

eQUEST™

Building Energy Modeling Guide for R-32 LG VRF Products

R-32 LG VRF Multi V i™ (Air-Cooled)
R-32 LG VRF Multi V S™ (Air-Cooled)



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Introduction

Overview

The eQUEST™ Building Energy Modeling Guide for LG Multi V provides step-by-step instructions for modeling LG Multi V systems. eQUEST™ is a building energy use and cost analysis program drawn from the DOE-2.2. The latest version, eQUEST™ Version 3.65, was built in 2018. Please visit the eQUEST™ website <http://www.doe2.com/equest/> to download the newest eQUEST™ and learn more about it.

Disclaimer and Usage Notice

This Building Energy Modeling Guide should be used as a guideline only. Building load and energy have been approximated for modeling purposes and vary with the input value of equipment (capacity, power input, etc.). Actual results will vary accordingly. The conclusions of this Modeling Guide do not guarantee actual energy costs or savings.

This Modeling Guide and its associated eQUEST™ library file are intended as data and analysis guides to help project engineers and system planners optimize the configuration of LG Multi V VRF systems based on energy utilization. Modeling accuracy is highly dependent on user-supplied data. It is the user's responsibility to understand how the data entered affects program output, and any predefined libraries are used only as guidelines for entering that data. The calculation results and reports shown in this Guide and the eQUEST™ library file are provided for use by qualified HVAC professionals. They are not a substitute for professional engineering judgment, site-specific analysis, safety review, or project-specific validation.

Information contained herein is provided for general informational and modeling purposes only and does not constitute engineering, system design, or performance advice. All performance data are subject to change without notice. Energy results, cost savings, and efficiency estimates may vary based on climate, installation, building characteristics, and usage conditions. Users are responsible for verifying that all modeling assumptions, parameters, and results comply with applicable codes, standards, and project requirements.

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Program Installation

How to install eQUEST™:

1. Download the latest version, eQUEST™ Version 3.65, from the DOE-2 Website <http://doe2.com/equest/index.html>.
2. Save the downloaded file (.msi) to your preferred location.
3. Double click the downloaded file (.msi) to run the installation.
4. Follow the program prompts to finish the installation using the default settings.

Importing Multi V Library File

Importing the Library File

This section shows how to replace the default library file in eQUEST™ with the LG Multi V library file.

How to import the Multi V library file into eQUEST™:

1. Obtain the LG Multi V library file (Bdllib.dat) from the following link:
<https://media.us.lg.com/web/fb9b717fcfa19bcc/public-resources/?viewType=grid&mediaId=3F86180A-7436-4EED-9EA2DAC5022448FA>
2. Double click the eQUEST™ on your desktop to open the program. The eQUEST™ Startup Options dialog box appears:

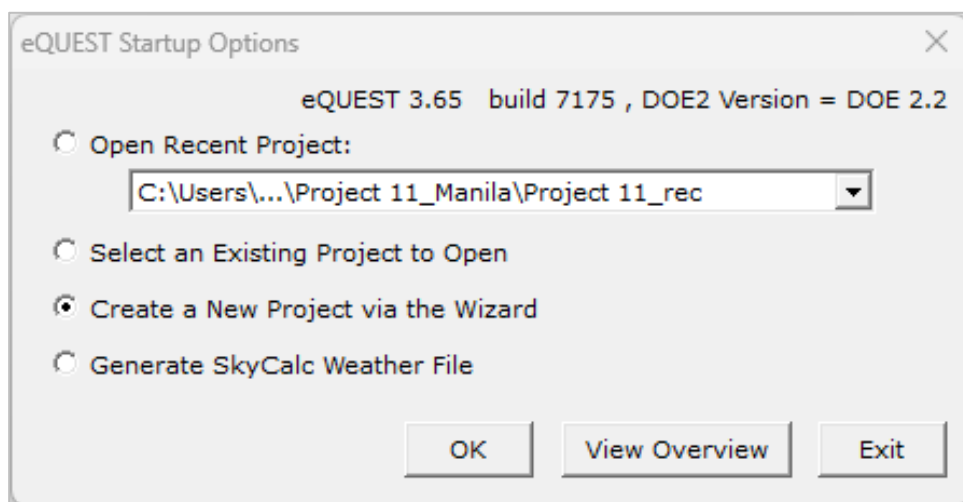


Figure 1. eQUEST™ Startup Options

3. Click the **OK** button to create a new project. The Which Wizard dialog box appears:

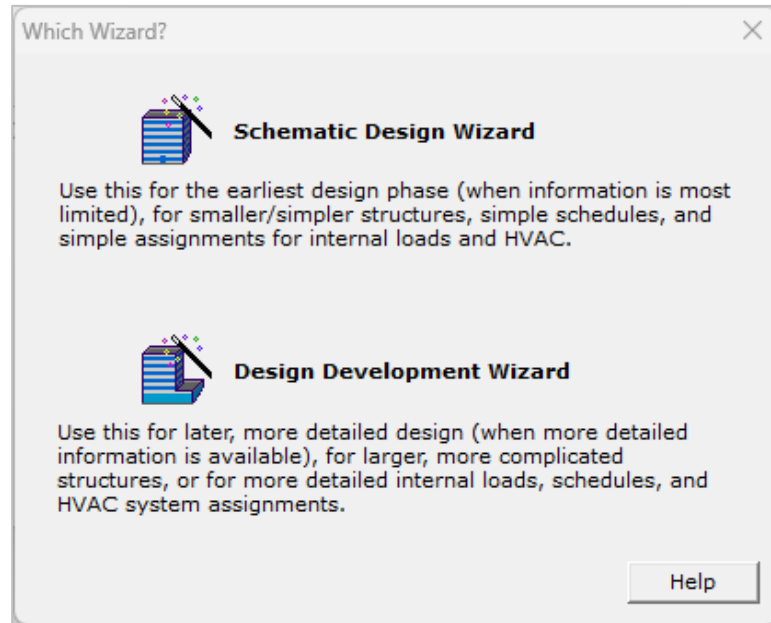


Figure 2. Which Wizard

4. Click the **Schematic Design Wizard** button.
5. When the Wizard appears, click the **Finish** button. The Wizard closes.
6. Click Tools > View File Locations > View eQUEST™ Data Directory. The eQUEST™ Data Directory opens in a new window.

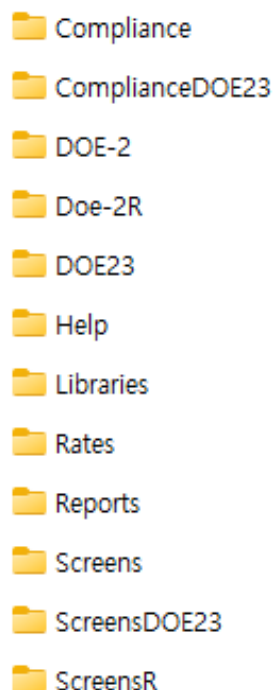


Figure 3. eQUEST™ Data Directory

7. Double click the DOE-2 folder. A list of files appears:

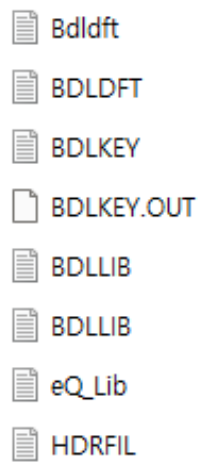


Figure 4. DOE-2 Folder

8. Rename the **Bdllib.dat** file to **original_Bdllib.dat**, so you can return to the default file if necessary.
9. Copy the LG Multi V library file (Bdllib.dat) and paste it to the DOE-2 folder.
10. Close the DOE-2 folder.
11. In eQUEST™, click **File > Exit** to close the program.

Testing the Library File

How to test the Multi V library file in eQUEST™:

1. Double click the eQUEST™ on your desktop to open the program.
2. Click **Mode > Detailed Data Edit**.
3. Click the **Air-Side HVAC** button from the top navigation bar.
4. Right click the **Performance Curves** folder in the Component Tree and click **Create Curve Fit**. The Create Curve Fit dialog box appears:

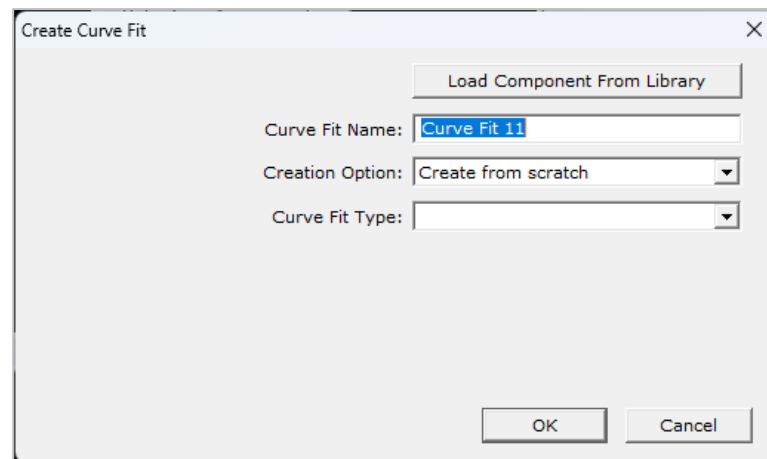


Figure 5. Create Curve Fit

5. Click the Load Component from Library button. The Curve Fit Library Selection appears:

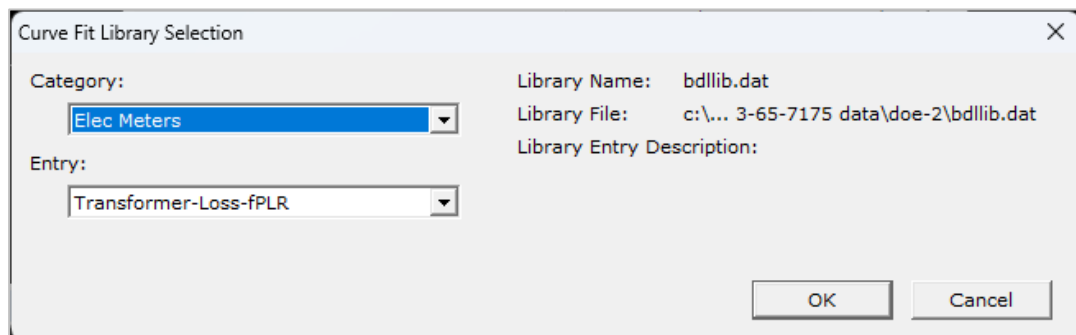


Figure 6. Curve Fit Library Selection

Note: For performance curves to display correctly, please verify you are using **DOE 2.2** and that the library file is in the correct path with its original name. The library file is not supported in DOE 2.3.

6. Select **Multi V i** in the **Category** and an applicable LG Multi V i Outdoor Unit in the **Entry** and click the **OK** button.

7. Click the **OK** button on the Create Curve Fit window.
8. Click the **Done** button on the Performance Curve Properties window. The LG Multi V i Outdoor Unit appears under the Performance Curves in the Component Tree.

The image shows a software window titled "Performance Curve Properties". At the top, it says "Currently Active Curve: ZRUM072*TE6-CoolCap-fEWB&ODB" and "Type: Bi-Quadratic in T". Below this are two tabs: "Basic Specifications" (selected) and "Data Points". Under "Basic Specifications", the "Curve Name" is "ZRUM072*TE6-CoolCap-fEWB&ODB". The "Curve Type" is "Bi-Quadratic in T" and the "Input Type" is "Curve Coefficients". The "Minimum Output" is "-1,000,000.00" and the "Maximum Output" is "1,000,000.00". The "Curve Formula" is $Z = a + bX + cX^2 + dY + eY^2 + fXY$. Below this, the coefficients are listed: "Where: a = -3.43446660, b = 0.09536529, c = -0.00043357, d = 0.01483036, e = -0.00004025, f = -0.00017802". A "Done" button is at the bottom right.

Figure 7. Performance Curve Properties

9. From the category list, select the product series you wish to model. The entry list displays the cooling and heating performance curves for all outdoor units. The meanings of the curves are as follows:
 - A. CoolCap / HeatCap: Cooling/Heating capacity
 - B. CoolEIR / HeatEIR: Cooling/Heating electric input ratio
 - C. CoolfPLR / HeatfPLR: Cooling/Heating part load ratio

Applying Performance Curves Into Your Project

Modeling outdoor units

To model VRF outdoor units:

Enter the cooling and heating electrical input ratios (EIRs) in Cooling > Unitary Power and Heating > Unitary Power in the "Air Side HVAC System Parameters" dialog box. (See Appendix.)

Select the appropriate capacity, power, and partial load curves for your cooling capacity as shown in the figures below.

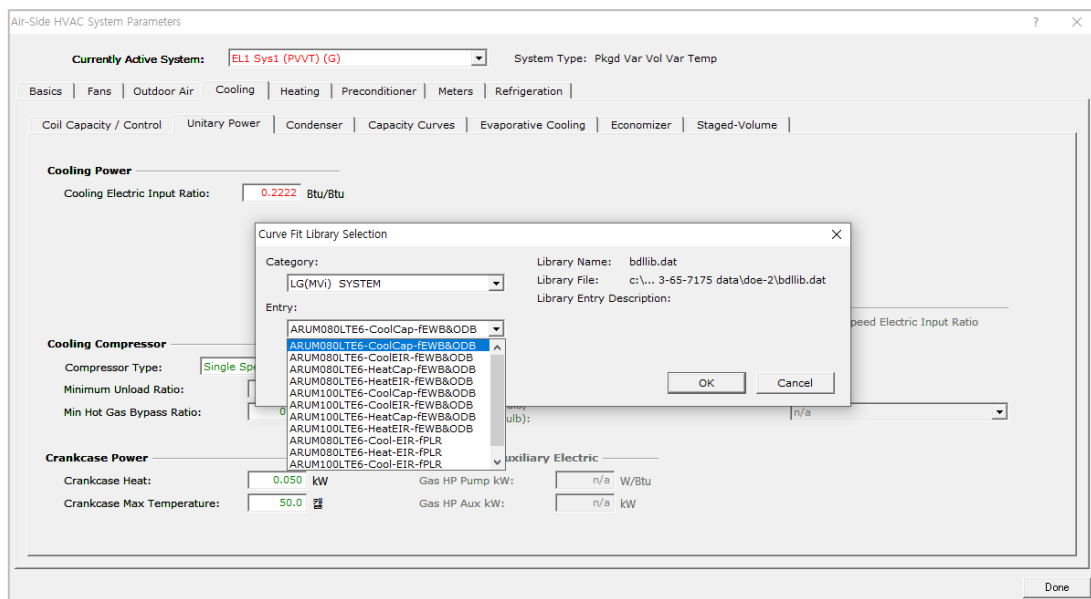


Figure 8. Select the Capacity Performance Curve

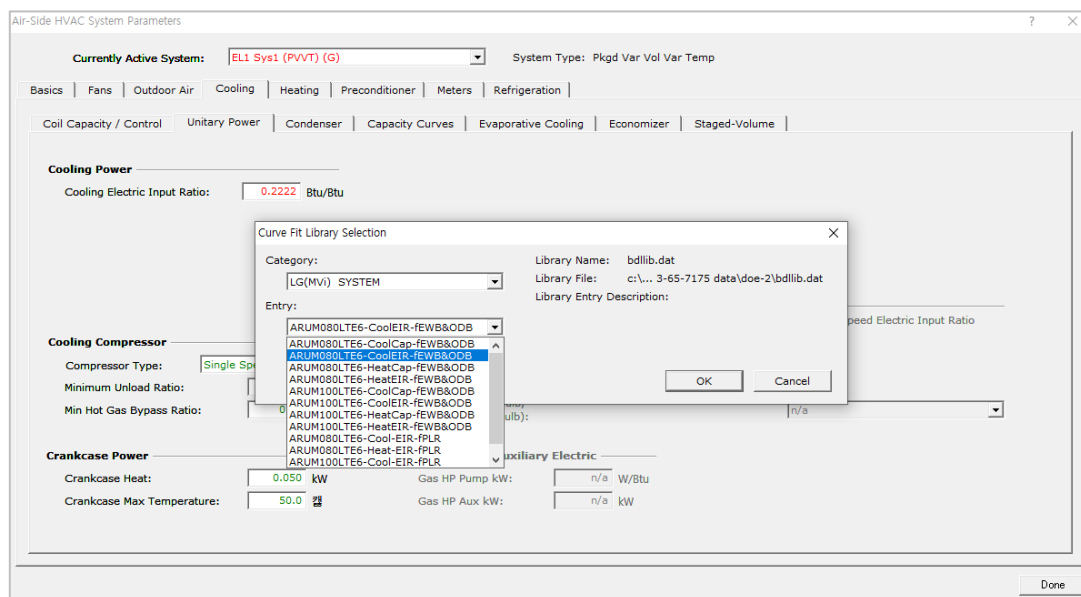


Figure 9. Select the Power Input Performance Curve

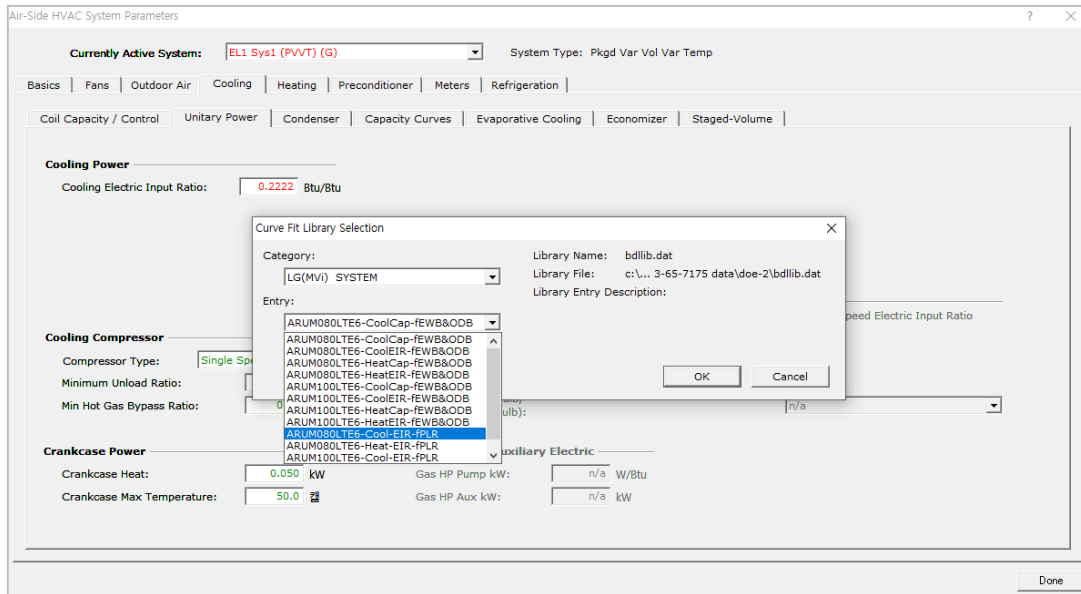


Figure 10. Select the Part Load Power Input Curve

Modeling indoor units

To model VRF indoor units:

In the Air-Side HVAC System Parameters dialog box, enter the Design kW/cfm in Fan Power and Control> Fan. (See Appendix.)

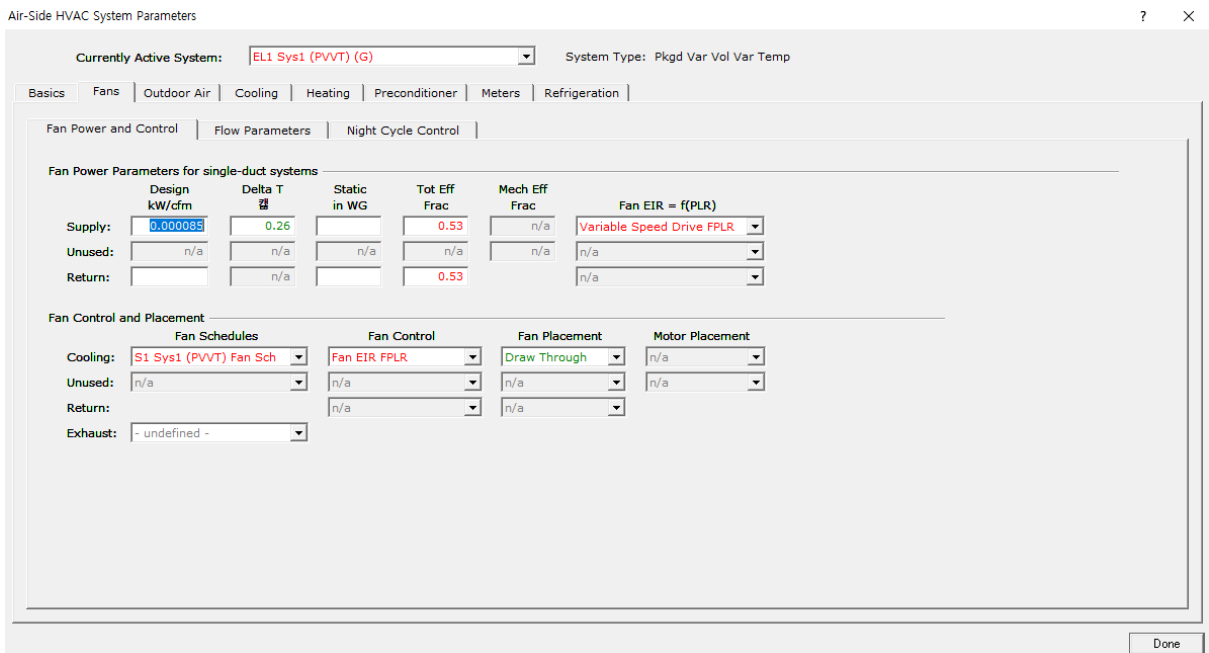


Figure 11. Design kW/cfm in Fan Power and Control

Appendix. Design Parameters

The outdoor-unit appendix values (Capacity, kW, EER, COP, EIR) provided in this guide represent only compressor and outdoor-fan performance and do not include indoor-unit airflow, fan power, or coil effects. These values are separate from AHRI full-system ratings and are formatted to meet energy modeling software requirements for independent indoor and outdoor performance inputs. For certified system ratings, please refer to the AHRI directory. For additional information, please contact LG Electronics, Inc. or your local LG Multi V sales representative.

Outdoor Unit: R-32 LG VRF Multi V i (Air-Cooled)

	Cooling					Heating				
Model Name (Multi V i)	Capacity (MBh)	Power input (kW)	EER	COP	Electric Input Ratio (EIR)	Capacity (MBh)	Power input (kW)	EER	COP	Electric Input Ratio (EIR)
ZRUM072B(D)TE6	72	3.74	19.3	5.6	0.1786	81	4.58	17.7	5.2	0.1923
ZRUM096B(D)TE6	96	5.77	16.6	4.9	0.2041	108	5.76	18.8	5.5	0.1818
ZRUM121B(D)TE6	119.7	7.8	15.3	4.5	0.2222	135	8.77	15.4	4.5	0.2222
ZRUM144B(D)TE6	144	8.81	16.3	4.8	0.2083	162	9.76	16.6	4.9	0.2041
ZRUM168B(D)TE6	168	11.46	14.7	4.3	0.2326	189	12.89	14.7	4.3	0.2326
ZRUM192B(D)TE6	192	13.16	14.6	4.3	0.2326	216	15.46	14.0	4.1	0.2439
ZRUM216B(D)TE6	216	12.96	16.7	4.9	0.2041	243	14.98	16.2	4.8	0.2083
ZRUM241B(D)TE6	233.1	14.95	15.6	4.6	0.2174	270	17.53	15.4	4.5	0.2222
ZRUM264B(D)TE6	264	15.63	16.9	5.0	0.2000	270	19.29	14.0	4.1	0.2439
ZRUM265B(D)TE6	264	15.31	17.2	5.1	0.1961	297	21.22	14.0	4.1	0.2439
ZRUM288B(D)TE6	288	17.2	16.7	4.9	0.2041	324	19.67	16.5	4.8	0.2083
ZRUM312B(D)TE6	312	17.38	18.0	5.3	0.1887	351	20.68	17.0	5.0	0.2000
ZRUM336B(D)TE6	336	20.62	16.3	4.8	0.2083	378	23.39	16.2	4.7	0.2128
ZRUM360B(D)TE6	360	22.77	15.8	4.6	0.2174	405	25.92	15.6	4.6	0.2174
ZRUM384B(D)TE6	384	24.36	15.8	4.6	0.2174	432	27.41	15.8	4.6	0.2174
ZRUM408B(D)TE6	408	27.21	15.0	4.4	0.2273	459	28.29	16.2	4.8	0.2083
ZRUM432B(D)TE6	430.5	28.49	15.1	4.4	0.2273	486	29.49	16.5	4.8	0.2083
ZRUM466B(D)TE6	455.7	28.49	16.0	4.7	0.2128	513	31	16.5	4.9	0.2041
ZRUM480B(D)TE6	476.7	30.85	15.5	4.5	0.2222	540	35.7	15.1	4.4	0.2273
ZRUM504B(D)TE6	504	33.64	15.0	4.4	0.2273	567	38.98	14.5	4.3	0.2326
ZRUM528B(D)TE6	525	36.79	14.3	4.2	0.2381	594	41.35	14.4	4.2	0.2381
Model Name (Multi V S)	Capacity (MBh)	Power input (kW)	EER	COP	Electric Input Ratio (EIR)	Capacity (MBh)	Power input (kW)	EER	COP	Electric Input Ratio (EIR)
ZRUN024GSS0	24	1.62	14.8	4.3	0.2326	27	1.98	13.6	4.0	0.2500
ZRUN036GSS0	36	2.32	15.5	4.5	0.2222	42	2.2	19.1	5.6	0.1786
ZRUN048GSS0	48	3.56	13.5	4.0	0.2500	54	3.1	17.4	5.1	0.1961
ZRUN060GSS0	60	4.62	13.0	3.8	0.2632	67	4.6	14.6	4.3	0.2326

Outdoor Unit: R-410A LG VRF Multi V Water 5

The Water-Source Heat Pump model (Multi V Water) will transition to the R-32 version, which is pending official release as of 1Q 2026. The modeling guide will be updated with the necessary performance tables once the product is officially released.

	Cooling (EWT = 86 F / RA = 67 F WB)					Heating (EWT = 68 F / RA = 70 F DB)				
208-230V	Capacity (MBh)	Power Input (kW)	EER	COP	Electric Input Ratio (EIR)	Capacity (MBh)	Power Input (kW)	EER	COP	Electric Input Ratio (EIR)
ARWM072BAS5	72	3.01	23.9	7.0	0.1389	79.3	2.97	26.7	7.8	0.1266
ARWM096BAS5	96	3.9	24.6	7.2	0.1786	105.7	3.94	26.8	7.9	0.1333
ARWM121BAS5	119.7	6.24	19.2	5.6	0.1852	132.1	5.17	25.6	7.5	0.1351
ARWM144BAS5	144	7.81	18.4	5.4	0.2174	158.5	6.29	25.2	7.4	0.1563
ARWM168BAS5	168	10.6	15.8	4.6	0.1786	185	8.52	21.7	6.4	0.1471
ARWM192BAS5	192	10.1	19.0	5.6	0.1961	211.4	9.09	23.3	6.8	0.1515
ARWM216BAS5	216	12.51	17.3	5.1	0.2128	237.8	10.5	22.6	6.6	0.1563
ARWM240BAS5	239.4	15	16.0	4.7	0.2222	263.2	12.08	21.8	6.4	0.1639
ARWM264BAS5	264	17.38	15.2	4.5	0.2222	290.6	13.87	21.0	6.1	0.1613
ARWM288BAS5	287.7	18.9	15.2	4.5	0.2564	317.1	15.09	21.0	6.2	0.1613
ARWM360BAS5	360	27.09	13.3	3.9	0.2941	396.3	18.69	21.2	6.2	0.1961
ARWM432BAS5	430.5	37.1	11.6	3.4	0.1389	475.6	27.22	17.5	5.1	0.1266
460V	Capacity (MBh)	Power Input (kW)	EER	COP	Electric Input Ratio (EIR)	Capacity (MBh)	Power Input (kW)	EER	COP	Electric Input Ratio (EIR)
ARWM072DAS5	74.2	2.05	36.2	10.6	0.0917	74.2	2.05	36.2	10.6	0.0917
ARWM096DAS5	98.9	2.66	37.2	10.9	0.1176	98.9	2.66	37.2	10.9	0.1176
ARWM121DAS5	123.3	4.25	29.0	8.5	0.1220	123.3	4.25	29.0	8.5	0.1220
ARWM144DAS5	148.4	5.33	27.8	8.2	0.1370	148.4	5.33	27.8	8.2	0.1370
ARWM168DAS5	173.1	6.97	24.8	7.3	0.1563	173.1	6.97	24.8	7.3	0.1563
ARWM192DAS5	197.8	9.02	21.9	6.4	0.1316	197.8	9.02	21.9	6.4	0.1316
ARWM216DAS5	222.5	8.53	26.1	7.6	0.1408	222.5	8.53	26.1	7.6	0.1408
ARWM240DAS5	246.6	10.23	24.1	7.1	0.1493	246.6	10.23	24.1	7.1	0.1493
ARWM264DAS5	272	11.86	22.9	6.7	0.1493	272	11.86	22.9	6.7	0.1493
ARWM288DAS5	296.4	12.9	23.0	6.7	0.1639	296.4	12.9	23.0	6.7	0.1639
ARWM360DAS5	370.9	17.95	20.7	6.1	0.1961	370.9	17.95	20.7	6.1	0.1961
ARWM432DAS5	443.5	25.31	17.5	5.1	0.2041	443.5	25.31	17.5	5.1	0.2041
ARWM504DAS5	519.2	31.21	16.6	4.9	0.2041	519.2	31.21	16.6	4.9	0.2041
ARWM576DAS5	588.5	35.35	16.6	4.9	0.0917	588.5	35.35	16.6	4.9	0.0917

Indoor Unit: R-32 LG VRF Multi V Non-Ducted Type

Type	Model	Capacity (MBh)	Max Input kW (Motor-rated)	CFM (High)	Power input-High mode	
					(kW)	(kW/cfm)
ART COOL™ MIRROR	ZRNU053SJRA	5.5	0.03	240	0.011	0.000046
ART COOL™ MIRROR	ZRNU073SJRA	7.5	0.03	254	0.012	0.000047
ART COOL™ MIRROR	ZRNU093SJRA	9.6	0.03	275	0.013	0.000047
ART COOL™ MIRROR	ZRNU123SJRA	12.3	0.03	300	0.015	0.000050
ART COOL™ MIRROR	ZRNU153SJRA	15.4	0.03	371	0.023	0.000062
ART COOL™ MIRROR	ZRNU183SKRA	19.1	0.06	494	0.032	0.000065
ART COOL™ MIRROR	ZRNU243SKRA	24.2	0.06	537	0.039	0.000073
WALL MOUNTED	ZRNU053SJSA	5.5	0.03	240	0.011	0.000046
WALL MOUNTED	ZRNU073SJSA	7.5	0.03	254	0.012	0.000047
WALL MOUNTED	ZRNU093SJSA	9.6	0.03	275	0.013	0.000047
WALL MOUNTED	ZRNU123SJSA	12.3	0.03	300	0.015	0.000050
WALL MOUNTED	ZRNU153SJSA	15.4	0.03	371	0.023	0.000062
WALL MOUNTED	ZRNU183SKRA	19.1	0.06234	494	0.032	0.000065
WALL MOUNTED	ZRNU243SKSA	24.2	0.06234	537	0.039	0.000073
WALL MOUNTED	ZRNU303SRAA	30	0.113	742	0.054	0.000073
WALL MOUNTED	ZRNU363SRAA	35.5	0.113	883	0.065	0.000074
1-WAY CASSETTE	ZRNU073TCAA	7.5	0.03	283	0.017	0.000060
1-WAY CASSETTE	ZRNU093TCAA	9.6	0.03	323	0.02	0.000062
1-WAY CASSETTE	ZRNU123TCAA	12.3	0.03	351	0.023	0.000065
1-WAY CASSETTE	ZRNU183TCAA	19.1	0.03	480	0.041	0.000085
2-WAY CASSETTE	ZRNU183TSAA	19.1	0.037	417	0.034	0.000082
2-WAY CASSETTE	ZRNU243TSAA	24.2	0.037	512	0.04	0.000078
4-WAY CASSETTE (2×2)	ZRNU053TRAA	5.5	0.043	265	0.013	0.000049
4-WAY CASSETTE (2×2)	ZRNU073TRAA	7.5	0.043	265	0.013	0.000049
4-WAY CASSETTE (2×2)	ZRNU093TRAA	9.6	0.043	283	0.014	0.000049
4-WAY CASSETTE (2×2)	ZRNU123TRAA	12.3	0.043	307	0.017	0.000055
4-WAY CASSETTE (2×2)	ZRNU153TQAA	15.4	0.043	388	0.024	0.000062
4-WAY CASSETTE (2×2)	ZRNU183TQAA	19.1	0.043	396	0.025	0.000063
4-WAY CASSETTE (3×3)	ZRNU073TAAA	7.5	0.166	653	0.0233	0.000036
4-WAY CASSETTE (3×3)	ZRNU093TAAA	9.6	0.166	670	0.0247	0.000037
4-WAY CASSETTE (3×3)	ZRNU123TAAA	12.3	0.166	687	0.0261	0.000038
4-WAY CASSETTE (3×3)	ZRNU153TAAA	15.4	0.166	711	0.0285	0.000040
4-WAY CASSETTE (3×3)	ZRNU183TAAA	19.1	0.166	735	0.0311	0.000042
4-WAY CASSETTE (3×3)	ZRNU243TAAA	24.2	0.166	813	0.04	0.000049
4-WAY CASSETTE (3×3)	ZRNU283TAAA	28	0.166	855	0.0455	0.000053

4-WAY CASSETTE (3×3)	ZRNU363TAAA	36.2	0.166	988	0.0647	0.000065
4-WAY CASSETTE (3×3)	ZRNU423TAAA	42	0.166	1091	0.0858	0.000079
4-WAY CASSETTE (3×3)	ZRNU483TAAA	48.1	0.166	1158	0.1	0.000086
FLOOR STANDING UNIT	ZRNU073CEAA	7.5	0.8	300	0.024	0.000080
FLOOR STANDING UNIT	ZRNU093CEAA	9.6	0.8	335	0.03	0.000090
FLOOR STANDING UNIT	ZRNU123CEAA	12.3	0.8	371	0.036	0.000097
FLOOR STANDING UNIT	ZRNU153CEAA	15.4	0.8	406	0.044	0.000108
FLOOR STANDING UNIT	ZRNU183CFAA	19.1	1.2	565	0.054	0.000096
FLOOR STANDING UNIT	ZRNU243CFAA	24.2	1.2	635	0.084	0.000132
FLOOR STANDING UNIT	ZRNU073CEUA	7.5	0.8	300	0.024	0.000080
FLOOR STANDING UNIT	ZRNU093CEUA	9.6	0.8	335	0.03	0.000090
FLOOR STANDING UNIT	ZRNU123CEUA	12.3	0.8	371	0.036	0.000097
FLOOR STANDING UNIT	ZRNU153CEUA	15.4	0.8	406	0.044	0.000108
FLOOR STANDING UNIT	ZRNU183CFUA	19.1	1.2	565	0.054	0.000096
FLOOR STANDING UNIT	ZRNU243CFUA	24.2	1.2	635	0.084	0.000132

Indoor Unit: R-32 LG VRF Multi V Ducted Type

Type	Model	Capacity (MBh)	Max Input kW (Motor-rated)	CFM (High)	Power input-High mode	
					(kW)	(kW/cfm)
MULTI-POSITION AHU	ZRNU123NAAA	12	0.25	500	0.091	0.000182
MULTI-POSITION AHU	ZRNU183NAAA	18	0.25	600	0.125	0.000208
MULTI-POSITION AHU	ZRNU243NAAA	24	0.25	800	0.173	0.000216
MULTI-POSITION AHU	ZRNU303NAAA	30	0.25	875	0.216	0.000246
MULTI-POSITION AHU	ZRNU363NBAA	36	0.4	1050	0.189	0.00018
MULTI-POSITION AHU	ZRNU423NBAA	42	0.4	1225	0.26	0.000212
MULTI-POSITION AHU	ZRNU483NBAA	48	0.4	1400	0.337	0.000241
MULTI-POSITION AHU	ZRNU543NCAA	54	0.684	1575	0.376	0.000239
MULTI-POSITION AHU	ZRNU603NCAA	60	0.684	1750	0.465	0.000266
LOW STATIC DUCTED	ZRNU073L1GA	7.5	0.019	270	0.031	0.000115
LOW STATIC DUCTED	ZRNU093L1GA	9.6	0.019	320	0.031	0.000097
LOW STATIC DUCTED	ZRNU123L2GA	12.3	0.024	360	0.041	0.000114
LOW STATIC DUCTED	ZRNU153L2GA	15.4	0.024	450	0.056	0.000124
LOW STATIC DUCTED	ZRNU183L2GA	19.1	0.024	530	0.071	0.000134
LOW STATIC DUCTED	ZRNU243L3GA	24	0.038	710	0.103	0.000145
MID STATIC DUCTED	ZRNU363M2AA	36.2	0.35	1130	0.184	0.000163
MID STATIC DUCTED	ZRNU423M2AA	42	0.35	1342	0.231	0.000172
MID STATIC DUCTED	ZRNU483M3AA	48.1	0.5	1413	0.172	0.000121
MID STATIC DUCTED	ZRNU073MAAA	7.5	0.165	283	0.047	0.000166
MID STATIC DUCTED	ZRNU093MAAA	9.6	0.165	353	0.048	0.000136
MID STATIC DUCTED	ZRNU123MAAA	12.3	0.165	494	0.056	0.000113
MID STATIC DUCTED	ZRNU153MAAA	15.4	0.165	530	0.081	0.000153
MID STATIC DUCTED	ZRNU183MAAA	19.1	0.165	635	0.102	0.000161
MID STATIC DUCTED	ZRNU243MAAA	24.2	0.165	706	0.11	0.000156
HIGH STATIC DUCTED	ZRNU363B8AA	36.2	0.4	1730	0.478	0.000276
HIGH STATIC DUCTED	ZRNU423B8AA	42	0.4	1914	0.528	0.000276
HIGH STATIC DUCTED	ZRNU483B8AA	48.1	0.4	2019	0.538	0.000266
HIGH STATIC DUCTED	ZRNU543B8AA	54	0.4	2019	0.765	0.000379
HIGH STATIC DUCTED	ZRNU763B8AA	76.4	0.4	2260	0.765	0.000338
HIGH STATIC DUCTED	ZRNU963B8AA	95.9	0.4	2542	0.8	0.000315

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DOE-2.2 Building Energy Use and Cost Analysis Program, Volume 2 Dictionary, Lawrence Berkely National Laboratory and James J. Hirsch & Associates (JJH).