



August 2, 2013

Ms. Abigail Daken  
U.S. Environmental Protection Agency (EPA)  
ENERGY STAR HVAC Program

Re: Johnson Controls Comments on ENERGY STAR Specification Framework for Central Air Conditioners and Air-Source Heat Pumps – Version 5.0

Dear Ms. Daken,

Johnson Controls, Inc. (JCI) appreciates the opportunity to provide comments on this important issue related to the Central Air-Conditioner and Air-Source Heat Pump Version 5.0 Framework document and the stakeholder discussion held on July 22, 2013.

### **Johnson Controls**

JCI is a global diversified technology company headquartered in Milwaukee, Wisconsin. Our 162,000 employees create quality products, services and solutions to optimize energy and operational efficiencies of buildings; lead-acid automotive batteries and advanced batteries for hybrid and electric vehicles; and interior systems for automobiles. Related to this rulemaking, JCI manufactures and sells residential and commercial heating and air conditioning equipment in the United States.

### **General Comments on Qualification Criteria:**

We believe the current ENERGY STAR specification for unitary CAC/ASHP products should remain through the end of 2014. Following the January 1, 2015 effective date for the regional energy efficiency standards in the United States, there may still be a place for the Energy Star Program as a known driver for energy efficiency. But the changing effectiveness of the Energy Star program related to the regional efficiency standards for unitary products could make this the right time to have the CAC/ASHP specification not utilize any performance metrics but should transition into one that has a focus on quality installations.

One key concern is the lack of harmonization with submittal requirements, audit procedures, and the reporting process now required by the Energy Star program when compared to the AHRI industry certification program for residential products. Factors such as test data submittal requirements, different pass/fail criteria, additional testing required upon failures or assumed failures due to the lack of a process for defective samples or test results, and more all increase the cost and complexity for manufacturers.

The value proposition that Energy Star certification brings to our products is approaching that point where increasing energy efficiency requirements are more challenging and less cost effective for the average consumer. Adding complexity when there are issues with the perceived value of the program just leads manufacturers to drop out of the Energy Star program. To be successful, the Energy Star program must be accurate and trusted by consumers, but manufacturers must see the value in participating in this program as well.

### **Issues on Which Energy Star Seeks Comment:**

#### **Regional Specification:**

*1. What alternative approaches can stakeholders suggest to allow for simplified, reliable labeling of ENERGY STAR certified models under a regional specification?*

We do not believe that there is a simple, easily understood labeling method available that the consumers will understand and find value in for a regional specification. The best option would be to maintain one simple, national Energy Star program that can be communicated effectively throughout the HVAC business chain to the consumers.

*2. EPA's understanding is that if needed for verification, installers can print out a certificate of performance for a particular combination from the AHRI certified equipment directory for equipment listed there. What do manufacturers, who are not members of AHRI, provide as proof of performance to utilities or consumers for rebates?*

Manufacturer's who do not participate in the voluntary industry programs available will have to provide their own documentation referencing their submittals and certification to the Department of Energy's (DOE) requirements for that product category.

**Performance Metrics:**

*1. Do utilities use COP and/or capacity at low temperatures to identify ASHPs that are better suited for use in cooler climates?*

While this situation may be desired by certain utilities, state or local authorities, the fact that COP and capacity ratings at different conditions are not certified rating values in the AHRI program and are not regulated by DOE is a significant factor in this discussion. The possible introduction of these metrics would place a significant regulatory burden on manufacturers, which would certainly lead to a reduction in manufacturer participation within this program. It is also likely lead to increased confusion and uncertainty for consumers as to what measures should be used for their own situation when trying to compare product options.

*2. Do manufacturers capture COP data during the testing currently conducted for DOE regulatory metrics?*

Since this data is not a certified or regulated metric, each manufacturer is likely to record different types, test conditions, and amounts of data during their own performance testing.

*3. For the northern region, can the HSPF be raised without increasing the SEER?*

From a design standpoint, there are methods that can be used to raise HSPF without requiring a significant increase in SEER. But those methods would generally have the effect of complicating the design, the control requirements, and the cost of those products. The benefits and value of doing this would require significant engineering development work.

**System status and diagnostics:**

*1. How prevalent are these technologies in the market today? What are your expectations for near term market evolution in this area?*

System status and diagnostics are generally considered as part of the premium system designs for heating and cooling applications. Our view is that this is no more than the top 5 to 10% of the residential products available in the market today. We do not expect this to significantly change in the near future, i.e. the next 3 to 5 years, or to move down from the premium products during this timeframe.

*2. What approximate percentage of your models have two way communication with a system controller?*

While we do provide systems with two way communications, this is not a significant portion of our total residential models at this time.

*3. In regard to maintaining energy efficiency, what information is most important to communicate back to the system controller? What is the potential resulting energy efficiency?*

Proper installation and set up of the HVAC system, including airflow and system refrigerant charge levels are the most important aspects related to energy efficiency. These are factors that can be communicated to the system controller, at various degrees of accuracy and cost. Other factors such as installation practices and duct work designs need to be considered in order to determine whether a field-installed product is indeed performing in the manner in which it was intended.

*4. Are there any product studies or sources of data available on the savings attained by effective system status communications?*

We are not aware of any substantive sources of data on this topic.

5. *The National Institute of Science and Technology (NIST)<sup>2</sup> is working on a Fault Detection and Diagnostics (FDD) program, a standalone software tool that uses a rule-based chart FDD to detect and diagnose common faults such as refrigerant undercharge, overcharge and indoor airflow. How do manufacturers foresee system designs incorporating FDD? How do utilities plan to use FDD?*

The use of FDD programs has been more common in commercial HVAC applications up to this time. Applying this software to residential systems comes with its own set of challenges and issues that need to be addressed to be effective and adopted in the residential market.

### **Supporting Quality Installation:**

1. *To properly design an air conditioner or heat pump system, the designer must know the capacity of the system at the indoor and outdoor design conditions selected, not just the rated capacity as reported to DOE. Designers commonly use ‘Expanded Performance Data’ from the manufacturer to determine the capacity of the system at these conditions, however, this data may not always be publically available or in a consistent format. EPA believes that freely accessible Expanded Performance Data, published in a consistent format, and provided for all rated combinations would significantly simplify designers’ task of designing the air conditioner or heat pump systems.*

While JCI understands the potential value of this proposal, the lack of a standardized and consistent format and database would make this approach extremely difficult to manage as an OEM. Without that standard set of data, test conditions, and format, having information that could be considered certified, valid, and accurate would be nearly impossible to manage.

2. *According to the ACCA Quality Installation standard, ANSI / ACCA 5 QI – 2010, HVAC Quality Installation Specification, which the ENERGY STAR Homes Version 3.0 specification requires, HVAC installers are instructed to measure air flow and/or static pressure at several specific points in the air path. This is generally done by drilling holes in the equipment cabinets immediately after installation. Air flow or pressure measurement probes are then inserted into these holes. EPA believes it would benefit installers, inspectors and manufacturers if equipment were shipped with holes or punch-outs already present, so that all parties are*

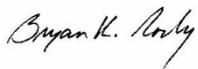
*measuring at the same locations. This is based on the supposition that manufacturers have the best insight into the appropriate places for these pressure measurements. EPA is considering including a requirement that such measurement ports or punch-outs be provided. Please see the attached document from the National Comfort Institute as an example of current guidance for placement of pressure measurement holes. EPA anticipates inclusion of similar guidance along with any requirement included in the specification. EPA welcomes feedback on inclusion of this potential requirement.*

We support the approach proposed for the Energy Star program that quality installation practices provides the most significant opportunity for future energy efficiency benefits. But making this a requirement adds a concern related to the application of mixed component systems, where different components of the system are provided from different manufacturers, such as a furnace from one manufacturer and an evaporator coil from another. How would data derived from different OEM requirements be consistent and accurate for mixed systems is a concern that would need to be addressed. So we do not favor this approach at this time.

**Summary:**

Johnson Controls Inc. appreciates the opportunity to provide these comments and urges Energy Star program to fully consider the comments provided above. Please contact me if you have any questions or comments.

Respectfully,



Bryan K. Rocky  
Director of Residential Product Management, Unitary Products  
Johnson Controls, Inc.