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Modeling Guide for Daikin VRV in eQUEST



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Introduction

This modeling guide contains step-by-step instructions for modeling Daikin VRV IV, III and WIV systems in eQUEST (version 3-65). To download and learn more about eQUEST, please visit http://www.doe2.com/equest/.

Please visit Daikin AC website: <u>http://www.daikinac.com/content/resources/software-tools/</u>, or Daikin city website <u>https://www.daikincity.com/</u> following the path: Library Home > 07 VRV/LC Sales Partners > Sales Tools & Applications Resources > Sales and Applications Tools > Energy Simulation for new products information update.

The Daikin VRV library file includes cooling and heating performance curves for Daikin VRV IV (RXYQ and REYQ series), VRV III air-cooled (RXYQ and REYQ series) and VRV WIV water-cooled (RWEYQ series) products. The cooling/heating curves are:

- Total Capacity; *f(t evaporator entering wet bulb, t condenser entering dry bulb)* These curves model equipment capacity at 100% load based on
 - For air-cooled products, ambient and indoor air temperature.
 - For water-cooled products, entering water and indoor air temperature.
- Electric Input Ratio; *f(t evaporator entering wet bulb, t condenser entering dry bulb)* These curves model equipment power input at 100% load based on
 - For air-cooled products, ambient and indoor air temperature.
 - For water-cooled products, entering water and indoor air temperature.
- Part Load Ratio; f(part load ratio)

This curve adjusts system power input based on the part load ratio of the condensing unit.

This document and its associate library file are intended to provide necessary data to help designers optimize the design of Daikin VRV systems based on building energy cost. This guide should be used as a guideline only. The modeling accuracy is highly dependent on the user input data and it is the users' responsibility to understand how the input data will affect the program output.



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Program Installation

To install eQUEST:

1. Download the latest version of eQUEST from the DOE website http://www.doe2.com/equest/.

eQUEST Version 3.65 Download:



- 2. Save the downloaded file (.msi) to your preferred location.
- 3. Double click the downloaded file (.msi) and follow the program prompts to finish the installation, using the default settings.



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Importing Daikin VRV Library File

This session demonstrates how to replace the default library file in eQuest with the Daikin VRV library file. To import the Daikin VRV library file into eQUEST:

1. Download the library file (BDLLIB.dat) from Daikin AC website

http://www.daikinac.com/content/resources/software-tools/

or Daikin City <u>https://www.daikincity.com</u> following the path: Library Home > 07 VRV/LC Sales Partners > Sales Tools & Applications Resources > Sales and Applications Tools > Energy Simulation>eQUEST

LIBRARY HOME	01 MINI-SPLIT	02 ALTHERMA	03 MULTI-SPLIT	04 SKY-AIR	05 VRV	06 CONTROLS & ACCESSORIES	07 VRV/LC SALES PARTNERS
Library Home > 07 VRV/LC	Sales Partners > Sales Tools &	Applications Resources > Sale	es and Applications Tools > En	ergy Simulation > eQuest			
-		Modeling Guide for	_				
BDLLIB.DAT	- Mo DAik	ODELING GUIDE FOR (IN VRV IN EQUEST.PDF)					
	and the second distance in the second distanc						

2. If you are an experienced user of eQUEST, jump to step 7. If not, double click the eQUEST icon

Q

^{UST3455} on your desktop to launch eQUEST. The eQUEST startup options dialog box appears:



- Click the OK button to create a new project. If this is not the first time opening eQUEST, open the recent project instead.
- If you choose to create a new project, the Which Wizard box will pop out as the following. Click the Schematic Design Wizard button. If you choose to open the recent project, jump to step 6.



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Which Wizard?
4 Schematic Design Wizard Use this for the earliest design phase (when information is most limited), for smaller/simpler structures, simple schedules, and simple assignments for internal loads and HVAC.
Design Development Wizard Use this for later, more detailed design (when more detailed information is available), for larger, more complicated structures, or for more detailed internal loads, schedules, and HVAC system assignments.

5. When the Wizard appears, click the **Finish** button. The Wizard closes.

request Schematic	Design Wizard	? 💌
General Informa	ation	
Project Name:	Project 7 Code Analysis: - none -	•
Building Type:	Office Bldg, Two Story	
Location Set:	California (Title 24)	
Region:	Los Angeles Area (CZ06) 🗾 Jurisdiction: CA Title24	• 🕐
City:	Los Angeles AP	
	Utility: Rate:	
Electric:	SCE (CA) GS-2 (non-TOU, 20 < kW < 500, three-phase	service) 🔻
Gas:	SCG (CA) GN-10 (buildings with < 20800 therms/mo)	-
Area, HVAC Ser Building A	vice & Other Data	w Grade: 0
Cooling Ed	quip: DX Coils Heating Equip: Furnace	
Analysis Y	rear: 2014 Daylighting Controls: No 💌 Usage Details: Simplifie	d Schedules 💌
Wizard Screen 1	of 41 🗹 🕐 Help 🔄 Previous Next Screen Screen	Einish 🔀

6. Click Tools > View File Locations > View eQUEST Data Directory.



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7. The eQUEST data directory appears in Windows Explore. Double click the DOE-2 folder.



					- • •
COO V 👍 + Libraries + Documents + I	/ly Doc	uments 🔸 eQUEST 3-65 Data 🔸	👻 🔩 Sear	rch eQUEST 3-65 Data	Q
Organize 🔻 😭 Open Share with 🔻	E-r	nail Burn New folder		:==	
✓ ★ Favorites ■ Desktop	Â	Documents library eQUEST 3-65 Data		Arrange by:	Folder 🔻
🗼 Downloads		Name	7	Date modified	Туре
🖳 Recent Places		DOF-2		10/6/2014 3:03 PM	File folder
		Help		10/6/2014 2:29 PM	File folder
✓ □ Libraries		Screens		10/6/2014 2:29 PM	File folder
Documents		Doe-2R		10/6/2014 2:29 PM	File folder
Imy Documents	=	DOE23		10/6/2014 2:29 PM	File folder
P EnergyPro 6		ScreensDOE23		10/6/2014 2:29 PM	File folder
P EQUEST 3-05 Data	_	ScreensR		10/6/2014 2:29 PM	File folder 🗧
OUEST 5-05 Projects		🐌 Wizard		10/6/2014 2:29 PM	File folder
From Shared Drive 9 29		퉬 Compliance		10/6/2014 2:29 PM	File folder
IBM		퉬 Reports		10/6/2014 2:29 PM	File folder
▶ ■ IFS		SkyCalcWthr		10/6/2014 2:29 PM	File folder
New Project		퉬 Window		10/6/2014 2:29 PM	File folder
New Project 2		퉬 Tutorials		10/6/2014 2:29 PM	File folder
New Project 3		ComplianceDOE23		10/6/2014 2:29 PM	File folder
New Project 4		퉬 Rates		10/6/2014 2:29 PM	File folder
Outlook Files		퉬 Libraries		10/6/2014 2:29 PM	File folder
Sep 22 call		퉬 Weather		9/16/2014 12:56 PM	File folder
Software comparison		eQUEST		10/7/2014 10:39 AM	Configuratic
TRACE 700 Projects		eQUESTDOE23		3/6/2014 1:30 PM	Configuratic 🖕
Public Documents	-	in P			- F

8. A list of files appears. Rename the BDLLIB.DAT file to Original-BDLLIB.DAT. So you can return to the default file if the need arises.

	BDLLIB.BIN	BIN File
9	BDLLIB	DAT File
	BDLLIB	Text Document
	HourlySeries.bin	BIN File
	RdBDLKey.bin	BIN File
_	Symbols.bin	BIN File
8	Original - BDLLIB	DAT File
	eQ_Lib	DAT File
	HDRFIL.BIN	BIN File
	BDLKEY.OUT	OUT File
	HourlySeries	Text Document
	BDLKEY.BIN	BIN File
	prob.	

- 9. Copy the Daikin VRV library file (BDLLIB.DAT) you downloaded from the Daikin website and paste it to this dialog box.
- 10. Close the dialog box.
- 11. In eQUEST, click **File > Exit** to close the program.



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System Modeling

The variable refrigerant flow (VRF) is not incorporated within eQUEST as a specific system type. This guide uses the package single zone system to model the VRV system as an example. It is the users' responsibility to evaluate the calculation methodology of the various system types within eQUEST and select the most proper one for their buildings. Also, this session only provides the necessary steps to set up the VRV system in eQUEST. Users should make their own choices and inputs on the other variables that are not mentioned in this guide.

Implementing the performance curves

To implement the wanted performance curves into your project:

- 1. Double click the eQUEST icon on your desktop again to open the program.
- 2. Click Mode > Detailed Data Edit.





- 3. Click the **Air-Side HVAC** button.
- 4. To the left of the pane, locate the **Performance Curves** folder in the tree.
- 5. Right click the folder and select Create Curve Fit.
- 6. Click the **Load Component from Library** button.

Create Curve Fit		8
	6 Load Component	From Library
	Curve Fit Name: Curve Fit 27	
	Creation Option: Create from scrat	ch 🗨
	Curve Fit Type:	•
	0	
	9	_
	ок	Cancel

- Select the desired product series based on your needs in the Category list. The Entry list populates with all the heating and cooling performance curves for the outdoor units. The meaning of the curves is:
 - *CoolCap | HeatCap*: Cooling/Heating capacity
 - CoolEIR / HeatEIR: Cooling/Heating electric input ratio
 - Cool-PLR / Heat-PLR: Cooling/Heating part load ratio

100		
ic 	Create Curve Fit	Load Component From Library
C	Curve Fit Library Selection	
	Category:	Library Name: bdllib.dat
	Elec Meters 👻	Library File: c:\t 3-65 data\doe-2\bdllib.dat
i	Entri Recip-CAP-FT Recip-EIR-FT Recip-EIR-FPLR Centrif-CAP-FT Centrif-EIR-FT Centrif-EIR-FPLR CAP-FAPP&WB 7	Library Entry Description:
	DAIKIN(VRVIIIAC) DAIKIN(VRVIIIWC)	
ster	m DAIKIN(VRVIVAC)	OK Cancel
errie	9	





- To make a full calculation, all the 6 curves are needed. Select one now as an example, and click the **OK** button. The set of 'ACHRVRT' curves can enable the consideration of the VRT benefits for the VRV IV products.
- 9. The dialog box disappears and the curve you selected will appear. Click the **OK** button.
- 10. The dialog box disappears and the performance curve properties appear. Click the **Done** button.

Performance Curve Properties		? X
Currently Active Curve: VRVAC-CoolEIR-fEWB&ODB Type: Bi-Quadratic in T		
Basic Specifications Data Points		1
Curve Name: VRVAC-CoolEIR-fEWB&ODB		
Curve Type: Bi-Quadratic in T ▼ Minimum Output: -1,000,000.00 Input Type: Curve Coefficients ▼ Maximum Output: 1,000,000.00		
Curve Formula: $Z = a + bX + cX^2 + dY + eY^2 + fXY$		
Where: $a = \begin{bmatrix} -4.79067993 \\ -4.79067993 \end{bmatrix} b = \begin{bmatrix} 0.14754899 \\ -0.00100000 \end{bmatrix} c = \begin{bmatrix} -0.00100000 \\ -0.00100000 \end{bmatrix}$		
d = -0.01380400 e = 0.00009600 f = 0.00011800		
	10	Done



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Repeat the procedure (step 5 – 10) to obtain all the 6 curves that are needed for the calculation.
 The curves will appear on the **Performance Curves** Tree.

Modeling air-cooled outdoor units

To model the outdoor units for air-cooled products:

1. Change the Mode back to Wizard Data Edit.



2. To the left of the panel, click Building Creation Wizard on the Actions panel.



- 3. A window pops out, asking if save changes to current project. Click the **Yes** button. If another Wizard Warning window pops out, click the **OK** button.
- 4. The window of eQUEST Schematic Design Wizard will appear. Define the project building geometry, material property, etc. based on your needs. Choose the HVAC System Definitions on the wizard screen, select DX coils for the cooling source and DX coils (Heat pump) for the heating source. Choose Air as the heat pump source.



г ћ е0 н	QUEST Schematic Desig VAC System Defini	gn Wizard				?	×
	Describe Up To 2 H\	/AC System Types	6		atom 3		
	Cooling Source:	DX Coils	-	No Cooling	stem 2	-	
	Heating Source:	DX Coils (Heat Pump)	•	No Heating		•	
	Heat Pump Src:	Air	•				
	System Type:	Split System Single Zone Heat Pump	. –	- none -		•	
	Return Air Path:	Ducted	•				
						_	
						5	
Wi	zard Screen 19 of 4	1 •	<u>H</u> elp	Previous Screen	Next Screen	<u>F</u> inish	*

- 5. Click the **Finish** button when all the wanted design is finished.
- The Air-Side HVAC panel will appear. Double click the Air Cooled Condenser Icon, the Air-Side HVAC System Parameters dialog will appear.
- 7. Locate **Cooling > Unitary Power** on the upper column.

a). Input the Cooling Electric Input Ratio (EIR) as

- 0.2565 (Btu/Btu) for VRV III
- 0.2651 for VRV IV heat pump w/o VRT
- 0.2684 for VRV IV heat recovery w/o VRT

If you are aware of the exact product number that is used in the system, please input the corresponding Cooling EIR of that product based on the values listed in *Appendix A*.

b). Select the proper performance curve for the EIR column, as it appears on the following figure.



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ir-Side HVAC System Parameters	? 🛛			
Currently Active System: Sys1 (PSZ) (G.C1) System Type: Pkgd Single Zone				
Basics Fans Outdoor Ai Cooling Heating Preconditioner Meters Refrigeration	1			
Coil Capacity / Contro Unitary Power Condenser Capacity Curves Evaporative Cooling Economizer Staged-Volume				
Cooling Power Cooling Electric Input Ratio: 0.2684 Btu/Btu				
7b				
Electric Input Ratio Low Speed Electric Input Ratio				
Cooling Compressor f(t entering wetbulb, t enter condenser): VRVACHR-CoolEIR-FEWB&ODB v				
Compressor Type: Single Speed f(part load ratio): VRVACHR-Cool-PLR				
Minimum Unload Ratio: 0.15 ratio (RPM): IV/3				
Min Hot Gas Bypass Ratio: 0.15 ratio ft(entering wetoulo, n/a t outdoor drybulb):				
Crankcase Power — Gas Heat Pump Auxiliary Electric —				
Crankcase Heat: 0.050 kW Gas HP Pump kW: n/a W/Btu				
Crankcase Max Temperature: 50.0 °F Gas HP Aux kW: n/a kW				
	Done			

8. Locate **Cooling > Capacity Curves** on the upper column. Select the proper performance curve for the cooling capacity, as it appears on the following figure.



9. Then locate Heating > Unitary Power on the upper column.

a). Input the Heating Electric Input Ratio (EIR) as

- 0.2585 (Btu/Btu) for VRV III
- 0.2340 for VRV IV heat pump without VRT
- 0.2235 for VRV IV heat pump with VRT
- 0.2827 for VRV IV heat recovery without VRT
- 0.2416 for VRV IV heat recovery with VRT.

If you are aware of the exact model number that is used in the system, please input the corresponding Heating EIR of that model based on the values listed in *Appendix A*.

b). Select the proper performance curve for the EIR column, as it appears on the following figure.



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Air-Side HVAC System Parameters		8 2
Currently Active System: Sys1 (PSZ) (G.C1)	 System Type: Pkgd Single Zone 	
Basics Fans Outdoor Air Cooling Heating	Preconditioner Meters Refrigeration	
Coil Can / Control Unitary Power	Sunn Heat/Defrost Can Curves/Waste Ht Stages	
Heating Electric Power	Heating Electric Input Ratio Curves	Low Speed Electric Input Ratio Curve
9a Heating Electric Input Ratio: 0.2585 Btu/Btu	t outdoor drybulb):	t outdoor drybulb):
Furnace	f(part load ratio): VRVAC-Heat-PLR 💌	9b
Furnace Heat Input Ratio: n/a Btu/Btu	f(RPM): DX-Heat-EIR-fRPM&	
Furnace Fuel Auxiliary: n/a Btu/h		
Furnace Electric Auxiliary: n/a kW	Gas Heat Pump Auxiliary Electric	
Furnace HIR = f(plr): n/a	Gas HP Pump kW: n/a W/Btu	
Furnace Off Loss: n/a	Gas HP Aux kW: n/a kW	
		Done

10. Locate **Heating > Cap Curves/Waste Ht** on the upper column. Select the proper performance curve for the cooling capacity, as it appears on the following figure.

	Basics Fans Outdoor Air Cooling Heating	ing Preconditioner Meters Refrigeration	
	Coil Cap / Control Unitary Power Preht / Base	ebrd Supp Heat/Defrost Cap Curves/Waste Ht Stage	es
	Total Capacity as f(temperatures)	Waste Heat	_
1(f(t entering wetbulb, t entering drybulb): VRVAC-HeatCap-fEv	Waste Heat Use: - undefined -	•
	f(t entering drybulb		_

Modeling fan power of the indoor units

To continue the previous step,

- 11. Locate **Fans > Fan Power and Control** on the upper column. Input the Design kW/cfm value in the box. The values for Daikin VRV indoor units at high speed can be found in *Appendix*
 - **B**.
- a. Since eQUEST does not apply library files for zone level air side equipment and only a single fan definition exists for the one system, an average assumed fan power density must be used for the system if different indoor units are used within the system. For example, the indoor units used for



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one system is 2 x FXDQ07MVJU, 3 x FXDQ09MVJU and 4 x FXDQ12MVJU. For 07 and 09, the tonnage is 7.5 and 9.5 ton. The total tonnage of the system is $2 \times 7.5 + 3 \times 9.5 + 4 \times 12 = 91.5$. The average full load energy rate is $(2 \times 7.5 \times 0.0002946 + 3 \times 9.5 \times 0.0002946 + 4 \times 12 \times 0.0003054)/91.5 = 0.00030027$.

Side HVAC System Parameters	? <mark>×</mark>
Currently Active System: Sys1 (PSZ) (G.C1) System Type: Pkgd Single Zone	
Basics Fans Outdoor Air Cooling Heating Preconditioner Meters Refrigeration	
Fan Power and Control Flow Parameters Night Cycle Control	
	1
Ean Power Parameters for single-duct systems	-
11 kW/cfm °F in WG Frac Frac Fan EIR = f(PLR)	
Return: n/a 0.53 n/a 🔽	
For Output and Discourses	
Fan Control and Placement — Fan Schedules Fan Control Fan Placement Motor Placement	
Cooling: Sys1 (PSZ) Fan Sch 💌 Constant Volume 💌 Draw Through 💌 n/a 💌	
Unused: n/a v n/a v n/a v	
Return: n/a V Exhaust - undefined -	
	4.0
	13
	Done

- 12. For duct free units (FXFQ-T, FXZQ-M, FXHQ-M, FXAQ-P, FXLQ-M and FXNQ-M series), the static pressure input should be zero. For ducted units (FXTQ-P, FXMQ-P, FXMQ-M, FXDQ-M series), the nominal External Static Pressure (ESP) values are given in the *Appendix B*. For engineering data manual, please visit <u>http://www.daikinac.com/content/resources/manuals/engineeringmanuals/vrv-systems/</u>.
- 13. Click the **Done** button.

Modeling water-cooled outdoor units

Modeling the water-cooled outdoor units has similar steps to the modeling of air-cooled units.

 Implement the water-cooled performance curves in the Category Daikin(WC). Please refer to page 7 step 7.



2. Follow the step 1-4 in modeling air-cooled outdoor units (*page* 9). Select **Water Loop** for the Heat Pump Src.

UEST Schematic Desi	gn Wizard			8
AC System Defini	itions			
Describe Up To 2 H\	/AC System Types			
	System 1	0	System	12
Cooling Source:	DX Coils	- 1	No Cooling	•
Heating Source:	DX Coils (Heat Pump)	•	No Heating	•
			2	
Heat Pump Src:	Water Loop	-	2	
System Type:	Water-Source Heat Pump (single/multi 💌 🖡	none -	•
Return Air Path:	Ducted	•		
			Previous N	ext III

Then follow the previous step 5-13 (*page 10-12*) to define the water-cooled system by choosing the water-cooled performance curves. The cooling EIR (*refer to page 10 step 7a*) for water-cooled system is **0.2123** and the heating EIR (*refer to page 11 step 9a*) is **0.1808**. The exact value for each product is listed in *Appendix C*.



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Appendix A1 Cooling and Heating EIR for VRV III Products

VRV III Model	Cooling EIR	Heating EIR	VRV III Model	Cooling EIR	Heating EIR
RXYQ72PBTJ/PBYD	0.219	0.249	REYQ72PBTJ/PBYD	0.214	0.236
RXYQ96PBTJ/PBYD	0.247	0.250	REYQ96PBTJ/PBYD	0.261	0.262
RXYQ120PBTJ/PBYD	0.258	0.270	REYQ120PBTJ/PBYD	0.268	0.265
RXYQ144PBTJ/PBYD	0.240	0.261	REYQ144PBTJ/PBYD	0.246	0.259
RXYQ168PBTJ/PBYD	0.235	0.249	REYQ168PBTJ/PBYD	0.258	0.251
RXYQ192PBTJPBYD	0.243	0.251	REYQ192PBTJ/PBYD	0.277	0.262
RXYQ216PBTJ/PBYD	0.253	0.253	REYQ216PBTJ/PBYD	0.295	0.268
RXYQ240PBTJ/PBYD	0.258	0.253	REYQ240PBTJ/PBYD	0.310	0.274
RXYQ264PBTJ/PBYD	0.246	0.255	REYQ264PBTJ/PBYD	0.291	0.278
RXYQ288PBTJ/PBYD	0.245	0.250	REYQ288PBTJ/PBYD	0.280	0.264
RXYQ312PBTJ/PBYD	0.249	0.252	REYQ312PBTJ/PBYD	0.292	0.268
RXYQ336PBTJ/PBYD	0.255	0.254	REYQ336PBTJ/PBYD	0.301	0.272
RXYQ360PBTJ/PBYD	0.258	0.254			



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Appendix A2 Cooling and Heating EIR for VRV IV Products

VRV IV Model	Cooling EIR w/o VRT	Heating EIR without VRT	Heating EIR with VRT	VRV IV Model	Cooling EIR w/o VRT	Heating EIR without VRT	Heating EIR with VRT
RXYQ72TTJU/TYDN	0.219	0.230	0.220	REYQ72TTJU/TYDN	0.196	0.230	0.220
RXYQ96TTJU/TYDN	0.217	0.209	0.200	REYQ96TTJU/TYDN	0.199	0.207	0.198
RXYQ120TTJU/TYDN	0.256	0.240	0.229	REYQ120TTJU/TYDN	0.233	0.241	0.230
RXYQ144TTJU/TYDN	0.280	0.234	0.223	REYQ144TTJU/TYDN	0.256	0.242	0.230
RXYQ168TTJU/TYDN	0.329	0.241	0.232	REYQ168TTJU/TYDN	0.282	0.258	0.246
RXYQ192TTJU/TYDN	0.242	0.243	0.227	REYQ192TTJU/TYDN	0.247	0.242	0.231
RXYQ216TTJU/TYDN	0.239	0.226	0.217	REYQ216TTJU/TYDN	0.254	0.232	0.221
RXYQ240TTJU/TYDN	0.256	0.240	0.229	REYQ240TTJU/TYDN	0.259	0.243	0.233
RXYQ264TTJU/TYDN	0.269	0.237	0.227	REYQ264TTJU/TYDN	0.273	0.250	0.241
RXYQ288TTJU/TYDN	0.278	0.234	0.223	REYQ288TTJU/TYDN	0.278	0.259	0.249
RXYQ312TTJU/TYDN	0.305	0.237	0.227	REYQ312TTJU/TYDN	0.292	0.266	0.254
RXYQ336TTJU/TYDN	0.328	0.240	0.230	REYQ336TTJU/TYDN	0.316	0.279	0.266
RXYQ360TTJU/TYDN	0.256	0.240	0.229	REYQ360TTJU/TYDN	0.279	0.245	0.234
RXYQ384TTJU/TYDN	0.278	0.232	0.223	REYQ384TTJU/TYDN	0.306	0.265	0.253
RXYQ408TTJU/TYDN	0.284	0.231	0.221	REYQ408TTJU/TYDN	0.317	0.282	0.269
				REYQ432TTJU/TYDN	0.332	0.289	0.277
				REYQ456TTJU/TYDN	0.366	0.301	0.289



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Appendix B Fan Power for Indoor Units

Non-ducted

Model	Design	Model	Design	Model	Design
wouer	(kW/cfm)	Woder	(kW/cfm)	Woder	(kW/cfm)
FXAQ07PVJU	0.00007308	FXFQ07TVJU	0.00006667	FXL(N)Q07MVJU9	0.00019184
FXAQ09PVJU	0.00010000	FXFQ09TVJU	0.00007029	FXL(N)Q09MVJU9	0.00019184
FXAQ12PVJU	0.00010345	FXFQ12TVJU	0.00007029	FXL(N)Q12MVJU9	0.00028214
FXAQ18PVJU	0.00006600	FXFQ15TVJU	0.00008008	FXL(N)Q18MVJU9	0.00021429
FXAQ24PVJU	0.00007874	FXFQ18TVJU	0.00010270	FXL(N)Q24MVJU9	0.00019286
FXEQ07PVJU	0.00013613	FXFQ24TVJU	0.00010296	FXUQ18PVJU	0.00011321
FXEQ09PVJU	0.00011947	FXFQ30TVJU	0.00015198	FXUQ24PVJU	0.00011321
FXEQ12PVJU	0.00012830	FXFQ36TVJU	0.00016652	FXUQ30PVJU	0.00018265
FXEQ15PVJU	0.00014791	FXHQ12MVJU	0.00021951	FXUQ36PVJU	0.00018265
FXEQ18PVJU	0.00011911	FXHQ24MVJU	0.00017887	FXZQ07MVJU9	0.00025000
FXEQ24PVJU	0.00013929	FXHQ36MVJU	0.00019398	FXZQ09MVJU9	0.00025000
		·	•	FXZQ12MVJU9	0.00023881
				FXZQ15MVJU9	0.00025773
				FXZQ18MVJU9	0.00026263



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Ducted

Model	FSP	Design	Model	FSP	Design
	20.	(kW/cfm)		20.	(kW/cfm)
FXDQ07MVJU	0.03	0.00032857	FXMQ07PA(PB)VJU	0.2	0.00025237
FXDQ09MVJU	0.03	0.00032857	FXMQ09PA(PB)VJU	0.2	0.00025237
FXDQ12MVJU	0.04	0.00033929	FXMQ12PA(PB)VJU	0.2	0.00042222
FXDQ18MVJU	0.06	0.00042045	FXMQ15PA(PB)VJU	0.4	0.00035714
FXDQ24MVJU	0.06	0.00033103	FXMQ18PA(PB)VJU	0.4	0.00033071
FXTQ12PAVJU	0.3	0.00024750	FXMQ24PA(PB)VJU	0.4	0.00033430
FXTQ18PAVJU	0.3	0.00025500	FXMQ30PA(PB)VJU	0.4	0.00032907
FXTQ24PAVJU	0.3	0.00020250	FXMQ36PA(PB)VJU	0.4	0.00033628
FXTQ30PAVJU	0.3	0.00024900	FXMQ48PA(PB)VJU	0.4	0.00033406
FXTQ36PAVJU	0.3	0.00028000	FXMQ54PA(PB)VJU	0.4	0.00028325
FXTQ42PAVJU	0.3	0.00032000	FXMQ48MFVJU	0.88	0.00056693
FXTQ48PAVJU	0.3	0.00041313	FXMQ72MFVJU	0.96	0.00055668
FXTQ54PAVJU	0.3	0.00049167	FXMQ96MFVJU	1.03	0.00051780
			FXMQ72MVJU	0.95	0.00072789
			FXMQ96MVJU	0.95	0.00066116



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Appendix C Cooling and Heating EIR for Water-Cooled Products

Model	Cooling EIR	Heating EIR
RWEYQ72PCTJ/PCYD	0.1990	0.1685
RWEYQ84PCTJ/PCYD	0.2275	0.1950
RWEYQ144PCTJ/PCYD	0.1990	0.1685
RWEYQ168PCTJ/PCYD	0.2275	0.1950
RWEYQ216PCTJ/PCYD	0.1990	0.1685
RWEYQ252PCTJ/PCYD	0.2275	0.1953