

Residential System Sizing Calculation

Summary

Project Title:
Ratliff Residence

, FL

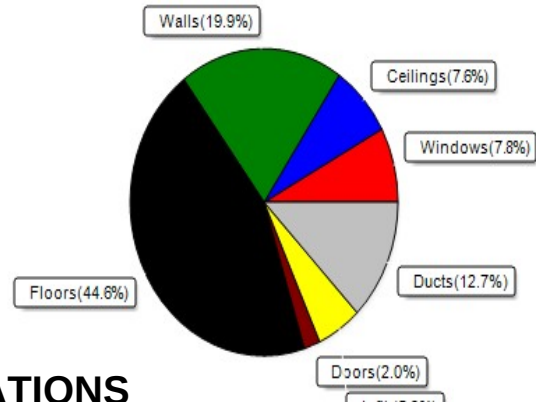
12/7/2023

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 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	32426 Btuh	Total cooling load calculation	25372 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	111.0 36000	Sensible (SHR = 0.85)	138.4 30600
Heat Pump + Auxiliary(0.0kW)	111.0 36000	Latent	165.5 5400
		Total (Electric Heat Pump)	141.9 36000

WINTER CALCULATIONS

Winter Heating Load (for 1921 sqft)

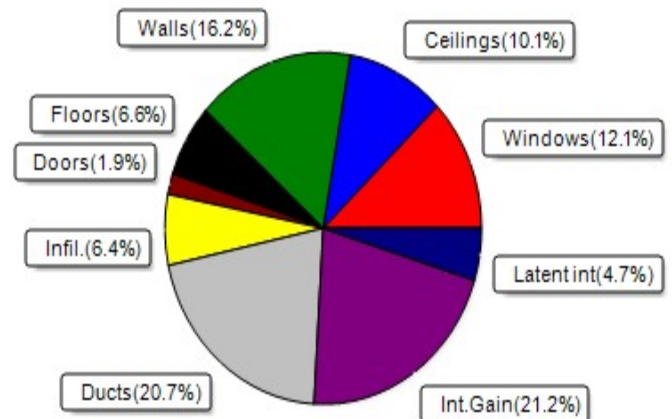
Load component	Load
Window total 245 sqft	2543 Btuh
Wall total 2095 sqft	6452 Btuh
Door total 40 sqft	640 Btuh
Ceiling total 1921 sqft	2474 Btuh
Floor total See detail report	14476 Btuh
Infiltration 39 cfm	1721 Btuh
Duct loss	4120 Btuh
Subtotal	32426 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	32426 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1921 sqft)

Load component	Load
Window total 245 sqft	3073 Btuh
Wall total 2095 sqft	4113 Btuh
Door total 40 sqft	480 Btuh
Ceiling total 1921 sqft	2562 Btuh
Floor total	1680 Btuh
Infiltration 29 cfm	613 Btuh
Internal gain	5380 Btuh
Duct gain	4206 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	22108 Btuh
Latent gain(ducts)	1046 Btuh
Latent gain(infiltration)	1018 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	3264 Btuh
TOTAL HEAT GAIN	25372 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

12-7-23

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Ratliff Residence

, FL

12/7/2023

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	13.5f	2.3ft	9.0	0.0	9.0	9	9	82	Btuh	
2	2 NFRC	0.20, 0.26	No	No	N	13.5f	2.3ft	60.0	0.0	60.0	9	9	549	Btuh	
3	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	30.0	0.0	30.0	9	9	274	Btuh	
4	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	3.0	0.0	3.0	9	24	73	Btuh	
5	2 NFRC	0.20, 0.26	No	No	S	9.5ft	2.3ft	45.0	45.0	0.0	9	11	412	Btuh	
6	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	15.0	15.0	0.0	9	11	137	Btuh	
7	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	15.0	15.0	0.0	9	11	137	Btuh	
8	2 NFRC	0.20, 0.26	No	No	W	1.5ft	2.3ft	30.0	0.0	30.0	9	24	727	Btuh	
9	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	15.0	15.0	0.0	9	11	137	Btuh	
10	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	22.5	0.0	22.5	9	24	545	Btuh	
	Window Total							245 (sqft)						3073	Btuh
Walls	Type						U-Value	R-Value	Area(sqft)		HTM		Load		
							Cav/Sheath								
1	Frame - Wood - Ext					0.09	13.0/0.0	317.5			2.3		719	Btuh	
2	Frame - Wood - Ext					0.09	13.0/0.0	108.0			2.3		244	Btuh	
3	Frame - Wood - Ext					0.09	13.0/0.0	111.0			2.3		251	Btuh	
4	Frame - Wood - Ext					0.09	13.0/0.0	288.0			2.3		652	Btuh	
5	Frame - Wood - Ext					0.09	13.0/0.0	27.0			2.3		61	Btuh	
6	Frame - Wood - Ext					0.09	13.0/0.0	39.0			2.3		88	Btuh	
7	Frame - Wood - Ext					0.09	13.0/0.0	191.5			2.3		433	Btuh	
8	Frame - Wood - Ext					0.09	13.0/0.0	18.0			2.3		41	Btuh	
9	Frame - Wood - Ext					0.09	13.0/0.0	63.0			2.3		143	Btuh	
10	Frame - Wood - Ext					0.09	13.0/0.0	18.0			2.3		41	Btuh	
11	Frame - Wood - Ext					0.09	13.0/0.0	51.0			2.3		115	Btuh	
12	Frame - Wood - Ext					0.09	13.0/0.0	27.0			2.3		61	Btuh	
13	Frame - Wood - Ext					0.09	13.0/0.0	120.0			2.3		272	Btuh	
14	Frame - Wood - Ext					0.09	13.0/0.0	219.0			2.3		496	Btuh	
15	Frame - Wood - Ext					0.09	13.0/0.0	76.3			2.3		173	Btuh	
16	Frame - Wood - Int					0.09	13.0/0.0	90.7			0.0		0	Btuh	
17	Frame - Wood - Ext					0.09	13.0/0.0	36.0			2.3		81	Btuh	
18	Frame - Wood - Ext					0.09	13.0/0.0	70.8			2.3		160	Btuh	
19	Frame - Wood - Ext					0.09	13.0/0.0	36.0			2.3		81	Btuh	
20	Frame - Wood - Int					0.09	13.0/0.0	186.7			0.0		0	Btuh	
	Wall Total							2095 (sqft)						4113	Btuh
Doors	Type								Area (sqft)		HTM		Load		
1	Wood - Exterior							20.0			12.0		240	Btuh	
2	Insulated - Exterior							20.0			12.0		240	Btuh	
	Door Total							40 (sqft)						480	Btuh
Ceilings	Type/Color/Surface						U-Value	R-Value	Area(sqft)		HTM		Load		
1	Vented Attic/Med/Shingle					0.032	30.0/0.0	1609.0			1.40		2255	Btuh	
2	SnglAsmb no airsp/Med/Shingle					0.034	30.0/0.0	312.0			0.99		308	Btuh	
	Ceiling Total							1921 (sqft)						2562	Btuh
Floors	Type							R-Value	Size		HTM		Load		
1	Slab On Grade						0.0	1609 (ft-perimeter)			0.0		0	Btuh	
2	Raised Wood - Adj						0.0	312 (sqft)			5.4		1680	Btuh	
	Floor Total							1921.0 (sqft)						1680	Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Ratliff Residence

, FL

12/7/2023

	Envelope Subtotal:					11908 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	15368	1	29.5	613 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	4000	5380 Btuh
	Sensible Envelope Load:					17902 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.235)					4206 Btuh
	Sensible Load All Zones					22108 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Ratliff Residence

, FL

12/7/2023

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17902 Btuh
	Sensible Duct Load	4206 Btuh
	Total Sensible Zone Loads	22108 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	22108 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1018 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1046 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3264 Btuh
	TOTAL GAIN	25372 Btuh

EQUIPMENT

1. Central Unit	#	36000 Btuh
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*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(½))
(Ornt - compass orientation)



Version 8

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Ratliff Residence
Building Type: User

, FL

12/7/2023

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	9.0		10.4	94 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	60.0		10.4	624 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	30.0		10.4	312 Btuh
4	2, NFRC 0.20	Vinyl	0.26	E	3.0		10.4	31 Btuh
5	2, NFRC 0.20	Vinyl	0.26	S	45.0		10.4	468 Btuh
6	2, NFRC 0.20	Vinyl	0.26	S	15.0		10.4	156 Btuh
7	2, NFRC 0.20	Vinyl	0.26	S	15.0		10.4	156 Btuh
8	2, NFRC 0.20	Vinyl	0.26	W	30.0		10.4	312 Btuh
9	2, NFRC 0.20	Vinyl	0.26	S	15.0		10.4	156 Btuh
10	2, NFRC 0.20	Vinyl	0.26	E	22.5		10.4	234 Btuh
	Window Total				244.5(sqft)			2543 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	318		3.55	1127 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	108		3.55	383 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	111		3.55	394 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	288		3.55	1022 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	27		3.55	96 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	39		3.55	138 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	192		3.55	680 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	63		3.55	224 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	51		3.55	181 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	27		3.55	96 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	120		3.55	426 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	219		3.55	778 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	76		3.55	271 Btuh
16	Frame - Wood	- Int	(0.089)	13.0/0.0	91		0.00	0 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	71		3.55	251 Btuh
19	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
20	Frame - Wood	- Int	(0.089)	13.0/0.0	187		0.00	0 Btuh
	Wall Total				2095(sqft)			6452 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Wood - Exterior,	n	(0.400)		20		16.0	320 Btuh
2	Insulated - Exterior,	n	(0.400)		20		16.0	320 Btuh
	Door Total				40(sqft)			640Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Ratliff Residence
Building Type: User

12/7/2023

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/M/Shing	(0.032)	30.0/0.0	1609	1.3	2050 Btuh
2	Single as/M/Shing	(0.034)	30.0/0.0	312	1.4	424 Btuh
	Ceiling Total			1921(sqft)		2474Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	205.0 ft(perim.)	47.2	9676 Btuh
2	Raised Wood - Adj	(0.385)	0.0	312.0 sqft	15.4	4800 Btuh
	Floor Total			1921 sqft		14476 Btuh
	Envelope Subtotal:					26585 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=
	Natural		0.15	15368	1.00	39.3
						1721 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.146)					4120 Btuh
All Zones	Sensible Subtotal All Zones					32426 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	32426 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	32426 Btuh

EQUIPMENT

1. Electric Heat Pump	#	36000 Btuh
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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