[6450-01-P]

DEPARTMENT OF ENERGY

[Case Number 2023-005; EERE-2023-BT-WAV-0018]

Energy Conservation Program: Notification of Petition for Waiver of Johnson Controls Inc. from the Department of Energy Central Air Conditioners and Heat Pumps Test Procedure and Notification of Grant of Interim Waiver

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

ACTION: Notification of petition for waiver and grant of an interim waiver; request for comments.

SUMMARY: This notification announces receipt of and publishes a petition for waiver and interim waiver from Johnson Controls Inc. ("JCI"), which seeks a waiver for specified basic models of central air conditioners ("CACs") and central air conditioning heat pumps ("HPs") (collectively, "CAC/HPs") from the U.S. Department of Energy ("DOE") test procedure used for determining the efficiency of CAC/HPs. According to JCI, testing its CAC/HP basic models that use variable-speed, oil-injected scroll compressors with only a 20-hour break-in period produces results unrepresentative of their true energy consumption characteristics, and would provide materially inaccurate comparative data. JCI requested that in lieu of the 20-hour break-in limit, it be permitted to test the specified CAC/HP basic models with a 72-hour break-in period. DOE also gives notification of an Interim Waiver Order that requires JCI to test and rate the specified CAC/HP basic models in accordance with the alternate test procedure set forth in the Interim Waiver Order. DOE solicits comments, data, and information concerning JCI's petition and its suggested alternate test procedure so as to inform DOE's final decision on JCI's waiver request.

DATES: Written comments and information are requested and will be accepted on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov* under docket number EERE-2023-BT-WAV-0018. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE-2023-BT-WAV-0018, by any of the following methods:

(1) *Email: JohnsonControlsCACHP2023WAV0018@ee.doe.gov*. Include the case number [Case No. 2023-005] in the subject line of the message.

(2) *Postal Mail:* Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, Petition for Waiver [Case No. 2023-005], 1000 Independence Avenue, SW., Washington, DC, 20585-0121. If possible, please submit all items on a compact disc ("CD"), in which case it is not necessary to include printed copies.

(3) *Hand Delivery/Courier:* Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., 6th Floor, Washington, DC, 20024. Telephone: (202) 287-1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimiles ("faxes") will be accepted. For detailed instructions on submitting comments and additional information on this process, see the "**SUPPLEMENTARY INFORMATION**" section of this document.

Docket: The docket for this activity, which includes *Federal Register* notices, public meeting attendee lists and transcripts (if a public meeting is held), 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 information that is exempt from public disclosure.

The docket webpage can be found at *www.regulations.gov/docket/EERE-2023-BT-WAV-0018*. The docket webpage contains instructions on how to access all documents, including public comments, in the docket. See below for information on how to submit comments through *www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: Ms. Julia Hegarty, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (240) 597-6737 E-mail: *AS_Waiver_Request@ee.doe.gov*.

Mr. Peter Cochran, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-33, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 586-9496. E-mail: *Peter.Cochran@hq.doe.gov*.

SUPPLEMENTARY INFORMATION: DOE is publishing JCI's petition for waiver in its entirety, pursuant to 10 CFR 430.27(b)(1)(iv)[1]. DOE is also publishing the Interim Waiver Order granted to JCI, which serves as notification of DOE's determination regarding JCI's petition for an interim waiver, pursuant to 10 CFR 430.27(e)(3). DOE invites all interested parties to submit in writing by [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***], comments and information on all aspects of the petition, including the alternate test procedure. Pursuant to 10 CFR 430.27(d), any person submitting written comments to DOE must also send a copy of such comments to the petitioner. The contact information for the petitioner is Chris Forth, *chris.m.forth@jci.com*, Johnson Controls Inc., 3110 N. Mead St. Wichita, KS 67219.

Submitting comments via www.regulations.gov. The *www.regulations.gov* web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be

[1] The petition did not identify any of the information contained therein as confidential business information.

publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. If this instruction is followed, persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information ("CBI")). Comments submitted through *www.regulations.gov* cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery/courier, or postal mail. Comments and documents submitted via email, hand delivery/courier, or postal mail also will be posted to *www.regulations.gov.* If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via postal mail or hand delivery/courier, please provide all items on a CD, if feasible, in which case it is not necessary to submit printed copies. Faxes will not be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public

disclosure should submit via email two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. Submit these documents via email. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

Case Number 2023-005

Interim Waiver Order

I. Authority and Background

The Energy Policy and Conservation Act, as amended ("EPCA"),[2] authorizes the U.S. Department of Energy ("DOE") to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part B of EPCA[3] established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency for certain types of consumer products. These products include CAC/HPs, the subject of this document. (42 U.S.C. 6292(a)(3))

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

The Federal testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6295(s)), and (2) making representations about the efficiency of that product (42 U.S.C. 6293(c)). Similarly, DOE

[2] 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.
[3] For editorial reasons, upon codification in the U.S. Code, Part B was redesignated as Part A.

must use these test procedures to determine whether the product complies with relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE is required to follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect the energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C.6293(b)(3)) The test procedure for CAC/HPs is contained in the Code of Federal Regulations ("CFR") at 10 CFR part 430, subpart B, appendix M1, *Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps* ("appendix M1").

Under 10 CFR 430.27, any interested person may submit a petition for waiver from DOE's test procedure requirements. DOE will grant a waiver from the test procedure requirements if DOE determines either that the basic model for which the waiver was requested contains a design characteristic that prevents testing of the basic model according to the prescribed test procedures, or that the prescribed test procedures evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(f)(2). A petitioner must include in its petition any alternate test procedures known to the petitioner to evaluate the performance of the product type in a manner representative of the energy consumption characteristics of the basic model. 10 CFR 430.27(b)(1)(iii). DOE may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(f)(2).

As soon as practicable after the granting of any waiver, DOE will publish in the *Federal Register* a notice of proposed rulemaking to amend its regulations so as to eliminate any need for the continuation of such waiver. 10 CFR 430.27(*l*) As soon thereafter as practicable, DOE will publish in the *Federal Register* a final rule to that effect. *Id*.

The waiver process also provides that DOE may grant an interim waiver if it appears likely that the underlying petition for waiver will be granted and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the underlying petition for waiver. 10 CFR 430.27(e)(3). Within one year of issuance of an interim waiver, DOE will either: (i) publish in the *Federal Register* a determination on the petition for waiver; or (ii) publish in the *Federal Register* a new or amended test procedure that addresses the issues presented in the waiver. 10 CFR 430.27(h)(1).

If the interim waiver test procedure methodology is different than the decision and order test procedure methodology, certification reports to DOE required under 10 CFR 429.12 and any representations must be based on either of the two methodologies until 180 days after the publication date of the decision and order. Thereafter, certification reports and any representations must be based on the decision and order test procedure methodology, unless otherwise specified by DOE. 10 CFR 430.27(i)(1). When DOE amends the test procedure to address the issues presented in a waiver, the waiver or interim waiver will automatically terminate on the date on which use of that test procedure is required to demonstrate compliance. 10 CFR 429.27(h)(3).

II. JCI's Petition for Waiver and Interim Waiver

On July 12, 2023, DOE received from JCI a petition for waiver and interim waiver from the test procedure for CAC/HPs set forth at 10 CFR part 430, subpart B, appendix M1.[4] (JCI, No. 1 at pp. 1-10)[5] Pursuant to 10 CFR 430.27(e)(1), DOE posted the petition on the DOE website at: *www.energy.gov/eere/buildings/current-test-procedure-waivers*. The petition did not identify any of the information contained therein as confidential business information.

According to JCI, testing its CAC/HP basic models that use variable-speed, oil-injected scroll compressors ("VSS systems") with only a 20-hour break-in period produces results unrepresentative of their true energy consumption characteristics, and would provide materially inaccurate comparative data. (JCI, No. 1 at p. 1) JCI requested that in lieu of the 20-hour break-in limit, it be permitted to test its VSS systems with a 72-hour break-in period. *Id.* Consequently, JCI seeks to use an alternate test procedure to test and rate specific CAC/HP basic models, which increases the break-in time limit stipulated in section 3.1.7 of appendix M1. *Id.*

On March 23, 2018, DOE granted JCI a waiver from DOE's then effective CAC/HP test procedure[6] for these same basic models of VSS systems, permitting them to test with a 72-hour break-in period. 83 FR 12735. DOE notes that the alternative test procedure requested by JCI in

[4] The specific basic models identified by JCI can be found in the docket at *www.regulations.gov/docket/EERE-2023-BT-WAV-0018* and is provided at the end of this document.

[5] A notation in this form provides a reference for information that is in the docket for this test procedure waiver (Docket No. EERE- EERE-2023-BT-WAV-0018) (available at *www.regulations.gov/document/EERE-2023-BT-WAV-0018-0001*). This notation indicates that the statement preceding the reference is document number 1 in the docket and appears at pages 1-10 of that document.

[6] On January 1, 2023, use of appendix M1 became required for any representations—including compliance certifications—made with respect to the energy use, power, or efficiency of CAC/HPs. Prior to January 1, 2023, such representations were required to be based on the test procedure at appendix M to subpart B of 10 CFR part 430.

this waiver petition for appendix M1 is identical to the alternative test procedure included in the waiver it previously obtained under appendix M.

JCI also requested an interim waiver from the existing DOE test procedure, noting that DOE previously granted JCI an interim waiver under appendix M regarding the allowable break-in period for these same models in 2017.[7] (JCI, No. 1 at pp. 7-8) Absent an interim waiver, JCI asserted that its VSS systems will continue to be at a competitive disadvantage on the market and consumers will continue to be exposed to materially inaccurate information about the energy consumption characteristics of its VSS systems. *Id.* As the circumstances surrounding JCI's request for an interim waiver and the products and models subject to the waiver have not changed, JCI asserted that an identical interim waiver is warranted. *Id.* DOE will grant an interim waiver if it appears likely that the petition for waiver will be granted, and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination of the petition for waiver. 10 CFR 430.27(e)(3).

III. Requested Alternate Test Procedure

EPCA requires that manufacturers use DOE test procedures when making representations about the energy consumption and energy consumption costs of covered products. (42 U.S.C. 6293(c)) Consistency is important when making representations about the energy efficiency of covered products, including when demonstrating compliance with applicable DOE energy conservation standards. Pursuant to 10 CFR 430.27, and after consideration of public comments on the petition, DOE may establish in a subsequent Decision and Order an alternate test procedure for the basic models addressed by the Interim Waiver Order.

[7] *See* 82 FR 43952 for DOE's notification of petition and grant of interim waiver published on September 20, 2017.

JCI seeks to use an alternate test procedure to test and rate specific CAC/HP basic models of VSS systems consistent with the waiver it previously obtained for these same basic models under appendix M.[8] (JCI, No. 1 at pp. 6-7) In its petition, JCI proposed to test and rate its specified basic models according to the test procedure prescribed by DOE at 10 CFR part 430, subpart B, appendix M1, except that the 20-hour break-in period maximum in section 3.1.7 of appendix M1 be replaced with a 72-hour maximum. *Id.* Under JCI's proposed alternative test procedure, the following language would be used instead of section 3.1.7 of appendix M1:

3.1.7 *Test Sequence*

Manufacturers may optionally operate the equipment under test for a "break-in" period, not to exceed 72 hours, prior to conducting the test method specified in this section. A manufacturer who elects to use this optional compressor break-in period in its certification testing should record this information (including the duration) in the test data underlying the certified ratings that are required to be maintained under 10 CFR 429.71. When testing a ducted unit (except if a heating-only heat pump), conduct the A or A_2 Test first to establish the cooling full-load air volume rate. For ducted heat pumps where the heating and cooling full-load air volume rates are different, make the first heating mode test one that requires the heating full-load air volume rate. For ducted heating-only heat pumps, conduct the H1 or $H1_2$ Test first to establish the heating full-load air volume rate. When conducting a cyclic test, always conduct it immediately after the steady-state test that requires the same test conditions. For variable-speed systems, the first test using the cooling minimum air volume rate should precede the E_v Test, and the first test using the heating minimum air volume rate must precede the $H2_v$ Test. The test laboratory makes all other decisions on the test sequence.

[8] *See* 83 FR 12735.

IV. Interim Waiver Order

DOE has reviewed JCI's application for an interim waiver, the alternate test procedure requested by JCI, and the test data provided by JCI.

DOE tentatively agrees that the circumstances surrounding JCI's request for an interim waiver and the products and models subject to the waiver have not changed since the granting of a similar waiver for testing to appendix M. Specifically, DOE has tentatively determined that the test data provided by JCI demonstrates that the specified VSS system models that are the subject of the waiver have compressors that may require more than the 20 hours of break-in time allowed by appendix M1. The oil injected into the oil-injected scroll compressors increases the coverage of the viscous oil layer between mating surfaces of the scroll. This is presumably its purpose, *i.e.,* to provide additional sealing in the gaps of the mating surfaces to improve compressor volumetric efficiency (relationship between displacement rate and volume flow rate of refrigerant drawn into the compressor). By enhancing this oil layer, the direct contact between irregularities in the surfaces may also be reduced, which would slow the wearing process that smooths out these irregularities, which is the break-in process. For this reason, oil injected compressors are expected to require additional break-in time.

DOE understands that absent a waiver, JCI's products cannot be tested and rated for energy consumption on a basis representative of their true energy consumption characteristics. DOE has initially determined that the alternate test procedure appears to allow for the accurate measurement of the energy efficiency of the specified basic models, while alleviating the testing problems cited by JCI in implementing the DOE test procedure for these basic models. Consequently, DOE has determined that JCI's petition for waiver likely will be granted. Furthermore, DOE has determined that it is desirable for public policy reasons to grant JCI immediate relief pending a determination of the petition for waiver.

For the reasons stated, it is **ORDERED** that:

(1) JCI must test and rate the following CAC/HP basic models that use certain variable-speed, oil-injected scroll compressors with the alternate test procedure set forth in paragraph (2).

	York	**Coleman**	**Luxaire**	**Fraser-Johnston**	**Champion**
Air Conditioners	YXV24B21	AC21B2421	AL21B2421	AL21B2421	AL21B2421
	YXV36B21	AC21B3621	AL21B3621	AL21B3621	AL21B3621
	YXV48B21	AC21B4821	AL21B4821	AL21B4821	AL21B4821
	YXV60B21	AC21B6021	AL21B6021	AL21B6021	AL21B6021
Heat Pumps	YZV24B21	HC20B2421	HL20B2421	HL20B2421	HL20B2421
	YZV36B21	HC20B3621	HL20B3621	HL20B3621	HL20B3621
	YZV48B21	HC20B4821	HL20B4821	HL20B4821	HL20B4821
	YZV60B21	HC20B6021	HL20B6021	HL20B6021	HL20B6021

(2) The alternate test procedure for the JCI basic models identified in paragraph (1) of this Interim Waiver Order is the test procedure for CAC/HPs prescribed by DOE at 10 CFR 430, subpart B, appendix M1 except that the maximum duration of the break-in period is increased from 20 hours to 72 hours, as detailed below. All other requirements of appendix M1 and DOE's regulations remain applicable.

In 3.1.7, *Test Sequence*, test using these instructions:

Manufacturers may optionally operate the equipment under test for a "break-in" period, not to exceed 72 hours, prior to conducting the test method specified in this section. A manufacturer who elects to use this optional compressor break-in period in its certification testing should record this information (including the duration) in the test data underlying the certified ratings that are required to be maintained under 10 CFR 429.71. When testing a ducted unit (except if a heating-only heat pump), conduct the A or A_2 Test first to establish the cooling full-load air volume rate. For ducted heat pumps where the heating and cooling full-load air

volume rates are different, make the first heating mode test one that requires the heating full-load air volume rate. For ducted heating-only heat pumps, conduct the H1 or $H1_2$ Test first to establish the heating full-load air volume rate. When conducting a cyclic test, always conduct it immediately after the steady-state test that requires the same test conditions. For variable-speed systems, the first test using the cooling minimum air volume rate should precede the E_v Test, and the first test using the heating minimum air volume rate must precede the $H2_v$ Test. The test laboratory makes all other decisions on the test sequence.

(3) *Representations*. JCI may not make representations about the efficiency of a basic model listed in paragraph (1) of this Interim Waiver Order for compliance, marketing, or other purposes unless that basic model has been tested in accordance with the provisions set forth in this alternate test procedure and such representations fairly disclose the results of such testing.

(4) This Interim Waiver Order shall remain in effect according to the provisions of 10 CFR 430.27.

(5) This Interim Waiver Order is issued on the condition that the statements, representations, test data, and documentary materials provided by JCI are valid. If JCI makes any modifications to the controls or configurations of a basic model subject to this Interim Waiver Order, such modifications will render the waiver invalid with respect to that basic model, and JCI will either be required to use the current Federal test method or submit a new application for a test procedure waiver. DOE may rescind or modify this waiver at any time if it determines the factual basis underlying the petition for the Interim Waiver Order is incorrect, or the results from the alternate test procedure are unrepresentative of the basic model's true energy consumption characteristics. 10 CFR 430.27(k)(1). Likewise, JCI may request that DOE rescind or modify the Interim Waiver Order if JCI discovers an error in the information provided to DOE

as part of its petition, determines that the interim waiver is no longer needed, or for other appropriate reasons. 10 CFR 430.27(k)(2).

(6) Issuance of this Interim Waiver Order does not release JCI from the applicable requirements set forth at 10 CFR part 429.

DOE makes decisions on waivers and interim waivers for only those basic models specifically set out in the petition, not future models that may be manufactured by the petitioner. JCI may submit a new or amended petition for waiver and request for grant of interim waiver, as appropriate, for additional basic models of CAC/HPs. Alternatively, if appropriate, JCI may request that DOE extend the scope of a waiver or an interim waiver to include additional basic models employing the same technology as the basic model(s) set forth in the original petition consistent with 10 CFR 430.27(g).

Signing Authority

This document of the Department of Energy was signed on October 16, 2023 by Jeffrey Marootian, Principal Deputy 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 October 17, 2023.

Treena V. Garrett,
Federal Register Liaison Officer,
U.S. Department of Energy.

Johnson Controls, Inc.
3110 N. Mead St. Wichita, KS 67219
Tel 316-239-2925 Fax 316-832-6598

July 7, 2023

VIA E-MAIL: AS_Waiver_Requests@ee.doe.gov

Mr. Lucas Adin
(cc. Ashley Armstrong)
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office, EE-5B
1000 Independence Avenue SW
Washington, DC 20585-0121

RE: Petition for Waiver and Interim Waiver of 20 Hour Break-In Period Limit for Certain JCI Central Air Conditioners and Heat Pumps with Variable Speed Compressors

Dear Mr. Adin:

Pursuant to 10 C.F.R. § 430.27, Johnson Controls, Inc. (JCI) respectfully submits this petition for waiver, and request for interim waiver, of the requirement in Section 3.1.7 of the test procedure for central air conditioners (CAC) and heat pumps (HP) found at Appendix M1 to Subpart B of 10 C.F.R. Part 430 that limits an optional compressor "break-in" period to a maximum of 20 hours before testing under Appendix M1 (the "20 Hour Break-In Limit"). Specifically, JCI seeks waiver of the 20 Hour Break-In Limit for its CACs and HPs with variable speed systems that use oil-injected scroll compressors (VSS systems), because testing these systems with only a 20-hour break-in period produces results unrepresentative of their true energy consumption characteristics, and would provide materially inaccurate comparative data.[1] JCI requests that in lieu of the 20 Hour Break-In Limit, it be permitted to test its VSS systems with a 72-hour break-in period.

In 2018, JCI obtained a waiver from the U.S. Department of Energy (DOE) from the break-in period limit of the then operative test procedure, which was found in Appendix M to Subpart B of 10 C.F.R. Part 430 for its CACs and HPs that use VSS systems.[2] Under the granted waiver, JCI was permitted to test its VSS systems with a 72-hour break-in period. As DOE is aware, while Appendix M1 replaced Appendix M effective January 1, 2023, Section 3.1.7 of the new test procedure remains unchanged. JCI also continues to manufacture and market the same types of CACs and HPs with VSS systems for which JCI previously obtained the waiver. For these reasons, JCI now seeks an identical waiver under Appendix M1 as the one it obtained under Appendix M. JCI also seeks an identical interim waiver under Appendix M1 as the one it obtained under Appendix M.

I. Johnson Controls, Inc.

Johnson Controls, Inc. is a diversified equipment and technology company with its operational headquarters in Milwaukee, Wisconsin and approximately 105,000 employees located around the globe. Our employees provide intelligent buildings, energy efficient solutions and integrated infrastructure to optimize energy efficiency and to create the smart buildings and

[1] Section 3.1.7 of Appendix M1 to Subpart B of 10 C.F.R. Part 430.
[2] 83 FR 12735.

communities of the future. Through its Residential & Light Commercial and Ducted Systems division, JCI manufactures and sells CAC and HP systems for residential use, including high efficiency variable speed systems. These products are manufactured in the United States, in Wichita, Kansas.

II. Background

A "break-in" period contemplates the running of equipment for a period of time before beginning of an efficiency test.[3] DOE has found that a "break-in period is particularly important for scroll compressors, which may be less efficient when first started and may require time to warm up to achieve optimal performance. Once the compressor is broken in, the performance should be more representative of the actual field performance."[4] Break-in allows "mating" parts to wear against each other, which results in reduced friction and leakage. Until this initial wear has occurred, the moving parts in the compressor generate greater friction when they contact each other, which decreases efficiency, and the seals between chambers that compress or expand the refrigerant may have greater leakage between the chambers, which reduces efficiency. Oil injection technology improves system efficiency, but the oil in the scroll elements prolongs the time required for this initial wear, which is needed to achieve nominal efficiency.

Section 3.1.7 of Appendix M1 to 10 C.F.R. Part 430, Subpart B provides that the "break-in" period for operated equipment may not exceed 20 hours.

III. Basic Models for Which Waiver Is Requested

JCI requests a waiver from the 20 Hour Break-In Limit for its split-system CAC and HP basic models that use variable speed scroll compressors with an oil-injection system. Specifically, JCI requests waiver for the same models for which it previously requested a waiver, which are listed in Exhibit A.

The variable speed scroll compressors used in these systems are optimized for high-efficiency residential air conditioner and heat pump systems in the 2-ton to 5-ton range.

IV. Grounds for Test Procedure Waiver

JCI requests a waiver on the same grounds that it previously requested a waiver because the circumstances under which DOE granted the previous waiver have not changed. Specifically, JCI requests a waiver for the same products and models that were the subject of the previous waiver, the language in Section 3.1.7 of Appendix M1 to 10 CFR Part 430, Subpart B has not changed from Appendix M to Appendix M1, and JCI has the same reasons and need for this waiver as it did in the previous waiver. While other aspects of the test method have changed, none of those changes alter the amount of time required to break-in the compressor and deliver the performance customers would expect to see in the long term. For these reasons, JCI is relying on the same grounds (and the same testing data) as it did for its previously granted waiver, which are reproduced below:

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DOE's regulations provide for granting of a test procedure waiver where testing of a basic model under the prescribed test procedures would "evaluate the basic model in a manner so unrepresentative of its true energy . . . consumption characteristics as to provide materially inaccurate

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[3] Energy Conservation Standards and Test Procedures for Commercial Heating, Air-Conditioning, and Water-Heating Equipment, Proposed Rule, 77 FR 2355, 2374 (Jan. 17, 2012).
[4] *Id*.

comparative data."[5] JCI seeks a waiver from the 20 Hour Break-In Limit for its VSS systems because limiting the optional break-in period to 20 hours results in testing that provides materially inaccurate data unrepresentative of the true energy efficiency characteristics of these systems.

JCI's VSS systems require significantly more than 20 hours of break-in to reach design efficiency, which is the level of efficiency that is representative of system performance over the lifetime of the VSS system, and would be more appropriately tested with a break-in period of 72 hours. DOE established the 20 hour Break-in Limit to reduce test variability,[6] but because variable speed compressors with oil injection do not completely wear in within 20 hours, performance variability for VSS systems actually increases when break-in is limited to 20 hours. As explained below, JCI conducted testing demonstrating that a 20-hour break-in period does not allow for sufficient break-in for its VSS systems to reach representative efficiency, but that a 72-hour break-in period does.

JCI conducted baseline VSS system performance tests under Appendix M after 20 hours of break-in – the maximum permitted under Appendix M1.[7] JCI then ran the same performance tests on the same units after longer break-in periods, of 44, 68, and 92 hours. JCI's testing shows that for the tested products, measured efficiency increased significantly with break-in periods longer than 20 hours. As is shown in the following sections, the Ev, B1, and F1 tests show substantial gains in efficiency with longer break-in periods.

Table 1 below shows testing data for a 3-ton air conditioning unit with a variable speed scroll compressor with oil injection tested after 20 hours of break-in. The unit was started at A2 conditions and instrumentation was verified before starting the A2 test with 20 hours of accumulated compressor run time. Completion of the A2 test was followed by the B2, B1, Ev, and F1 tests.

JCI then operated the test system for an additional 24 hours, for a total compressor run time of 44 hours, to determine if an increased break-in period improved performance. The results in Table 1 show the calculated SEER2 improved by 0.4 with this additional 24 hour period of break in. The most substantial gain was found in the EV and F1 tests.

Table 1: 3-ton AC System Testing, with 20 Hour Break-In and 44 Hour Break-in

Calorimeter 20 Hr Break-In Compressor							Increased Break-In Run ~ 24 Hours						
Test	ID Capacity	Watts	EER2	CFM	Static	ID Watts	Test	ID Capacity	Watts	EER2	CFM	Static	ID Watts
A2	35103	2778	12.6	1200	0.58	380	A2	35103	2735	14.0	1200	0.58	380
B2	37434	2425	15.4	1200	0.58	380	B2	37136	2402	17.1	1200	0.58	380
Ev	19223	1078	17.8	670	0.16	75	Ev	19162	1040	18.6	670	0.16	75
B1	10366	521	19.9	440	0.26	32	B1	10325	533	18.8	440	0.26	32
F1	11179	329	34.0	440	0.24	32	F1	11215	308	34.3	440	0.24	32
		SEER2	19.2						SEER2	19.6			

JCI then operated the test system for two more 24-hour break-in periods and collected system performance data after each break-in period. A second system was also installed into a psychrometric test cell and tested after the same intervals of compressor run time. As shown in Table 2, the performance data from both samples shows improvement after the first two additional 24-hour break-in periods, tapering off in the third 24-hour break-in period. With an additional 48 hours of break-in, there is an average of 8.5% improvement in SEER2 across both tests. Sample 1 improved from a SEER2 of 19.16 to 20.10 and sample 2 improved from a SEER2 of 18.44 to 20.81. This average gain of more than 1.0 SEER2 is significant in the current marketplace.

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[5] 10 C.F.R. § 430.27(a)(1).

[6] Final Rule at 1445 ("[T]he establishment of the 20-hour limit is to maintain test repeatability among labs regardless of who conducts the test.")

[7] These test results are representative of the break-in characteristics of all models for which JCI seeks waiver herein.

Table 2: 3-ton AC System Performance with Increasing Break-in Periods

Sample 1					Sample 2				
Test	**20 Hr**	**44 Hr**	**68 Hr**	**92 Hr**	**Test**	**20 Hr**	**44 Hr**	**68 Hr**	**92 Hr**
A2	12.64	12.83	12.80	12.91	A2	12.70	12.80	12.68	12.74
B2	15.44	15.46	15.54	15.65	B2	15.51	15.56	15.38	15.55
Ev	17.83	18.43	18.45	19.97	Ev	19.81	18.77	19.39	19.51
B1	19.89	19.37	21.70	21.84	B1	22.96	22.40	22.40	22.34
F1	34.00	36.47	36.95	38.00	F1	39.63	38.51	38.38	38.38
SEER2	19.16	19.56	20.10	21.24	SEER2	18.44	20.54	20.81	20.88

Additional unit sizes were tested using the same procedure as described above. As shown in Tables 3 and 4 below, results from those additional tests show the same pattern – increased efficiency with longer break-in periods beyond 20 hours.

Table 3: 4-ton AC System Performance with Increasing Break-in Periods

Sample 1					Sample 2				
Test	**20 Hr**	**44 Hr**	**68 Hr**	**92 Hr**	**Test**	**20 Hr**	**44 Hr**	**68 Hr**	**92 Hr**
A2	12.68	12.97	13.03	13.11	A2	12.89	13.15	12.92	12.88
B2	15.44	15.70	15.88	15.90	B2	15.92	15.95	15.83	15.68
Ev	18.39	18.90	18.99	19.09	Ev	19.16	19.21	19.03	19.56
B1	20.11	21.17	21.41	21.49	B1	21.40	20.43	20.27	21.95
F1	36.81	38.25	38.67	37.52	F1	35.44	37.51	36.10	38.86
SEER2	19.71	20.36	20.51	20.49	SEER	20.35	20.37	20.08	20.93

Table 4: 5-ton AC System Performance with Increasing Break-in Periods

Sample 1					Sample 2				
Test	**20 Hr**	**44 Hr**	**68 Hr**	**92 Hr**	**Test**	**20 Hr**	**44 Hr**	**68 Hr**	**92 Hr**
A2	12.70	12.75	12.76	12.84	A2	12.83	12.97	13.08	13.07
B2	15.49	15.52	15.60	15.71	B2	15.53	15.64	15.72	15.90
Ev	19.00	19.31	19.45	19.54	Ev	19.01	19.37	19.46	19.98
B1	22.32	23.32	24.03	24.26	B1	22.29	23.11	23.07	23.94
F1	36.36	38.35	38.76	38.82	F1	35.51	37.24	37.89	39.00
SEER2	20.50	21.07	21.35	21.48	SEER2	20.48	21.01	21.11	21.69

In evaluating this test data, JCI determined that the increase in system efficiency and reduced test variability that occurs with the lengthier break-in periods was principally due to a reduction in required compressor power during the test. Figures 5 and 6 show the decrease in compressor watts compared to the 20-hour baseline compressor for 3-ton and 5-ton AC systems. For both systems, results show a consistent reduction in watts consumed as the break-in time of the compressor is increased. This is most significant at the Ev, B1 and F1 test conditions.

Figure 5: Decrease in Compressor Watts (3 Ton AC) with 3 Additional 24-hour Break-In Periods, Relative to 20-hour Break-In Baseline

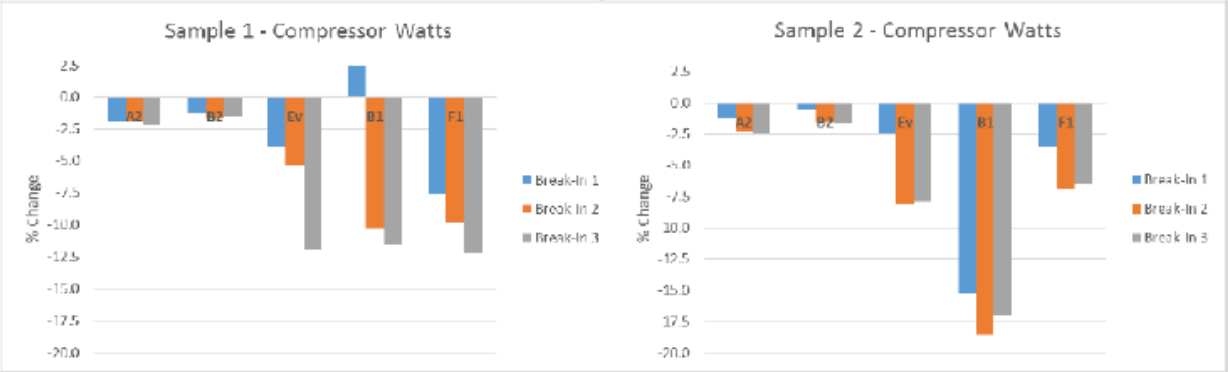
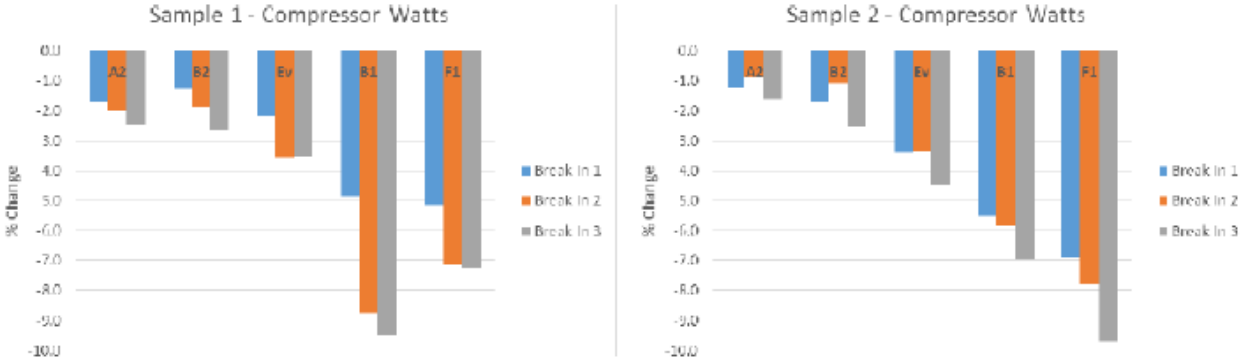


Figure 6: Decrease in Compressor Watts (5 Ton AC) with 3 Additional 24-hour Break-In Periods, Relative to 20-hour Break-In Baseline



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These test results show that a VSS system is not fully broken in at 20 hours, and that rating such a system with only a 20-hour break-in period can understate a system's SEER2 rating performance by 1 to 2 SEER2 (or approximately 5% to 10%). Because the 20 Hour Break-In Limit does not allow sufficient time for full break-in of VSS systems, the efficiency rating of a VSS system measured under Appendix M1 falls below the actual efficiency level at which the system will operate for the great majority of its time in service. JCI is thus unable to represent, on the basis of Appendix M1 testing, the full efficiency at which its VSS systems will operate. To achieve a particular efficiency rating under the Appendix M1 test method, JCI is forced to overdesign its VSS systems to meet an even higher target efficiency rating after full break-in. In short, the 20 Hour Break-In Limit in Appendix M1 results in the underrating of JCI's VCC systems, and thus produces materially inaccurate data about the efficiency of VSS systems for comparison purposes, leaving homeowners without the information needed to objectively evaluate the benefits of such systems.

This underrating under Appendix M1 for JCI's VSS systems has significant consequences in the marketplace. Because of underrating due to the 20 Hour Break-In Limit, the full efficiency advantage of JCI's VSS systems will not be apparent versus lower-efficiency full stage compressor products, for which the 20 Hour Break-In Limit does not bias results. Consumers for whom central air conditioner measured efficiency is an important factor will be misled about the merits of VSS systems on the basis of measured efficiency under Appendix M1. Although the JCI models at issue are very efficient, and perform well above the applicable minimum efficiency standards, accurate ratings for high efficiency products such as these are important for purposes of, for instance, determining eligibility for Energy Star, utility rebates, tax credits, and green building recognition.

V. Alternative Test Procedures

DOE's Appendix M1 test procedure, as currently promulgated but with the option of an extended, 72-hour break-in period, constitutes the appropriate alternate test procedure that will evaluate the performance of JCI's VSS systems in a manner representative of its energy characteristics. Therefore, JCI proposes to test the basic models for which it seeks waiver by applying the entirety of Appendix M1 to 10 CFR Part 430, Subpart B, with a single modification to Section 3.1.7, as shown below:

> 3.1.7 Test Sequence
> Manufacturers may optionally operate the equipment under test for a ‘‘break-in’’ period, not to exceed 20 72 hours, prior to conducting the test method specified in this section. A manufacturer who elects to use this optional compressor break-in period in its certification testing should record this information (including the duration) in the test data underlying the certified ratings that are required to be maintained under 10 CFR 429.71. When testing a ducted unit (except if a heating-only heat pump), conduct the A or A2 Test first to establish the cooling full-load air volume rate. For ducted heat pumps where the heating and cooling full-load air volume rates are different, make the first heating mode test one that requires the heating full-load air volume rate. For ducted heating-only heat pumps, conduct the H1 or H12 Test first to establish the heating full-load air volume rate. When conducting a cyclic test, always conduct it immediately after the steady-state test that requires the same test conditions. For variable-speed systems, the first test using the cooling minimum air volume rate should precede the EV Test, and the first test using the heating minimum air volume rate must precede the H2V Test. The test laboratory makes all other decisions on the test sequence.

Thus, the only substantive change would be to modify the maximum length of the optional break-in period for JCI's VSS systems. As required by Appendix M1, JCI would report the break-in period used in its product compliance certifications. The language proposed above is identical to the language proposed by JCI and accepted by DOE in 2018.

VI. Similar Products

The competitive market has not changed since JCI received the prior waiver. As a result, JCI is aware of the same, previously identified, manufacturers of residential central air conditioners and heat pumps that offer VSS systems using scroll compressors with oil injection: Carrier Corporation, Daikin Industries, Goodman Manufacturing Co. LP, Lennox International Inc., Nortek Global HVAC, Rheem Sales Company, and Trane.

VII. Petition for Interim Waiver

DOE granted JCI’s previous interim waiver regarding the break-in period for the same products that are the subject of this interim waiver request. The circumstances surrounding JCI’s request for an interim waiver and the products and models subject to the waiver have not changed. JCI subsequently seeks, pursuant to 10 CFR § 430.27, an identical interim waiver of the 20 Hour Break-In Limit for the JCI VSS systems.

DOE will grant an interim waiver if it appears likely that the petition for waiver will be granted and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver.[8] Interim relief is important to ensure that JCI can make materially accurate representations about the energy efficiency of its VSS systems in its certifications to DOE and marketing materials while DOE is considering the merits of JCI's petition for waiver.

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[8] 10 C.F.R. § 430.27(e)(3).

Basic Models for Which a Waiver is Requested. JCI seeks an interim waiver for the models listed in Exhibit A.

Manufacturers of All Other Basic Models. JCI identified known similar products in Section VI, above.

Alternate Test Procedures. JCI identified alternate test procedures in Section V, above. JCI incorporates reference to those same test procedures for purposes of its interim waiver request.

Likely Success of the Petition for Waiver. For the reasons outlined above, JCI believes that there are strong arguments for granting the petition for waiver on the merits. Specifically, JCI testing of its VSS systems shows that a 72-hour break-in period produces test results that are more representative of the actual product efficiencies at which the VSS systems will operate over the lifetime of the product than those results obtained under the current 20 hour break-in period limit.

Competitive Disadvantage. If JCI must continue to comply with the 20 Hour Break-In Limit for its VSS systems, these systems will be disadvantaged in the market relative to other types central air conditioners and heat pumps for which a break-in period of 20 hours or less products results representative of actual operating efficiency. As shown above, the impact of the 20 Hour Break-In Limit on ratings is significant – it can reduce ratings by 1 to 2 SEER2. The effects of such depressed ratings in the market can be significant.

Public Policy Reasons to Grant Interim Waiver. Without an interim waiver, consumers will continue to be exposed to materially inaccurate information about the energy consumption characteristics of JCI‟s VSS systems. This inaccurate information harms consumers (especially those seeking to evaluate very high efficiency CAC/HP products) and distorts markets. Further, underrating high efficiency products is inconsistent with the policy objectives of EPCA.

For all of these reasons, DOE should grant an interim waiver while it considers the petition for waiver set out above.

VIII. Conclusion

For the reasons stated above, JCI respectfully requests that DOE grant this petition for waiver of the 20 Hour Break-In Limit with respect to its VSS systems. JCI further requests DOE to grant its request for an interim waiver while its petition for waiver is under consideration.

If you have any questions or would like to discuss this request, please contact me at (316) 832-6393. We greatly appreciate your attention to this matter.

Sincerely,

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EXHIBIT A

JCI Basic Models for Which Test Procedure Waiver Is Requested

	York	Coleman	Luxaire	Fraser-Johnston	Champion
AC	YXV24B21	AC21B2421	AL21B2421	AL21B2421	AL21B2421
	YXV36B21	AC21B3621	AL21B3621	AL21B3621	AL21B3621
	YXV48B21	AC21B4821	AL21B4821	AL21B4821	AL21B4821
	YXV60B21	AC21B6021	AL21B6021	AL21B6021	AL21B6021
HP	YZV24B21	HC20B2421	HL20B2421	HL20B2421	HL20B2421
	YZV36B21	HC20B3621	HL20B3621	HL20B3621	HL20B3621
	YZV48B21	HC20B4821	HL20B4821	HL20B4821	HL20B4821
	YZV60B21	HC20B6021	HL20B6021	HL20B6021	HL20B6021

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