

Residential System Sizing Calculation

Summary

Chris & Beverly Hamrick

Project Title:
Hamrick Residence

Lake City, FL 32024

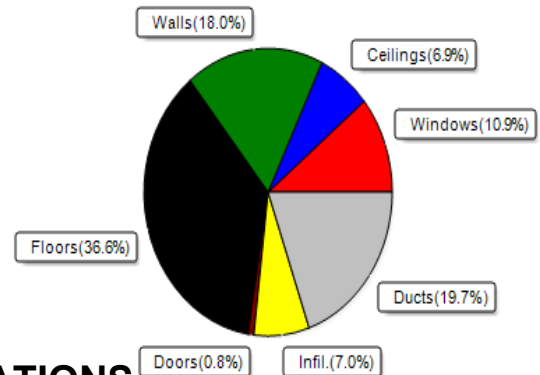
8/9/2022

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	48454 Btuh	Total cooling load calculation	32954 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 48454	Sensible (SHR = 0.70)	87.2 23068
Heat Pump + Auxiliary(0.0kW)	100.0 48454	Latent	152.4 9886
		Total (Electric Heat Pump)	100.0 32954

WINTER CALCULATIONS

Winter Heating Load (for 3159 sqft)

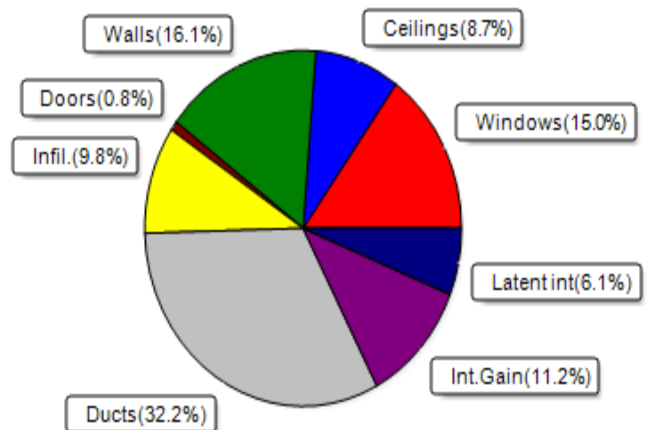
Load component		Load	
Window total	368 sqft	5299	Btuh
Wall total	2459 sqft	8730	Btuh
Door total	20 sqft	368	Btuh
Ceiling total	3317 sqft	3368	Btuh
Floor total	3159 sqft	17747	Btuh
Infiltration	78 cfm	3410	Btuh
Duct loss		9532	Btuh
Subtotal		48454	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		48454	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3159 sqft)

Load component		Load	
Window total	368 sqft	4953	Btuh
Wall total	2459 sqft	5307	Btuh
Door total	20 sqft	276	Btuh
Ceiling total	3317 sqft	2862	Btuh
Floor total		0	Btuh
Infiltration	58 cfm	1215	Btuh
Internal gain		3700	Btuh
Duct gain		8157	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		26469	Btuh
Latent gain(ducts)		2469	Btuh
Latent gain(infiltration)		2016	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		2000	Btuh
Total latent gain		6485	Btuh
TOTAL HEAT GAIN		32954	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: 8 / 9 / 2022

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Chris & Beverly Hamrick

Project Title:
Hamrick Residence
Building Type: User

Lake City, FL 32024

8/9/2022

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.25	Vinyl	0.36	S	60.0		14.4	864 Btuh
2	2, NFRC 0.25	TIM	0.36	S	40.0		14.4	576 Btuh
3	2, NFRC 0.25	Vinyl	0.36	S	30.0		14.4	432 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	6.0		14.4	86 Btuh
5	2, NFRC 0.25	Vinyl	0.36	E	15.0		14.4	216 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
7	2, NFRC 0.25	Vinyl	0.36	N	6.0		14.4	86 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	60.0		14.4	864 Btuh
9	2, NFRC 0.25	TIM	0.36	N	60.0		14.4	864 Btuh
10	2, NFRC 0.25	Vinyl	0.36	N	12.0		14.4	173 Btuh
11	2, NFRC 0.25	TIM	0.36	E	20.0		14.4	288 Btuh
12	2, NFRC 0.25	Vinyl	0.36	N	30.0		14.4	432 Btuh
13	2, NFRC 0.25	Vinyl	0.36	N	6.0		14.4	86 Btuh
14	2, NFRC 0.25	Vinyl	0.36	W	8.0		14.4	115 Btuh
Window Total					368.0(sqft)			5299 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	224		3.55	795 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.55	288 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	195		3.55	692 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	387		3.55	1374 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	150		3.55	533 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	246		3.55	873 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	181		3.55	643 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	231		3.55	820 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	42		3.55	149 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	274		3.55	973 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	202		3.55	717 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	246		3.55	873 Btuh
Wall Total					2459(sqft)			8730 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Garage, n		(0.460)		20		18.4	368 Btuh
Door Total					20(sqft)			368Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	3317		1.0	3368 Btuh
Ceiling Total					3317(sqft)			3368Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	376.0 ft(perim.)		47.2	17747 Btuh
Floor Total					3159 sqft			17747 Btuh
Envelope Subtotal:								35512 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Chris & Beverly Hamrick

Project Title:
Hamrick Residence
Building Type: User

Lake City, FL 32024

8/9/2022

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 28431	Wall Ratio 1.00	CFM= 77.9	3410 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.245)					9532 Btuh
All Zones	Sensible Subtotal All Zones					48454 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	48454 Btuh 0 Btuh 48454 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	48454 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

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Chris & Beverly Hamrick

Project Title:
Hamrick Residence

Lake City, FL 32024

8/9/2022

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

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	0.25, 0.36	No	No	S		9.5ft.	1.0ft.	60.0	60.0	0.0	12	14	726	Btuh
2	2 NFRC	0.25, 0.36	No	No	S		9.5ft.	1.0ft.	40.0	40.0	0.0	12	14	484	Btuh
3	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	30.0	30.0	0.0	12	14	363	Btuh
4	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	6.0	0.7	5.3	12	31	172	Btuh
5	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	15.0	0.7	14.3	12	31	450	Btuh
6	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	15.0	0.0	15.0	12	12	181	Btuh
7	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	6.0	0.0	6.0	12	12	73	Btuh
8	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	60.0	0.0	60.0	12	12	726	Btuh
9	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	60.0	0.0	60.0	12	12	726	Btuh
10	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	12.0	0.0	12.0	12	12	145	Btuh
11	2 NFRC	0.25, 0.36	No	No	E		11.5f	1.0ft.	20.0	20.0	0.0	12	31	242	Btuh
12	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	30.0	0.0	30.0	12	12	363	Btuh
13	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	6.0	0.0	6.0	12	12	73	Btuh
14	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	8.0	1.0	7.0	12	31	229	Btuh
	Window Total								368 (sqft)					4953 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext		0.09		13.0/0.0		224.0		2.3		507 Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.0		81.0		2.3		183 Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.0		195.0		2.3		441 Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.0		387.0		2.3		876 Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.0		150.0		2.3		340 Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.0		246.0		2.3		557 Btuh				
7	Frame - Wood - Ext		0.09		13.0/0.0		181.0		2.3		410 Btuh				
8	Frame - Wood - Ext		0.09		13.0/0.0		231.0		2.3		523 Btuh				
9	Frame - Wood - Ext		0.09		13.0/0.0		42.0		2.3		95 Btuh				
10	Frame - Wood - Ext		0.09		13.0/0.0		274.0		2.3		620 Btuh				
11	Frame - Wood - Adj		0.09		13.0/0.0		202.0		1.7		341 Btuh				
12	Frame - Wood - Adj		0.09		13.0/0.0		246.0		1.7		415 Btuh				
	Wall Total						2459 (sqft)			5307 Btuh					
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Garage		20.0		13.8	276 Btuh									
	Door Total		20 (sqft)		276 Btuh										
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Vented Attic/Light/Shingle/RB		0.025		38.0/0.0		3317.0		0.86		2862 Btuh				
	Ceiling Total						3317 (sqft)			2862 Btuh					
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade		0.0		3159 (ft-perimeter)		0.0		0 Btuh						
	Floor Total						3159.0 (sqft)			0 Btuh					
	Envelope Subtotal:										13398 Btuh				

Manual J Summer Calculations

Residential Load - Component Details (continued)

Chris & Beverly Hamrick

Project Title:
Hamrick Residence

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

8/9/2022

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 28431	Wall Ratio 1	CFM= 58.4	Load 1215 Btuh
Internal gain		Occupants 10	Btuh/occupant X 230	Appliance +	1400	Load 3700 Btuh
	Sensible Envelope Load:					18313 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.445)					8157 Btuh
	Sensible Load All Zones					26469 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Chris & Beverly Hamrick

Project Title: Hamrick Residence

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

8/9/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18313 Btuh
	Sensible Duct Load	8157 Btuh
	Total Sensible Zone Loads	26469 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	26469 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2016 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2469 Btuh
	Latent occupant gain (10.0 people @ 200 Btuh per person)	2000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	6485 Btuh
	TOTAL GAIN	32954 Btuh

EQUIPMENT

1. Central Unit	#	32954 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