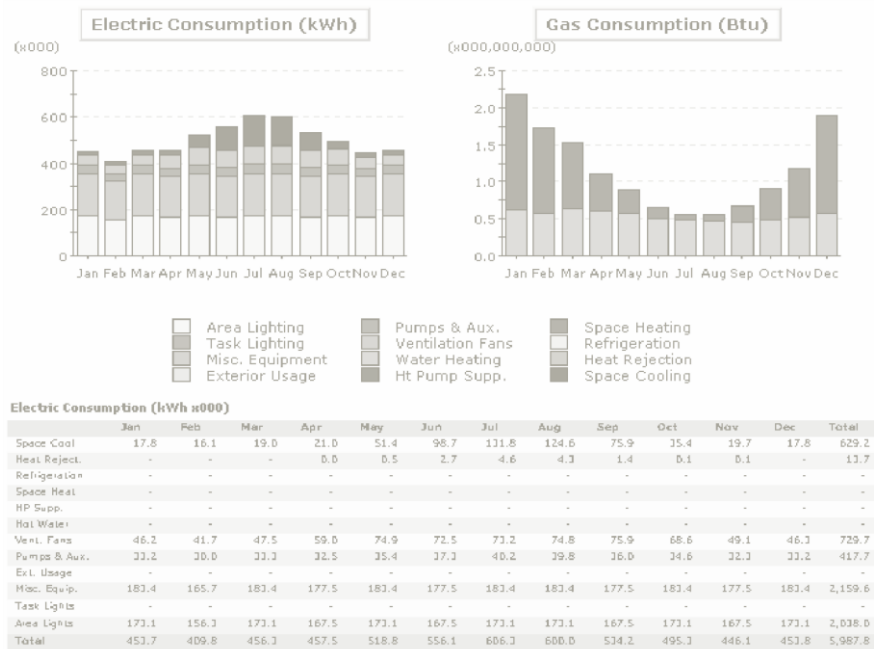


# eQUEST Building Energy Modeling Guide for LG Multi V™



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# Table of Contents

<b>Introduction .....</b>	<b>3</b>
Overview.....	3
Disclaimer .....	3
<b>Program Installation.....</b>	<b>4</b>
<b>Importing Multi V Library File .....</b>	<b>5</b>
<b>Testing the Library File .....</b>	<b>8</b>
<b>Design Parameters .....</b>	<b>10</b>
LG VRF Multi V (air).....	10
LG VRF Multi V (water).....	11
LG VRF Multi V Indoor Units.....	12
<b>Authors .....</b>	<b>14</b>
<b>Contributors.....</b>	<b>14</b>

# Introduction

## Overview

The eQUEST Building Energy Modeling Guide for LG Multi V provides step-by-step instructions for modeling LG Multi V system. The 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 latest eQUEST and learn more about it.

## Disclaimer

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.), and 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 design and analysis guides to help designers optimize the design 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 meant to aid the system designer and are not a substitute for design services, judgment, or experience.



# 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 your LG Sales Representative.
2. Double click the eQUEST on your desktop to open the program. The eQUEST

Startup Options dialog box appears:

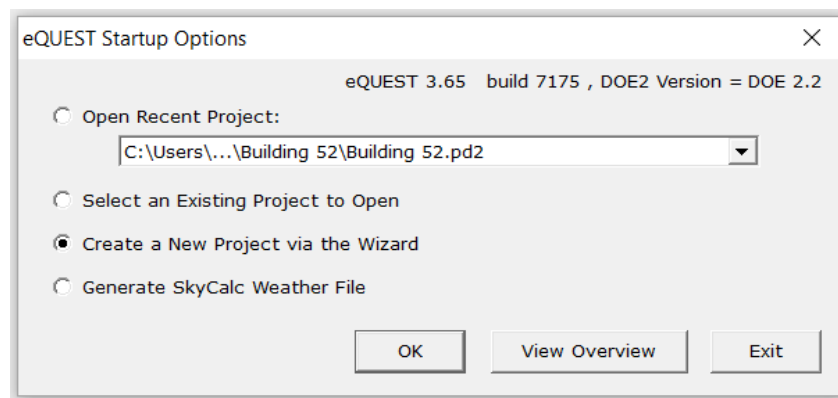


Figure 1: eQUEST Startup Options

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**Note:** If you are an experienced user of eQUEST, open an existing project.

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

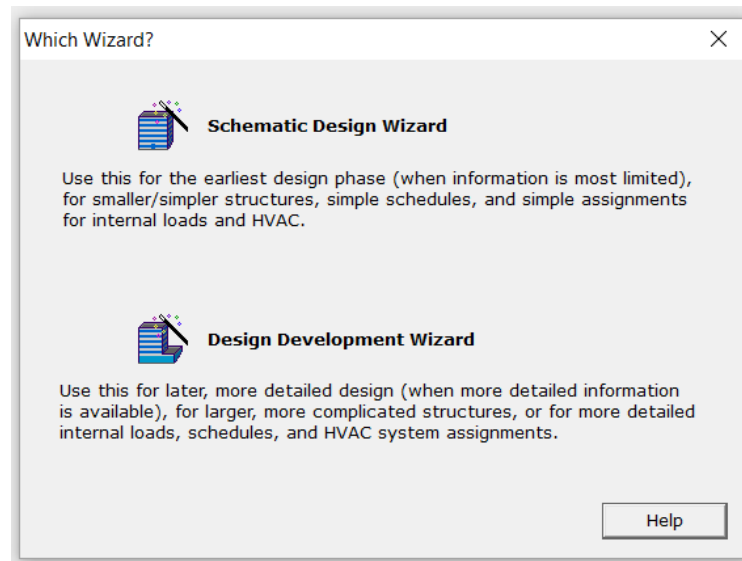


Figure 2: Which Wizard

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

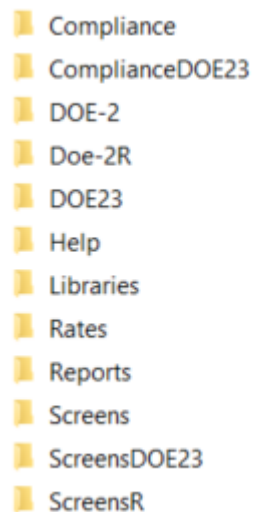


Figure 3: eQUEST Data Directory

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

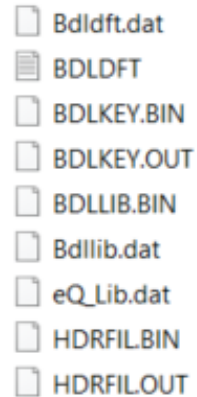


Figure 4: DOE-2 Folder

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:

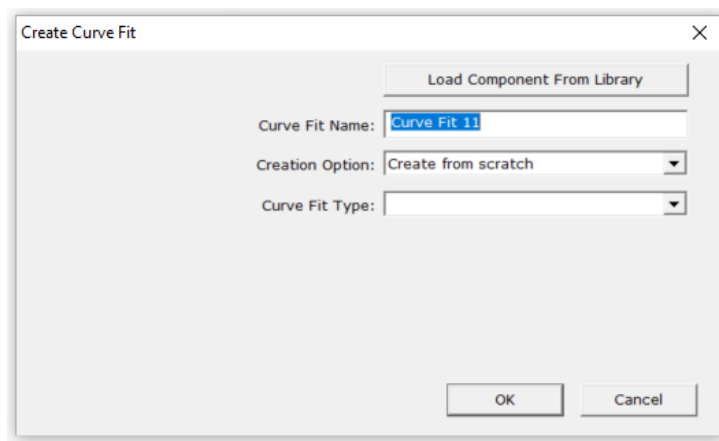


Figure 5: Create Curve Fit

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

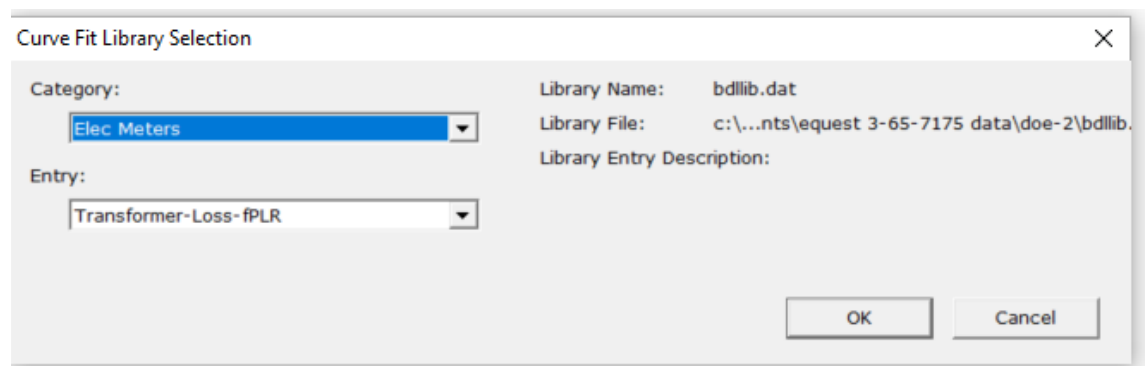


Figure 6: Curve Fit Library Selection



6. Select **Multi V 5 (HP)** in the **Category** and an applicable LG Multi V 5 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 5 Outdoor Unit appears under the Performance Curves in the Component Tree.

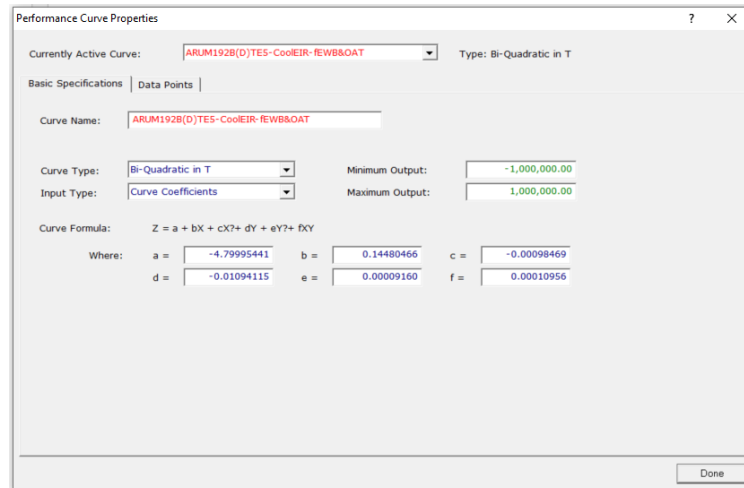


Figure 7: Performance Curve Properties

# Design Parameters

For more detail info, please contact to LG Electronics USA, Inc. or LG Multi V Sales Representatives.

## LG VRF Multi V (air)

Model Name	Cooling				Heating			
	Capacity (MBh)	Power input (kW)	EER	COP	Capacity (MBh)	Power input (kW)	EER	COP
ARUM072B(D)TE5	72	4.28	16.82	<b>4.9</b>	81	5.39	15.0	<b>4.4</b>
ARUM096B(D)TE5	96	5.33	18.01	<b>5.3</b>	108	6.74	16.0	<b>4.7</b>
ARUM121B(D)TE5	120	7.72	15.54	<b>4.6</b>	135	9.2	14.7	<b>4.3</b>
ARUM144B(D)TE5	144	9.3	15.48	<b>4.5</b>	162	10.54	15.4	<b>4.5</b>
ARUM168B(D)TE5	168	12.23	13.74	<b>4.0</b>	189	13.98	13.5	<b>4.0</b>
ARUM192B(D)TE5	192	13.61	14.11	<b>4.1</b>	216	15.46	14.0	<b>4.1</b>
ARUM216B(D)TE5	216	15.37	14.05	<b>4.1</b>	243	17.75	13.7	<b>4.0</b>
ARUM241B(D)TE5	240	16.8	14.29	<b>4.2</b>	243	17.75	13.7	<b>4.0</b>
ARUM264B(D)TE5	264	17.56	15.03	<b>4.4</b>	297	20.72	14.3	<b>4.2</b>
ARUM288B(D)TE5	288	18.94	15.21	<b>4.5</b>	324	22.2	14.6	<b>4.3</b>
ARUM312B(D)TE5	312	20.7	15.07	<b>4.4</b>	351	24.49	14.3	<b>4.2</b>
ARUM336B(D)TE5	336	23.09	14.55	<b>4.3</b>	378	26.95	14.0	<b>4.1</b>
ARUM360B(D)TE5	360	24.67	14.59	<b>4.3</b>	405	28.29	14.3	<b>4.2</b>
ARUM384B(D)TE5	384	27.6	13.91	<b>4.1</b>	432	31.73	13.6	<b>4.0</b>
ARUM408B(D)TE5	408	28.98	14.08	<b>4.1</b>	459	33.21	13.8	<b>4.1</b>
ARUM432B(D)TE5	432	30.74	14.05	<b>4.1</b>	486	35.5	13.7	<b>4.0</b>
ARUM456B(D)TE5	456	30.81	14.80	<b>4.3</b>	513	36.15	14.2	<b>4.2</b>
ARUM480B(D)TE5	480	32.39	14.82	<b>4.3</b>	540	37.49	14.4	<b>4.2</b>
ARUM504B(D)TE5	504	35.32	14.27	<b>4.2</b>	567	40.93	13.9	<b>4.1</b>

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## LG VRF Multi V (water)

208-230V	Cooling (EWT = 86 °F / RA = 67°F WB)			Heating (EWT = 68 °F / RA = 70°F DB)		
	Capacity (MBh)	Power input(kW)	COP	Capacity (MBh)	Power input(kW)	COP
ARWN(B)072BAS4	72	3.91	<b>5.40</b>	79.3	3.96	<b>5.87</b>
ARWN(B)096BAS4	96	5.41	<b>5.20</b>	105.7	5.46	<b>5.67</b>
ARWN(B)121BAS4	120	7.03	<b>5.00</b>	132.1	7.09	<b>5.46</b>
ARWN(B)144BAS4	144	8.79	<b>4.80</b>	158.5	8.83	<b>5.26</b>
ARWN(B)168BAS4	168	9.32	<b>5.28</b>	185	9.42	<b>5.76</b>
ARWN(B)192BAS4	192	10.94	<b>5.14</b>	211.4	11.05	<b>5.61</b>
ARWN(B)216BAS4	216	12.7	<b>4.98</b>	237.8	12.79	<b>5.45</b>
ARWN(B)288BAS4	288	17.58	<b>4.80</b>	317	17.66	<b>5.26</b>
ARWN(B)360BAS4	360	21.49	<b>4.91</b>	396.3	21.62	<b>5.37</b>
ARWN(B)432BAS4	432	26.37	<b>4.80</b>	475.5	26.49	<b>5.26</b>
460V	Capacity (MBh)	Power input(kW)	COP	Capacity (MBh)	Power input(kW)	COP
ARWN(B)072DAS4	72	3.98	<b>5.30</b>	79.3	3.96	<b>5.87</b>
ARWN(B)096DAS4	96	5.41	<b>5.20</b>	105.7	5.46	<b>5.67</b>
ARWN(B)121DAS4	120	6.9	<b>5.10</b>	132.1	7.09	<b>5.46</b>
ARWN(B)144DAS4	144	8.12	<b>5.20</b>	158.5	8.83	<b>5.26</b>
ARWN(B)168DAS4	168	9.66	<b>5.10</b>	185	9.42	<b>5.76</b>
ARWN(B)192DAS4	192	11.26	<b>5.00</b>	211.4	11.05	<b>5.61</b>
ARWN(B)240DAS4	240	13.53	<b>5.20</b>	264.2	13.3	<b>5.82</b>
ARWN(B)288DAS4	288	16.56	<b>5.10</b>	317	17.66	<b>5.26</b>
ARWN(B)336DAS4	336	19.32	<b>5.10</b>	369.9	19.48	<b>5.57</b>
ARWN(B)384DAS4	384	22.52	<b>5.00</b>	422.8	22.67	<b>5.47</b>
ARWN(B)480DAS4	480	27.5	<b>5.12</b>	528.4	27.51	<b>5.63</b>
ARWN(B)576DAS4	576	33.78	<b>5.00</b>	634.1	34.01	<b>5.46</b>

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# LG VRF Multi V Indoor Units

## Non-ducted Type

Type	Model	Capacity (MBh)	Max Input kW (Motor-rated)	CFM(High)	Power input(kW) -High mode
4Way 2X2 CST	ARNU05GTRC4	5.5	0.03	265	<b>0.013</b>
4Way 2X2 CST	ARNU07GTRC4	7.5	0.03	265	<b>0.013</b>
4Way 2X2 CST	ARNU09GTRC4	9.6	0.03	283	<b>0.014</b>
4Way 2X2 CST	ARNU12GTRC4	12.3	0.03	307	<b>0.017</b>
4Way 2X2 CST	ARNU15GTQC4	15.4	0.03	388	<b>0.024</b>
4Way 2X2 CST	ARNU18GTQC4	19.1	0.03	396	<b>0.025</b>
4Way 3X3 CST	ARNU24GTPC4	24.2	0.033	600	<b>0.031</b>
4Way 3X3 CST	ARNU28GTPC4	28	0.033	671	<b>0.04</b>
4Way 3X3 CST	ARNU073TNA4	7.5	0.144	459	<b>0.018</b>
4Way 3X3 CST	ARNU093TNA4	9.6	0.144	477	<b>0.019</b>
4Way 3X3 CST	ARNU123TNA4	12.3	0.144	494	<b>0.022</b>
4Way 3X3 CST	ARNU153TNA4	15.4	0.144	530	<b>0.025</b>
4Way 3X3 CST	ARNU183TNA4	19.1	0.144	565	<b>0.027</b>
4Way 3X3 CST	ARNU243TNA4	24.2	0.144	742	<b>0.051</b>
4Way 3X3 CST	ARNU36GTNC4	36.2	0.144	883	<b>0.07</b>
4Way 3X3 CST	ARNU243TMA4	24.2	0.144	777	<b>0.047</b>
4Way 3X3 CST	ARNU283TMA4	28	0.144	812	<b>0.052</b>
4Way 3X3 CST	ARNU363TMA4	36.2	0.144	918	<b>0.064</b>
4Way 3X3 CST	ARNU42GTMC4	42	0.144	1,059	<b>0.104</b>
4Way 3X3 CST	ARNU48GTMC4	48.1	0.144	1,130	<b>0.12</b>
1Way CST	ARNU07GTUC4	7.5	0.04	290	<b>0.020</b>
1Way CST	ARNU09GTUC4	9.6	0.04	325	<b>0.022</b>
1Way CST	ARNU12GTUC4	12.3	0.04	353	<b>0.024</b>
1Way CST	ARNU18GTTC4	19.1	0.07	470	<b>0.038</b>
1Way CST	ARNU24GTTC4	24.2	0.07	515	<b>0.051</b>
2Way CST	ARNU18GTLC4	19.1	0.07	459	<b>0.034</b>
2Way CST	ARNU24GTLC4	24.2	0.07	601	<b>0.04</b>
Wall Mount	ARNU05GSBL4	5.5	0.021	230	<b>0.009</b>
Wall Mount	ARNU07GSBL4	7.5	0.021	247	<b>0.01</b>
Wall Mount	ARNU09GSBL4	9.6	0.021	290	<b>0.012</b>
Wall Mount	ARNU12GSBL4	12.3	0.021	336	<b>0.016</b>
Wall Mount	ARNU15GSBL4	15.4	0.021	371	<b>0.021</b>
Wall Mount	ARNU18GSCL4	19.1	0.0395	441	<b>0.023</b>
Wall Mount	ARNU24GSCL4	24.2	0.0395	494	<b>0.039</b>
Wall Mount	ARNU073SER2	7.5	0.4	247	<b>0.012</b>
Wall Mount	ARNU093SER2	9.6	0.4	282	<b>0.014</b>
Wall Mount	ARNU123SER2	12.3	0.4	353	<b>0.020</b>
Wall Mount	ARNU153SER2	15.4	0.4	371	<b>0.022</b>
Wall Mount	ARNU183S8R2	19.1	0.35	508	<b>0.036</b>
Wall Mount	ARNU243S8R2	24.2	0.35	632	<b>0.053</b>

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Ducted Type

Type	Model	Capacity (MBh)	Max Input kW (Motor-rated)	CFM(High)	Power input(kW) -High mode
Vertical Air Handling Unit	ARNU123NJA4	12	0.228	530	<b>0.080</b>
Vertical Air Handling Unit	ARNU183NJA4	18	0.228	580	<b>0.090</b>
Vertical Air Handling Unit	ARNU243NJA4	24	0.228	710	<b>0.120</b>
Vertical Air Handling Unit	ARNU303NJA4	30	0.228	880	<b>0.180</b>
Vertical Air Handling Unit	ARNU363NJA4	36	0.228	990	<b>0.230</b>
Vertical Air Handling Unit	ARNU423NKA4	42	0.366	1,250	<b>0.260</b>
Vertical Air Handling Unit	ARNU483NKA4	48	0.366	1,400	<b>0.330</b>
Vertical Air Handling Unit	ARNU543NKA4	54	0.366	1,475	<b>0.370</b>
Ducted(Low)	ARNU07GL1G4	7.5	0.04	270	<b>0.031</b>
Ducted(Low)	ARNU09GL1G4	9.6	0.04	320	<b>0.039</b>
Ducted(Low)	ARNU12GL2G4	12.3	0.085	360	<b>0.041</b>
Ducted(Low)	ARNU15GL2G4	15.4	0.085	450	<b>0.056</b>
Ducted(Low)	ARNU18GL2G4	19.1	0.085	530	<b>0.071</b>
Ducted(Low)	ARNU24GL3G4	24	0.115	710	<b>0.103</b>
Ducted(Low)	ARNU07GB3G4	7.5	0.085	283	<b>0.016</b>
Ducted(Low)	ARNU09GB3G4	9.6	0.085	318	<b>0.016</b>
Ducted(Low)	ARNU12GB3G4	12.3	0.085	353	<b>0.019</b>
Ducted(Low)	ARNU15GB3G4	15.4	0.085	388	<b>0.021</b>
Ducted(Low)	ARNU18GB4G4	19.1	0.115	494	<b>0.05</b>
Ducted(Low)	ARNU24GB4G4	24.2	0.115	600	<b>0.074</b>
High Static Duct	ARNU07GBHA4	7.5	0.15	230	<b>0.058</b>
High Static Duct	ARNU09GBHA4	9.6	0.15	286	<b>0.067</b>
High Static Duct	ARNU12GBHA4	12.3	0.15	339	<b>0.078</b>
High Static Duct	ARNU15GBHA4	15.4	0.15	399	<b>0.09</b>
High Static Duct	ARNU18GBHA4	19.1	0.15	459	<b>0.103</b>
High Static Duct	ARNU24GBHA4	24.2	0.15	565	<b>0.132</b>
High Static Duct	ARNU073BGA4	7.5	0.45	441	<b>0.050</b>
High Static Duct	ARNU093BGA4	9.6	0.45	452	<b>0.050</b>
High Static Duct	ARNU123BGA4	12.3	0.45	477	<b>0.052</b>
High Static Duct	ARNU153BGA4	15.4	0.45	487	<b>0.053</b>
High Static Duct	ARNU183BGA4	19.1	0.45	537	<b>0.058</b>
High Static Duct	ARNU243BGA4	24.2	0.45	671	<b>0.082</b>
High Static Duct	ARNU283BGA4	28	0.45	915	<b>0.125</b>
High Static Duct	ARNU363BGA4	36	0.45	1,141	<b>0.235</b>
High Static Duct	ARNU423BGA4	42	0.45	1,218	<b>0.267</b>
High Static Duct	ARNU283BRA4	28	0.45	1,278	<b>0.249</b>
High Static Duct	ARNU363BRA4	36.2	0.45	1,381	<b>0.300</b>
High Static Duct	ARNU423BRA4	42	0.45	1,490	<b>0.330</b>
High Static Duct	ARNU483BRA4	48.1	0.45	1,582	<b>0.425</b>
High Static Duct	ARNU543BRA4	54	0.45	1,801	<b>0.49</b>
High Static Duct	ARNU363B8A4	36.2	0.8	1,730	<b>0.478</b>
High Static Duct	ARNU423B8A4	42	0.8	1,814	<b>0.528</b>
High Static Duct	ARNU483B8A4	48.1	0.8	2,019	<b>0.538</b>
High Static Duct	ARNU763B8A4	76.4	0.8	2,260	<b>0.765</b>
High Static Duct	ARNU963B8A4	95.9	0.8	2,542	<b>0.8</b>

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## References

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



LG Electronics USA



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