

Topic	Comment Summary	EPA Response
Scope: units below 65 kBtu/hr	<p>Four stakeholders support the scope expansion to include air-cooled three-phase units with a cooling capacity below 65,000 Btu/h.</p> <p>One stakeholder requests EPA reduce scope to exclude units below 65,000 Btu/h to align with capacities in AHRI 1230 and NEEP’s cold climate specifications. They support including these products in the residential CACHP specification that relies on Appendix M1/AHRI 210/240-2023 instead.</p>	<p>EPA thanks stakeholders for their support for including very small units.</p> <p>EPA reiterates that specifications are separated by market rather than by test method. In addition, DOE classifies these units as commercial. For these reasons, very small units will remain in this specification.</p>
Scope: allow only heat pumps	<p>One stakeholder suggests EPA reduce the scope to only allow heat pumps to qualify because they offer efficient cooling and heating.</p>	<p>EPA does not currently plan to limit the specification to only heat pumps.</p>
Scope: dual fuel gas packs	<p>One stakeholder recommends EPA include dual fuel heating systems (electric heat pumps with a natural gas furnace) explicitly because it is a strategy to ensure sufficient heating in colder climates.</p>	<p>EPA welcomes the introduction of these products to the market and looks forward to their growth as a step toward decarbonizing commercial heating. EPA has clarified the definition of “gas packs” to remove the appearance of excluding them.</p>
Scope: VRF above 240 kBtu/hr	<p>Two stakeholders suggest EPA include variable refrigerant flow equipment rated above 240,000 Btu/h so they can be eligible for incentives equivalent to smaller equipment and reduce confusion when small and large modules are combined.</p>	<p>EPA will not expand the scope because systems that large should consider building-based efficiency and system design instead of just component selection. However, EPA is open to reexamining this decision for VRF.</p>
Efficiency Criteria: stringency	<p>Three stakeholders believe that the proposed efficiency levels are too stringent, especially compared to previous increases in requirements and in light of the upcoming federal standards</p>	<p>EPA understands these concerns but must set levels above the upcoming standards. EPA has reduced the criteria based on new information about likely product availability in 2023. Given</p>

	<p>change. They highlight the potential for low pass rates and/or high product cost.</p> <p>One stakeholder does not support the IEER levels for small central unitary heat pumps because unlike for large central unitary heat pumps, the IEER criteria is significantly lower than the corresponding Efficiency Level (EL) 4 from DOE.</p>	<p>these new levels, comparison with DOE’s EL 4 is no longer relevant. The new levels strike a balance between product availability, cost, and savings.</p>
<p>Efficiency Criteria: decrease as capacity increases</p>	<p>Five stakeholders believe the efficiency requirements should decrease as capacity increases in order to align with DOE, available products, and engineering fundamentals.</p>	<p>EPA agrees with these comments and has updated IEER criteria to decrease as capacity increases.</p>
<p>Efficiency Criteria: difference between heating section types</p>	<p>Three stakeholders believe that the difference between electric resistance (or none) units and all other heating section types should be 0.2 to align with DOE. One stakeholder recommends reducing the requirements for electric resistance (or none) units. One stakeholder also includes EER in this comment.</p>	<p>EPA acknowledges the technical reasoning behind this request and has adjusted the criteria to reflect it.</p>
<p>Efficiency Criteria: coordinate with CEE</p>	<p>Two stakeholders suggest EPA coordinate with the Consortium for Energy Efficiency (CEE), especially for air-cooled three-phase units with a cooling capacity below 65,000 Btu/h, because one set of specifications promoted by all efficiency programs in the US and Canada increases market impact.</p>	<p>EPA will continue to work with other energy efficiency organizations.</p>

<p>Efficiency Criteria: remove EER</p>	<p>One stakeholder argues that for products with capacities 65,000 Btu/h to 240,000 Btu/hr, the efficiency criteria should be IEER and COP. EER should not be at a stringent level because it is already included in the IEER calculation and should allow for innovation to meet stringent IEER criteria.</p>	<p>DOE replaced EER with IEER as a better reflection of annual cooling energy use, which EPA supports. However, particularly for commercial buildings, peak demand remains a key parameter and for most of the equipment, EER remains a reasonable metric for predicting it. As a result, EPA has retained EER criteria.</p>
<p>Cold Climate</p>	<p>One stakeholder does not support regional-specific performance requirements because it makes harmonization between ENERGY STAR and other energy efficiency specifications difficult. Two stakeholders recommend EPA harmonize criteria for VRFs with NEEP’s Cold Climate VRF specification.</p> <p>Two stakeholders argue there are not enough light commercial HVAC products to justify cold climate specifications.</p> <p>One stakeholder supports the ENERGY STAR Cold Climate designation for central unitary heat pumps and VRF heat pumps because it provides customer insight and supports national decarbonization goals.</p>	<p>The updated criteria in the Final Draft will work synergistically with those proposed by NEEP for cold climate VRF.</p> <p>While heat pumps are a relatively small part of the unitary commercial market, EPA expects this to grow and feels that setting out guideposts towards effective cold climate criteria for unitary equipment is timely. Nevertheless, as other groups are also working on criteria, EPA has delayed finalizing those for CUHP.</p>
<p>Cold Climate: low ambient capacity maintenance vs. COP</p>	<p>Three stakeholders agree that capacity maintenance at low temperatures is more important than a higher coefficient of performance because of concern around supplemental heat sources.</p>	<p>EPA notes that the argument for capacity maintenance being more critical assumes that the building must use the same curb the current products are on, which is only relevant to CUHP. Meanwhile, the argument for COP being</p>

	<p>Two stakeholders believe the capacity maintenance requirement should be removed or reduced for VRF systems because it is arbitrary as design of these systems is based on meeting building load. One stakeholder believes if capacity maintenance must remain, a comparison between 5°F and 47°F is better.</p>	<p>more important assumes the HP can be designed to carry the full heating load at design temperature, which is far more likely to be true for VRF. Thus, EPA will emphasize COP for VRF units (with appropriate adjustments based on further analysis in response to comments) and on capacity maintenance for CUHP.</p>
<p>Cold Climate: VRF criteria</p>	<p>One stakeholder proposes increasing IEER requirements for VRF because the proposed level is lower than the performance of many cold climate marketed systems.</p> <p>Two stakeholders believe the COP criteria for VRFs is too stringent and may inadvertently eliminate many variable VRF systems that are designated as cold climate heat pumps from meeting ENERGY STAR criteria.</p> <p>Two stakeholders support removing EER requirements for VRF systems because they believe cold climate distinction should only focus on heating performance and efficiency and these systems rarely operate at maximum cooling capacity in cold climate regions. They point to EPA’s removal of EER from the ENERGY STAR Version 6.1 CAC/HP specification and the DOE’s intention to replace EER with IEER.</p>	<p>While EPA remains cautious about cutting off potential lower cost units, it is attractive to capture all the savings available if all products that otherwise meet the specification have higher IEER. EPA has proposed a higher IEER but may revert to Draft 1 levels if needed.</p> <p>EPA has adjusted the COP criteria slightly.</p> <p>EPA proposes removing EER criteria for cold climate VRF, in order to recognize entire product lines which have performed well in the field in cold climates. We expect some utilities will include EER criteria, because peak cooling demand is critical in their area.</p>
<p>Cold Climate: 5° F for units</p>	<p>One stakeholder encouraged EPA to include performance testing at 5° F for very small central</p>	<p>EPA agrees that 5° F performance is more reflective of actual cold climate capability. The</p>

<p>under 65 kBtu/hr</p>	<p>unitary air conditioners and central unitary heat pumps to support very cold climate performance once the proposed harmonization of three-phase units to M1 is finalized. They also encourage EPA to develop capacity maintenance and coefficient of performance requirements at 5° F for other types of light commercial heat pumps in future specifications.</p>	<p>updated cold climate proposal has been recast to coordinate with that for residential equipment, and therefore now relies on 5° F performance.</p>
<p>Gas/Electric Package Units: prescriptive staging requirements</p>	<p>Four stakeholders object to the requirement for gas furnaces in gas/electric packaged units to be variable-capacity or capable of operating in at least 3 distinct speeds because this does not clearly increase efficiency and is instead intended to increase comfort. Two stakeholders believe very few models meet this criterion. One stakeholder reports their research review showed mixed savings from these systems.</p> <p>However, one stakeholder supports a requirement for gas furnaces in gas/electric packaged units to be variable-capacity or capable of operating in at least 3 distinct speeds because gas furnaces in gas/electric package units are not currently addressed by ENERGY STAR and staged or modulating combustion can significantly reduce annual energy consumption by reducing on/off cycling, according to DOE.</p> <p>One stakeholder believes that if EPA includes this requirement, then EPA should recognize the benefits of heat pumps with gas supplemental</p>	<p>EPA thanks stakeholders for their views on this topic and has altered the requirement to be for 2-stage gas/electric packaged AC units. For heat pumps, the gas section is not carrying the entire heating load and single stage gas is acceptable.</p>

	<p>heating (dual fuel heat pumps) by considering compressor heating one of the stages.</p>	
<p>Gas/Electric Package Units: test method</p>	<p>One stakeholder suggests EPA consider a whole box approach for rating the efficiency of packaged gas heating equipment. Instead of using thermal efficiency ratings that test at full fire and does not capture full operating efficiency over an average period of use, the stakeholder suggests EPA adopt a test procedure and heating efficiency requirement inclusive of all features impacting gas and energy consumption, such as CSA Group’s CSA P.8, which produces a thermal efficiency and heating season total coefficient of performance.</p>	<p>EPA thanks the stakeholder on their feedback and will review CSA Group’s CSA P.8 when it is published and consider it for a future revision.</p>
<p>Gas/Electric Package Units: AFUE</p>	<p>One stakeholder argues any increase to the DOE AFUE criteria for Gas/Electric Package units is economically unjustified and can result in condensate in the heat exchanger which is corrosive and can cause reliability issues.</p>	<p>EPA appreciates the support for avoiding higher AFUE requirements.</p>

<p>Future Revisions: CVP</p>	<p>One stakeholder supports the plans to introduce a CVP in the future to ensure that expected energy savings are being realized.</p> <p>One stakeholder suggests that once DOE finalizes the test procedure for three-phase equipment, EPA extends the use of the CVP for very small central unitary air conditioners and central unitary heat pumps.</p> <p>One stakeholder encourages EPA to consider requiring the CVP for ENERGY STAR certification for small and large VRF systems because DOE has proposed to only include CVP testing in enforcement and research shows some VRF systems in the field as operating at efficiencies 45% to 65% worse than manufacturer reported values.</p>	<p>EPA thanks stakeholders for their input. Cold climate units below 65 kBtu/hr will now be subject to the low ambient CVP. EPA will continue to consider including the CVP for VRF between 65 and 240 kBtu/hr in a future revision, balancing performance assurance with test burden.</p>
<p>Test Method</p>	<p>One stakeholder suggests the test method for three-phase <65,000 Btu/h equipment be updated to AHRI 210/240 – 2017 with Addendum 1 to determine SEER and HSPF as AHRI 210/240 – 2023 cannot be used for this purpose as the tests were removed in that version to align with DOE Appendix M1.</p> <p>One stakeholder suggests the correct test method for variable refrigerant flow equipment is “AHRI Standard 1230 with Addendum 1”.</p>	<p>EPA thanks stakeholders for their input and has revised the test methods in Table 7. The test methods now reference DOE regulations at 10 CFR Part 431 Subpart F – Table 1 and Proposed Appendix B1 for very small products seeking recognition in terms of EER2/SEER2/HSPF2. For very small equipment, EPA has provided equivalent criteria in terms of current and proposed metrics. Further test method updates will be considered as DOE rulemakings approach completion.</p>

<p>Connected Criteria</p>	<p>One stakeholder agrees that criteria for a connected designation is not appropriate for light commercial HVAC equipment because communication with building automation are either through a proprietary system or an open communications protocol.</p>	<p>EPA thanks the stakeholder for their feedback.</p>
<p>Refrigerant</p>	<p>One stakeholder is not in support of refrigerant reporting requirements because although this information is reported to AHRI for certain product categories, ENERGY STAR has not stated their use of the information.</p>	<p>EPA thanks the stakeholder for their feedback. We find that purchasers are increasingly interested in refrigerants as another way to use voluntary purchasing choices as a way to drive lower climate impact.</p>
<p>Effective Date</p>	<p>One stakeholder is concerned about the limited time until the ENERGY STAR specification is effective, but supports a January 1, 2023 effective date because it aligns with DOE.</p>	<p>EPA’s intended effective date is January 1, 2023. Our intention is to complete the specification in a timely fashion, to allow as much time as possible for the transition.</p>
<p>Considerations for Future Revision</p>	<p>One stakeholder warns automatic fault detection and diagnostics are a complicated requirement because of the technology and unique customer systems. They request EPA work with manufacturers during future revisions.</p>	<p>EPA plans to continue to work with stakeholders.</p>