

Test Procedures From Which Waiver Is Requested

MEUS seeks a waiver from the test procedures applicable, for purposes of the Energy Policy and Conservation Act (EPCA), to commercial package air conditioning and heating equipment. In particular, MEUS seeks a waiver from the currently applicable test procedures provided in ARI 210/240 (1989), and from the test procedures provided in ARI 2140/240 (1994) that the Department has proposed to adopt.

Section 343(a)(4)(A) of EPCA provides that the test procedures for purposes of EPCA shall be those generally accepted procedures referenced in ASHRAE/IES Standard 90.1 and in effect on June 30, 1992. Section 343(a)(4)(B) of EPCA provides for the Secretary to amend the test procedure for a product if the industry test procedure is modified, unless the Secretary determines that such a modified test procedure does not meet the statutory criteria.

The ARI test procedures referenced in the version of ASHRAE 90.1 in effect in 1992 are ARI 210/240 (1989). ARI has subsequently modified the 1989 version of the test procedures several times. The Department issued a Notice of Proposed Rulemaking proposing to adopt ARI 210/240 (1994),³ but has not taken final action with respect to that proposal. Thus, the currently applicable test procedures for EPCA purposes are contained in ARI Standard 210/240 (1989).

While the proposal to adopt ARI 210/240 (1994) has not been finalized as of the filing of this petition, we understand that it is under active consideration. Therefore, we request waiver from the applicable test procedures, including ARI 210/240 (1989) or ARI 210/240 (1994) if adopted, so as to avoid the need to request another waiver if the 1994 version is adopted by the Department.

Basic Models for Which Waiver Is Requested

MEUS requests a waiver from the test procedures for the following basic product models:

CITY MULTI Variable Refrigerant Flow Zoning System R-2 Series Outdoor Equipment:

- PURY-80TMU, 80,000 Btu/h, 208/230-3-60 split-system variable-speed heat pump
- PURY-100TMU, 100,000 Btu/h, 208/230-3-60 split-system variable-speed heat pump

CITY MULTI Variable Refrigerant Flow Zoning System Y Series Outdoor Equipment:

- PUHY-80TMU, 80,000 Btu/h, 208/230-3-60 split-system variable-speed heat pump
- PUHY-100TMU, 100,000 Btu/h, 208/230-3-60 split-system variable-speed heat pump
- PUY-80TMU, 80,000 Btu/h, 208/230-3-60 split-system variable-speed air conditioner
- PUY-100TMU, 100,000 Btu/h, 208/230-3-60 split-system variable-speed air conditioner

CITY MULTI Variable Refrigerant Flow

Zoning System Indoor Equipment:⁴

- PCFY Series—Ceiling Suspended—PCFY-16/24/40/48***_*
- PDFY Series—Ceiling Concealed Ducted—PDFY-08/10/12/16/20/24/28/32/40/48***_*
- PEFY Series—Ceiling Concealed Ducted, Low External Static Pressure—PEFY-08/10/12***_*
- PEFY Series—Ceiling Concealed Ducted, High External Static Pressure—PEFY-16/20/24/28/32/40/48***_*
- PFFY Series—Floor Standing—PFFY-08/10/12/16/20/24***_*
- PKFY Series—Wall-Mounted—PKFY-08/10/12/16/20/24/32/40***_*
- PLFY Series—4-Way Airflow Ceiling Cassette—PLFY-12/16/20/24/32/40/48***_*
- PLFY Series—2-Way Airflow Ceiling Cassette—PLFY-08/10/12/16/20/24/32/40/48***_*
- PMFY Series—1-Way Airflow Ceiling Cassette—PMFY-08/10/12/16***_*

Need for Waiver of the Test Procedure

MEUS seeks a waiver from the applicable test procedures because the current test procedures evaluate CITY MULTI VRFZ System products “in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data.”⁵ The energy usage of the CITY MULTI VRFZ Systems cannot be representatively measured using the current test procedures for several reasons discussed below.

1. *The test procedure provides for testing of the pair of indoor and outdoor assemblies making up a typical split system, but provides no direction about how to test CITY MULTI systems with which literally millions of combinations of indoor units could be used with any given outdoor assembly.*

The ARI test procedures do not provide for separate testing of indoor and outdoor components of split systems. Rather, they provide for the indoor and outdoor elements to be tested together. In particular, the test procedure provides that “the requirements of rating outlined in this standard are based upon the use of matched assemblies.” ARI Standard 210/240 3.2 (1989).⁶ Virtually all of the systems covered by this test procedure have one outdoor unit matched to one indoor coil,⁷ so the test procedure’s direction to test

“matched assemblies” can be straightforwardly applied. With CITY MULTI VRFZ Systems, however, there is no standard configuration of outdoor and indoor units that can be tested together as representative. The products are intended to be used in zoning systems, and each outdoor unit can be connected with up to 16 separate indoor units in a zoned system. Moreover, MEUS offers 58 indoor unit models. Each of these indoor unit models is designed to be used with up to 15 other indoor units, which need not be the same models, in combination with a single outdoor unit. Thus, for each of the CITY MULTI VRFZ outdoor coils, there are well over 1,000,000 combinations of indoor coils that can be matched up in a system configuration.

The current test procedure provides no direction for determining what combination or combinations of outdoor and indoor units should be tested in these circumstances. It is not practical to test each possible combination. The test procedure provides no mechanism for sampling component combinations.⁸ Thus, the test procedure does not contemplate, and cannot practicably be applied to, the CITY MULTI VRFZ systems consisting of multiple assemblies that are intended to be used in a very large number of different combinations.

2. *The test procedure calls for testing “matched assemblies,” but CITY MULTI systems are designed to be used in zoning systems where the capacity of the indoor units does not match capacity of the outdoor unit.*

Indoor and outdoor coils in split systems are typically balanced, that is, the capacity of the outdoor coil is equivalent to the capacity of the indoor coil. The test procedure’s application to “matched assemblies” contemplates such a balance between indoor and outdoor coil capacity. With the CITY MULTI VRFZ Systems, however, the sum of the capacity of the indoor units connected into the system can be as much as 150% of the capacity of the outdoor coil. Such unbalanced combinations of CITY MULTI indoor and outdoor units are permitted by the zoning characteristics of the system, the use of electronic expansion valves to precisely control refrigerant flow to each indoor coil, and the system intelligence for overall system control. The test procedure designed for matched assemblies does not contemplate or address testing for substantially unbalanced zoning systems such as the CITY MULTI.⁹

3. *The current test procedure does not accommodate infinite variability in compressor speed.*

The compressors in typical commercial package air conditioners and heat pumps are on/off systems, with the compressor

2 indoor coils. By contrast, the City Multi VRFZ systems will have typically 4 to 8 indoor coils, can be configured with as many as 16 indoor coils.

⁸ Any modification of test procedures to provide for testing of a sample of configurations would need to assure that the test results produced would fairly represent energy used in other component combinations used by customers.

⁹ Note that the ARI test procedure is also ambiguous about how to determine the capacity of such unbalanced VRFZ systems.

³ 65 FR 48828 (Aug. 9, 2000).

⁴ The * denotes engineering differences in the models.

⁵ See 10 CFR 430.27 (2003) (standard for granting waiver from test procedures for consumer products) and 10 CFR 431.29 (2002) (standard for granting waiver from test procedures for electric motors.)

⁶ The same language appears in ARI Standard 210/240 3.2 (1994).

⁷ An analysis of commercial products from 65,000 Btu/h to 240,000 Btu/h covered by ARI Standard 210/240 and listed in the ARI Unitary Large Equipment (ULE) directory was conducted by MEUS. For the products in the Split System Heat Pump (HRCU-A-CB) category, 172 of 173 (over 99%) of the systems listed have one indoor coil, and the other system has two indoor coils. For the products in the Condensing Unit Coil and Blower (RCU-A-CB) category, 649 of 653 (over 99%) of the listed systems have one indoor coil and the other four systems have two indoor coils. None of the listed products in these categories have more than