shipped with the unit but not factory-installed, do not install the dampers for testing.