

Residential System Sizing Calculation

Summary

Project Title:
Raphael Residence

, FL

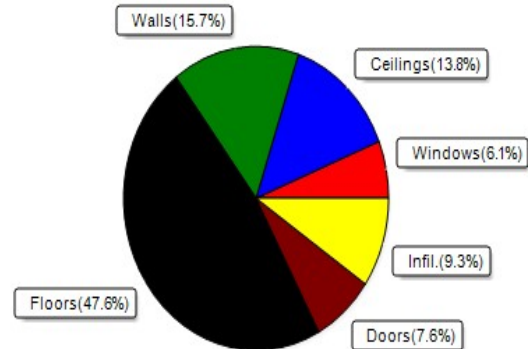
5/7/2025

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 ft.) Temp Range(M)					
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)					
Winter design temperature(TMY3 99%)	30	F	Summer design temperature(TMY3 99%)	94	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	40	F	Summer temperature difference	19	F
Total heating load calculation		45481 Btuh	Total cooling load calculation		28935 Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	131.9	60000	Sensible (SHR = 0.75)	184.1	45000
Heat Pump + Auxiliary(0.0kW)	131.9	60000	Latent	333.5	15000
			Total (Electric Heat Pump)	207.4	60000

WINTER CALCULATIONS

Winter Heating Load (for 3328 sqft)

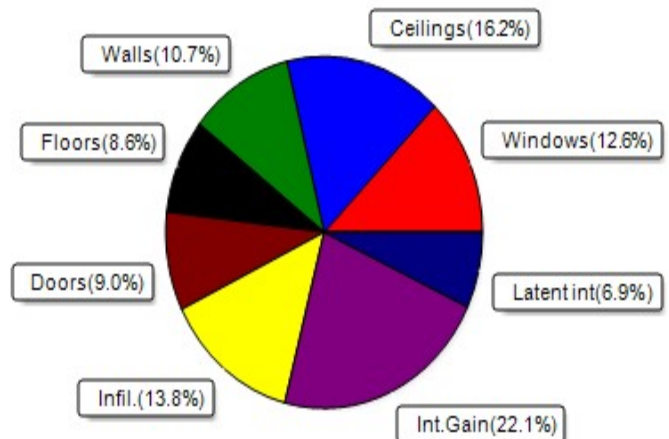
Load component	Load
Window total 265 sqft	2756 Btuh
Wall total 2571 sqft	7125 Btuh
Door total 188 sqft	3459 Btuh
Ceiling total 3328 sqft	6256 Btuh
Floor total See detail report	21661 Btuh
Infiltration 96 cfm	4224 Btuh
Duct loss	0 Btuh
Subtotal	45481 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	45481 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3328 sqft)

Load component	Load
Window total 265 sqft	3648 Btuh
Wall total 2571 sqft	3105 Btuh
Door total 188 sqft	2594 Btuh
Ceiling total 3328 sqft	4692 Btuh
Floor total	2493 Btuh
Infiltration 72 cfm	1505 Btuh
Internal gain	6400 Btuh
Duct gain	0 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	24438 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	2497 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	2000 Btuh
Total latent gain	4497 Btuh
TOTAL HEAT GAIN	28935 Btuh



8th Edition



EnergyGauge® / USRCZB v8.1.05

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: 5-6-25

[Signature]

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Raphael Residence

, FL

5/7/2025

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

Component Loads for Whole House

Window	Type*					Overhang		Window Area(sqft)			HTM		Load		
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
1	2 NFRC	0.20, 0.26	No	No	N		1.5ft.	1.3ft.	36.0	0.0	36.0	9	9	329	Btuh
2	2 NFRC	0.20, 0.26	No	No	N		1.5ft.	1.3ft.	24.0	0.0	24.0	9	9	220	Btuh
3	2 NFRC	0.20, 0.26	No	No	N		1.5ft.	1.3ft.	36.0	0.0	36.0	9	9	329	Btuh
4	2 NFRC	0.20, 0.26	No	No	N		1.5ft.	1.3ft.	12.0	0.0	12.0	9	9	110	Btuh
5	2 NFRC	0.20, 0.26	No	No	E		1.5ft.	1.3ft.	8.0	0.0	8.0	9	24	194	Btuh
6	2 NFRC	0.20, 0.26	No	No	E		1.5ft.	1.3ft.	8.0	0.0	8.0	9	24	194	Btuh
7	2 NFRC	0.20, 0.26	No	No	S		1.5ft.	1.3ft.	8.0	8.0	0.0	9	11	73	Btuh
8	2 NFRC	0.20, 0.26	No	No	S		1.5ft.	1.3ft.	36.0	36.0	0.0	9	11	329	Btuh
9	2 NFRC	0.20, 0.26	No	No	S		1.5ft.	1.3ft.	36.0	36.0	0.0	9	11	329	Btuh
10	2 NFRC	0.20, 0.26	No	No	W		1.5ft.	1.3ft.	36.0	0.0	36.0	9	24	872	Btuh
11	2 NFRC	0.20, 0.26	No	No	E		1.5ft.	1.3ft.	4.0	0.0	4.0	9	24	97	Btuh
12	2 NFRC	0.20, 0.26	No	No	E		1.5ft.	1.3ft.	15.0	0.0	15.0	9	24	363	Btuh
13	2 NFRC	0.20, 0.26	No	No	S		1.5ft.	1.3ft.	6.0	6.0	0.0	9	11	55	Btuh
	Excursion													154	Btuh
	Window Total								265 (sqft)					3648 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	78.0		1.0			80	Btuh
2	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	99.0		1.0			102	Btuh
3	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	193.3		1.0			198	Btuh
4	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	192.0		1.0			197	Btuh
5	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	97.5		1.0			100	Btuh
6	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	18.0		1.0			18	Btuh
7	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	103.5		1.0			106	Btuh
8	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	290.0		1.0			297	Btuh
9	Frame - Wood - Adj						0.09	13.0/0.0	346.0		1.7			583	Btuh
10	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	98.7		1.0			101	Btuh
11	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	40.0		1.0			41	Btuh
12	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	122.7		1.0			126	Btuh
13	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	84.0		1.0			86	Btuh
14	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	78.0		1.0			80	Btuh
15	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	123.0		1.0			126	Btuh
16	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	45.0		1.0			46	Btuh
17	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	199.5		1.0			205	Btuh
18	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	45.0		1.0			46	Btuh
19	Concrete Blk,Hollow - Ext						0.06	13.0/0.0	124.5		1.0			128	Btuh
20	Frame - Wood - Ext						0.09	13.0/0.0	93.0		2.3			210	Btuh
21	Frame - Wood - Ext						0.09	13.0/0.0	100.7		2.3			228	Btuh
	Wall Total								2571 (sqft)					3105 Btuh	
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior							48.0		13.8			662	Btuh	
2	Insulated - Exterior							48.0		13.8			662	Btuh	
3	Insulated - Exterior							24.0		13.8			331	Btuh	
4	Insulated - Garage							20.0		13.8			276	Btuh	
5	Insulated - Exterior							48.0		13.8			662	Btuh	
	Door Total								188 (sqft)					2594 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Raphael Residence

, FL

5/7/2025

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	SnglAsmb no airsp/DarkMetal	0.047	21.0/0.0	2865.0	1.41	4039 Btuh
2	SnglAsmb no airsp/DarkMetal	0.047	21.0/0.0	463.0	1.41	653 Btuh
	Ceiling Total			3328 (sqft)		4692 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	2865 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj		0.0	463 (sqft)	5.4	2493 Btuh
	Floor Total			3328.0 (sqft)		2493 Btuh
	Envelope Subtotal:					16533 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.15	29489	1	72.2	1505 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		10	X 230	+	4100	6400 Btuh
	Sensible Envelope Load:					24438 Btuh
Duct load	Average sealed, Supply(R6.0-Cond), Return(R6.0-Cond) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					24438 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Raphael Residence

, FL

5/7/2025

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	24438 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	24438 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	24438 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2497 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (10.0 people @ 200 Btuh per person)	2000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4497 Btuh
	TOTAL GAIN	28935 Btuh

EQUIPMENT

1. Central Unit	#	48000 Btuh
2. PTAC and Room Unit	#	12000 Btuh

*Key: Window types (Panels - Number and type of panes of glass)
(SHGC - Shading coefficient of glass as SHGC numerical value)
(U - Window U-Factor)
(InSh - Interior shading device: none(No), Blinds(B), Draperies(D) or Roller Shades(R))
- For Blinds: Assume medium color, half closed
- For Draperies: Assume medium weave, half closed
- For Roller shades: Assume translucent, half closed
(IS - Insect screen: none(N), Full(F) or Half(1/2))
(Ornt - compass orientation)



Version 8

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Raphael Residence
Building Type: User

, FL

5/7/2025

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.20	Vinyl	0.26	N	36.0		10.4	374 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	24.0		10.4	250 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	36.0		10.4	374 Btuh
4	2, NFRC 0.20	Vinyl	0.26	N	12.0		10.4	125 Btuh
5	2, NFRC 0.20	Vinyl	0.26	E	8.0		10.4	83 Btuh
6	2, NFRC 0.20	Vinyl	0.26	E	8.0		10.4	83 Btuh
7	2, NFRC 0.20	Vinyl	0.26	S	8.0		10.4	83 Btuh
8	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
9	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
10	2, NFRC 0.20	Vinyl	0.26	W	36.0		10.4	374 Btuh
11	2, NFRC 0.20	Vinyl	0.26	E	4.0		10.4	42 Btuh
12	2, NFRC 0.20	Vinyl	0.26	E	15.0		10.4	156 Btuh
13	2, NFRC 0.20	Vinyl	0.26	S	6.0		10.4	62 Btuh
Window Total					265.0(sqft)			2756 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	78		2.56	200 Btuh
2	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	99		2.56	254 Btuh
3	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	193		2.56	496 Btuh
4	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	192		2.56	492 Btuh
5	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	98		2.56	250 Btuh
6	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	18		2.56	46 Btuh
7	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	104		2.56	265 Btuh
8	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	290		2.56	744 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	346		3.55	1228 Btuh
10	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	99		2.56	253 Btuh
11	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	40		2.56	103 Btuh
12	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	123		2.56	315 Btuh
13	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	84		2.56	215 Btuh
14	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	78		2.56	200 Btuh
15	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	123		2.56	315 Btuh
16	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	45		2.56	115 Btuh
17	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	200		2.56	512 Btuh
18	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	45		2.56	115 Btuh
19	Conc Blk,Hollow	- Ext	(0.064)	13.0/0.0	125		2.56	319 Btuh
20	Frame - Wood	- Ext	(0.089)	13.0/0.0	93		3.55	330 Btuh
21	Frame - Wood	- Ext	(0.089)	13.0/0.0	101		3.55	357 Btuh
Wall Total					2571(sqft)			7125 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Raphael Residence
Building Type: User

5/7/2025

Doors	Type	Storm Ueff.		Area X	HTM=	Load	
	1	Insulated - Exterior, n	(0.460)		48	18.4	883 Btuh
	2	Insulated - Exterior, n	(0.460)		48	18.4	883 Btuh
	3	Insulated - Exterior, n	(0.460)		24	18.4	442 Btuh
	4	Insulated - Garage, n	(0.460)		20	18.4	368 Btuh
	5	Insulated - Exterior, n	(0.460)		48	18.4	883 Btuh
	Door Total			188(sqft)		3459Btuh	
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load	
	1	Single as/D/Metal	(0.047)	21.0/0.0	2865	1.9	5385 Btuh
	2	Single as/D/Metal	(0.047)	21.0/0.0	463	1.9	870 Btuh
	Ceiling Total			3328(sqft)		6256Btuh	
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load	
	1	Slab On Grade	(1.180)	0.0	308.0 ft(perim.)	47.2	14538 Btuh
	2	Raised Wood - Adj	(0.385)	0.0	463.0 sqft	15.4	7124 Btuh
	Floor Total			3328 sqft		21661 Btuh	
	Envelope Subtotal:					41257 Btuh	
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural	0.20	29489	1.00	96.3	4224 Btuh	
Duct load	Average sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh	
All Zones	Sensible Subtotal All Zones					45481 Btuh	

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	45481 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	45481 Btuh

EQUIPMENT

1. Electric Heat Pump	#	48000 Btuh
2. Electric Heat Pump	#	12000 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Raphael Residence
Building Type: User

, FL

5/7/2025

Key: Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)

U - (Window U-Factor)

HTM - (ManualJ Heat Transfer Multiplier)



Version 8