



ENERGY STAR® Program Requirements Product Specification for Room Air Conditioners

Eligibility Criteria Draft 1 Version 5.0

2 Following is the **Draft 1 Version 5.0** ENERGY STAR Product Specification for Room Air Conditioners. A
3 product shall meet all of the identified criteria to earn the ENERGY STAR.

4 **1) Definitions:** Below are the definitions of the relevant terms in this document. Where noted below,
5 definitions are identical to the definitions in the U.S Department of Energy (DOE) test procedure at 10
6 Code of Federal Regulations (CFR) 430, Subpart B, Appendix F or in 10 CFR 430.2. The definitions
7 from the CFR have been reprinted for ease of use, however, the CFR definitions take precedence
8 and may be modified by DOE during the rulemaking process.

9 A. Room Air Conditioner (RAC)¹: A window-mounted or through-the-wall-mounted encased
10 assembly, other than a “packaged terminal air conditioner,” that delivers cooled, conditioned air to
11 an enclosed space, and is powered by single-phase electric current. It includes a source of
12 refrigeration and may include additional means for ventilating and heating.

13 1. Casement-only¹: A RAC designed for mounting in a casement window with an encased
14 assembly with a width of 14.8 inches or less and a height of 11.2 inches or less.

15 2. Casement-slider¹: A RAC with an encased assembly designed for mounting in a sliding or
16 casement window with a width of 15.5 inches or less.

17 3. Reverse Cycle²: A RAC that employs a means for reversing the function of the indoor and
18 outdoor coils such that the indoor coil becomes the refrigerating system condenser, allowing
19 for heating of the air in the conditioned space; similarly, the outdoor coil becomes the
20 evaporator, utilizing outdoor air as a source of heat.

21 4. Through the Wall (TTW): A RAC without louvered sides. These units may also be referred to
22 as “built-in” units.

23 5. Electromechanical: A RAC that measures room temperature with a thermostat that
24 undergoes a physical change (dimensional, phase change, etc.) relative to temperature, and
25 utilizes mechanical rotary, switch, or similar user controls for cooling output, fan speed,
26 desired temperature, or other features.

27 B. Basic Model¹: All units of a given type of covered product (or class thereof) manufactured by one
28 manufacturer, having the same primary energy source, and which have essentially identical
29 electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption,
30 energy efficiency, water consumption, or water efficiency.

31 C. Tested Basic Connected Model (TBCM): A basic model that has been tested to validate it meets
32 Demand Response criteria in section 4.G.

33 D. Alternative Demand Response Validation (ADRV): A set of parameters developed by the
34 manufacturer that predict a basic model’s ability to meet the demand response portion of the
35 connected criteria.

36 E. Cooling Capacity: The amount of cooling, in British thermal units per hour (Btu/h), provided to a
37 conditioned space, measured under the specified conditions.³

38 F. Cooling Mode: An active mode in which a room air conditioner has activated the main cooling
39 function according to the thermostat or temperature sensor signal or switch (including remote
40 control).³

41 G. Combined Energy Efficiency Ratio (CEER): The energy efficiency of a room air conditioner as
42 measured in accordance with the test procedure at 10 CFR 430, Subpart B, Appendix F or, a
43 DOE-approved test procedure waiver pursuant to 10 CFR Part 430.27 expressed in units of BTU
44 per watt-hour (BTU/Wh).

- 45 H. Ethylene Propylene Diene Monomer (EPDM): A closed-cell rubber that is used for outdoor
46 gasketing and/or heating, ventilating, and air conditioning applications.
- 47 I. Louvered Sides: Exterior side vents on a RAC enclosure to facilitate airflow over the outdoor coil.
- 48 J. Packaged Terminal Air Conditioner (PTAC)¹: A wall sleeve and a separate unencased
49 combination of heating and cooling assemblies specified by the builder and intended for mounting
50 through the wall. It includes a prime source of refrigeration, separable outdoor louvers, forced
51 ventilation, and heating availability energy.
- 52 K. Portable Air Conditioner⁴: A portable encased assembly, other than a “packaged terminal air
53 conditioner,” “room air conditioner,” or “dehumidifier,” that delivers cooled, conditioned air to an
54 enclosed space, and is powered by single-phase electric current. It includes a source of
55 refrigeration and may include additional means for air circulation and heating.
- 56 L. Represented Value: The represented value is determined pursuant to 10 CFR Part 429, Subpart
57 B § 429.15 and is the identical value certified to DOE, listed on the ENERGY STAR QPL, and
58 shown on consumer facing materials.

59 **Note:** EPA is proposing to update and add new definitions in alignment with DOE’s test procedure final
60 rule, published in March 2021.

61 **2) Scope:**

- 62 A. Included Products: Products that meet the definition of a room air conditioner as specified herein
63 are eligible for ENERGY STAR certification, with the exception of those products listed in Section
64 2.B.
- 65 B. Excluded Products: PTACs, portable air conditioners, and room air conditioner models with
66 electric resistance heat as the primary heat source are not eligible for ENERGY STAR
67 certification under this specification. Products that are covered under other ENERGY STAR
68 product specifications, e.g., dehumidifiers, are not eligible for certification under this specification.

69 **3) Certification Criteria:**

- 70 A. Combined Energy Efficiency Ratio (CEER): CEER shall be greater than or equal to the minimum
71 CEER as shown in Table 1.
72

¹ 10 CFR 430, Subpart A, Section 430.2

² Derived from ASHRAE 58 – Method of Testing for Rating Room Air Conditioner and Package Terminal Air Conditioner Heating Capacity

³ 10 CFR 430, Subpart B, Appendix F

⁴ 10 CFR 430.2

Table 1: Units Without Reverse Cycle

Product Class	CEER (Btu/Wh)
1. Without reverse cycle, with louvered sides, and less than 6,000 Btu/h	13.1
2. Without reverse cycle, with louvered sides, and 6,000 to 7,999 Btu/h	13.7
3. Without reverse cycle, with louvered sides, and 8,000 to 13,999 Btu/h	16.0
4. Without reverse cycle, with louvered sides, and 14,000 to 19,999 Btu/h	16.0
5a. Without reverse cycle, with louvered sides, and 20,000 to 27,999 Btu/h	13.8
5b. Without reverse cycle, with louvered sides, and 28,000 Btu/h or more	13.2
6. Without reverse cycle, without louvered sides, and less than 6,000 Btu/h	12.8
7. Without reverse cycle, without louvered sides, and 6,000 to 7,999 Btu/h	12.8
8a. Without reverse cycle, without louvered sides, and 8,000 to 10,999 Btu/h	14.1
8b. Without reverse cycle, without louvered sides, and 11,000 to 13,999 Btu/h	13.9
9. Without reverse cycle, without louvered sides, and 14,000 to 19,999 Btu/h	13.7
10. Without reverse cycle, without louvered sides, and 20,000 Btu/h or more	13.8
11. With reverse cycle, with louvered sides, and less than 20,000 Btu/h	14.4
12. With reverse cycle, without louvered sides, and less than 14,000 Btu/h	13.7
13. With reverse cycle, with louvered sides, and 20,000 Btu/h or more	13.7
14. With reverse cycle, without louvered sides, and 14,000 Btu/h or more	12.8
15. Casement-Only	13.9
16. Casement-Slider	15.3

75

76 **Note:** EPA is proposing new performance levels with this ENERGY STAR Room Air Conditioner Version
77 5.0, Draft 1. Since the ENERGY STAR Room Air Conditioner Version 4.0 specification went into effect in
78 October 2015, DOE issued new analyses of federal minimum efficiency requirements for RACs. The
79 proposed amended federal standard is more stringent such that, for some product classes, the current
80 ENERGY STAR criteria would not offer meaningful differentiation beyond the federal minimum. As such,
81 EPA is proposing an updated ENERGY STAR specification that continues to offer consumers energy
82 savings above standard product offerings.

83

84 In February 2015, EPA finalized a Version 4.0 specification, which set the ENERGY STAR level at 10%
85 more efficient than the 2014 minimum federal efficiency standard. In Draft 1 Version 5.0, EPA is
86 proposing that to certify as ENERGY STAR, RACs must be at least 19-50% more efficient than the 2014
87 minimum federal efficiency standard.

88

89 EPA anticipates that as manufacturers revise RAC designs to meet a future federal standard, there will be
90 opportunity to reduce the incremental cost to achieve ENERGY STAR efficiency levels by leveraging
91 existing technologies and design options for use in RAC products such as more efficient
92 compressors/motors.

93

94 EPA recognizes the potential grid benefit and customer convenience of room air conditioners with
95 connected capabilities. As such, EPA continues to support the connected criteria in Section 4 of this
96 specification. However, in response to stakeholder requests to ease testing burden for connected room
97 air conditioners, EPA amended the ENERGY STAR testing requirements to allow the certification of
98 models as having connected functionality through the Alternative Demand Response Validation (ADRV)
99 in ENERGY STAR Version 4.2. Even with this amendment, however, EPA is aware that most highly
100 efficient models that are Smart or Wi-Fi capable are not certified as Connected. Rather, most of the
101 models that are certified as Connected are those that need the 5% credit to qualify as ENERGY STAR.

102

103 As such, EPA proposes two changes to the criteria for ENERGY STAR connected products. First, EPA
104 plans to simplify the connected criteria and, if deemed helpful, amend the Test Procedure for Connected
105 Criteria for room air conditioners to further reduce testing burden. Second, EPA will discontinue the

106 connected adder for demand response capable residential room air conditioners. EPA believes that
107 maintaining both the consumer value of connected appliances and preserving the efficiency of products
108 that consumers expect of ENERGY STAR certified room air conditioners is in the best interest of the
109 consumer. Further discussions on these two changes are found under Section 4 of this proposed
110 specification.

111
112 For payback analysis, EPA evaluated the market and DOE's Technical Support Document (TSD) that was
113 published March 30, 2022. EPA concurs with the payback period range of 0.7-4.0 years, depending on
114 the product class.

115
116 B. Energy Saver Mode:

- 117
118 1. Product shall have an "Energy Saver Mode," which may be consumer override-able. In this
119 mode, fan operation shall occur only in conjunction with compressor operation, with the
120 following exceptions:
121
122 a. The fan may continue to run for a period not exceeding 5 minutes after the compressor is
123 switched off.
124
125 b. After the above period, when the compressor is off, the fan may be cycled on for up to
126 17% of the total compressor off cycle time to facilitate accurate control of room
127 temperature. For example, the fan may run for 1 minute then cycle off for at least 5
128 minutes or the fan may run for 2 minutes then cycle off for at least 10 minutes.
129 Manufacturers may use other fan run durations, but fan run time shall not exceed 17% of
130 total cycle time

131
132 TTW RACs, as defined in Section 1 may include an installer accessible setting that disables
133 Energy Saver Mode functionality. The setting may be accessible from the product's controls
134 or may use a physical switch, jumper or the like. Appropriate measures shall be taken to
135 ensure that the setting is implemented as an installer setting not intended to be consumer
136 accessible. For example, physical switches or jumpers shall require the use of tool(s),
137 removal of a panel, or the like; settings accessible in the product's controls shall require a
138 unique sequence of button presses, shall be in a hidden menu, shall require an installer
139 password, or the like. For TTW RACs, the installation manual shall state the Energy Saver
140 Mode must be enabled at the end of installation for it to be a proper installation.

- 141
142 2. Products, excepting electromechanical RACs as defined in Section 1, shall ship with Energy
143 Saver Mode enabled as the default setting.
144
145 3. Products, excepting electromechanical RACs as defined in Section 1, shall default to Energy
146 Saver Mode each time the unit is switched to cooling mode. However, products are not
147 required to default to Energy Saver Mode upon restoration of power after an electrical power
148 outage that results in a loss of power to the unit.

149 **Note:** EPA is proposing to clarify the language that Energy Saver Mode shall default on upon a unit
150 being switched to cooling mode and that the Energy Saver Mode must be enabled when installation of a
151 TTW unit is completed for it to be a proper installation.

152
153 C. Filter Reminder:

- 154
155 1. Products, excepting electromechanical RACs as defined in Section 1, shall have a filter
156 reminder that provides visual notification recommending the filter be checked, cleaned or
157 replaced, as applicable. The filter reminder may be based on operating hours, sensing
158 technology, or other means.
159
160 2. TTW RACs, as defined in Section 1, may include an installer accessible setting that disables
161 Filter Reminder functionality. The setting may be accessible from the product's controls or
162 may use a physical switch, jumper or the like. Appropriate measures shall be taken to ensure
163 that the setting is implemented as an installer setting not intended to be consumer
164 accessible. For example, physical switches or jumpers shall require the use of tool(s),

165 removal of a panel, or the like; settings accessible in the product's controls shall require a
166 unique sequence of button presses, shall be in a hidden menu, shall require an installer
167 password, or the like.

168
169 **D. Installation Requirements:**

- 170
171 1. *Installation Materials (window units only):* Room air conditioners intended for window
172 installations shall be shipped with weather stripping and/or gasket materials appropriate for
173 all intended applications, including the window size(s) the unit is typically used for, when
174 installed according to provided instructions. The materials shall minimize air leaks (seal)
175 between the room air conditioner and the window opening, including the area between the
176 room air conditioner and the window sash, and the area between the room air conditioner
177 and the windowsill (if bottom-mounted) or the window head (if top-mounted). The materials
178 shall also seal gaps between fixed and movable window sashes. Acceptable weather
179 stripping or gasket material includes, but is not limited to, vinyl clad foam, EPDM cellular
180 rubber, silicone rubber, or comparable alternatives that resist air and water infiltration as well
181 as degradation due to ultraviolet (UV) radiation exposure. Room air conditioner side curtains
182 must be tight fitting to minimize air leaks and contain insulation in the panel with a minimum
183 insulation value of R1 as determined by the Federal Trade Commission's (FTC) Labeling and
184 Advertising of Home Insulation regulations, 16 CFR part 460.
185
186 2. *Installation Instructions:* Products shall ship with detailed installation documentation that
187 includes text and, where applicable, diagrams intended to facilitate installation that minimizes
188 air leakage and thermal losses. Instructions shall include recommendations on the proper
189 locations to install weather stripping or gaskets and, optionally, the use of temporary tape or
190 removable caulk to seal the unit in place. If the product is a TTW unit, instructions shall also
191 include a recommendation that the consumer install an appropriately sized cover, to include
192 recommended specifications that facilitate satisfactory fit, when the RAC is not in use to
193 provide additional insulation and air sealing.

194
195 **E. Model Numbers:** Model numbers used for ENERGY STAR certified product submissions shall be
196 consistent with FTC (as specified in 16 CFR 305) and DOE (as specified in 10 CFR 429.15(b))
197 submissions.

198
199 **F. Additional Reporting Requirements:** Report the type of refrigerant used in the room air
200 conditioner, for example R-32 or R-290.
201

202 **NOTE:** EPA is proposing required refrigerant reporting as a part of Draft 1. For the past couple of years,
203 manufacturers have had the option to report refrigerant type for relevant ENERGY STAR products,
204 including room air conditioners. Both ENERGY STAR utility partners and consumers have requested
205 increased transparency around refrigerants used in products and their related global warming potentials
206 (GWP) to understand their impact on climate.

207 **4) Connected Product Criteria:**

208 The following optional connected criteria are applicable to Included Products, Section 2.A., that meet
209 the definition of a room air conditioner.

210 **A. Connected RAC System**

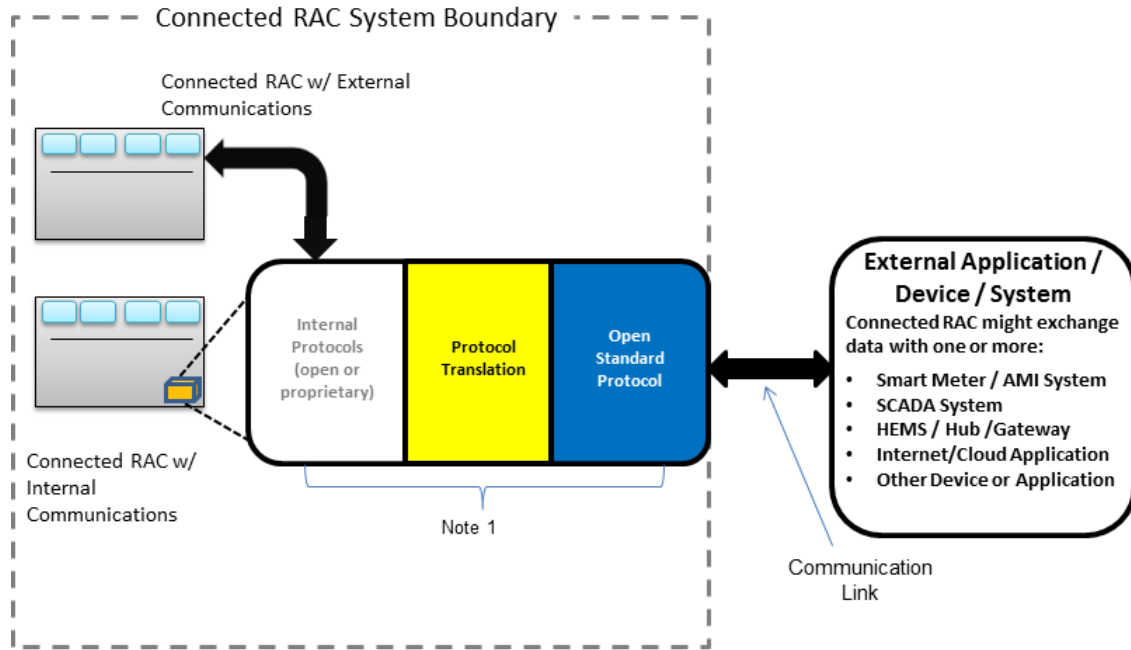
211 To be recognized as connected, a Connected RAC System, as shown in Figure 1) shall include
212 the appliance plus all elements (hardware, software) required to enable communications in
213 response to consumer-authorized energy related commands (*not including third-party remote
214 management which may be made available solely at the discretion of the manufacturer*). These
215 elements may be resident inside or outside of the base appliance. This capability shall be
216 supported through one or more means, as identified in Section 4.B.2.

217 The specific design and implementation of the Connected RAC System is at the manufacturer's
 218 discretion provided it is interoperable with other devices via open communications protocol and
 219 enables economical consumer-authorized third-party access to the functionalities provided for in
 220 Sections 4.D, 4.F and 4.G., and the capabilities shall be supported through one or more means,
 221 as identified in Section 4.B.2. A product that enables economical and direct, on-premises, open-
 222 standards based interconnection is the preferred option for meeting this requirement, but
 223 alternative approaches are also acceptable.

224 The product must continue to comply with the applicable product safety standards – the addition
 225 of the functionality described below shall not override existing safety protections and functions.

226
 227

Figure 1. Connected RAC System Boundary – Illustrative Example



Note 1: Communication device(s), link(s) and/or processing that enables open standards-based communication between the Connected RAC System and Energy Management Device/Application(s). These elements could be within the base appliance, and/or an external communication module, a hub/gateway, or in the Internet/cloud.

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 229
 230
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 232
 233 **Note:** In the years since EPA first instituted groundbreaking connected criteria, with the help of our
 234 stakeholders, the practice and market for connected products has matured significantly. Largely,
 235 consumer demand for the increased amenity, such as the ability to control a RAC remotely, has been the
 236 biggest driver of connectivity in products. Meanwhile, utilities have experimented with using connected
 237 appliances to limit demand peaks and to shift load to times when power is clean and inexpensive.
 238 Because a 5% credit associated with the connected adder is significant in terms of efficiency, a test
 239 procedure was necessary to ensure that RAC connectivity provided meaningful value to the market
 240 and/or additional potential for more energy savings. However, EPA understands that sophisticated
 241 connected capabilities that the ENERGY STAR room air conditioner specification currently outlines have
 242 not been widely used in the market, nor is EPA aware of any utilities with plans to incorporate these
 243 capabilities.

244 Furthermore, the complexity of the requirements and testing burden have prevented many high-efficiency
 245 products that can provide grid responsiveness from being certified as connected. As a result, EPA is
 246 proposing to simplify the criteria and associated testing requirements while also removing the 5% credit.
 247 EPA seeks to make the connected criteria both more useful to those interested in grid response from
 248 RACs and less burdensome to test. For instance, all currently recognized connected RACs use
 249 OpenADR, and EPA would consider specifying use of that and/or a CTA-2045 port as EPA has for other
 250 cooling products. Furthermore, it may be that conformance to either of these standards is sufficient to
 251 demonstrate demand response capability. In that case, the only additional criteria would be aimed at the
 252 types of capabilities covered in subsections D, E, F, and H of this specification.

253 EPA offers these thoughts to spur discussion and to seek stakeholder feedback on the above-discussed
254 concept of simplifying the criteria and what it should include. EPA would particularly appreciate feedback
255 on the following questions:

256 Regarding connectivity protocols, would product brand owners be open to EPA specifying compliance
257 with OpenADR and/or CTA-2045 for products to be recognized as connected (brand owners could
258 choose either or both standards)? For utilities and aggregators, would this facilitate product choice within
259 programs or reduce costs to administrate programs?

260 For product brand owners, would connected criteria that could be evaluated by examining documentation
261 and product(s) information lead to connected recognition for more product lines?

262 For utilities and aggregators, would ENERGY STAR connected recognition of a wider variety of RAC
263 models (particularly the highest efficiency ones) make reliance on ENERGY STAR connected recognition
264 more useful? Are there other criteria that would increase the usefulness of ENERGY STAR connected
265 recognition?

266 Lastly, we understand that utilities that have run DR programs for RACs in the past are turning towards
267 reliance on aggregators that can offer customers a variety of products that could be used for DR. Are
268 other utilities using such a model that have not had RAC DR programs in the past? EPA would appreciate
269 the opportunity to connect with aggregators with the help of utility partners, or at least request that utilities
270 forward this specification and related questions to aggregators with whom utilities are working.

271 B. Communications

272 1. Open Standards – Communication with entities outside the Connected RAC System that
273 enables connected functionality (Sections 4.D, 4.F and 4.G) must use, for all communication
274 layers, standards:

- 275 • Included in the Electric Power Alliance Catalog of Standards,⁵ and/or
- 276 • Included in the NIST Smart Grid framework⁶ Tables 4.1 and 4.2, and/or
- 277 • Adopted by the American National Standards Institute (ANSI) or another well-established
278 international standards organization such as the International Organization for
279 Standardization (ISO), International Electrotechnical Commission (IEC), International
280 Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE)
281 or Internet Engineering Task Force (IETF).

282 Note: EPA recognizes that standardized messages to enable requisite connected
283 functionality may not be available. In such cases, manufacturer-specific messaging is
284 unavoidable, and is permitted by certain open standards. In cases where proprietary
285 messaging is necessary, the Application Programming Interface (API) or similar documents
286 must ensure open access to the connected functionalities outlined in Section 4.C.

287 2. Communications Hardware Architecture – Communication with entities outside the
288 Connected RAC System that enables connected functionality (Sections 4.D through 4.G)
289 shall be enabled by any of the following means, according to the manufacturer's preference:

- 290 a. Built-in communication technology
- 291 b. Manufacturer-specific external communication module(s) and/or device(s)
- 292 c. Open standards-based communication port on the appliance combined with open
293 standards-based communications module
- 294 d. Open standards-based communication port(s) on the appliance in addition to a, b or c,
295 above

296 If option b or c is used, the communication module/device(s) must be easy for a consumer to
297 install and shipped with the appliance, provided to the consumer at the time of sale, or
298 provided to the consumer in a reasonable amount of time after the sale.

299 **Note:** EPA updated the webpage link for the Electric Power Alliance Catalog of Standards in footnote 5.

300 C. Open Access

⁵ <https://sepapower.org/knowledge/catalog-of-standards/>

⁶ <http://www.nist.gov/smartgrid/upload/NIST-SP-1108r3.pdf>

301
302 To enable interconnection with the product, in addition to Section 4.B.1 that requires open-
303 standards, an interface specification, API or similar documentation shall be made available to
304 interested parties that at a minimum, allows transmission, reception and interpretation of the
305 following information:
306

- 307 ▪ Energy Consumption Reporting specified in Section 4.D (must include accuracy, units and
308 measurement interval);
- 309 ▪ Operational Status, User Settings & Messages specified in Section 4.F (if transmitted via a
310 communication link);
- 311 ▪ Demand Response specified in Section 4.G.

312 D. Energy Consumption Reporting

314 In order to enable simple, actionable energy use feedback to consumers and consumer
315 authorized energy use reporting to third parties, the product shall be capable of transmitting
316 energy consumption data via a communication link to energy management systems and other
317 consumer authorized devices, services, or applications. This data shall be representative of the
318 product's interval energy consumption. It is recommended that data be reported in watt-hours for
319 intervals of 15 minutes or less, however, representative data may also be reported in alternate
320 units and intervals as specified in the product manufacturer's interface specification or API
321 detailed in Section 4.C.

322 The product may also provide energy use feedback to the consumer on the product itself. On-
323 product feedback, if provided, may be in units and format chosen by the manufacturer (e.g.,
324 \$/month).

325 E. Remote Management

326 The product shall be capable of receiving and responding to consumer authorized remote
327 requests (*not including third-party remote management which may be made available solely at*
328 *the discretion of the manufacturer*), via a communication link, similar to consumer controllable
329 functions on the product. The product is not required to respond to remote requests that would
330 compromise performance and/or product safety as determined by the product manufacturer.

331 F. Operational Status, User Settings & Messages

- 332 1. The product shall be capable of providing the following information to energy management
333 systems and other consumer authorized devices, services or applications via a
334 communication link:
 - 335 • Operational / Demand Response (DR) status (for example: off/standby, energy saver
336 mode, low cool, max cool, delay appliance load, temporary appliance load reduction).
- 337 2. The product shall be capable of providing the following information on the product and/or to
338 energy management systems and other consumer authorized devices, services or
339 applications via communication link:
 - 340 • At least two types of messages relevant to the energy consumption of the product. For
341 example, messages for room air conditioners might address performance issues or
342 reporting energy consumption that is outside the product's normal range.

343 G. Demand Response

344 The product shall have the capability to receive, interpret and act upon consumer-authorized
345 signals by automatically adjusting its operation depending on both the signal's contents and
346 settings from consumers. At a minimum, the product shall be capable of providing the following
347 capabilities for all cycle and setting combinations, except where otherwise noted:

- 348 1. *Delay Appliance Load (DAL) Capability*: The capability of the product to respond to a signal
349 in accordance with consumer settings, except as permitted below; by increasing the set
350 temperature by at least 4°F for at least 4 hours.
 - 351 a. Maximum Set Temperature – The increased set temperature shall not exceed 85°F.

- 352 b. Consumer override – The consumer shall be able to override the product’s DAL response
353 without limitation.
- 354 c. The product shall be able to provide at least one DAL response in a rolling 24-hour
355 period.
- 356 2. *Temporary Appliance Load Reduction (TALR) Capability:* The capability of the product to
357 respond to a signal in accordance with consumer settings, except as permitted below; by
358 disabling compressor operation for at least 10 minutes.
- 359 a. Maximum Set Temperature – The product shall not respond if the set temperature is
360 ≥ 85°F.
- 361 b. Consumer override – The consumer shall be able to override the product’s TALR
362 response without limitation.
- 363 c. The product shall be able to provide at least three TALR responses in a rolling 24-hour
364 period. The product is not required to provide more than one TALR response per 60-
365 minute period.

366 H. Information to Consumers

367 If additional modules, devices, services and/or infrastructure are part of the configuration required
368 to activate the product’s communications capabilities, prominent labels or other forms of
369 consumer notifications with instructions shall be displayed at the point of purchase and in the
370 product literature. These shall provide specific information on what consumers must do to activate
371 these capabilities (e.g. “*This product has Wi-Fi capability and requires Internet connectivity and a
372 wireless router to enable interconnection with an Energy Management System, and/or with other
373 external devices, systems or applications.*”).

374 **5) Test Requirements:**

- 375 A. One of the following sampling plans shall be used to test energy performance for certification to
376 ENERGY STAR:
- 377 1. A single unit is selected, obtained, and tested. The measured performance of this unit and of
378 each subsequent unit manufactured must be equal to or better than the ENERGY STAR
379 specification requirements. Note that to determine the represented value per 10 CFR Part
380 429, Subpart B § 429.15, additional testing outside of ENERGY STAR is required. The
381 represented value must also be equal to or better than the ENERGY STAR specification
382 requirements.
- 383 2. At least two units are selected, obtained and tested. The represented value is calculated from
384 the test results according to the sampling requirements defined in 10 CFR Part 429, Subpart
385 B § 429.15. The represented value must be equal to or better than the ENERGY STAR
386 specification requirements.
- 387 Results of the tested unit(s) may be used to certify additional individual model variations within a
388 Basic Model as long as the definition for Basic Model provided in Section 1, above, and in 10
389 CFR Part 430.2 is met.
- 390 B. When testing room air conditioners, the following test method shall be used to determine
391 ENERGY STAR certification:

Table 5: Test Methods for ENERGY STAR Certification

ENERGY STAR Requirement	Test Method Reference
CEER	10 CFR 430, Subpart B, Appendix F OR DOE-approved test procedure waiver pursuant to 10 CFR Part 430.27*
Sound Pressure	An internationally recognized ISO or ANSI test procedure measuring sound pressure with any adjustments documented and submitted at the time of certification for each basic model

393 C. Compliance with Energy Saver Mode, Filter Reminder, and Installation criteria shall be through
394 examination of product and/or product documentation.

395 D. The measured sound pressure dB(A) for the lowest operational mode available shall be reported
396 for each basic model. The lowest operational mode means the compressor and fan are still in
397 operation, but at the lowest cooling output level.

398

399 **Note:** EPA is proposing to include sound pressure reporting for the lowest operational model available.
400 EPA has included an identical requirement for ENERGY STAR Most Efficient recognition for multiple
401 years. Reduced sound levels are a prominent feature for room air conditioners as consumers typically
402 occupy the area nearby the unit. In particular, variable speed RACs are especially quiet and may be ideal
403 for consumers using RACs in sleeping or working areas, where the lowest operational mode may be
404 preferred. EPA believes consumer knowledge of the sound level capabilities of these units will allow
405 consumers to make better informed decisions when comparing models. EPA invites
406 comments/suggestions if a specific test method should be used to measure sound pressure.

407

408 E. Compliance with connected functionality requirements, as specified in Section 4, shall be
409 demonstrated through examination of product and/or product documentation. In addition, demand
410 response functionality shall be verified using the ENERGY STAR Test Method for Room Air
411 Conditioners to Validate Demand Response (June 2017).

412 F. Compliance of a basic model with demand response functionality (section 4.G.) shall be:

413 1. Validated by testing using the ENERGY STAR Test Method for Room Air Conditioners to
414 Validate Demand Response (June 2017) in order for a product to be listed as having
415 connected functionality on the Qualified Product List.

416 OR

417 2. Predicted via an Alternative Demand Response Validation (ADRV). An ADRV is
418 developed based on the specific set of manufacturer-defined parameters from a minimum
419 of (2) tested basic connected models (TBCMs) that have been tested according to the
420 ENERGY STAR Test Method for Room Air Conditioners to Validate Demand Response
421 (June 2017) and meet the demand response requirements of the connected criteria.
422 Examples of these manufacturer-defined parameters can include, but are not limited to,
423 hardware and software documentation, connection types and capabilities, and computer
424 simulations. To use an ADRV for a model's certification, the manufacturer shall submit 1)
425 test data from the relevant TBCMs, and 2) a short memo to the certifying body stating
426 their intent to use an ADRV to meet the demand response portion of testing requirements
427 and explaining how the TBCM test data is relevant to the model for certification.

428 i. A TBCM manufactured by an original equipment manufacturer (OEM) and sold
429 across different brands and brand owners may be used to support an ADRV
430 across those brands.

431 ii. Manufacturers are responsible for ensuring the accuracy and reliability of the
432 ADRV. Models certified based on an ADRV will be subject to verification testing
433 based on the ENERGY STAR Test Method for Room Air Conditioners to Validate
434 Demand Response.

435
436 **Note:** As discussed in Section 4) Connected Product Criteria, EPA is considering significant changes to
437 the criteria for connected recognition. These changes will impact the DR test method (and whether there
438 is a test method) for RACs. This will also affect the need for an ADRV. The test method section will be
439 updated accordingly in subsequent drafts.

440
441 EPA has also removed the requirement that RACs with efficient variable outputs require a test procedure
442 waiver from DOE because DOE has incorporated testing for variable output into their test procedure final
443 rule published in March 2021.

444
445 G. Significant Digits and Rounding: All calculations shall be carried out as specified in Appendix F to
446 Subpart B of Part 430 and 10 CFR Part 430.23(f). Do not round individual test results. Rounding
447 is specified in 10 CFR Part 429 for the represented value.

448 **6) Effective Date:** The ENERGY STAR Room Air Conditioner specification shall take effect on **TBD**.
449 Any product model with a date of manufacture on or after this date shall meet this specification to
450 earn the ENERGY STAR. The date of manufacture is specific to each unit and is the date on which a
451 unit is considered completely assembled.

452 **Note:** EPA is aware that RACs are a seasonal product with specific manufacturing cycles to support an
453 April-August retail sales cycle. EPA intends to finalize this Version 5.0 specification in 2022 and
454 anticipates it would take effect 9 months later. As with other ENERGY STAR specifications, early
455 certification will be available once the specification has been finalized, and thus, early adoption will be
456 available prior to the 2023 cooling season.

457 **7) Future Specification Revisions:** EPA reserves the right to change the criteria should federal
458 requirements, technological and/or market changes affect its usefulness to consumers, industry or the
459 environment. In keeping with current policy, revisions to the specification are arrived at through
460 industry discussions. In the event of a specification revision, please note that ENERGY STAR
461 certification is not automatically granted for the life of a product model.