

## HOW DOES THE RINNAI HYDRONIC FURNACE IMPACT SEER RATING IN COOLING APPLICATIONS:

As with all hydronic air-handlers which do not incorporate an evaporator or chilled water coil, the Rinnai Hydronic Furnace does not have COP or SEER numbers because it DOES NOT incorporate the cooling and/or heating engine. However, based on the following AHRI statement we can show how the Rinnai Hydronic Furnace affects the system efficiency.

AHRI Standard 210/240, Appendix M to subpart B (Uniform test method for measuring the energy consumption of central air conditioners) section 5.1 - Calculations for seasonal energy efficiency ratio (SEER) in air source units, states:

"Units which do not have indoor air circulating fans furnished as part of the model shall have their measured total cooling capacities adjusted by subtracting 1,250 Btu/hr per 1,000 CFM of measured indoor air flow and adding to the total steady-state electrical power input 365 watts per 1,000 CFM of measured indoor air flow."

All split systems (evaporator/condensing unit match set) on the market are rated in accordance with the above statement. As long as a Rinnai Hydronic Furnace model consumes no more than 365 watts for each 1,000 CFM delivered at the stated rating point of 0.5" external static pressure (ESP) then the stated SEER number will NOT be impacted negatively. If a unit consumes less than 365 watts per 1,000 CFM delivered then the stated SEER number will be impacted positively, that is the system will deliver higher than rated SEER (refer to Table 1).

<b>Table 1: Power Comparison AHRI/RINNAI®</b>			
<b>Rinnai Models</b>	<b>AHRI benchmark Watts/CFM</b>	<b>Rinnai Watts/CFM at rating point [w/ECM]</b>	<b>Impact on SEER</b>
37AHB045---	0.365	0.294	Positive
37AHB060---		0.356	Positive
37AHB075---		0.298	Positive
37AHB090---		0.375	Very Slight Negative (Statistically no effect)

THIS LIST DOES NOT INFER AHRI CERTIFICATION CREDENTIALS.

### DISCLAIMER:

The information contained herein is accurate and complete to the best of our knowledge and belief at the time of publication. This information was provided to assist you in understanding the system SEER or COP ratings. Rinnai Corporation, or any of its subsidiaries, assumes no liability whatsoever for the accuracy or completeness of the information contained herein.

## TB– 88 Rinnai Hydronic Furnace Impact on SEER Rating

### HOW TO ACCESS THE AHRI DIRECTORY TO OBTAIN AND PRINT A CERTIFICATE OF PRODUCT RATING:

STEP 1: Go to [www.ahridirectory.org](http://www.ahridirectory.org) or <http://www.ahridirectory.org/ahridirectory/pages/home.aspx>

Both URLs will take you to the Directory of Certified Product Performance page on the Air-Conditioning, Heating and Refrigeration Institute's (AHRI) website.

STEP 2: Under the tab marked "Residential" click once on the sub-tab marked "Air Conditioners and Air Conditioner Coils." For more information about the Search fields, click the question mark (?) next to the search field. For search tips, refer to FAQs.

STEP 3: Refer to Table 3 in this document and identify the selected coil model for your project; for example, let us look at an 'A-coil' from the Goodman/Amana line. The identified coil model is: **CAPF1824A6**.

**Practical Note:** Use coil model numbers exactly as indicated in the table: to be precise, for Goodman/Amana coil CAPF1824A6; use coil model number only, less cabinet descriptor, i.e. use "1824A6" in lieu of "CAPF1824A6."

STEP 4: On AHRI's AC Search page (fig. 1.0), look in the right column and locate indoor unit entry tab (titled "Indoor Unit Model Number"); enter "1824A6," before clicking the search button, enter the required code into the appropriate section (titled "to search, enter the code in the picture above") then click the "Search" button located at the bottom right hand section of page.

**Practical Note:** Required picture code is not case sensitive.

The image shows the AHRI AC Search page. At the top left is the AHRI logo with the text "Air-Conditioning, Heating, and Refrigeration Institute". At the top right is the "AHRI CERTIFIED" logo with the website URL. The main content area is titled "AC Search" and includes a "Home" link. Below the title, there is a note: "For more information about the Search fields, click ? next to the search field. For search tips, refer to FAQs." The search form is divided into several sections. On the left, there are dropdown menus for "AHRI Certified Reference Number", "AHRI Type", "Outdoor Unit Manufacturer (Systems)", "Indoor Unit Manufacturer (Mix-Match Or Coil)", "Furnace Model Number", "SEER (Btuh/Watt)", "Phase", "High Sales (Only applicable to Systems)", and "Eligible for Federal Tax Credit". In the center, there are dropdown menus for "Please Select an AHRI Type", "Please Select a Manufacturer", and "Please Select a Manufacturer". To the right of these, there are input fields for "Min." and "Max." values for "1-Phase or 3-Phase", "Cooling Cap. (Btuh)", "EER (Btuh/Watt)", and "Manufacturer Type". There are also radio buttons for "Yes", "No", and "No Preference" for "High Sales" and "Eligible for Federal Tax Credit". On the far right, there are dropdown menus for "Model Status", "Outdoor Unit Model Number", "Outdoor Unit Trade/Brand/Name (Systems)", "Please Select an Outdoor Unit Trade/Brand/Name", "Min.", "Max.", "Systems and Mix-Match(Coil)", and "Yes", "No", and "No Preference". A red box labeled "Search page" points to the "AC Search" title. A red box labeled "Enter indoor model here" points to the "Indoor Unit Model Number" field. A red box labeled "Enter picture code here" points to a cloud-shaped graphic containing the code "E2KXGA". At the bottom right, there are "Search" and "Reset" buttons. Below the buttons, there is a link to "Terms and Conditions".

**FIGURE 1.0: Image of AHRI's AC Search page**

**Practical Note:** Rinnai Technical Bulletin 86 lists all rated combinations of condensing unit with the selected A-Coil. Additional facts listed in TB-86: AHRI certification number, manufacturer's name, Model Status, Btu/h rating, SEER etc.

## TB– 88 Rinnai Hydronic Furnace Impact on SEER Rating

The screenshot shows the AHRI website in an Internet Explorer browser. A table of AC models is displayed, with a file download dialog box overlaid on top. The dialog box asks "Do you want to open or save this file?" and provides options to "Open", "Save", or "Cancel". The file is named "AHRICertificate.pdf" and is from "www.ahridirectory.org".

AHRI Certified Ref #	Model Status	Manufacturer Type	Trade/Brand Name	Manufacturer	Outdoor Unit Model Number	Indoor Unit Model Number	SEER	Phase	AHRI Type	HSVTC	Exclusively for Export	Est. National Avg. Annual Operating Cooling Cost (\$)	Eligible for Federal Tax Credit
3056027	Discontinued	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING			11.00	13.00	1	RCU-A-C		161	
3299514	Discontinued	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING	ASX130181A*	CHPF1824A6C**EEP	18000	11.00	13.00	1	RCU-A-C	161	
3540002	Discontinued	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING	ASX130181B*	CHPF1824A6B**EEP	18000	9.80	13.00	1	RCU-A-C	161	
3706352	Discontinued	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING	ASX130181B*	CHPF1824A6C**EEP	18000	9.80	13.00	1	RCU-A-C	161	
3838985	Active	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING	ASX130181C*	CHPF1824A6C**EEP	18000	9.80	13.00	1	RCU-A-C	161	
4704301	Active	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING	ASX130181D*	CHPF1824A6C**EEP	18000	11.00	13.00	1	RCU-A-C	161	
3056063	Discontinued	Systems	ASX13 SERIES	AMANA HEATING AND AIR CONDITIONING	ASX130241A*	CHPF1824A6B**EEP	23000	11.00	13.00	1	RCU-A-C	206	

**FIGURE 2.0: Image of AHRI's System page**

**Practical Note:** Refer to notes on upper left of webpage for additional information and/or description of table annotation.

**STEP 5:** Double click on a row to view/print AHRI certificate.

**STEP 6:** A file download dialog box will appear, click "Open" to view certificate or "Save" to save the PDF certificate at a designated location on your desktop.

The image shows an AHRI Certificate of Product Ratings for a Split System Air-Cooled Condensing Unit. The certificate includes the AHRI Certified Reference Number (3540002), Date (9/25/2011), Product Name, Outdoor Unit Model Number (ASX130181B\*), Indoor Unit Model Number (CHPF1824A6B\*\*EEP), Manufacturer (AMANA HEATING AND AIR CONDITIONING), and Trade/Brand Name (ASX13 SERIES). It also lists the Cooling Capacity (18000 Btu/h), SEER Rating (9.80), and SEER Rating (Cooling) (13.00). The certificate is signed by the AHRI and includes a QR code.

**FIGURE 3.0: Image of AHRI's Certificate**