[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 431

[EERE-2017-BT-TP-0031]

RIN 1904-AE06

Energy Conservation Program: Test Procedure for Air-Cooled, Three-Phase, Small Commercial Package Air Conditioning and Heating Equipment with a Cooling Capacity of Less than 65,000 Btu/h and Air-Cooled, Three-Phase, Variable Refrigerant Flow Air Conditioners and Heat Pumps with a Cooling Capacity of Less than 65,000 Btu/h

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

ACTION: Final rule.

SUMMARY: The U.S. Department of Energy ("DOE") amends its test procedures for air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 British thermal units per hour ("Btu/h") and air-cooled, three-phase, variable refrigerant flow air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h to incorporate by reference the latest version of the relevant industry test standard. DOE adopts the seasonal energy efficiency ratio 2 ("SEER2") and heating seasonal performance factor 2 ("HSPF2") metrics specified by that industry test standard in the DOE test procedures for the three-

phase equipment that is the subject of this final rule. Additionally, DOE amends certain provisions for representations and enforcement for this equipment to harmonize with single-phase products.

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 material 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***]. The incorporation by reference of certain other material listed in the rule was approved by the Director of the Federal Register on February 6, 2017.

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

A link to the docket webpage can be found at *www.regulations.gov/docket/EERE-2017-BT-TP-0031*. The docket webpage 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 email: *ApplianceStandardsQuestions@ee.doe.gov*.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

DOE incorporates by reference the following industry standards as follows:

ANSI/AHRI Standard 210/240-2008, "2008 Standard for Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment", approved 2011 and updated by addendum 1 in June 2011 and addendum 2 in March 2012 ("ANSI/AHRI 210/240-2008") – into part 431.

AHRI Standard 210/240-2023, "2023 Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment", copyright 2020 ("AHRI 210/240-2023") – into parts 429 and 431.

ANSI/AHRI Standard 1230-2010, "2010 Standard for Performance Rating of Variable Refrigerant Flow Multi-Split Air-Conditioning and Heat Pump Equipment", approved August 2, 2010 and updated by addendum 1 in March 2011 ("ANSI/AHRI 1230-2010") – into part 431.

Copies of these standards can be obtained from the AHRI website by going to *www.ahrinet.org*.[1]

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") – into part 431.

Copies of ANSI/ASHRAE 37-2009 can be obtained from the American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or online at *webstore.ansi.org*.

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

[1] AHRI 210/240-2008 is available at *www.ahrinet.org/app_content/ahri/files/standards%20pdfs/ansi%20standards%20pdfs/ansi.ahri%20standard%20210.240%20with%20addenda%201%20and%202.pdf.*

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I. Authority and Background

Small, large, and very large commercial package air conditioning and heating equipment are included in the list of "covered equipment" for which the U.S. Department of Energy ("DOE" or the "Department") is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6311(1)(B)–(D)) Air-cooled, three-phase, small commercial air conditioners and heat pumps with a cooling capacity of less than 65,000 British thermal units per hour ("Btu/h") ("3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h")[2] and air-cooled, three-phase, variable refrigerant flow ("VRF" or "VRF multi-split systems") air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h ("3-phase VRF with cooling capacity of less than 65,000 Btu/h")[3] are two separate categories of small commercial package air conditioning and heating equipment. DOE's test procedures and energy conservation standards for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h are currently prescribed at Title 10 of the Code of Federal Regulations ("CFR") parts 431.96 and 431.97, respectively. The following sections discuss DOE's authority to establish test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h and relevant background information regarding DOE's consideration of test procedures for this equipment.

[2] ACUACs and ACUHPs are "air-cooled commercial unitary air conditioners" and "air-cooled commercial unitary heat pumps." These terms are consistent with those typically used for similar equipment with a cooling capacity of greater than or equal to 65,000 Btu/h.

[3] As used in this rulemaking, the term "3-phase VRF with cooling capacity of less than 65,000 Btu/h" refers only to air-cooled equipment.

A. Authority

The Energy Policy and Conservation Act, as amended ("EPCA"),[4] authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317, as codified) Title III, Part C[5] of EPCA, added by Pub. L. 95-619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. This equipment includes 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h, the subjects of this final rule. (42 U.S.C. 6311(1)(B))

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

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

[4] 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.
[5] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1.

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)-(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))

As discussed, 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h are both categories of small commercial package air conditioning and heating equipment. EPCA requires that the test procedures for small commercial package air conditioning and heating equipment shall be those generally accepted industry testing procedures or rating

procedures 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)) Further, if that industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the *Federal Register* and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

EPCA also requires that, at least once every 7 years, DOE shall evaluate test procedures for each type of covered equipment, including those addressed in this final rule, 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, DOE must publish the proposed test procedure 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 comments on the proposed test procedure. (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 procedure. (42 U.S.C. 6314(a)(1)(A)(ii)) DOE is publishing this final rule consistent with its obligations under EPCA.

B. Background

DOE's current test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h are codified at 10 CFR 431.96.

The Federal test procedure for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h was last amended in a final rule published in the *Federal Register* on May 16, 2012, to incorporate by reference American National Standards Institute ("ANSI")/AHRI Standard 210/240-2008, "Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment" ("ANSI/AHRI 210/240-2008"). 77 FR 28928 ("May 2012 final rule"). The May 2012 final rule also established additional testing requirements at 10 CFR 431.96(c) and (e) that provide an optional break-in period for testing and add specifications regarding the use of manufacturer instructions in set-up, respectively, applicable to measuring seasonal energy efficiency ratio ("SEER") and heating seasonal performance factor ("HSPF") for this equipment. *Id*. at 77 FR 28991.

The Federal test procedure for 3-phase VRF with cooling capacity of less than 65,000 Btu/h was also last amended in the May 2012 final rule and incorporated by reference ANSI/AHRI Standard 1230-2010, "2010 Standard for Performance Rating of Variable Refrigerant Flow Multi-Split Air-Conditioning and Heat Pump Equipment"

("ANSI/AHRI 1230-2010"). The testing requirements at 10 CFR 431.96(c) and (e) also apply to VRF multi-split systems. Additionally, the May 2012 final rule established additional testing requirements at 10 CFR 431.96(d) and (f) that provide for refrigerant line length corrections for tests conducted using ANSI/AHRI 1230-2010 and for manufacturer involvement in assessment or enforcement testing for VRF multi-split systems, respectively. *Id*.

In 2017, AHRI published an updated version of its standard "Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment" ("AHRI 210/240-2017"). AHRI 210/240-2017 includes a number of changes as compared to ANSI/AHRI 210/240-2008 that are relevant to DOE's current test procedure, and many of these changes were based on DOE's test procedure for single-phase, central air conditioners and central air conditioning heat pumps (collectively, "CAC/HPs") with a cooling capacity of less than 65,000 Btu/h.[6] DOE's current test procedures for single-phase CAC/HPs with a cooling capacity of less than 65,000 Btu/h are codified at 10 CFR part 430, subpart B, appendices M and M1 ("appendix M" and "appendix M1", respectively). Prior to January 1, 2023, any representations, including compliance certifications, made with respect to the energy use, power, or efficiency of CAC/HPs must be based on the results of testing pursuant to appendix M. On or after January 1, 2023, any representations, including compliance certifications, made with respect to the energy use,

[6] Three-phase equipment models generally are identical physically to their single-phase, residential counterparts except for the electrical systems and components designed for three-phase power input.

power, or efficiency of CAC/HPs must be based on the results of testing pursuant to appendix M1.

Following the publication of AHRI 210/240-2017, on October 2, 2018, DOE published in the *Federal Register* a request for information ("RFI") seeking comments on whether DOE should align its test procedure (and certification and enforcement requirements) for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h with that of air-cooled, single-phase CAC/HPs with a cooling capacity of less than 65,000 Btu/h, consistent with the update to AHRI 210/240-2017. 83 FR 49501 ("October 2018 RFI").

In April 2019, AHRI published "Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment (with Addendum 1)" ("AHRI 210/240-2017 with Addendum 1"), which incorporated minor revisions to definitions, testing requirements, and efficiency calculations.

On October 23, 2019, ASHRAE released ASHRAE Standard 90.1-2019, which maintained the reference to AHRI Standard 210/240 as the industry testing standard for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h but updated the editions referenced. For the period prior to January 1, 2023, ASHRAE Standard 90.1-2019 references AHRI 210/240-2017. For the period beginning January 1, 2023, ASHRAE Standard 90.1-2019 references AHRI Standard 210/240-2023, "Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment" ("AHRI 210/240-2023") AHRI 210/240-2023 harmonizes with DOE's appendix M1 test

procedure and provides for measuring energy efficiency using the SEER2 and HSPF2 metrics for CAC/HPs. ASHRAE Standard 90.1-2019 maintained the reference to AHRI Standard 1230 as the industry testing standard for all VRF multi-split systems, including air-cooled, three-phase units with a cooling capacity of less than 65,000 Btu/h, with an update to reference the most recently published version at the time, AHRI 1230-2014 with Addendum 1.[7]

In May 2020 and May 2021, AHRI published AHRI 210/240-2023 and AHRI 1230-2021, respectively. AHRI 1230-2021 excludes from its scope air-cooled, VRF multi-split systems with a cooling capacity of less than 65,000 Btu/h. Both AHRI 210/240-2017 with Addendum 1 and AHRI 210/240-2023 exclude from their scope only VRF multi-split systems that have capacities greater than or equal to 65,000 Btu/h. Because AHRI 1230-2021 explicitly excludes VRF multi-split systems with a cooling capacity of less than 65,000 Btu/h from scope, and the scope exclusion in AHRI 210/240-2023 applies only to VRF multi-split systems with a cooling capacity of 65,000 Btu/h or greater, 3-phase VRF with cooling capacity of less than 65,000 Btu/h are included within the scope of AHRI 210/240-2023.

As such, DOE has determined that AHRI 210/240-2023 is now the appropriate industry test standard for 3-phase VRF with cooling capacity of less than 65,000 Btu/h. 3-phase VRF with cooling capacity of less than 65,000 Btu/h do not currently exist on the market, but DOE expects that any such equipment introduced to the market in the future

[7] 3-phase VRF with cooling capacity of less than 65,000 Btu/h are not excluded from the scope of either AHRI 210/240 (2017 and 2023) or AHRI 1230-2014 with Addendum 1.

would likely be identical to air-cooled, single-phase, VRF multi-split systems (except for the components designed for three-phase power input). Therefore, DOE has determined that it is appropriate to align the test procedure for 3-phase VRF with cooling capacity of less than 65,000 Btu/h (AHRI 210/240-2023) with the test procedure for their single-phase counterparts (*i.e.*, appendix M1).

On December 8, 2021, DOE published a notice of proposed rulemaking ("NOPR") ("December 2021 NOPR") proposing, in relevant part, to update the references in the Federal test procedures to the most recent versions of the relevant industry test procedures as they relate to 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. 86 FR 70316, 70319. In addition, DOE proposed to update most of its representation and enforcement requirements for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h to be consistent with those of their consumer product counterparts (*i.e.*, air-cooled, single-phase CAC/HPs with a cooling capacity of less than 65,000 Btu/h (which include single-phase VRF multi-split systems)). *Id.* DOE held a public meeting on January 10, 2022, via a webinar, to present the proposed amendments and provide stakeholders with further opportunity to comment.[8]

DOE received comments in response to the December 2021 NOPR from the interested parties listed in Table I.1.

[8] The transcript of the public meeting is available at *https://www.regulations.gov/document/EERE-2017-BT-TP-0031-0012*.

Table I.1 List of Commenters with Written Submissions in Response to the December 2021 NOPR

Commenter(s)	Reference in this Final Rule	Comment No. in the Docket	Commenter Type
Air-Conditioning, Heating, and Refrigeration Institute	AHRI	16	Trade Association
Appliance Standards Awareness Project ("ASAP"), American Council for an Energy-Efficient Economy ("ACEEE"), and Natural Resources Defense Council ("NRDC")	Joint Advocates	17	Energy Efficiency Advocates
Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison; collectively, the California Investor-Owned Utilities	CA IOUs	18	Utilities
Carrier Corporation	Carrier	15	Manufacturer
Lennox International	Lennox	14	Manufacturer
Northwest Energy Efficiency Alliance	NEEA	20	Efficiency Advocate
New York State Energy Research and Development Authority	NYSERDA	13	State Government
Trane Technologies	Trane	19	Manufacturer

A parenthetical reference at the end of a comment quotation or paraphrase provides the location of the item in the public record.[9] To the extent that interested parties have provided written comments that are substantively consistent with any oral comments provided during the January 10, 2022, public meeting, DOE cites the written comments throughout this final rule. DOE did not identify any oral comments provided during the webinar that are not substantively addressed by written comments.

[9] The parenthetical reference provides a reference for information located in the docket of DOE's rulemaking to develop test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. (Docket No. EERE-2017-BT-TP-0031, which is maintained at *www.regulations.gov.*) The references are arranged as follows: (commenter name, comment docket ID number, page of that document).

On March 30, 2022, DOE published in the *Federal Register* an energy conservation standards ("ECS") NOPR ("March 2022 ECS NOPR") that proposed amended energy conservation standards for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h in terms of the new cooling and heating metrics, SEER2 and HSPF2, respectively. 87 FR 18290.

II. Synopsis of the Final Rule

In this final rule, DOE is updating the references in the Federal test procedures to the most recent versions of the relevant industry test procedures as they relate to 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. Specifically, DOE is updating its regulations at 10 CFR 431.96, "Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps," as follows: (1) to incorporate by reference AHRI 210/240-2023 and ANSI/ASHRAE 37-2009; and (2) to establish provisions for determining SEER2 and HSPF2. The current DOE test procedures for all equipment addressed in this final rule are relocated to a new appendix F of subpart F to 10 CFR part 431 ("appendix F") without change, and the new test procedure adopting AHRI 210/240-2023 is established in a new appendix F1 of subpart F to 10 CFR part 431 ("appendix F1") for determining SEER2 and HSPF2. Use of appendix F1 is not required until such time as compliance is required with amended energy conservation standards that rely on SEER2 and HSPF2, should DOE adopt such standards.

In addition, DOE is updating most of its representation and enforcement requirements for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h to be consistent with those of their single-phase, consumer product counterparts (*i.e.*, air-cooled, single-phase CAC/HPs with a cooling capacity of less than 65,000 Btu/h (which include single-phase VRF multi-split systems).

As noted, the current DOE test procedures for all equipment addressed in this final rule are being relocated to appendix F without change. The adopted amendments for the revised test procedures at appendix F1 are summarized in Table II.1 and are compared to the test procedure provisions in place prior to these amendments, as well as the reason for each adopted change.

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

DOE Test Procedures Prior to Amendment	Amended Test Procedures	Attribution
Incorporate by reference ANSI/AHRI 210/240-2008 (for equipment other than VRF multi-split systems) and ANSI/AHRI 1230-2010 (for VRF multi-split systems).	Incorporate by reference AHRI 210/240-2023 and ANSI/ASHRAE 37-2009 in a new appendix F1 for all three-phase equipment subject to this rulemaking.	EPCA requirement to harmonize with industry test procedure.
Applicable representation requirements are those specified at 10 CFR 429.43 and 10 CFR 429.70 for commercial heating, ventilating, and air conditioning ("HVAC") equipment.	Amend representation requirements at new 10 CFR 429.67 and 10 CFR 429.70—including basic model definition, tested combination, determination of represented value, and alternative energy determination method ("AEDM") requirements—largely consistent with requirements for single-phase consumer product counterparts.	Harmonization with single-phase consumer product counterparts and reduction of testing burden on manufacturers.

DOE Test Procedures Prior to Amendment	Amended Test Procedures	Attribution
	Amended representation requirements allow the use of an AEDM that is validated with testing of otherwise identical single-phase central air conditioners and heat pumps for rating three-phase, less than 65,000 Btu/h single package units and split systems.	

DOE has determined that the amendments described in section III of this document regarding the establishment of appendix F will not alter the measured efficiency of equipment addressed in this document or require retesting or recertification solely as a result of DOE's adoption of the amendments to the test procedures. However, DOE has determined that the test procedures' amendments in appendix F1 will alter the measured efficiency of the affected equipment but that such amendments are consistent with the updated industry test procedures. Further, use of the test procedures in appendix F1 and the amendments to the representation requirements in 10 CFR 429.43 and 429.70 are not required until the compliance date of amended standards in terms of SEER2 and HSPF2, should DOE adopt such standards. Additionally, DOE has determined that the amendments will not increase the cost of testing relative to the updated industry test procedures.

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*. Section III of this document discusses DOE's actions in detail.

III. Discussion

The discussion that follows details the specific changes that DOE is making to the current test procedure regulations affecting 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h.

A. Scope of Applicability

Three-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h are both categories of small commercial package air conditioning and heating equipment. Commercial package air-conditioning and heating equipment may be air cooled, water cooled, evaporatively cooled, or water source based (not including ground water source). This equipment is electrically operated and designed as unitary central air conditioners or central air conditioning heat pumps for use in commercial applications. 10 CFR 431.92.

As discussed in the December 2021 NOPR, 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h are typically nearly identical (and therefore typically have comparable efficiency) to single-phase CAC/HPs with rated cooling capacities of less than 65,000 Btu/h, which are consumer products also subject to EPCA and for which DOE has already established energy conservation standards (10 CFR 430.32(c)) and test procedures (appendices M and M1). 86 FR 70316, 70320. Based on this "nearly identical" relationship, while 3-phase VRF with cooling capacity of less than 65,000 Btu/h do not currently exist on the market, DOE stated in the December 2021 NOPR that it expects that any such equipment introduced to the market in the future is

likely to be identical (except for the components designed for three-phase power input) to their single-phase counterparts, which are a subset of single-phase CAC/HPs, and, as such, are also rated using appendices M and M1. *Id.*

3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h are further disaggregated into four equipment classes: single-package air conditioners, single-package heat pumps, split-system air conditioners, and split-system heat pumps[10]. 10 CFR 431.97(b). This final rule amends the test procedure applicable to all four equipment classes but without amending its current scope. 3-phase VRF with cooling capacity of less than 65,000 Btu/h are further disaggregated into two equipment classes: air conditioners and heat pumps. 10 CFR 431.97(f). This final rule amends the test procedure applicable to both equipment categories but without amending its current scope.

B. Proposed Organization of the Test Procedure

In the December 2021 NOPR, DOE proposed to relocate and centralize the current test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h to a new appendix B to subpart F of part 431, such that the proposed appendix B would be consistent with the current test procedures at 10 CFR 431.96 (as applicable to the three-phase equipment addressed in this rulemaking) and would continue to reference

[10] The term "single package unit" means any central air conditioner or central air-conditioning heat pump in which all the major assemblies are enclosed in one cabinet. The term "split system" means any central air conditioner or central air-conditioning heat pump in which one or more of the major assemblies are separate from the others. 10 CFR 431.92.

ANSI/AHRI 210/240-2008 and ANSI/AHRI 1230-2010 and provide instructions for determining SEER and HSPF. 86 FR 70316, 70320-70321. DOE correspondingly proposed to update the existing incorporation by reference of ANSI/AHRI 210/240-2008 and ANSI/AHRI 1230-2010 at 10 CFR 431.95 to apply it to appendix B. The proposed appendix B would also centralize the additional test provisions currently applicable under 10 CFR 431.96, *i.e.*, 10 CFR 431.96(c) through (f). *Id.* As proposed, the three-phase equipment addressed in this rulemaking would be required to be tested according to appendix B until such time as compliance is required with amended energy conservation standards that rely on the SEER2 and HSPF2 metrics, should DOE adopt such standards. *Id.*

Similarly, DOE proposed to amend the test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h by adopting AHRI 210/240-2023 in a new appendix B1 to subpart F of part 431. *Id.* DOE proposed to adopt the updated version of AHRI Standard 210/240, *i.e.*, AHRI 210/240-2023, including the SEER2 and HSPF2 metrics. As proposed, the three-phase equipment addressed in this rulemaking would not be required to be tested using the test procedure in proposed appendix B1 until such time as compliance is required with amended energy conservation standards that rely on the SEER2 and HSPF2 metrics, should DOE adopt such standards. *Id.*

DOE did not receive any comments in response to the proposed organization of the test procedures. As discussed in the following sections of this final rule, DOE is adopting AHRI 210/240-2023, including the SEER2 and HSPF2 metrics. Accordingly,

for the reasons discussed in the December 2021 NOPR and as discussed in the preceding paragraphs, DOE is finalizing the proposed organization of the test procedures by establishing appendices F and F1[11] for testing 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h.

C. Metrics

As noted, for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h, the cooling metric and heating metric currently specified by DOE are the SEER and HSPF metrics, respectively. 10 CFR 431.96. As noted in the December 2021 NOPR, SEER is a seasonal efficiency metric that accounts for electricity consumption in active and standby cooling modes during the cooling season, while HSPF is a seasonal efficiency metric that accounts for electricity consumption in active and standby heating modes for heat pumps during the heating season. 86 FR 70316, 70320. These same metrics currently apply to single-phase CAC/HPs, including single-phase, air-cooled VRF multi-split systems with a cooling capacity of less than 65,000 Btu/h (see appendix M). *Id.*

As discussed in the December 2021 NOPR, SEER2 and HSPF2 are metrics established in the amended test procedure for single-phase CAC/HPs (appendix M1) and have the same definitions as their counterpart metrics in appendix M (*i.e.*, SEER and

[11] Although DOE proposed in the December 2021 NOPR to establish test procedures at appendices B and B1 for the three-phase equipment subject to this rulemaking, appendix B has since been established for direct-expansion dedicated outdoor air systems. Further, appendices C, D, and E have been designated for other categories of commercial air conditioning and heating equipment. As a result, in this final rule, DOE establishes appendices F and F1 for the equipment that is the subject of this final rule.

HSPF) but reflect the amendments made to the test procedure in appendix M1, which change the measured efficiency values compared to appendix M. (*See* 82 FR 1426, 1437 (Jan. 5, 2017) explaining DOE's decision to adopt the new metrics SEER2 and HSPF2.) *Id.* at 86 FR 70321.

D. Updates to Industry Standards and Proposed Test Procedures for Three-Phase Equipment with Cooling Capacity of Less than 65,000 Btu/h

As noted, the current DOE test procedure at 10 CFR 431.96 for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h incorporates by reference ANSI/AHRI 210/240-2008 with Addenda 1 and 2 (*i.e.*, ANSI/AHRI 210/240-2008, but omitting section 6.5). ANSI/AHRI 210/240-2008 includes as appendix C (which is designated as normative in the industry test standard[12]) the entirety of the text of appendix M as amended by a final rule published on October 22, 2007 (72 FR 59906). Appendix M provides the Federal test procedure for determining the efficiency of single-phase CAC/HPs with rated cooling capacities of less than 65,000 Btu/h, which are consumer products covered under 10 CFR part 430.

The current DOE test procedure at 10 CFR 431.96 for 3-phase VRF with cooling capacity of less than 65,000 Btu/h incorporates by reference ANSI/AHRI 1230-2010 with Addendum 1 (*i.e.*, ANSI/AHRI 1230-2010, but omitting sections 5.1.2 and 6.6).

[12] The inclusion of appendix M in the normative appendix C of AHRI 210/240-2008 means that appendix M was required to be followed when testing in accordance with ANSI/AHRI 210/240-2008.

As noted previously in this document, AHRI has published several updated industry standards: AHRI 210/240-2017 (published in December 2017); AHRI 210/240-2017 with Addendum 1 (published in April 2019); AHRI 210/240-2023 (published in May 2020); and AHRI 1230-2021 (published in May 2021).

As discussed in the following sections, DOE is incorporating by reference AHRI 210/240-2023 as the test procedure for the three-phase equipment addressed in this final rule. DOE is also incorporating by reference ANSI/ASHRAE 37-2009, which is referenced by AHRI 210/240-2023. Use of the amended test procedures incorporating AHRI 210/240-2023 will not be required until such time as compliance is required with amended standards in terms of the new metrics, SEER2 and HSPF2, should DOE adopt such energy conservation standards. These amended test procedures align with the test procedure and metrics for CAC/HPs specified at appendix M1.

1. Harmonization with Single-Phase Products

As discussed in the December 2021 NOPR, the three-phase equipment that is the subject of this final rule is often nearly identical to their single-phase counterparts. 86 FR 70316, 70322. Specifically, three-phase models generally are manufactured on the same production lines and are physically identical to their corresponding single-phase central air conditioner and central air conditioning heat pump models, except that the former have three-phase electrical systems and use components—primarily motors and compressors—that are designed for three-phase power input. *Id.* Other key operational components, such as heat exchangers and fans (excluding fan motors), are typically identical for three-phase and single-phase designs of a given model family. *Id.* In

addition, most manufacturers' model numbers for single-phase products and three-phase equipment are interchangeable, and three-phase and single-phase versions of the same model typically have the same energy efficiency ratings. *See*, *e.g.*, 80 FR 42614, 42622 (July 17, 2015) and 83 FR 49501, 49504.

As discussed in the December 2021 NOPR, in response to the October 2018 RFI, stakeholders supported harmonizing the test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h with the test procedures for single-phase CAC/HPs with a cooling capacity of less than 65,000 Btu/h.[13] (CA IOUs, No. 2 at pp. 1-2; Ingersoll Rand, No. 3 at p. 2; AHRI, No. 4 at pp. 1-2; NRDC and ASAP, No. 5 at pp. 1-2; Lennox, No. 6 at pp. 1-2; Carrier, No. 7 at p. 1; Goodman, No. 8 at pp. 1-3). 86 FR 70316, 70322. In addition, several stakeholders supported harmonizing with both appendix M and appendix M1 or at a minimum, with appendix M1 (Carrier, No. 7 at p. 2; Goodman, No. 8 at pp. 1-2; AHRI, No. 4 at p. 2; CA IOUs, No. 2 at p. 2; NRDC and ASAP, No. 5 at pp. 1-2; Lennox, No. 6 at p. 2). *Id.*

The following sections discuss DOE's consideration of harmonization with the relevant industry standards, including consideration of harmonization with appendices M and appendix M1.

[13] All comments are available at *www.regulations.gov,* in Docket No. EERE–2017–BT–TP–0031.

2. AHRI 210/240-2017 and AHRI 210/240-2017 with Addendum 1

In the December 2021 NOPR, DOE considered whether to harmonize the current test procedures for the three-phase equipment addressed in this document with appendix M by adopting AHRI 210/240-2017 and AHRI 210/240-2017 with Addendum 1 for compliance prior to January 1, 2023. 86 FR 70316, 70321-70324. However, DOE noted that the required 360-day compliance lead-time period for test procedure final rules for ASHRAE equipment specified in EPCA (42 U.S.C. 6314(d)(1)) would result in little to no time between the compliance date of the final rule for this test procedure rulemaking and January 1, 2023–when appendix M1 is required for testing CAC/HPs (and when appendix M will no longer be used). *Id.* at 86 FR 70322. Therefore, DOE tentatively concluded that there would be little practical benefit to harmonizing the test procedures for the three-phase equipment addressed in this final rule with the current test procedures for CAC/HPs at appendix M. *Id.* Furthermore, DOE identified errors in AHRI 210/240-2017 with Addendum 1 that DOE tentatively determined would need to be corrected in regulatory text if DOE were to adopt AHRI 210/240-2017 with Addendum 1. *Id.* at 86 FR 70323. For these reasons, DOE tentatively concluded that adopting a revised test procedure (*i.e.*, referencing AHRI 210/240-2017 or AHRI 210/240-2017 with Addendum 1, along with the substantive corrections and deviations that would be required) for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h would be unduly burdensome to manufacturers. *Id.* at 86 FR 70324. DOE considered these reasons to constitute clear and convincing evidence that adopting AHRI 210/240-2017 or AHRI 210/240-2017 with Addendum 1 would not meet the requirements specified in 42 U.S.C. 6314(a)(2). *Id.*

As such, DOE proposed to maintain the current test procedure for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h, which incorporates by reference ANSI/AHRI 210/240-2008, until such time as use of the amended test procedure referencing AHRI 210/240-2023 would be required. *Id*. Several commenters supported the proposal to maintain reference to ANSI/AHRI 210/240-2008 with Addenda 1 and 2 as the Federal test procedure for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h, until such time as use of the amended test procedure referencing AHRI 210/240-2023 would be required. (AHRI, No. 16 at p. 2; CA IOUs, No. 18 at pp. 1-2; Carrier, No. 15 at p. 2; Lennox, No.14 at p. 2; NYSERDA, No. 13 at pp. 1-2; Trane, No. 19 at p. 1)

However, CA IOUs commented that because ANSI/AHRI 210/240–2008 with Addenda 1 and 2 references ANSI/ASHRAE 37-2005 (while appendix M and ANSI/AHRI Standard 1230–2010 reference ANSI/ASHRAE 37-2009), there is a discrepancy in the treatment of 3-phase ACUAC and ACUHP versus VRF equipment under the proposed appendix B.[14] (CA IOUs, No. 18 at p. 2) CA IOUs recommended that DOE consider adding an exception in section 1 of appendix B, such that ANSI/AHRI Standard 210/240–2008 is required in conjunction with ANSI/ASHRAE 37–2009, thereby making the incorporation by reference fully consistent with the approaches taken for single-speed products under appendix M and VRF equipment in ANSI/AHRI Standard 1230–2010. (*Id.*)

[14] As noted, appendix B as proposed in the December 2021 NOPR corresponds to appendix F as finalized in this final rule.

DOE acknowledges the concern raised by CA IOUs, but DOE notes that ANSI/AHRI 1230–2010 does not reference ANSI/ASHRAE 37-2009 as commented by CA IOUs (and erroneously mentioned by DOE in the December 2021 NOPR[15]), but instead references ANSI/ASHRAE 37-2005. Therefore, there is no discrepancy in the treatment of 3-phase ACUAC and ACUHP versus VRF equipment as proposed in appendix B in the December 2021 NOPR (and as adopted in appendix F in this final rule) because ANSI/AHRI 210/240-2008 and ANSI/AHRI 1230–2010 both reference ANSI/ASHRAE 37-2005. Additionally, DOE notes that appendix F is intended to reflect the test procedure as it is prescribed in the *Federal Register* currently—and the current test procedure for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h references ANSI/AHRI 210/240–2008, which in turn references ANSI/ASHRAE 37-2005. As such, referencing ANSI/ASHRAE 37–2009 in appendix F would lead to appendix F being incongruous with the current test procedure.

As a result, DOE is maintaining the reference to ANSI/AHRI 210/240-2008 with Addenda 1 and 2 as the Federal test procedure for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h in appendix F without an exception related to the version of ANSI/ASHRAE 37. DOE is also updating the existing incorporation by reference of ANSI/AHRI 210/240-2008 at 10 CFR 431.95 to apply to appendix F. As stated previously in this document, appendix F will serve as the Federal test procedure

[15] In the December 2021 NOPR, DOE mistakenly stated that ANSI/AHRI 1230–2010 references ANSI/ASHRAE 37-2009. 86 FR 70316, 70325-70326. This oversight did not impact any of the DOE analysis conducted in the December 2021 NOPR.

until such time as use of the amended test procedure referencing AHRI 210/240-2023, appendix F1, is required as discussed in the following section.

3. AHRI 210/240-2023

In the December 2021 NOPR, DOE noted that AHRI 210/240-2023 generally corrects the errors in AHRI 210/240-2017 with Addendum 1 and harmonizes with the updated Federal test method for single-phase CAC/HPs with rated cooling capacities of less than 65,000 Btu/h (*i.e.*, appendix M1, required for use beginning January 1, 2023), which includes single-phase, air-cooled, VRF multi-split systems with a cooling capacity of less than 65,000 Btu/h. 86 FR 70316, 70324. Additionally, DOE noted that the updates contained in AHRI 210/240-2023 provide for measuring energy efficiency using the SEER2 and HSPF2 metrics, which are the metrics adopted by ASHRAE Standard 90.1-2019 for the 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h standards beginning January 1, 2023.[16] *Id.* In response to this update to AHRI 210/240, DOE proposed to incorporate AHRI 210/240-2023 as the test procedure with which representations must be made beginning with the compliance date of any amended DOE standards for three-phase equipment relying on SEER2 and HSPF2 as the metrics.[17] *Id.*

[16] ASHRAE 90.1-2019 did not update the metrics for 3-phase VRF with cooling capacity of less than 65,000 Btu/h. Those metrics remain SEER and HSPF in ASHRAE Standard 90.1.

[17] The timing and implementation of any amended standards may be different for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h, depending on DOE rulemakings related to energy conservation standards for those separate categories of equipment.

In the December 2021 NOPR, DOE sought comment on its proposal to incorporate by reference AHRI 210/240-2023 in the DOE test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. *Id*. at 86 FR 70325. DOE also sought comment on its proposal to require compliance with these test procedures on the compliance date of any amended energy conservation standards that DOE may adopt later as part of a future rulemaking. *Id*.

Commenters generally supported the proposal to incorporate by reference AHRI 210/240-2023 in the DOE test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h, with a compliance date aligning with the compliance date of any amended DOE standards for three-phase equipment relying on SEER2 and HSPF2 as the metrics. (AHRI, No. 16 at pp. 2-3; Carrier, No. 15 at pp. 2-3; Lennox, No. 14 at p. 2; NEEA, No. 20 at p. 1; NYSERDA, No. 13 at pp. 1-2; Trane, No. 19 at p. 1)

In summary, for the reasons discussed in the December 2021 NOPR and in this document, DOE is incorporating by reference AHRI 210/240-2023 in the DOE test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h, with the amended test procedures required for use beginning on the compliance date of any amended energy conservation standards. Specifically, in appendix F1, DOE is referencing AHRI 210/240-2023 except for the following sections:

Section 6 – Rating Requirements (these provisions are not related to the method of test, and DOE separately addresses these topics in 10 CFR part 429);

Sections 6.1.8, 6.4.1, 6.4.2, 6.4.3, and 6.4.4 (minimum testing and certification requirements);

Sections 6.2 and 6.4.6 (permits a given product to have multiple ratings of different values);

Section 6.5 (uncertainty allowances for testing, which are not relevant to the Federal test procedure);

Sections 7 through 10, Appendix C, and Appendix I (relevant only to AHRI's certification program);

Appendix F: Sections F15.2 and F17 (pertains to electrical measurements and cyclic tolerances, respectively; DOE proposed modifications as discussed in the December 2021 NOPR. 86 FR 70316, 70324-70325);

Appendix G (pertains to the exclusion of certain optional features for testing, as discussed in the subsequent subsection); and

Appendix H (pertains to off-mode testing, which is not required by DOE for three-phase equipment).

a. Appendix G of AHRI 210/240-2023

In Appendix G of AHRI 210/240-2023, AHRI included a list of components that must be present for testing (Section G1.2) and a list of features that are optional for testing (Section G2), which provides additional instruction to address certain of these features and additional details that are beyond the scope of the current Commercial HVAC Enforcement Policy[18]. Also, there are five features[19] that are included in the Commercial HVAC Enforcement Policy for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h that are not included in Section G2 of AHRI 210/240-2023. Currently, enforcement testing of 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h falls under DOE's Commercial HVAC Enforcement Policy, which outlines how certain features of this equipment will be treated for compliance testing.

In the December 2021 NOPR, DOE found that certain optional features listed in Section G2 (as well as certain features that are included in DOE's current Commercial HVAC Enforcement Policy but not included in Section G2 of AHRI 210/240-2023) are present in models of 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h. 86 FR 70316, 70325. However, DOE found that these same features are also present in models of single-phase CAC/HPs with cooling capacity of less than 65,000 Btu/h. *Id*. DOE's Commercial HVAC Enforcement Policy does not apply to single-phase products and appendices M and M1 do not include any special treatment for

[18] The enforcement policy for commercial HVAC equipment can be found at *www.energy.gov/gc/downloads/commercial-equipment-testing-enforcement-policies*.
[19] These five features are high-static indoor blower or oversized motor; desuperheaters; outdoor fan with Variable Frequency Drive ("VFD"); indoor fan with VFD; and compressor with VFD.

these optional features within the test procedure. In addition, DOE has not received any waivers related to these features and DOE does not have technical justification to support differential treatment of such features for three-phase equipment as compared to single-phase products. As such, DOE tentatively determined that any of these features present in 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h can also be tested in accordance with the proposed test procedure and that, to maintain harmonization with single-phase products, it was not necessary to adopt Appendix G of AHRI 210/240-2023 in the proposed test procedure. *Id*. DOE further noted that if DOE adopted an amended test procedure for three-phase equipment that does not reference Appendix G, DOE would rescind the Commercial HVAC Enforcement Policy to the extent that it is applicable to 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. *Id*.

AHRI, Carrier, and Trane disagreed with DOE's tentative proposal to not adopt Appendix G of the AHRI 210/240-2023 standard, which outlines how certain features of this 3-phase equipment will be treated for compliance testing. (AHRI, No. 16 at p. 3; Carrier, No. 15 at pp. 2-3; Trane, No. 19 at p. 1) AHRI stated that not all three-phase equipment models are based on a single-phase platform and that even those that are face different codes and standards requirements than residential products. (AHRI, No. 16 at p. 3) AHRI and Carrier asserted that DOE's tentative determination that single-phase products sold in the market include some of the features included in Appendix G is insufficient justification to not adopt Appendix G for three-phase equipment. (AHRI, No. 16 at p. 3; Carrier, No. 15 at p. 2) AHRI and Carrier further commented that DOE

did not clarify which single-phase product features DOE analyzed to conclude that there was no technical justification to support differential treatment of such features for three-phase equipment as compared to single-phase products. (AHRI, No. 16 at p. 3; Carrier, No. 15 at p. 2) AHRI and Carrier added that there was technical justification for testing exemptions outlined in Appendix G, such as three-phase power, which is exclusive to commercial buildings. *Id.* AHRI and Carrier further noted that building codes have exclusive requirements for commercial buildings, which create technical differences between three-phase models and their single-phase counterparts, as evidenced by California's energy code, Title 24-2022, which requires economizers on units down to 33,000 Btu/hr. (AHRI, No. 16 at p. 3; Carrier, No. 15 at pp. 2-3) AHRI and Carrier also commented that an appendix for ASHRAE Standard 90.1 is considering similar requirements for economizers on units down to 33,000 Btu/h. *Id.* AHRI and Carrier further commented that without the Commercial HVAC Enforcement Policy or Appendix G, manufacturers would not be able to factory install economizers. *Id.* In conclusion, AHRI, Carrier, and Trane recommended that DOE adopt Appendix G from AHRI 210/240-2023 as part of the test procedures to continue to permit the necessary flexibility for components. (AHRI, No. 16 at p. 3; Carrier, No. 15 at p. 3; Trane, No. 19 at p. 1)

In this final rule, DOE is adopting AHRI 210/240-2023 without Appendix G in its test procedures for the three-phase equipment subject to this final rule to align the test procedures for single-phase products and three-phase equipment. As discussed in the December 2021 NOPR, DOE has not identified any optional components specified in Appendix G that are included in three-phase equipment but not single-phase products. Therefore, while certain optional components (*e.g.*, economizers, as suggested by AHRI

and Carrier) are offered as part of certain models of three-phase equipment, such components are also offered as part of certain models of single-phase products. DOE's test procedure for CAC/HPs does not include provisions excluding Appendix G components, such as economizers, and, as discussed, DOE has not received petitions for waivers with regard to testing CAC/HPs with such components.

Further, the commenters did not provide any justification for a testing exemption for the Appendix G components in three-phase equipment but not single-phase products – *i.e.*, commenters did not provide any information to suggest that testing a three-phase unit with a specific Appendix G component would present any complications that would not exist when testing an otherwise identical single-phase unit with the same Appendix G component.

While the vast majority of three-phase equipment on the market are otherwise identical to single-phase models, DOE acknowledges that there are a number of three-phase equipment model lines without a single-phase counterpart. However, per AHRI 210/240-2023, there is no difference in testing three-phase equipment with single-phase counterparts as compared to testing three-phase equipment without single-phase counterparts. Additionally, the commenters did not provide any justification as to why three-phase equipment without single-phase counterparts would warrant different treatment with regard to Appendix G components.

With regard to AHRI and Carrier's assertions that certain Appendix G components (such as economizers) may be installed more commonly in three-phase

equipment than single-phase products (particularly because certain commercial building codes may require use of specific Appendix G components, such as economizers), the prevalence of the component in shipments of three-phase equipment is not a relevant consideration for whether test procedure provisions are warranted to exclude the component from testing. Regardless of whether Appendix G components are included more commonly in three-phase equipment than single-phase products, DOE has concluded that they are included in both three-phase equipment and single-phase products. DOE notes that commenters did not provide any information to suggest that any of the components specified in Appendix G are included in three-phase equipment but not single-phase products.

Additionally, DOE disagrees with the commenter's assertions that the use of three-phase power in commercial buildings provides a technical justification for exemption of Appendix G components. If building codes require certain Appendix G components for three-phase equipment, this requirement may increase the fraction of shipments of three-phase equipment with those components relative to single-phase products, but it does provide any technical justification for exempting the component from testing, given that the components are also included in single-phase products, albeit in a potentially lower fraction of shipments.

DOE disagrees with AHRI and Carrier's assertion that Appendix G would be necessary for manufacturers to be able to factory install economizers. DOE notes that manufacturers are able to factory install economizers in single-phase products even though there is no exemption of Appendix G components for testing such products, and

the same will be true without any allowance for exempted components for three-phase equipment. DOE reiterates that, in this final rule, DOE is harmonizing the test procedures for three-phase equipment with that for single-phase products, and that commenters have not provided justification needed to support the assertion that three-phase equipment warrants exemption of components when those components are also included in single-phase products.

As such, DOE has determined that models of 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h that include components specified in Appendix G can be tested in accordance with the test procedure adopted in this final rule. To harmonize with the test procedure for single-phase products, DOE is not adopting Appendix G of AHRI 210/240-2023 as part of the amended test procedure adopted in this final rule. While no models of 3-phase VRF with cooling capacity of less than 65,000 Btu/h are currently on the market, DOE expects that if those models are on the market the same determination would apply for the same reasons. In conjunction with this final rule, DOE is rescinding the Commercial HVAC Enforcement Policy to the extent that it is applicable to 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h.

4. AHRI 1230

As discussed previously, AHRI 1230-2021 excludes from its scope 3-phase VRF with cooling capacity of less than 65,000 Btu/h. Therefore, in this final rule, DOE is not adopting AHRI 1230-2021 because by its explicit terms AHRI 1230-2021 is not applicable to the equipment considered in this final rule.

As discussed previously in section III.D.2.b of this final rule, DOE is incorporating by reference AHRI 210/240-2023 for testing 3-phase VRF with cooling capacity less than 65,000 Btu/h. The current Federal test procedure for this equipment, now codified at appendix F, which references ANSI/AHRI 1230-2010, remains the required test procedure until such time as DOE adopts amended energy conservation standards for this equipment.

5. ASHRAE 37

As discussed in the December 2021 NOPR, ANSI/ASHRAE Standard 37, which provides a method of test for many categories of air conditioning and heating equipment, is referenced for testing by all versions of AHRI Standards 210/240 and 1230. 86 FR 70316, 70325. Appendix E of AHRI 210/240-2023 provides additional instruction and exceptions regarding the application of the test methods specified in ANSI/ASHRAE 37-2009. And ANSI/ASHRAE 37-2005 is referenced in ANSI/AHRI 1230-2010, which is currently the referenced industry test standard in the DOE test procedure for VRF multi-split systems. ANSI/ASHRAE 37-2005 is also referenced by ANSI/AHRI 210/240-2008, which is currently the referenced industry test standard in the DOE test procedure for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h. *Id.*

As such, given the use of ANSI/ASHRAE 37-2009 when testing according to AHRI 210/240-2023, DOE is directly referencing ANSI/ASHRAE 37-2009 in its test procedures for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. Specifically, in

appendix F1, DOE is referencing the applicable sections of ANSI/ASHRAE 37-2009—*i.e.*, all sections except Sections 1, 2, and 4.[20]

As noted in section III.B of this final rule, appendix F references AHRI 210/240-2008 (which in turn references ANSI/ASHRAE 37-2005) for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and references AHRI 1230-2010 (which in turn references ANSI/ASHRAE 37-2005) for 3-phase VRF with cooling capacity of less than 65,000 Btu/h. As discussed, appendix F is meant only as a new location for the current test procedures and, as a result, DOE is not changing the embedded references to ANSI/ASHRAE 37.

E. Certification, Compliance, and Enforcement Requirements

In the December 2021 NOPR, DOE proposed amendments to the basic model definition and product-specific enforcement provisions for the three-phase equipment specified at 10 CFR 431.92 and 10 CFR 429.134, respectively, to align with the provisions for single-phase products. 86 FR 70316, 70326. Comments received on DOE's proposals are discussed in the following subsections.

1. Representation Requirements

In the December 2021 NOPR, DOE proposed that the representation and certification requirements for the three-phase equipment subject to this rulemaking would

[20] DOE is excluding references to Section 1 ("Purpose"), Section 2 ("Scope"), and Section 4 ("Classifications") in ANSI/ASHRAE 37-2009 to avoid any potentially contradictory requirements with DOE regulations.

be included in a new section at 10 CFR 429.64[21] and excluded from the scope of 10 CFR 429.43. *Id.* DOE also proposed to establish a new section 10 CFR 429.70(i)[22] for alternative energy determination method ("AEDM") requirements that would apply to the three-phase equipment addressed in this rulemaking. *Id.*

a. Use of Single-Phase AEDM for Rating Three-Phase Equipment

Through its newly proposed provisions in 10 CFR 429.64 and 420.70(i), DOE intended to mirror the representation requirements applicable to CAC/HPs in 10 CFR 429.16 and 429.70(e), except for the minimum testing requirements and certain AEDM validation requirements for each basic model of single-package units and single-split systems. *Id.* DOE tentatively determined that an AEDM validated pursuant to 10 CFR 429.70(e) would also be appropriate for rating basic models of three-phase, less than 65,000 Btu/h single-package units and single split-systems that have otherwise identical single-phase counterparts. *Id*. at 86 FR 70327. As such, for three-phase, less than 65,000 Btu/h single-package units and single-split systems, DOE proposed in 10 CFR 429.70(i)(2) to permit a manufacturer to rely on an AEDM for CAC/HPs that is validated in accordance with 10 CFR 429.70(e)(2) with testing of otherwise identical single-phase counterparts, without additional validation testing.[23] *Id*. DOE noted that if a manufacturer offers three-phase models that do not have otherwise identical single-phase

[21] The provisions proposed in the December 2021 NOPR at 10 CFR 429.64 are being finalized at 10 CFR 429.67 in this final rule as 10 CFR 429.64 has since been established for electric motors.
[22] The provisions proposed in the December 2021 NOPR at 10 CFR 429.70(i) are being finalized at 10 CFR 429.70(l) in this final rule as 10 CFR 429.70(i) has since been established for consumer furnaces and consumer boilers.
[23] DOE proposed that while the AEDM would not need additional validation testing, it would need to reflect the slight difference in performance between single-phase and three-phase components. 86 FR 7016, 70327.

counterparts, or the manufacturer has not validated an AEDM in accordance with 10 CFR 429.70(e)(2) with testing of the otherwise identical single-phase counterparts, the manufacturer would be required to test a single unit sample for each of two basic models to validate an AEDM, consistent with the existing requirements for all capacities of three-phase equipment. *Id.*

In conjunction with this proposal, DOE proposed also to specify in the newly proposed 10 CFR 429.70(i)(3) that "otherwise identical" means differing only in the phase of the electrical system and the phase of power input for which the motors and compressors are designed. *Id.*

DOE requested comment on the proposal to permit, for three-phase, less than 65,000 Btu/h single-package and single-split system basic models with otherwise identical single-phase counterparts, the use of ratings based on an AEDM validated using the test results from an otherwise identical CAC/HPs, rather than requiring validation using the test results with testing of three-phase models. *Id.* DOE further requested comment on its proposed specification of the term "otherwise identical" and whether the proposed AEDM requirements should include a provision to validate the correlation between single-phase and three-phase performance as determined using an AEDM. *Id.*

AHRI, Carrier, and Lennox expressed general support for DOE's proposals related to the representation requirements. (AHRI, No. 16 at p. 4; Carrier, No. 15 at p. 4; Lennox, No. 14 at p. 3) However, AHRI, Carrier, and Lennox recommended a modification regarding the term "otherwise identical"—specifically recommending that,

in addition to allowing AEDM use between similar single and three- phase equipment, DOE should also allow similar three-phase designs of different voltages to use AEDM data from an otherwise identical single-phase product, asserting that the performance differences between different voltages are similarly well known. *Id.* Lennox elaborated that while residential central air conditioners and heat pumps typically use 230V single-phase power sources, commercial three-phase equipment can use 230V, 460V, and 575V three-phase power sources. (Lennox, No. 14 at p. 3)

DOE acknowledges that three-phase equipment is often installed with voltages that are higher than the voltage typically used for their single-phase counterparts. Further, DOE has determined that, comparable to the differences between single- and three-phase power, the slight performance differences between models designed for use with multiple voltages (*e.g.*, minor differences in compressor performance depending on the supply voltage of the compressor motor; or minor differences from transformer losses if a transformer is used in the unit to change the voltage) are well understood and can be accounted for within an AEDM. Therefore, DOE considers the clarification suggested by AHRI, Carrier, and Lennox to be appropriate and is updating "otherwise identical" to mean differing only in the phase *or voltage* [emphasis added] of the electrical system and the phase *or voltage* [emphasis added] of power input for which the motors and compressors are designed.

Regarding the provision to validate the correlation between single-phase and three-phase performance, Carrier and Lennox agreed that this validation was not necessary. (Carrier, No. 15 at p. 4; Lennox, No. 14 at p. 3) Carrier commented that

system validation would increase test burden without providing a benefit and that an otherwise identical three-phase model generally outperforms the single-phase counterpart. (Carrier, No. 15 at p. 4) Lennox commented that the performance characteristics of single-phase and three-phase components are well known and already incorporated into manufacturer AEDMs and that further validation of the correlation between single-phase and three-phase performance is not needed. (Lennox, No. 14 at p. 3)

Conversely, CA IOUs and Joint Advocates expressed support for requiring some form of validation to correlate the performance between single-phase and three-phase performance as determined using an AEDM. (CA IOUs, No. 18 at p. 2; Joint Advocates, No. 17 at p. 2) CA IOUs recommended that DOE optionally allow manufacturers to submit supplemental information to DOE with the intent of demonstrating the efficiency increase via correlation data for three-phase basic models relative to their single-phase counterpart basic models. (CA IOUs, No. 18 at p. 2) Joint Advocates supported validating an AEDM based on the tested performance of a three-phase basic model and commented that it was their understanding that this validation would not be equivalent to developing and validating a new AEDM. Alternatively, Joint Advocates suggested that DOE could perform a crosswalk to develop ratings for three-phase equipment based on the output of a validated AEDM for otherwise identical single-phase equipment. (Joint Advocates, No. 17 at p. 2)

As noted in the December 2021 NOPR and as indicated by Lennox's comment, slight differences in performance between single-phase and three-phase models (*e.g.*,

minor differences in compressor performance depending on the electrical phase of the compressor motor) are well understood and can be accounted for within an AEDM (*e.g.*, slightly different compressor coefficients used to model performance for single-phase vs. three-phase compressors), rather than requiring testing of three-phase models. 86 FR 70316, 70327; (Lennox, No. 14 at p. 3) Further, for other categories of commercial package air conditioning and heating equipment, DOE allows an AEDM to be used to develop ratings for all equipment within a validation class, which encompasses all models in an equipment category with a given heat rejection medium (*e.g.*, a single AEDM can be used to develop ratings for all basic models of air-cooled CUACs with cooling capacity greater than 65,000 Btu/h offered by a manufacturer). 10 CFR 429.70(c)(2)(iv) Therefore, for other equipment categories, current DOE regulations allow use of an AEDM to cover both single and three-phase equipment without a need for additional validation of the performance differences between single and three-phase equipment. DOE has concluded that such a validation requirement for the three-phase equipment subject to this rulemaking would not be needed to develop representative ratings and would impose unnecessary certification burden on manufacturers. Therefore, DOE is not requiring that manufacturers validate the correlation between single-phase and three-phase performance as determined using an AEDM.

DOE is adopting the AEDM provisions as proposed in the December 2021 NOPR. Specifically, at 10 CFR 429.70(l)(2)[24], DOE is permitting a manufacturer to rely on an AEDM for CAC/HPs that is validated in accordance with 10 CFR 429.70(e)(2)

[24] As noted, 10 CFR 429.70(i) as proposed in the December 2021 NOPR corresponds to 10 CFR 429.70(l) as finalized in this final rule.

with testing of otherwise identical single-phase counterparts, without additional validation testing.

b. Use of AEDM for Certain Configurations of Three-Phase Equipment

As part of the harmonization with single-phase requirements, the proposal in 10 CFR 429.64, as presented in the December 2021 NOPR, required that all representations for outdoor units with no match and for multi-split systems, multi-circuit systems, and multi-head mini-split systems must be determined through testing or other specified means, rather than through an AEDM. 86 FR 70316, 70327. As currently specified, the requirements at 10 CFR 429.16(c)(2)-(3) do not permit AEDMs for single-phase products with these configurations; as such, there would not be any extensively validated AEDMs available for products and equipment with these configurations. DOE noted that it is not aware of any three-phase models on the market with these configurations (*i.e.*, outdoor units with no match or multi-split, multi-circuit, and multi-head mini-split systems), and, therefore, DOE tentatively concluded that this proposal would not result in increased testing burden or costs for any manufacturer. *Id.* In the December 2021 NOPR, DOE requested comment on the existence of three-phase, less than 65,000 Btu/h models of outdoor units with no match or multi-split, multi-circuit, and multi-head mini-split systems on the market. *Id.*

Carrier commented that it was not aware if the referenced models exist in the market today. (Carrier, No. 15 at p. 4) Joint Advocates expressed support for prohibiting the use of AEDMs for three-phase outdoor units with no match, multi-split, multi-circuit, and multi-head mini-split systems to align with the single-phase requirements. (Joint

Advocates, No. 17, at p. 1) Lennox recommended that DOE implement the same requirements for the three-phase outdoor units with no match considered under DOE's proposal as apply for single-phase products per 10 CFR 429.16, including the provisions at 10 CFR 429.16(c)(2)-(3), which do not permit AEDM use. Lennox added that to ensure consistency and a level playing field between comparable products, the specific provisions for an outdoor unit with no match as outlined at 10 CFR 429.16(a)(1) and further test requirements at 10 CFR 429.16(b)(2)(i) should apply to the three-phase equipment. (Lennox, No. 14 at p. 4) AHRI recommended permitting AEDMs to rate any three-phase, less than 65,000 Btu/h models of outdoor units with no match or multi-split, multi-circuit, and multi-head mini-split systems on the market and aligning requirements with single-phase products. (AHRI, No. 16 at p. 5)

DOE notes that it is uncertain as to whether or not AHRI supported this proposal to not permit AEDM for the aforementioned configurations. AHRI expressed support for aligning the requirements for three-phase equipment with those for single-phase products – but contradictorily recommended permitting the use of AEDM for such configurations, which, if implemented, would lead to a misalignment between the treatment of three-phase and single-phase products.

No commenters identified any models on the market of outdoor units with no match and multi-split, multi-circuit, and multi-head mini-split systems. Therefore, DOE concludes that the proposed AEDM provisions that do not allow use of an AEDM for outdoor units with no match and multi-split, multi-circuit, and multi-head mini-split systems would not impose any burden on manufacturers. As such, DOE is adopting the

provisions related to outdoor units with no match and multi-split, multi-circuit, and multi-head mini-split systems as proposed in the December 2021 NOPR.

c. Coil-only Ratings for Single-split-system Air Conditioners

As DOE noted in the December 2021 NOPR, the proposal in 10 CFR 429.64 also required every individual combination of single-split-system air conditioner equipped with a single-stage or two-stage compressor distributed in commerce to be rated as a coil-only combination, with additional blower-coil representations allowed as applicable. 86 FR 70316, 70327 And as discussed in the December 2021 NOPR, the three-phase equipment category may include models that are part of a line of commercial three-phase equipment that includes equipment below DOE's 65,000 Btu/h capacity boundary (rather than models that are otherwise identical to single-phase central air conditioners). *Id.* DOE noted that, based on the review of models certified in DOE's Compliance Certification Database, DOE expected almost all of these models to be packaged units, which are not impacted by the proposal in the December 2021 NOPR. *Id.*

In the December 2021 NOPR, DOE requested comment on whether there are models of three-phase, single-split-system air conditioners with single-stage or two-stage compressors that are not distributed in commerce as a coil-only combination (*i.e.*, distributed in commerce only as blower-coil combination(s)). *Id.*

Carrier commented that it is not aware if the referenced models exist in the market today, while Lennox stated it was not aware of three-phase split system air conditioners with single-stage or two-stage compressors that are not distributed in commerce with

coil-only combinations (*i.e.*, that are distributed in commerce only as blower-coil combinations). (Carrier, No. 15 at p. 5; Lennox, No. 14 at p. 4)

Joint Advocates supported DOE's proposal requiring that every individual combination distributed in commerce must be rated as a coil-only combination. (Joint Advocates, No. 17, at p. 1) Lennox recommended that DOE align the representation requirements of three-phase equipment with similar single-phase products as outlined at 10 CFR 429.16(a)(1), so that all single- and two-stage air conditioners must have a coil-only match representative of the least efficient combination. (Lennox, No. 14 at p. 4)

AHRI commented that it is not aware of any three-phase, two-stage systems distributed in commerce as coil-only combinations, further commenting that three-phase products are most often used in small commercial applications and churches and are provided in matched combinations, and in the event that there are systems not provided as matched combinations, any three-phase requirements should be aligned with single-phase requirements. (AHRI, No. 16 at p. 5)

Based on AHRI's comment, DOE is uncertain which representation requirements AHRI recommends that DOE adopt for three-phase equipment. AHRI's comment suggests that all three-phase, single-split-system air conditioners with two-stage compressors are distributed in commerce only as matched combinations (i.e., blower-coil systems). This contradicts Lennox's comment that it was not aware of three-phase split system air conditioners with single-stage or two-stage compressors that are distributed in commerce only as blower-coil combinations.

DOE's representation requirements for single-phase products require that every individual combination distributed in commerce of single-split-system air conditioner equipped with a single-stage or two-stage compressor has to be rated as a coil-only combination, with additional blower-coil representations allowed as applicable. *See* 10 CFR 429.16(a)(1). Therefore, the SEER2 standards for single-phase single-split-system air conditioners adopted in a direct final rule published on January 6, 2017 (82 FR 1786) are based on coil-only representations. Coil-only ratings are generally lower than blower-coil ratings because the default fan power coefficient and default fan heat coefficient specified in the test procedure for rating coil-only systems are generally more power-consuming than integral fans in blower-coil systems (see section III.D.3.a of this final rule for further discussion of default fan power and fan heat coefficients for coil-only systems). As such, if DOE were to allow blower-coil ratings for rating three-phase single-split-system air conditioners and DOE were to adopt the SEER2 standards for three-phase split system air conditioners proposed in the ECS NOPR (which align with the SEER2 standards specified for single-phase products at 10 CFR 430.32(c)(5)), the SEER2 standards for three-phase split system air conditioners would effectively be less stringent than the standards for the single-phase counterparts, despite the standard values being equivalent.

Given Lennox's comment suggesting that there are no three-phase split system air conditioners with single-stage or two-stage compressors that are distributed in commerce only as blower-coil combinations, the specific support for the proposals expressed by Lennox and Joint Advocates, the absence of any specific alternate approaches included in AHRI's comment, and the broad general support for harmonization between three-phase

equipment and single-phase products as discussed in section III.D.1, in this final rule, DOE is adopting the provisions related to three-phase single-split-system air conditioners with single-stage or two-stage compressors as proposed in the December 2021 NOPR.

Additionally, DOE is also clarifying the proposed language in the table at 10 CFR 429.67(b)(1)[25] to state that, for single-split system air conditioners with single- or two-stage compressors, each model of outdoor unit must include a represented value for at least one coil-only individual combination that is distributed in commerce and which is representative of the least efficient combination distributed in commerce with that particular model of outdoor unit. For that particular model of outdoor unit, additional represented values for coil-only and blower-coil individual combinations are allowed, if distributed in commerce. This clarification to the provisions proposed in the December 2021 NOPR harmonizes with the provisions adopted in 10 CFR 429.16(a)(1) for CACP/HPs in a final rule published on October 26, 2022. 87 FR 64550.

2. Basic Model Definition

The current definition of "basic model" for three-phase equipment in 10 CFR 431.92 refers to all units manufactured by one manufacturer within a single equipment class, having the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common 'nominal' cooling capacity. *See* 10 CFR 431.92(2).[26] The definition of "basic model" for single-phase products in 10 CFR 430.2

[25] As noted, 10 CFR 429.64 as proposed in the December 2021 NOPR corresponds to 10 CFR 429.67 as finalized in this final rule.
[26] The definition applicable to variable refrigerant flow systems is different in wording but similar in content. *See* 10 CFR 431.92(5).

provides additional specifications on this same concept. *See* 10 CFR 430.2 (defining the term "basic model" and detailing the application of this term to different configurations of central air conditioners and central air conditioner heat pumps). For example, for split systems manufactured by outdoor unit manufacturers, a basic model includes all individual combinations having the same model of outdoor unit but with percentage variation limits on compressor, outdoor coil, and outdoor fan characteristics. *Id*.

In the December 2021 NOPR, DOE proposed to amend its "basic model" definition for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h to align with that for single-phase CAC/HPs, as this definition forms the basis for the requirements in 10 CFR 429.16. 86 FR 70316, 70327-70328. DOE requested comment on its proposal to align the definition of "basic model" for three-phase equipment at 10 CFR 431.96 with that for single-phase products at 10 CFR 430.2. *Id.*

AHRI, Carrier, and Lennox supported aligning the definition of "basic model" for three-phase equipment at 10 CFR 431.96 with that for single-phase products at 10 CFR 430.2. (AHRI, No. 16 at p. 5; Carrier, No. 15 at p. 5; Lennox, No. 14 at p. 4) Lennox further recommended that language in 10 CFR 430.2 that allows for "essentially identical" electrical equipment should also be included in 10 CFR 431.92, with the added clarification that the various three-phase equipment with varying voltages are to be considered essentially identical. (Lennox, No. 14 at p. 4)

After consideration, DOE finds Lennox's recommendation to be unnecessary because "essentially identical" at the proposed 10 CFR 431.92(7)(i)-(iii) includes requirements on the power input for the compressor, outdoor fan, and indoor fan (as applicable). For example, for split systems manufactured by outdoor unit manufacturers (proposed 10 CFR 431.92(7)(i)), one of the requirements to be considered "essentially identical" is that the power input for the compressor be within 5 percent and the power input for the outdoor fan be within 20 percent. DOE considers that these requirements on power input ensure that three-phase equipment employing differing three-phase voltages would still be considered to have "essentially identical" characteristics, regardless of the differing voltages. Therefore, DOE has concluded that the issue raised in Lennox's comment does not warrant deviating from DOE's proposal to harmonize the basic model definition for three-phase equipment with that for single-phase products.

For the reasons discussed in this section and in the December 2021 NOPR, DOE is amending and aligning the definition of "basic model" for three-phase equipment subject to this rulemaking at 10 CFR 431.96 with that for single-phase products at 10 CFR 430.2.

3. Certification Reporting Requirements

The certification reporting requirements for CAC/HPs at 10 CFR 429.16 currently require more detail in filed certification reports than the certification requirements for commercial HVAC equipment at 10 CFR 429.43. In the December 2021 NOPR, DOE proposed to retain the requirements for certification reports currently at 10 CFR 429.43 for the three-phase equipment subject to this rulemaking rather than adopting the

certification report requirements for single-phase products at 10 CFR 429.16. 86 FR 70316, 70328.

AHRI, Carrier, Lennox, and Trane supported retaining the requirements for certification reports currently at 10 CFR 429.43 rather than adopting the certification reporting requirements for single-phase products at 10 CFR 429.16. (AHRI, No. 16 at pp. 5-6; Carrier, No. 15 at p. 5; Lennox, No. 14 at pp. 4-5; Trane, No. 19 at p. 2) Carrier commented additionally that the confidence interval specified in 10 CFR 429.16(b)(3) for CAC/HPs[27] is different from that specified in 10 CFR 429.43(a)(1)(ii)(B) for commercial HVAC equipment,[28] and that three-phase equipment should use the same confidence interval of 90 percent, as they are based on the designs of their single-phase counterparts. (Carrier, No. 15 at p. 5)

For the reasons discussed in the December 2021 NOPR and this document, in this final rule, DOE is retaining the certification reporting requirements for the three-phase equipment subject to this rulemaking (*i.e.*, DOE is not aligning with the single-phase certification requirements at this time). Regarding the suggestion by Carrier to align the sampling plan confidence interval for the three-phase equipment subject to this rulemaking with those of their single-phase counterparts, DOE notes that this alignment was already proposed in the December 2021 NOPR and is resolved via the representation requirements adopted in the newly established 10 CFR 429.67. Specifically, DOE is

[27] The sampling requirements at 10 CFR 429.16(b)(3) for central air conditioners and heat pumps specify a confidence interval of 90 percent.
[28] The sampling requirements at 10 CFR 429.43(a)(1)(ii)(B) for commercial HVAC equipment specify a confidence interval of 95 percent.

adopting a 90 percent confidence interval for the sampling plans specified at 10 CFR 429.67(c)(2), mirroring the existing requirements for single-phase products in 10 CFR 429.16(b)(3).

4. Product-Specific Enforcement Provisions

In the December 2021 NOPR, DOE proposed to amend its product-specific enforcement requirements by adding provisions to a new 10 CFR 429.134(s)[29] for the three-phase equipment addressed in this rulemaking that would align with those already required at 10 CFR 429.134(k) for single-phase products. 86 FR 70316, 70328. These provisions would pertain only to DOE assessment and enforcement testing and would not impact manufacturer testing. *Id.* Additionally, these requirements would apply only to equipment subject to any potential future standards that DOE may establish in terms of SEER2 and HSPF2. *Id.*

Regarding cooling capacity, DOE proposed that the cooling capacity of each tested unit be measured pursuant to the test procedure and that the mean of the measurement(s) (either the measured cooling capacity for a single unit sample or the average of the measured cooling capacities for a multiple unit sample of the test sample) be used to determine compliance with the applicable standards. *Id.*

Regarding cyclic degradation coefficients, which are a measure of efficiency loss that would occur as a result of the compressor cycling to meet a low load level in field

[29] The provisions proposed in the December 2021 NOPR at 10 CFR 429.134(s) are being finalized at 10 CFR 429.134(y) in this final rule. 10 CFR 429.134(s) has since been established for direct-expansion dedicated outdoor air systems (DX-DOASes).

applications, DOE proposed to measure the cooling and/or heating cyclic degradation coefficient, C_D^c/C^h, respectively, by conducting the optional cyclic tests if the manufacturer certifies that it conducted the optional cyclic tests. If the manufacturer certifies that it did not conduct the optional cyclic tests, the proposal required that the default C_D^c/C^h values specified in the test procedure be used as the basis for calculating SEER2 or HSPF2 for each unit tested. *Id.*

DOE received no comments on these proposals. Regarding the cyclic degradation coefficients, DOE is clarifying that the selection of the default values of C_D^c and/or C^h be made according to the criteria for the cyclic test in section 4 of appendix F1, and not Sections 6.1.3.1 and 6.1.3.2 of AHRI 210/240-2023 as mistakenly proposed in the December 2021 NOPR. 86 FR 70316, 70343. Section 4 of appendix F1 aligns with section 3.5e of appendix M, which is referenced in the existing cyclic degradation provisions for at 10 CFR 429.134(k)(2) for single-phase products. As stated in the December 2021 NOPR, the proposal intended to add product-specific enforcement requirements for three-phase equipment that align with those specified for single-phase products, which is better effectuated by the criteria in section 4 of appendix F1 rather than Sections 6.1.3.1 and 6.1.3.2 of AHRI 210/240-2023. *Id* at 86 FR 70328.

For the reasons discussed in this section and in the December 2021 NOPR, DOE is adopting these provisions (including the minor revision discussed) at 10 CFR 429.134(y).

F. Other Comments Received on the NOPR

In response to the December 2021 NOPR, DOE received several additional comments not specific to any of the issues on which DOE sought comment in the December 2021 NOPR and discussed previously in this final rule. This section addresses those comments.

Joint Advocates, CA IOUs, NEEA, and NYSERDA recommended that DOE consider ways to improve the representativeness of the test procedures for ACUACs, ACUHPs, and VRFs with cooling capacity less than 65,000 Btu/h in future rulemakings. In particular, Joint Advocates, CA IOUs, and NYSERDA encouraged DOE to investigate a load-based test procedure[30] for both single-phase and three-phase equipment. (Joint Advocates, No. 17 at p. 2; CA IOUs, No. 18 at p. 3; NYSERDA, No. 13 at p. 2) Joint Advocates commented that a load-based test procedure, as compared to the current steady-state method, would be more representative of actual energy use and, in turn, would provide more accurate information about efficiency to purchasers. (Joint Advocates, No. 17 at p. 2) CA IOUs added that a dynamic load-based test procedure could yield representations that better reflect the average use cycle of a covered product. (CA IOUs, No. 18 at p. 3). NYSERDA commented that evaluation of a dynamic load-

[30] A dynamic load-based test method differs from the steady-state test method currently used in DOE test procedures for air conditioning and heat pump equipment. In a steady-state test method, the indoor room is maintained at a constant temperature throughout the test. In this type of test, any variable-speed or variable-position components of air conditioners and heat pumps are set in a fixed position, which is typically specified by the manufacturer. In contrast, a dynamic load-based test has the conditioning load applied to the indoor room using a load profile that approximates how the load varies for units installed in the field. In this type of test, an air conditioning system or heat pump is allowed to automatically determine and vary its control settings in response to the imposed conditioning loads, rather than relying on manufacturer-specified settings.

based testing would be especially important for equipment installed in office buildings due to the potential for overcooling. (NYSERDA, No. 13 at p. 2)

CA IOUs and NYSERDA also suggested that DOE consider mandating the $H4_2$ heating test (as specified in the test procedure for central air conditioners and central air conditioning heat pumps at appendix M1)[31] in a future rulemaking for the three-phase equipment subject to this rulemaking. (CA IOUs, No. 18 at p. 3; NYSERDA, No. 13 at p. 2) Both commenters also suggested that DOE consider a controls verification procedure ("CVP") for the $H4_2$ heating mode test, suggesting that this may serve as a first step to validate cold climate performance of variable-speed VRF heat pumps and ACUHPs while providing significant utility to consumers in cold climate regions. (*Id.*)

NEEA recommended that DOE also consider including a CVP for the three-phase equipment subject to this rulemaking, similar to DOE's proposal to adopt the CVP specified in AHRI 1230-2021 for VRF multi-split systems in a test procedure NOPR for VRF multi-split systems. (*See* 86 FR 706440 (Dec. 10, 2021)). (NEEA, No. 20 at p. 2) NEEA commented that while it understands that there is currently not a CVP associated with AHRI 210/240-2023, DOE could adopt a CVP in the test procedure for the three-phase equipment subject to this rulemaking similar to that defined for VRF multi-split systems in AHRI 1230-2021 in order to ensure controls performance. (*Id.*)

[31] The $H4_2$ heating test is an optional full-load test for central air conditioners and heat pumps conducted at an outdoor entering temperature of 5 °F.

DOE is aware that there is ongoing work addressing questions about whether the current DOE and industry test procedures for variable-speed air conditioners and heat pumps are fully representative. However, in this final rule, DOE is aligning the test procedures for three-phase equipment with the current test procedure for single-phase products, consistent with the referenced industry test procedures in ASHRAE 90.1-2019. EPCA requires that the test procedures for small commercial package air conditioning and heating equipment (including the three-phase equipment subject to this rulemaking) shall be those generally accepted industry testing procedures or rating procedures developed or recognized by the AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, EPCA requires that if an industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the *Federal Register* and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B)) AHRI 210/240-2023, referenced in ASHRAE Standard 90.1, does not include a dynamic load based testing method, does not mandate the $H4_2$ test, and does not include a CVP. Further, commenters did not provide evidence to support deviating from AHRI 210/240-2023 to adopt such provisions. Therefore, DOE has concluded that it lacks clear or convincing evidence to adopt the test methods and provisions suggested by Joint Advocates, CA IOUs, NEEA, and NYSERDA in this rulemaking.

Additionally, CA IOUs and NYSERDA raised the issue of DOE coverage of air moving systems paired with coil-only three-phase ACUACs and ACUHPs. (CA IOUs,

No. 18 at p. 2; NYSERDA, No. 13 at p. 2) CA IOUs and NYSERDA commented that DOE's test procedure set forth in appendix AA to subpart B of 10 CFR part 430 ("appendix AA") addresses the measurement of energy consumption of furnace fans in single-phase products, but that no such test procedure exists in 10 CFR part 431 for indoor blowers or designated air movers paired with coil-only three-phase ACUACs and ACUHPs. (*Id.*) NYSERDA further commented that thousands of coil-only three-phase ACUAC and ACUHP combinations are currently available and that the test procedure for the three-phase equipment subject to this rulemaking does not account for all energy being used for such systems. NYSERDA recommended that DOE investigate avenues to address this challenge. (NYSERDA, No. 13 at p. 2)

As recognized by CA IOUs and NYSERDA, while the test method set forth in appendix AA addresses the measurement of energy consumption of furnace fans in single-phase products, it does not currently apply to three-phase furnace fans. While indoor fans present in blower-coil combinations of three-phase ACUAC and ACUHP are included in the three-phase equipment subject to the test procedures being established as part of this rulemaking, any three-phase furnace fans paired with coil-only combinations of three-phase ACUAC and ACUHP are not currently subject to a test procedure that accounts for their energy consumption. Three-phase furnace fans are outside the scope of this rulemaking as they are not covered within the definition of small commercial package air conditioning and heating equipment, but DOE may address this equipment as part of a separate rulemaking, as applicable.

G. Effective and Compliance Dates

The effective date for the adopted test procedure amendments 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 procedures adopted in this final rule are required only for the evaluation and issuance of updated efficiency standards (*e.g.*, standards using the SEER2 and HSPF2 metrics), compliance with the amended test procedure does not require use of such modified test procedure provisions until the compliance date of those updated standards.

Any voluntary representations of SEER2 and HSPF2 made prior to the compliance date of amended standards for three-phase equipment that rely on SEER2 and HSPF2 would need to be based on appendix F1 starting 360 days after publication of this final rule in the *Federal Register*. Manufacturers may use appendix F1 to certify compliance with any amended standards based on SEER2 and HSPF2, if adopted, prior to the applicable compliance date for those energy conservation standards.

H. Test Procedure Costs

EPCA requires that the test procedures for small commercial package air conditioning and heating equipment, which includes 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h, be generally accepted industry testing procedures or rating

procedures developed or recognized by either AHRI or ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, if such an industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure unless DOE determines, by rule published in the *Federal Register* and supported by clear and convincing evidence, that such an amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2)-(3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

In this final rule, DOE is amending the existing test procedures for three-phase, less than 65,000 Btu/h equipment by incorporating by reference, with some modification, the updated version of the applicable industry test method, AHRI 210/240-2023, including the energy efficiency metrics SEER2 and HSPF2. DOE is also amending certain representation requirements to align more closely with the representation requirements for single-phase CAC/HPs. Amendments to both the test procedures and representation requirements in this final rule are consistent with comments from interested parties who supported aligning the Federal regulations for the three-phase equipment addressed in this document with the regulations of their single-phase consumer product counterparts.

DOE has determined that these test procedures would be representative of an average use cycle and would not be unduly burdensome for manufacturers to conduct. Appendix F, measuring both SEER and HSPF per ANSI/AHRI 210/240-2008, does not contain any changes from the current Federal test procedures, and therefore would not require retesting solely as a result of DOE's adoption of this amendment. Similarly,

appendix F1, measuring both SEER2 and HSPF2 per AHRI 210/240-2023, would not lead to an increase in cost as compared with testing to the test procedures in appendix F. Specifically, DOE estimates that the cost for third-party lab testing in accordance with appendix F1 would be $5,500 for air conditioners and $8,500 for heat pumps, which is consistent with the costs for testing in accordance with the current test procedures.

As discussed in section III.E.1 of this final rule, DOE is amending the representation requirements for certifying basic models of three-phase, less than 65,000 Btu/h equipment to harmonize with the requirements for single-phase products. For models of outdoor units with no match and multi-split, multi-circuit, and multi-head mini-split systems, this amendment of the representation requirements may increase testing requirements for three-phase equipment compared to the existing requirements. However, DOE is not aware of any such models on the market in these categories, and, accordingly, DOE has concluded that the representation requirements will not lead to an increase in testing cost for any manufacturer.

As discussed in section III.E.1 of this final rule, DOE is amending the AEDM[32] requirements for certifying basic models of three-phase, less than 65,000 Btu/h single-package units and single-split systems. Because most manufacturers' models of three-phase, less than 65,000 Btu/h equipment are nearly identical to their corresponding

[32] Manufacturers are not required to perform laboratory testing on all basic models. In accordance with 10 CFR 429.70, three-phase, less than 65,000 Btu/h equipment manufacturers may elect to use AEDMs. An AEDM is a computer modeling or mathematical tool that predicts the performance of non-tested basic models. Such tools, when properly developed, can provide a means to predict the energy usage or efficiency characteristics of a basic model of a given covered product or equipment and reduce the burden and cost associated with testing.

single-phase consumer products, DOE is allowing the use of an AEDM validated using testing of otherwise identical single-phase counterparts for certifying basic models of three-phase, less than 65,000 Btu/h single package units and split systems. For manufacturers that produce both single-phase consumer products and three-phase, less than 65,000 Btu/h equipment, this adoption would reduce any burden that might result from the proposed test procedures in appendix F1 of this final rule because, for such manufacturers, all certification of three-phase, less than 65,000 Btu/h equipment could be conducted using AEDMs without testing the three-phase, less than 65,000 Btu/h equipment.

As discussed previously throughout this final rule, the test procedures in appendix F1 will not be mandatory until the compliance date of any amended energy conservation standards based on SEER2 and HSPF2. Given that most manufacturers of the three-phase equipment subject to this final rule are AHRI members, and DOE is referencing the prevailing industry test procedure that was established for use in AHRI's certification program (which DOE presumes will be updated to include SEER2 and HSPF2), DOE expects that manufacturers will already be testing using the test methods in AHRI 210/240-2023 by January 1, 2023 – the effective date for minimum SEER2 and HSPF2 levels in ASHRAE 90.1-2019 for three-phase equipment, and also the date on which testing according to appendix M1 for single-phase central air conditioners is required.

Based on this expectation, DOE tentatively determined in the December 2021 NOPR that the test procedure amendments would not increase the testing burden on three-phase, less than 65,000 Btu/h equipment manufacturers. 86 FR 70316, 70329.

Additionally, DOE tentatively determined that the test procedure amendments 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. *Id.*

Lennox commented that the harmonized test procedures would reduce manufacturer burden as compared to manufacturers having to follow two separate test procedures. (Lennox, No. 14 at p. 5) AHRI indicated that there would be no expected increase in test burden if their concerns regarding the adoption of appendix G of AHRI 210/240-2023 were addressed. (AHRI, No. 16 at p. 6)

In response to the comments by AHRI, DOE's reasoning behind its decision not to adopt appendix G of AHRI 210/240-2023 is discussed in section III.D.2.c of this final rule. And based on the reasons discussed in the December 2021 NOPR and this document, DOE has concluded that the test procedure amendments adopted in this final rule will not increase testing burden on manufacturers, compared to current industry practice.

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.

On December 8, 2021, DOE published in the *Federal Register* a notice of proposed rulemaking proposing, in relevant part, to update the references in the Federal test procedures to the most recent version of the relevant industry test procedures as they relate to air-cooled, three-phase, small commercial air conditioners and heat pumps with a cooling capacity of less than 65,000 British thermal units per hour ("3-phase ACUACs

and ACUHPs with cooling capacity of less than 65,000 Btu/h") and air-cooled, three-phase, variable refrigerant flow ("VRF" or "VRF multi-split systems") air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h ("3-phase VRF with cooling capacity of less than 65,000 Btu/h"). In addition, DOE proposed to update most of its compliance and enforcement requirements for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h to be consistent with those for the consumer product counterparts (*i.e.*, air-cooled, single-phase, central air conditioners and central air conditioning heat pumps with a cooling capacity of less than 65,000 Btu/h (which include single-phase VRF multi-split systems)).

As part of the December 2021 NOPR, DOE conducted its initial regulatory flexibility analysis ("IRFA"). The following sections outline DOE's determination 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 did not receive any written comments that specifically addressed the impacts on small businesses or that were provided directly in response to the IRFA request for comment.

For manufacturers of 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h, the Small Business Administration ("SBA") has set a size threshold, which defines those entities classified as "small businesses" for the purposes of the statute. DOE used the

SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. *See* 13 CFR part 121. The equipment covered by this final rule is classified under North American Industry Classification System ("NAICS") code 333415,[33] "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.

DOE identified manufacturers using DOE's Compliance Certification Database[34] and prior rulemaking information. For three-phase less than 65,000 Btu/h ACUACs and ACUHPs, DOE identified seventeen original equipment manufacturers ("OEM") covered by this rulemaking. DOE did not identify any manufacturers of three-phase, less than 65,000 But/h VRF. DOE screened out companies that do not meet the definition of a "small business" or are foreign-owned and operated. DOE identified four small, domestic OEMs for consideration. DOE used publicly available information and subscription-based market research tools (*e.g.*, reports from Dun & Bradstreet[35]) to determine headcount, revenue, and geographic presence of the small businesses. Of those four small OEMs, one of them is an AHRI member and three are not AHRI members.

[33] The size standards are listed by NAICS code and industry description and are available at **:** *www.sba.gov/document/support-table-size-standards* (last accessed July 18, 2022).
[34] DOE's Compliance Certification Database is available at *www.regulations.doe.gov/certification-data* (last accessed July 18, 2022).
[35] Dun & Bradstreet reports are available at *app.dnbhoovers.com* (last accessed July 18, 2022).

DOE understands all AHRI members and all manufacturers currently certifying in the AHRI Directory (including small businesses) will be testing their models in accordance with AHRI 210/240-2023, the industry test procedure DOE is referencing, and using AHRI's certification program, which DOE presumes will be updated to include the SEER2 and HSPF2 metrics. The test procedures' amendments would not add any additional testing burden to manufacturers that are or will be using the AHRI 210/240-2023 test procedure for their models of 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h.

DOE determined the range of additional potential testing costs for the three small businesses that are not AHRI members and do not certify their equipment that is the subject of this final rule in the AHRI Directory. These small businesses would only incur additional testing costs if the companies would not otherwise be using the AHRI 210/240-2023 test procedure to test their models of 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. Of these three small businesses, the first manufacturer certifies one basic model to the DOE Compliance Certification Database, the second manufacturer certifies three basic models to the DOE Compliance Certification Database, and the third manufacturer certifies twelve basic models to the DOE Compliance Certification Database.[36]

[36] DOE's Compliance Certification Database is available at *www.regulations.doe.gov/certification-data* (last accessed July 21, 2022).

In this final rule, DOE is relocating the current DOE test procedures to a new appendix F to subpart F of part 431 ("appendix F") without change. Appendix F does not contain any changes from the current Federal test procedures, and therefore would have no cost to industry and would not require retesting as a result of DOE's adoption of this amendment to the test procedures.

DOE is also amending the test procedures at appendix F1 to subpart F of part 431 ("appendix F1"). Specifically, DOE is incorporating by reference the updated industry test standard AHRI 210/240-2023 for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h (for which the current Federal test procedure references AHRI 210-240-2008) and for 3-phase VRF with cooling capacity of less than 65,000 Btu/h (for which the current Federal test procedure references AHRI 1230-2010). In addition, DOE is adopting the efficiency metrics SEER2 and HSPF2 from AHRI 210/240-2023 in the test procedure at appendix F1. Finally, DOE is harmonizing representation and enforcement requirements with those applicable to single-phase products.

Appendix F1 adopts the most recent industry test procedure, AHRI 210/240-2023. DOE determined the cost for third-party lab testing according to the appendix F1 test procedure to be $8,500 for three-phase, less than 65,000 Btu/h heating equipment and $5,500 for three-phase, less than 65,000 Btu/h air conditioning equipment.

The first of the three small businesses that DOE analyzed manufactures one basic model of three-phase equipment with a cooling capacity less than 65,000 Btu/h, which is

an air conditioner. If a manufacturer conducts physical testing to certify a basic model, two units are required to be tested for the basic model. If this manufacturer uses a third-party lab to test this basic model, DOE estimates this small business would incur additional testing costs of approximately $11,000. DOE estimates the annual revenue of this small business is approximately $82.5 million; thus, DOE estimates testing costs to be less than 0.01 percent of this manufacturer's annual revenue.

The second of the three small businesses that DOE analyzed manufactures three basic models of three-phase equipment with a cooling capacity less than 65,000 Btu/h, — all of which are air conditioners. If this manufacturer uses a third-party lab to test these basic models, DOE estimates this small business would incur additional testing costs of approximately $33,000. DOE estimates the annual revenue of this small business to be approximately $16 million; thus, DOE estimates testing costs to be less than one percent of this manufacturer's annual revenue.

The third of the three small businesses that DOE analyzed manufactures twelve basic models of three-phase equipment with a cooling capacity less than 65,000 Btu/h, — all of which are air conditioners. If this manufacturer uses a third-party lab to test these basic models, DOE estimates this small business would incur additional testing costs of approximately $132,000. DOE estimates the annual revenue of this small business to be approximately $120 million; thus, DOE estimates testing costs to be less than one percent of this manufacturer's annual revenue.

As a result of this analysis, DOE determined that the cost impacts on the three small businesses 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 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h 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 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. (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.

DOE is not amending the certification or reporting requirements for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h in this final rule. Instead, DOE may consider proposals to amend the certification requirements and reporting for 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h under a separate rulemaking regarding appliance and equipment certification. DOE will address changes to OMB Control Number 1910-1400 at that time, as necessary.

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 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h. 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 amending 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 3-phase ACUACs and ACUHPs with cooling capacity of less than 65,000 Btu/h and 3-phase VRF with cooling capacity of less than 65,000 Btu/h adopted in this final rule incorporates testing methods contained in certain sections of the following commercial standards: AHRI 210/240-2023 and ANSI/ASHRAE 37-2009. DOE has evaluated these standards and is unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (*i.e.*, whether they were 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 final 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

ANSI/AHRI 210/240-2008 is an industry-accepted test procedure for measuring the performance of air conditioning and heating equipment. ANSI/AHRI 210/240-2008 is available on AHRI's website at:

www.ahrinet.org/app_content/ahri/files/standards%20pdfs/ansi%20standards%20pdfs/ansi.ahri%20standard%20210.240%20with%20addenda%201%20and%202.pdf.

AHRI 210/240-2023 is an updated version of the industry-accepted test procedure for measuring the performance of air conditioning and heating equipment. AHRI 210/240-2023 is available on AHRI's website at *www.ahrinet.org/search-standards.aspx*.

ANSI/AHRI 1230-2010 is an industry-accepted test procedure for measuring the performance of VRF multi-split air conditioning and heating equipment. ANSI/AHRI 1230-2010 is available on AHRI's website at *www.ahrinet.org/search-standards.aspx*.

ANSI/ASHRAE 37-2009 is an industry-accepted test procedure that provides a method of test for many categories of air conditioning and heating equipment. ANSI/ASHRAE 37-2009 is available on ANSI's website at *webstore.ansi.org*.

The following standards were previously approved for incorporation by reference in the section where they appear and no change is made: AHRI 210/240-2008, AHRI 340/360-2007, ASHRAE 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, Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on November 22, 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 22, 2022

FRANCISCO MORENO

Digitally signed by FRANCISCO MORENO
Date: 2022.11.22 16:46:43 -05'00'

Francisco Alejandro Moreno

Acting Assistant Secretary for Energy Efficiency and Renewable Energy

U.S. Department of Energy

For the reasons stated in the preamble, DOE amends parts 429 and 431 of Chapter II of Title 10, Code of Federal Regulations 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)(1) through (c)(4) as paragraphs (c)(2) through (c)(5); and

b. Adding new paragraph (c)(1) .

The addition reads as follows:

§429.4 Materials incorporated by reference.

* * * * *

(c) * * *

(1) AHRI Standard 210/240-2023, ("AHRI 210/240-2023"), *2023 Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment*, copyright 2020; IBR approved for §429.67.

* * * * *

3. Amend §429.12 by revising paragraph (b)(8) to read as follows:

§429.12 General requirements applicable to certification reports.

* * * * *

(b) * * *

(8) The test sample size as follows:

(i) The number of units tested for the basic model; or

(ii) In the case of single-split system or single-package central air conditioners and central air conditioning heat pumps; air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h; air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h; or multi-split, multi-circuit, or multi-head mini-split systems other than the "tested combination," the number of units tested for each individual combination or individual model; or

(iii) If an AEDM was used in lieu of testing, enter "0" (and in the case of central air conditioners and central air conditioning heat pumps, this must be indicated separately for each metric);

* * * * *

4. Amend §429.43 by:

a. Revising the section heading;

b. Removing paragraphs (b)(2)(iii), (iv,) (ix) and (x);

c. Redesignating paragraphs (b)(2)(v) through (viii) as paragraphs (b)(2)(iii) through (vi);

d. Redesignating paragraphs (b)(2)(xi) through (xiv) as paragraphs (b)(2)(vii) through (x).

e. Removing paragraphs (b)(4)(iii) through (vi); and

f. Redesignating paragraphs (b)(4)(vii) through (xiii) as paragraphs (b)(4)(iii) through (ix).

The revision reads as follows:

§429.43 Commercial heating, ventilating, air conditioning (HVAC) equipment (excluding air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 British thermal units per hour and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 British thermal units per hour cooling capacity).

* * * * *

5. Add §429.67 to read as follows:

§429.67 Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 British thermal units per hour and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 British thermal units per hour.

(a) *Applicability.* (1) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF), representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in §429.43 of this title as it appeared in the 10 CFR parts 200-499 edition revised as of January 1, 2021.

(2) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio 2 (SEER2) and heating seasonal performance factor 2 (HSPF2) metrics, representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in this section. If manufacturers choose to certify compliance with any standards in terms of SEER2 and

HSPF2 prior to the applicable compliance date for those standards, the requirements of this section must be followed.

(b) *Determination of Represented Value*—(1) *Required represented values.* Determine the represented values (including SEER2, HSPF2, cooling capacity, and heating capacity, as applicable) for the individual models/combinations (or "tested combinations") specified in table 1 to this paragraph (b)(1).

Table 1 to Paragraph (b)(1)

Category	Equipment subcategory	Required represented values
Single-Package unit	Single-Package AC (including Space-Constrained)	Every individual model distributed in commerce.
	Single-Package HP (including Space-Constrained)	
Outdoor Unit and Indoor Unit (Distributed in Commerce by OUM (Outdoor Unit Manufacturer))	Single-Split-System AC with Single-Stage or Two-Stage Compressor (including Space-Constrained and Small-Duct, High Velocity Systems (SDHV))	Every individual combination distributed in commerce. Each model of outdoor unit must include a represented value for at least one coil-only individual combination that is distributed in commerce and which is representative of the least efficient combination distributed in commerce with that particular model of outdoor unit. For that particular model of outdoor unit, additional represented values for coil-only and blower-coil individual combinations are allowed, if distributed in commerce.
	Single-Split-System AC with Other Than Single-Stage or Two-Stage Compressor (including Space-Constrained and SDHV)	Every individual combination distributed in commerce, including all coil-only and blower coil combinations.

Category	Equipment subcategory	Required represented values
	Single-Split-System HP (including Space-Constrained and SDHV)	Every individual combination distributed in commerce.
	Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—non-SDHV (including Space-Constrained)	For each model of outdoor unit, at a minimum, a non-ducted "tested combination." For any model of outdoor unit also sold with models of ducted indoor units, a ducted "tested combination." When determining represented values on or after the compliance date of any amended energy conservation standards, the ducted "tested combination" must comprise the highest static variety of ducted indoor unit distributed in commerce (i.e., conventional, mid-static, or low-static). Additional representations are allowed, as described in paragraph (d)(3) of this section.
	Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV	For each model of outdoor unit, an SDHV "tested combination." Additional representations are allowed, as described in paragraph (d)(3) of this section.
Indoor Unit Only Distributed in Commerce by ICM (Independent Coil Manufacturer)	Single-Split-System Air Conditioner (including Space-Constrained and SDHV)	Every individual combination distributed in commerce.
	Single-Split-System Heat Pump (including Space-Constrained and SDHV)	
	Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV	For a model of indoor unit within each basic model, a SDHV "tested combination." Additional representations are allowed, as described in section (d)(3)(ii) of this section.
Outdoor Unit with no Match		Every model of outdoor unit distributed in commerce (tested with

Category	Equipment subcategory	Required represented values
		a model of coil-only indoor unit as specified in paragraph (c)(2) of this section).

(2) *Refrigerants.* (i) If a model of outdoor unit (used in a single-split, multi-split, multi-circuit, multi-head mini-split, and/or outdoor unit with no match system) is distributed in commerce and approved for use with multiple refrigerants, a manufacturer must determine all represented values for that model using each refrigerant that can be used in an individual combination of the basic model (including outdoor units with no match or "tested combinations"). This requirement may apply across the listed categories in table 1 to paragraph (b)(1) of this section. A refrigerant is considered approved for use if it is listed on the nameplate of the outdoor unit. If any of the refrigerants approved for use is HCFC-22 or has a 95 °F midpoint saturation absolute pressure that is ± 18 percent of the 95 °F saturation absolute pressure for HCFC-22, or if there are no refrigerants designated as approved for use, a manufacturer must determine represented values (including SEER2, HSPF2, cooling capacity, and heating capacity, as applicable) for, at a minimum, an outdoor unit with no match. If a model of outdoor unit is not charged with a specified refrigerant from the point of manufacture or if the unit is shipped requiring the addition of more than two pounds of refrigerant to meet the charge required for testing per Section 5.1.8 of AHRI 210/240-2023 (incorporated by reference, see §429.4) (unless either {a} the factory charge is equal to or greater than 70 percent of the outdoor unit internal volume multiplied by the liquid density of refrigerant at 95 °F or {b} an A2L refrigerant is approved for use and listed in the certification report), a

manufacturer must determine represented values (including SEER2, HSPF2, cooling capacity, and heating capacity, as applicable) for, at a minimum, an outdoor unit with no match.

(ii) If a model is approved for use with multiple refrigerants, a manufacturer may make multiple separate representations for the performance of that model (all within the same individual combination or outdoor unit with no match) using the multiple approved refrigerants. In the alternative, manufacturers may certify the model (all within the same individual combination or outdoor unit with no match) with a single representation, provided that the represented value is no more efficient than its performance using the least-efficient refrigerant. A single representation made for multiple refrigerants may not include equipment in multiple categories or equipment subcategories listed in table 1 to paragraph (b)(1) of this section.

(3) *Limitations for represented values of individual combinations.* Paragraph (b)(3)(i) of this section explains the limitations for represented values of individual combinations (or "tested combinations").

(i) *Multiple product classes.* Models of outdoor units that are rated and distributed in individual combinations that span multiple product classes must be tested, rated, and certified pursuant to paragraph (b) of this section as compliant with the applicable standard for each product class.

(ii) Reserved.

(4) *Requirements.* All represented values under paragraph (b) of this section must be based on testing in accordance with the requirements in paragraph (c) of this section or the application of an AEDM or other methodology as allowed in paragraph (d) of this section.

(c) *Units tested*—(1) *General.* The general requirements of §429.11 apply to air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h, and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h; and

(2) *Sampling plans and represented values.* For individual models (for single-package systems) or individual combinations (for split-systems, including "tested combinations" for multi-split, multi-circuit, and multi-head mini-split systems) with represented values determined through testing, each individual model/combination (or "tested combination") must have a sample of sufficient size tested in accordance with the applicable provisions of this subpart. For heat pumps (other than heating-only heat pumps), all units of the sample population must be tested in both the cooling and heating modes and the results used for determining all representations. The represented values for any individual model/combination must be assigned such that:

(i) *Off-Mode.* Any represented value of power consumption or other measure of energy consumption for which consumers would favor lower values must be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, x is the sample mean; n is the number of samples; and x_i is the i^{th} sample; or,

(B) The upper 90 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.90}(\frac{s}{\sqrt{n}})$$

And x is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.90}$ is the t statistic for a 90 percent one-tailed confidence interval with n−1 degrees of freedom (from appendix A of this subpart). Round represented values of off-mode power consumption to the nearest watt.

(ii) *SEER2 and HSPF2.* Any represented value of the energy efficiency or other measure of energy consumption for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; *n* is the number of samples; and x_i is the ith sample; or,

(B) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.90}(\frac{s}{\sqrt{n}})$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.90}$ is the t statistic for a 90 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart). Round represented values of SEER2 and HSPF2 to the nearest 0.05.

(iii) *Cooling Capacity and Heating Capacity.* The represented values of cooling capacity and heating capacity must each be a self-declared value that is:

(A) Less than or equal to the lower of:

(1) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and x_i is the ith sample; or,

(2) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.90}(\frac{s}{\sqrt{n}})$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.90}$ is the t statistic for a 90 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix D of this part).

(B) Rounded according to:

(1) The nearest 100 Btu/h if cooling capacity or heating capacity is less than 20,000 Btu/h,

(2) The nearest 200 Btu/h if cooling capacity or heating capacity is greater than or equal to 20,000 Btu/h but less than 38,000 Btu/h, and

(3) The nearest 500 Btu/h if cooling capacity or heating capacity is greater than or equal to 38,000 Btu/h and less than 65,000 Btu/h.

(d) *Determination of represented values*—(1) *All basic models except outdoor units with no match and multi-split systems, multi-circuit systems, and multi-head mini-split systems.* For every individual model/combination within a basic model, either—

(i) A sample of sufficient size, comprised of production units or representing production units, must be tested as complete systems with the resulting represented values for the individual model/combination obtained in accordance with paragraphs (c)(1) and (2) of this section; or

(ii) The represented values of the measures of energy efficiency or energy consumption through the application of an AEDM in accordance with paragraph (e) of this section and §429.70.(2) *Outdoor units with no match.* All models of outdoor units

with no match within a basic model must be tested with a model of coil-only indoor unit meeting the requirements of Section 5.1.6.2 of AHRI 210/240-2023. Models of outdoor units with no match may not be rated with an AEDM, other than to determine the represented values for models using approved refrigerants other than the one used in testing.

(3) *For multi-split systems, multi-circuit systems, and multi-head mini-split systems.* The following applies:

(i) For each non-SDHV basic model, at a minimum, a manufacturer must test the model of outdoor unit with a "tested combination" composed entirely of non-ducted indoor units. For any models of outdoor units also sold with models of ducted indoor units, a manufacturer must test a second "tested combination" composed entirely of ducted indoor units (in addition to the non-ducted combination). The ducted "tested combination" must comprise the highest static variety of ducted indoor unit distributed in commerce (*i.e.,* conventional, mid-static, or low-static).

(ii) If a manufacturer chooses to make representations of a variety of a basic model (i.e., conventional, low static, or mid-static) other than a variety for which a representation is required under paragraph (b)(1) of this section the manufacturer must conduct testing of a tested combination according to the requirements in paragraphs (c)(1) and (2) of this section.

(iii) For basic models that include mixed combinations of indoor units (*i.e.*, combinations that are comprised of any two of the following varieties – non-ducted, low-

static, mid-static, and conventional ducted indoor units), the represented value for the mixed combination is the mean of the represented values for the individual component combinations as determined in accordance with paragraphs (c)(1) and (2) and (d)(3)(i) and (ii) of this section.

(iv) For each SDHV basic model distributed in commerce by an OUM, the OUM must, at a minimum, test the model of outdoor unit with a "tested combination" composed entirely of SDHV indoor units. For each SDHV basic model distributed in commerce by an ICM, the ICM must test the model of indoor unit with a "tested combination" composed entirely of SDHV indoor units, where the outdoor unit is the least efficient model of outdoor unit with which the SDHV indoor unit will be paired. The least efficient model of outdoor unit is the model of outdoor unit in the lowest SEER2 combination as certified by the outdoor unit manufacturer. If there are multiple outdoor unit models with the same lowest SEER2 represented value, the indoor coil manufacturer may select one for testing purposes.

(v) For basic models that include SDHV and an indoor unit of another variety (i.e., non-ducted, low-static, mid-static, and conventional ducted), the represented value for the mixed SDHV/other combination is the mean of the represented values for the SDHV and other tested combination as determined in accordance with paragraphs (c)(1) and (2) and paragraphs (d)(3)(i) through (ii) of this section.

(vi) All other individual combinations of models of indoor units for the same model of outdoor unit for which the manufacturer chooses to make representations must be rated

as separate basic models, and the provisions of paragraphs (c)(1) and (2) and (d)(3)(i) through (v) of this section apply.

(e) *Alternative efficiency determination methods.* In lieu of testing, represented values of efficiency or consumption may be determined through the application of an AEDM pursuant to the requirements of §429.70(l) and the provisions of this section.

(1) *Power or energy consumption.* Any represented value of the average off mode power consumption or other measure of energy consumption of an individual model/combination for which consumers would favor lower values must be greater than or equal to the output of the AEDM but no greater than the standard.

(2) *Energy efficiency.* Any represented value of the SEER2, HSPF2, or other measure of energy efficiency of an individual model/combination for which consumers would favor higher values must be less than or equal to the output of the AEDM but no less than the standard.

(3) *Cooling capacity.* The represented value of cooling capacity of an individual model/combination must be no greater than the cooling capacity output simulated by the AEDM.

(4) *Heating capacity.* The represented value of heating capacity of an individual model/combination must be no greater than the heating capacity output simulated by the AEDM.

(f) *Certification reports.* This paragraph specifies the information that must be included in a certification report.

(1) The requirements of §429.12; and

(2) Pursuant to §429.12(b)(13), for each individual model (for single-package systems) or individual combination (for split-systems, including outdoor units with no match and "tested combinations" for multi-split, multi-circuit, and multi-head mini-split systems), a certification report must include the following public equipment-specific information:

(i) Commercial package air conditioning equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase): The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(ii) Commercial package heating equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase): The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)), the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(iii) Variable refrigerant flow multi-split air conditioners that are air-cooled with rated cooling capacity of less than 65,000 Btu/h (3-Phase): The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)) and rated cooling capacity in British thermal units per hour (Btu/h).

(iv) Variable refrigerant flow multi-split heat pumps that are air-cooled with rated cooling capacity of less than 65,000 Btu/h (3-Phase): The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh), the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/Wh), and rated cooling capacity in British thermal units per hour (Btu/h).

(3) Pursuant to §429.12(b)(13), for each individual model/combination (including outdoor units with no match and "tested combinations"), a certification report must include supplemental information submitted in PDF format. The equipment-specific, supplemental information must include any additional testing and testing set up instructions (*e.g.,* charging instructions) for the basic model; identification of all special features that were included in rating the basic model; and all other information (*e.g.,* operational codes or component settings) necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (*e.g.,* manuals) for DOE consideration in performing testing under subpart C of this part. The equipment-specific, supplemental information must include at least the following:

(i) Air cooled commercial package air conditioning equipment with a cooling capacity of less than 65,000 Btu/h (3-phase): The nominal cooling capacity in British thermal units per hour (Btu/h); rated airflow in standard cubic feet per minute (SCFM) for each fan coil; rated static pressure in inches of water; refrigeration charging instructions (e.g., refrigerant charge, superheat and/or subcooling temperatures); frequency or control set points for variable speed components (*e.g.,* compressors, VFDs);

required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model.

(ii) Commercial package heating equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-phase): The nominal cooling capacity in British thermal units per hour (Btu/h); rated heating capacity in British thermal units per hour (Btu/h); rated airflow in standard cubic feet per minute (SCFM) for each fan coil; rated static pressure in inches of water; refrigeration charging instructions (*e.g.*, refrigerant charge, superheat and/or subcooling temperatures); frequency or control set points for variable speed components (*e.g.*, compressors, VFDs); required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model.

(iii) Variable refrigerant flow multi-split air conditioners that are air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase): The nominal cooling capacity in British thermal units per hour (Btu/h); outdoor unit(s) and indoor units identified in the tested combination; components needed for heat recovery, if applicable; rated airflow in standard cubic feet per minute (SCFM) for each indoor unit; rated static pressure in inches of water; compressor frequency set points; required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, upon DOE request, the manufacturer must provide a layout of the system set-up for testing including charging instructions consistent with the installation manual.

(iv) Variable refrigerant flow multi-split heat pumps that are air-cooled with a rated cooling capacity of less than 65,000 Btu/h (3-Phase): The nominal cooling capacity in British thermal units per hour (Btu/h); rated heating capacity in British thermal units per hour (Btu/h); outdoor unit(s) and indoor units identified in the tested combination; components needed for heat recovery, if applicable; rated airflow in standard cubic feet per minute (SCFM) for each indoor unit; rated static pressure in inches of water; compressor frequency set points; required dip switch/control settings for step or variable

components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, upon DOE request, the manufacturer must provide a layout of the system set-up for testing including charging instructions consistent with the installation manual.

6. Amend §429.70 by:

a. Revising paragraph (c)(1) introductory text;

b. Revising the tables in paragraphs (c)(2)(iv) and

(c)(5)(vi)(B); and

c. Adding paragraph (l).

The revisions and addition read as follows:

§429.70 Alternative methods for determining energy efficiency and energy use.

* * * * *

(c) Alternative efficiency determination method (AEDM) for commercial HVAC & WH products (excluding air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 Btu/h cooling capacity), and commercial refrigerators, freezers, and refrigerator-freezers—(1) Criteria an AEDM must satisfy. A manufacturer may not apply an AEDM to a basic model to determine its efficiency pursuant to this section unless:

* * * * *

(2) * * *

(iv) * * *

Validation class	**Minimum number of distinct models that must be tested per AEDM**
(A) Commercial HVAC validation classes	
Air-Cooled, Split and Packaged ACs and HPs Greater than or Equal to 65,000 Btu/h Cooling Capacity and Less than 760,000 Btu/h Cooling Capacity	2 Basic Models.
Water-Cooled, Split and Packaged ACs and HPs, All Cooling Capacities	2 Basic Models.
Evaporatively-Cooled, Split and Packaged ACs and HPs, All Capacities	2 Basic Models.
Water-Source HPs, All Capacities	2 Basic Models.
Single Package Vertical ACs and HPs	2 Basic Models.

Packaged Terminal ACs and HPs	2 Basic Models.
Air-Cooled, Variable Refrigerant Flow ACs and HPs Greater than or Equal to 65,000 Btu/h Cooling Capacity	2 Basic Models.
Water-Cooled, Variable Refrigerant Flow ACs and HPs	2 Basic Models.
Computer Room Air Conditioners, Air Cooled	2 Basic Models.
Computer Room Air Conditioners, Water-Cooled	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Air-cooled or Air-source Heat Pump, Without Ventilation Energy Recovery Systems	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Air-cooled or Air-source Heat Pump, With Ventilation Energy Recovery Systems	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Water-cooled, Water-source Heat Pump, or Ground Source Closed-loop Heat Pump, Without Ventilation Energy Recovery Systems	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Water-cooled, Water-source Heat Pump, or Ground Source Closed-loop Heat Pump, With Ventilation Energy Recovery Systems	2 Basic Models.
(B) Commercial water heater validation classes	
Gas-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons	2 Basic Models.
Gas-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons	2 Basic Models.
Oil-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons	2 Basic Models.
Oil-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons	2 Basic Models.
Electric Water Heaters	2 Basic Models.
Heat Pump Water Heaters	2 Basic Models.
Unfired Hot Water Storage Tanks	2 Basic Models.
(C) Commercial packaged boilers validation classes	
Gas-fired, Hot Water Only Commercial Packaged Boilers	2 Basic Models.
Gas-fired, Steam Only Commercial Packaged Boilers	2 Basic Models.
Gas-fired Hot Water/Steam Commercial Packaged Boilers	2 Basic Models.

Oil-fired, Hot Water Only Commercial Packaged Boilers	2 Basic Models.
Oil-fired, Steam Only Commercial Packaged Boilers	2 Basic Models.
Oil-fired Hot Water/Steam Commercial Packaged Boilers	2 Basic Models.
(D) Commercial furnace validation classes	
Gas-fired Furnaces	2 Basic Models.
Oil-fired Furnaces	2 Basic Models.
(E) Commercial refrigeration equipment validation classes	
Self-Contained Open Refrigerators	2 Basic Models.
Self-Contained Open Freezers	2 Basic Models.
Remote Condensing Open Refrigerators	2 Basic Models.
Remote Condensing Open Freezers	2 Basic Models.
Self-Contained Closed Refrigerators	2 Basic Models.
Self-Contained Closed Freezers	2 Basic Models.
Remote Condensing Closed Refrigerators	2 Basic Models.
Remote Condensing Closed Freezers	2 Basic Models.

[1] *The minimum number of tests indicated above must be comprised of a transparent model, a solid model, a vertical model, a semi-vertical model, a horizontal model, and a service-over-the counter model, as applicable based on the equipment offering. However, manufacturers do not need to include all types of these models if it will increase the minimum number of tests that need to be conducted.*

* * * * *

(5) * * *

(vi) * * *

(B) * * *

Equipment	Metric	Applicable tolerance

Commercial Packaged Boilers	Combustion Efficiency Thermal Efficiency	5% (0.05) 5% (0.05)
Commercial Water Heaters or Hot Water Supply Boilers	Thermal Efficiency Standby Loss	5% (0.05) 10% (0.1)
Unfired Storage Tanks	R-Value	10% (0.1)
Air-Cooled, Split and Packaged ACs and HPs Greater than or Equal to 65,000 Btu/h Cooling Capacity and Less than 760,000 Btu/h Cooling Capacity	Energy Efficiency Ratio Coefficient of Performance Integrated Energy Efficiency Ratio	5% (0.05) 5% (0.05) 10% (0.1)
Water-Cooled, Split and Packaged ACs and HPs, All Cooling Capacities	Energy Efficiency Ratio Coefficient of Performance Integrated Energy Efficiency Ratio	5% (0.05) 5% (0.05) 10% (0.1)
Evaporatively-Cooled, Split and Packaged ACs and HPs, All Capacities	Energy Efficiency Ratio Coefficient of Performance Integrated Energy Efficiency Ratio	5% (0.05) 5% (0.05) 10% (0.1)
Water-Source HPs, All Capacities	Energy Efficiency Ratio Coefficient of Performance Integrated Energy Efficiency Ratio	5% (0.05) 5% (0.05) 10% (0.1)
Single Package Vertical ACs and HPs	Energy Efficiency Ratio Coefficient of Performance	5% (0.05) 5% (0.05)
Packaged Terminal ACs and HPs	Energy Efficiency Ratio Coefficient of Performance	5% (0.05) 5% (0.05)
Variable Refrigerant Flow ACs and HPs (Excluding Air-Cooled, Three-phase with Less than 65,000 Btu/h Cooling Capacity)	Energy Efficiency Ratio Coefficient of Performance Integrated Energy Efficiency Ratio	5% (0.05) 5% (0.05) 10% (0.1)
Computer Room Air Conditioners	Sensible Coefficient of Performance	5% (0.05)
Direct Expansion-Dedicated Outdoor Air Systems	Integrated Seasonal Coefficient of Performance 2 Integrated Seasonal Moisture Removal Efficiency 2	10% (0.1) 10% (0.1)
Commercial Warm-Air Furnaces	Thermal Efficiency	5% (0.05)
Commercial Refrigeration Equipment	Daily Energy Consumption	5% (0.05)

* * * * *

(l) *Alternate Efficiency Determination Method (AEDM) for air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 Btu/h cooling capacity.*

(1) *Applicability.* (i) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF), representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in §429.70(c) of this title as it appeared in the 10 CFR parts 200-499 edition revised as of January 1, 2021.

(ii) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio 2 (SEER2) and heating seasonal performance factor 2 (HSPF2) metrics, representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in this section. If manufacturers choose to certify compliance with any standards in terms of SEER2 and HSPF2 prior to the applicable compliance date for those standards, the requirements of this section must be followed.

(2) *Criteria an AEDM must satisfy.* A manufacturer may not apply an AEDM to an individual model/combination to determine its represented values (SEER2 and HSPF2, as applicable) pursuant to this section unless authorized pursuant to §429.67(e) and:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the individual model or combination (SEER2 and HSPF2, as applicable) as measured by the applicable DOE test procedure; and

(ii) The manufacturer has validated the AEDM in accordance with paragraph (i)(3) of this section.

(3) *Validation of an AEDM.* For manufacturers whose models of air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h or air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h are otherwise identical to their central air conditioner and heat pump models (meaning differing only in phase or voltage of the electrical system and the phase or voltage of power input for which the motors and compressors are designed) and who have validated an AEDM for the otherwise identical central air conditioners and heat pumps under §429.70(e)(2), no additional validation is required. For manufacturers whose models of air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h or air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h who have not validated an AEDM for otherwise

identical central air conditioners and heat pumps under §429.70(e)(2) must, before using an AEDM, validate the AEDM's accuracy and reliability as follows:

(i) *Minimum testing*. The manufacturer must test a single unit each of two basic models in accordance with paragraph (i)(3)(iii) of this section. Using the AEDM, calculate the energy use or efficiency for each of the tested individual models/combinations within each basic model. Compare the represented value based on testing and the AEDM energy use or efficiency output according to paragraph (i)(3)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and reliability of the AEDM and that their representations are appropriate and the models being distributed in commerce meet the applicable standards, regardless of the amount of testing required in this paragraph.

(ii) *Individual model/combination tolerances.* This paragraph (i)(3)(ii) provides the tolerances applicable to individual models/combinations rated using an AEDM.

(A) The predicted represented values for each individual model/combination calculated by applying the AEDM may not be more than four percent greater (for measures of efficiency) or less (for measures of consumption) than the values determined from the corresponding test of the individual model/combination.

(B) The predicted energy efficiency or consumption for each individual model/combination calculated by applying the AEDM must meet or exceed the applicable federal energy conservation standard.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current individual models/combinations; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 431 of this chapter; and

(C) Each test must have been performed in accordance with the applicable DOE test procedure with which compliance is required at the time the individual models/combinations used for validation are distributed in commerce.

(4) *AEDM records retention requirements.* If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Product information, complete test data, AEDM calculations, and the statistical comparisons from the units tested that were used to validate the AEDM pursuant to paragraph (i)(3) of this section; and

(iii) Product information and AEDM calculations for each individual model/combination to which the AEDM has been applied.

(5) *Additional AEDM requirements.* If requested by the Department, the manufacturer must:

(i) Conduct simulations before representatives of the Department to predict the performance of particular individual models/combinations;

(ii) Provide analyses of previous simulations conducted by the manufacturer; and/or

(iii) Conduct certification testing of individual models or combinations selected by the Department.

(6) *AEDM verification testing.* DOE may use the test data for a given individual model/combination generated pursuant to §429.104 to verify the represented value determined by an AEDM as long as the following process is followed:

(i) *Selection of units.* DOE will obtain one or more units for test from retail, if available. If units cannot be obtained from retail, DOE will request that a unit be provided by the manufacturer;

(ii) *Lab requirements.* DOE will conduct testing at an independent, third-party testing facility of its choosing. In cases where no third-party laboratory is capable of testing the equipment, testing may be conducted at a manufacturer's facility upon DOE's request.

(iii) *Testing.* At no time during verification testing may the lab and the manufacturer communicate without DOE authorization. If, during test set-up or testing, the lab indicates to DOE that it needs additional information regarding a given individual model or combination in order to test in accordance with the applicable DOE test

procedure, DOE may organize a meeting between DOE, the manufacturer, and the lab to provide such information.

(iv) *Failure to meet certified value.* If an individual model/combination tests worse than its certified value (*i.e.,* lower than the certified efficiency value or higher than the certified consumption value) by more than 5 percent, or the test results in cooling capacity that is lower than its certified cooling capacity, DOE will notify the manufacturer. DOE will provide the manufacturer with all documentation related to the test set up, test conditions, and test results for the unit. Within the timeframe allotted by DOE, the manufacturer may present any and all claims regarding testing validity.

(v) *Tolerances.* This paragraph specifies the tolerances DOE will permit when conducting verification testing.

(A) For consumption metrics, the result from a DOE verification test must be less than or equal to 1.05 multiplied by the certified represented value.

(B) For efficiency metrics, the result from a DOE verification test must be greater than or equal to 0.95 multiplied by the certified represented value.

(vi) *Invalid represented value.* If, following discussions with the manufacturer and a retest where applicable, DOE determines that the verification testing was conducted appropriately in accordance with the DOE test procedure, DOE will issue a determination that the represented values for the basic model are invalid. The manufacturer must conduct additional testing and re-rate and re-certify the individual models/combinations

within the basic model that were rated using the AEDM based on all test data collected, including DOE's test data.

(vii) *AEDM use.* This paragraph (i)(6)(vii) specifies when a manufacturer's use of an AEDM may be restricted due to prior invalid represented values.

(A) If DOE has determined that a manufacturer made invalid represented values on individual models/combinations within two or more basic models rated using the manufacturer's AEDM within a 24-month period, the manufacturer must test the least efficient and most efficient individual model/combination within each basic model in addition to the individual model/combination specified in §429.16(b)(2). The 24-month period begins with a DOE determination that a represented value is invalid through the process outlined in paragraphs (i)(6)(i) through (vi) of this section.

(B) If DOE has determined that a manufacturer made invalid represented values on more than four basic models rated using the manufacturer's AEDM within a 24-month period, the manufacturer may no longer use an AEDM.

(C) If a manufacturer has lost the privilege of using an AEDM, the manufacturer may regain the ability to use an AEDM by:

(1) Investigating and identifying cause(s) for failures;

(2) Taking corrective action to address cause(s);

(3) Performing six new tests per basic model, a minimum of two of which must be performed by an independent, third-party laboratory from units obtained from retail to validate the AEDM; and

(4) Obtaining DOE authorization to resume use of an AEDM.

7. Section 429.134 is amended by adding paragraph (y) to read as follows:

§429.134 Product-specific enforcement provisions.

* * * * *

(y) *Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h.* The following provisions apply for assessment and enforcement testing of models subject to standards in terms of SEER2 and HSPF2 (as applicable).

(1) *Verification of cooling capacity*. The cooling capacity of each tested unit of the individual model (for single-package units) or individual combination (for split systems) will be measured pursuant to the test requirements of appendix F1 to subpart F of part 431. The mean of the cooling capacity measurement(s) (either the measured cooling capacity for a single unit sample or the average of the measured cooling capacities for a multiple unit sample) will be used to determine the applicable standards for purposes of compliance.

(2) *Verification of C_D value*.

(i) For models other than models of outdoor units with no match, if manufacturers certify that they did not conduct the optional tests to determine the C^c and/or C^h value for an individual model (for single-package systems) or individual combination (for split systems), as applicable, the default value of C^c and/or C^h will be used as the basis for calculation of SEER2 or HSPF2 for each unit tested. If manufacturers certify that they conducted the optional tests to determine the value of C^c and/or C^h for an individual model (for single-package systems) or individual combination (for split systems), as applicable, the value of C^c and/or C^h will be measured pursuant to the test requirements of appendix F1 to subpart F of part 431 for each unit tested. The result for each unit tested (either the tested value or the default value, as selected according to the criteria for the cyclic test in section 4 of appendix F1 to subpart F of part 431) will be used as the basis for calculation of SEER2 or HSPF2 for that unit.

(ii) For models of outdoor units with no match, DOE will use the default value of Cc and/or Ch specified in the test procedure in appendix F1 to subpart F of part 431.

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

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

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

9. Amend §431.92 in the definition of *Basic model,* by revising paragraphs (5) and (7), and adding paragraph (8) to read as follows:

§431.92 Definitions concerning commercial air conditioners and heat pumps.

* * * * *

Basic model includes:

* * * * *

(5) *Small, large, and very large air-cooled or water-cooled commercial package air conditioning and heating equipment* (*excluding air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h cooling capacity)* means all units manufactured by one manufacturer within a single equipment class, having the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common "nominal" cooling capacity.

* * * * *

(7) *Variable refrigerant flow systems (excluding air-cooled, three-phase, variable refrigerant flow air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h)* means all units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s) that have a

common “nominal” cooling capacity and the same heat rejection medium (e.g., air or water) (includes VRF water source heat pumps).

(8) *Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h* and *air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h* means all units manufactured by one manufacturer, having the same primary energy source, and, which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency; where essentially identical electrical, physical, and functional (or hydraulic) characteristics means:

(i) For split systems manufactured by outdoor unit manufacturers (OUMs): all individual combinations having the same model of outdoor unit, which means comparably performing compressor(s) [a variation of no more than five percent in displacement rate (volume per time) as rated by the compressor manufacturer, and no more than five percent in capacity and power input for the same operating conditions as rated by the compressor manufacturer], outdoor coil(s) [no more than five percent variation in face area and total fin surface area; same fin material; same tube material], and outdoor fan(s) [no more than ten percent variation in airflow and no more than twenty percent variation in power input];

(ii) For split systems having indoor units manufactured by independent coil manufacturers (ICMs): all individual combinations having comparably performing

indoor coil(s) [plus or minus one square foot face area, plus or minus one fin per inch fin density, and the same fin material, tube material, number of tube rows, tube pattern, and tube size]; and

(iii) For single-package systems: all individual models having comparably performing compressor(s) [no more than five percent variation in displacement rate (volume per time) rated by the compressor manufacturer, and no more than five percent variations in capacity and power input rated by the compressor manufacturer corresponding to the same compressor rating conditions], outdoor coil(s) and indoor coil(s) [no more than five percent variation in face area and total fin surface area; same fin material; same tube material], outdoor fan(s) [no more than ten percent variation in outdoor airflow], and indoor blower(s) [no more than ten percent variation in indoor airflow, with no more than twenty percent variation in fan motor power input];

(iv) Except that,

(A) For single-package systems and single-split systems, manufacturers may instead choose to make each individual model/combination its own basic model provided the testing and represented value requirements in 10 CFR 429.67 of this chapter are met; and

(B) For multi-split, multi-circuit, and multi-head mini-split combinations, a basic model may not include both individual small-duct, high velocity (SDHV) combinations and non-SDHV combinations even when they include the same model

of outdoor unit. The manufacturer may choose to identify specific individual combinations as additional basic models.

* * * * *

10. Amend §431.95 by:

a. Revising paragraph (b)(1);

b. Redesignating paragraphs (b)(2) through (9) as (b)(3) through (10);

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

d. Revising newly redesignated paragraph (b)(9); and

e. Revising paragraph (c)(2).

The revisions and addition read as follows:

§431.95 Materials incorporated by reference.

* * * * *

(b) * * *

(1) ANSI/AHRI Standard 210/240-2008 (AHRI 210/240-2008), *2008 Standard for Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment*, approved by ANSI on October 27, 2011, and updated by addendum 1 in June 2011 and addendum 2 in March 2012; IBR approved for §431.96 and appendix F to this subpart.

(2) AHRI Standard 210/240-2023 (AHRI 210/240-2023), *2023 Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment*, copyright May 2020 ; IBR approved for appendix F1 to this subpart.

* * * * *

(9) ANSI/AHRI Standard 1230-2010 (AHRI 1230-2010), *2010 Standard for Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment*, approved August 2, 2010, and updated by addendum 1 in March 2011; IBR approved for §431.96 and appendices D and F 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, F1, G, and G1 to this subpart.

* * * * *

11. Amend §431.96 by revising Table 1 to paragraph (b), to read as follows:

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

* * * * *

(b) * * *

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	Appendix F to this subpart[3]	None.
			SEER2 and HSPF2	Appendix F1 to this subpart[3]	None.

	Air-Cooled AC and HP	≥65,000 Btu/h and <135,000 Btu/h	EER, IEER, and COP	Appendix A of 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	Paragraph (e).
Large Commercial Package Air-Conditioning and Heating Equipment	Air-Cooled AC and HP	≥135,000 Btu/h and <240,000 Btu/h	EER, IEER and COP	Appendix A to this subpart	None.
	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	Appendix F to this subpart[3]	None.
			SEER2	Appendix F1 to this subpart[3]	None.
Variable Refrigerant Flow Multi-split Systems, Air-cooled	HP	<65,000 Btu/h (3-phase)	SEER and HSPF	Appendix F to this subpart[3]	None.
			SEER2 and HSPF2	Appendix F1 to this subpart[3]	None.
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 of this subpart[3]	None.
		≥65,000 Btu/h and <760,000 Btu/h	IEER and COP	Appendix D1 of this subpart[3]	None.
Variable Refrigerant Flow Multi-split Systems, Water-source	HP	<760,000 Btu/h	EER and COP	Appendix D of this subpart[3]	None.
		<760,000 Btu/h	IEER and COP	Appendix D1 of this subpart[3]	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/h	ISMRE2 and ISCOP2	Appendix B of 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 table 1, consult the notes at the beginning of those appendices to determine the applicable appendix to use for testing.

* * * * *

Appendix E to Subpart F of Part 431 [Reserved]

12. Add reserved appendix E to subpart F of part 431.

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

Appendix F to Subpart F of Part 431—Uniform Test Method for the Measurement of Energy Consumption of Air-cooled, Three-Phase, Small Commercial Package Air Conditioning and Heating Equipment with a Cooling Capacity of Less than 65,000 Btu/h and Air-Cooled, Three-Phase, Variable Refrigerant Flow Multi-Split Air Conditioners and Heat Pumps with a Cooling Capacity of Less than 65,000 Btu/h

Note: Manufacturers must use the results of testing under this appendix to determine compliance with the relevant standard from §431.97 as that standard appeared

in the January 1, 2022, edition of 10 CFR parts 200-499. Specifically, representations must be based upon results generated either under this appendix or under 10 CFR 431.96 as it appeared in the 10 CFR parts 200-499 edition revised as of January 1, 2021.

For any amended standards for air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h that rely on SEER2 and HSPF2 published after January 1, 2021, manufacturers must use the results of testing under appendix F1 to determine compliance. Representations related to energy consumption must be made in accordance with the appropriate appendix that applies (i.e., appendices F or F1) when determining compliance with the relevant standard. Manufacturers may also use appendix F1 to certify compliance with any amended standards that rely on SEER2 and HSPF2 prior to the applicable compliance date for those standards.

1. Incorporation by Reference

DOE incorporated by reference in §431.95, the entire standard for ANSI/AHRI 210/240-2008 and ANSI/AHRI 1230-2010. However, certain enumerated provisions of those standards, as set forth in this section 1, are inapplicable. To the extent there is a conflict between the terms or provisions of a referenced industry standard and the CFR, the CFR provisions control.

1.1 ANSI/AHRI 210/240-2008:

(a) Section 6.5 - *Tolerances*

(b) Reserved.

1.2 ANSI/AHRI 1230-2010:

(a) Section 5.1.2 – *Manufacturer involvement*

(b) Section 6.6 – *Verification testing and uncertainty*

2. General

2.1 Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h. Determine the seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF) (as applicable) in accordance with ANSI/AHRI 210/240-2008. Sections 3 to 6 of this appendix provide additional instructions for determining SEER and HSPF.

2.2 Air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h. Determine the SEER and HSPF (as applicable) in accordance with ANSI/AHRI 1230-2010.

Sections 3 through 6 of this appendix provide additional instructions for determining SEER and HSPF.

3. Optional break-in period. 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 in this appendix. A manufacturer who elects to use an optional

compressor break-in period in its certification testing should record this period's duration as part of the information in the supplemental testing instructions under 10 CFR 429.43.

4. Additional provisions for equipment set-up. The only additional specifications that may be used in setting up the basic model for test are those set forth in the installation and operation manual shipped with the unit. Each unit should be set up for test in accordance with the manufacturer installation and operation manuals. Sections 3.1 through 3.3 of this appendix provide specifications for addressing key information typically found in the installation and operation manuals.

4.1. If a manufacturer specifies a range of superheat, sub-cooling, and/or refrigerant pressure in its installation and operation manual for a given basic model, any value(s) within that range may be used to determine refrigerant charge or mass of refrigerant, unless the manufacturer clearly specifies a rating value in its installation and operation manual, in which case the specified rating value shall be used.

4.2. The airflow rate used for testing must be that set forth in the installation and operation manuals being shipped to the commercial customer with the basic model and clearly identified as that used to generate the DOE performance ratings. If a rated airflow value for testing is not clearly identified, a value of 400 standard cubic feet per minute (scfm) per ton shall be used.

4.3. For air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h,

the test set-up and the fixed compressor speeds (i.e., the maximum, minimum, and any intermediate speeds used for testing) should be recorded and maintained as part of the test data underlying the certified ratings that is required to be maintained under 10 CFR 429.71.

5. Refrigerant line length corrections for air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h. For test setups where it is physically impossible for the laboratory to use the required line length listed in Table 3 of ANSI/AHRI 1230-2010, then the actual refrigerant line length used by the laboratory may exceed the required length and the following cooling capacity correction factors are applied:		
Piping length beyond minimum, X (ft)	Piping length beyond minimum, Y (m)	Cooling capacity correction (%)
0>X≤20	0>Y≤6.1	1
20>X≤40	6.1>Y≤12.2	2
40>X≤60	12.2>Y≤18.3	3
60>X≤80	18.3>Y≤24.4	4
80>X≤100	24.4>Y≤30.5	5
100 >X≤120	30.5>Y≤36.6	6

6. Manufacturer involvement in assessment or enforcement testing for air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h. A manufacturer's representative will be

allowed to witness assessment and/or enforcement testing. The manufacturer's representative will be allowed to inspect and discuss set-up only with a DOE representative and adjust only the modulating components during testing in the presence of a DOE representative that are necessary to achieve steady-state operation. Only previously documented specifications for set-up as specified under sections 3 and 4 of this appendix will be used.

14. Add appendix F1 to subpart F of part 431 to read as follows:

Appendix F1 to Subpart F of Part 431—Uniform Test Method for the Measurement of Energy Consumption of Air-cooled, Three-Phase, Small Commercial Package Air Conditioning and Heating Equipment with a Cooling Capacity of Less than 65,000 Btu/h and Air-Cooled, Three-Phase, Variable Refrigerant Flow Multi-Split Air Conditioners and Heat Pumps with a Cooling Capacity of Less than 65,000 Btu/h

Note: Manufacturers must use the results of testing under this appendix to determine compliance with any amended standards for air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h provided in §431.97 that are published after January 1, 2021, and that rely on seasonal energy efficiency ratio 2 (SEER2) and heating seasonal performance factor 2 (HSPF2). Representations related to energy consumption must be made in accordance with the

appropriate appendix that applies (i.e., appendices F or F1) when determining compliance with the relevant standard. Manufacturers may also use this appendix to certify compliance with any amended standards that rely on SEER2 and HSPF2 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 210/240-2023 and ANSI/ASHRAE 37-2009. However, certain enumerated provisions of AHRI 210/240-2023 and ANSI/ASHRAE 37-2009, as set forth in this section 1, are inapplicable. To the extent there is a conflict between the terms or provisions of a referenced industry standard and the CFR, the CFR provisions control. Any subsequent amendment to a referenced document by the standard-setting organization will not affect the test procedure in this appendix, unless and until the test procedure is amended by DOE.

1.1. AHRI 210/240-2023:

(a) Section 6 Rating Requirements – 6.1 Standard Ratings – 6.1.8 Tested Combinations or Tested Units

(b) Section 6 Rating Requirements – 6.2 Application Ratings

(c) Section 6 Rating Requirements – 6.4 Ratings

(d) Section 6 Rating Requirements – 6.5 Uncertainty and Variability

(e) Section 7 - Minimum Data Requirements for Published Ratings

(f) Section 8 - Operating Requirements

(g) Section 9 - Marking and Nameplate Data

(h) Section 10 - Conformance Conditions

(i) Appendix C - Certification of Laboratory Facilities Used to Determine Performance of Unitary Air-Conditioning & Air-Source Heat Pump Equipment – Informative

(j) Appendix F - ANSI/ASHRAE Standard 116-2010 Clarifications/Exceptions – Normative - F15.2 and F17

(k) Appendix G - Unit Configuration for Standard Efficiency Determination – Normative

(l) Appendix H - Off-Mode Testing – Normative

(m) Appendix I Verification Testing – Normative

1.2. ANSI/ASHRAE 37-2009:

(a) Section 1 - Purpose

(b) Section 2 - Scope

(c) Section 4 - Classification

2. General. Determine the seasonal energy efficiency ratio 2 (SEER2) and heating seasonal performance factor 2 (HSPF2) (as applicable) in accordance with AHRI 210/240-2023 and ANSI/ASHRAE 37-2009. Sections 3 and 4 to this appendix provide additional instructions for determining SEER2 and HSPF2.

3. Energy Measurement Accuracy. The watt-hour (W□h) measurement system(s) shall be accurate within ± 0.5 percent or 0.5 W□h, whichever is greater, for both ON and OFF cycles. If two measurement systems are used, then the meters shall be switched within 15 seconds of the start of the OFF cycle and switched within 15 seconds prior to the start of the ON cycle.

4. Cycle Stability Requirements. Conduct three complete compressor OFF/ON cycles. Calculate the degradation coefficient CD for each complete cycle. If all three CD values are within 0.02 of the average CD then stability has been achieved, and the highest CD value of these three shall be used. If stability has not been achieved, conduct additional cycles, up to a maximum of eight cycles total, until stability has been achieved between three consecutive cycles. Once stability has been achieved, use the highest CD value of the three consecutive cycles that establish stability. If stability has not been achieved after eight cycles, use the highest CD from cycle one through cycle eight, or the default CD, whichever is lower.