

Residential System Sizing Calculation

Summary

Amaya Kellum

Project Title:
220603

Lake City, FL

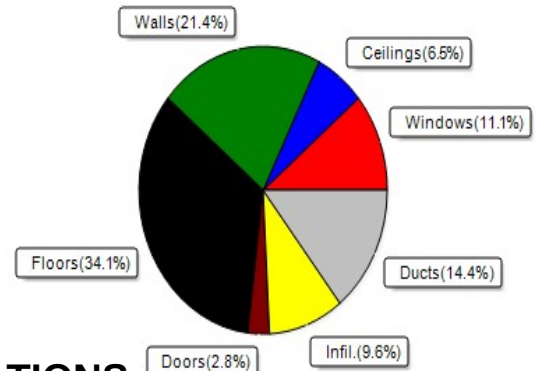
2022-05-19

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	26420 Btuh	Total cooling load calculation	24785 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.8 29000	Sensible (SHR = 0.75)	103.0 21750
Heat Pump + Auxiliary(0.0kW)	109.8 29000	Latent	198.1 7250
		Total (Electric Heat Pump)	117.0 29000

WINTER CALCULATIONS

Winter Heating Load (for 1603 sqft)

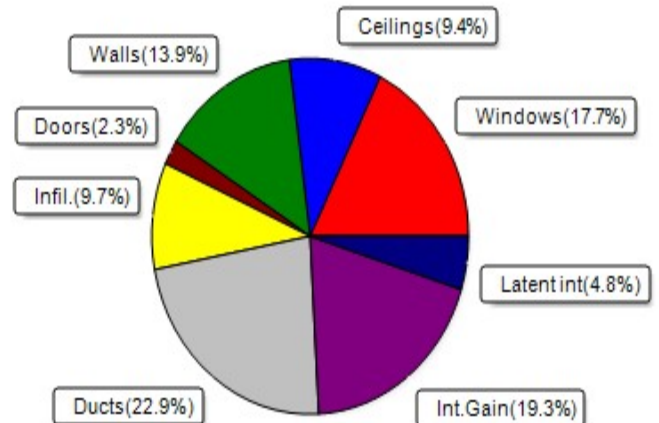
Load component		Load	
Window total	222 sqft	2925	Btuh
Wall total	1595 sqft	5664	Btuh
Door total	47 sqft	747	Btuh
Ceiling total	1700 sqft	1726	Btuh
Floor total	1603 sqft	9015	Btuh
Infiltration	58 cfm	2536	Btuh
Duct loss		3806	Btuh
Subtotal		26420	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		26420	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1603 sqft)

Load component		Load	
Window total	222 sqft	4390	Btuh
Wall total	1595 sqft	3456	Btuh
Door total	47 sqft	560	Btuh
Ceiling total	1700 sqft	2330	Btuh
Floor total		0	Btuh
Infiltration	43 cfm	903	Btuh
Internal gain		4780	Btuh
Duct gain		4706	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		21125	Btuh
Latent gain(ducts)		961	Btuh
Latent gain(infiltration)		1499	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3660	Btuh
TOTAL HEAT GAIN		24785	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2022-05-19

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Amaya Kellum

Project Title:

220603

Lake City, FL

Building Type: User

2022-05-19

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

This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.20	Vinyl	0.33	NW	36.0		13.2	475 Btuh
2	2, NFRC 0.20	Vinyl	0.33	N	11.1		13.2	147 Btuh
3	2, NFRC 0.20	Vinyl	0.33	NW	54.0		13.2	713 Btuh
4	2, NFRC 0.20	Vinyl	0.33	W	12.5		13.2	165 Btuh
5	2, NFRC 0.20	Vinyl	0.33	NW	15.0		13.2	198 Btuh
6	2, NFRC 0.20	Vinyl	0.33	NE	3.0		13.2	40 Btuh
7	2, NFRC 0.20	Vinyl	0.33	SE	24.0		13.2	317 Btuh
8	2, NFRC 0.20	Vinyl	0.33	SE	24.0		13.2	317 Btuh
9	2, NFRC 0.20	Vinyl	0.33	SW	6.0		13.2	79 Btuh
10	2, NFRC 0.20	Vinyl	0.33	SW	36.0		13.2	475 Btuh
Window Total					221.6(sqft)			2925 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	70		3.55	248 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	32		3.55	112 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	70 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	78		3.55	277 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	32		3.55	112 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	25		3.55	89 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	144		3.55	511 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	236		3.55	836 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	51		3.55	181 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	33		3.55	117 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	38		3.55	133 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	33		3.55	117 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	75		3.55	264 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	41		3.55	144 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	34		3.55	121 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	68		3.55	240 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	80		3.55	285 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	60		3.55	213 Btuh
19	Frame - Wood	- Ext	(0.089)	13.0/0.0	82		3.55	290 Btuh
20	Frame - Wood	- Ext	(0.089)	13.0/0.0	368		3.55	1305 Btuh
Wall Total					1595(sqft)			5664 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
2	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
Door Total					47(sqft)			747Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1700		1.0	1726 Btuh
Ceiling Total					1700(sqft)			1726Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Amaya Kellum
Lake City, FL

Project Title:
220603
Building Type: User

2022-05-19

Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 191.0 ft(perim.) 1603 sqft	HTM= 47.2	Load 9015 Btuh 9015 Btuh
	Envelope Subtotal:					20077 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.23	Volume(cuft) 14908	Wall Ratio 1.00	CFM= 57.9	2536 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.168)					3806 Btuh
All Zones	Sensible Subtotal All Zones					26420 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	26420 Btuh 0 Btuh 26420 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	29000 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

Amaya Kellum

Project Title:
220603

Lake City, FL

2022-05-19

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 315 degrees.

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, 0.33	No	No	NW		1.5ft	1.5ft	36.0	0.0	36.0	10	20	710	Btuh	
2	2 NFRC	0.20, 0.33	No	No	N		8.0ft	1.0ft	11.1	0.0	11.1	10	10	116	Btuh	
3	2 NFRC	0.20, 0.33	No	No	NW		8.0ft	1.0ft	54.0	0.0	54.0	10	20	1064	Btuh	
4	2 NFRC	0.20, 0.33	No	No	W		4.5ft	1.0ft	12.5	6.8	5.7	10	26	216	Btuh	
5	2 NFRC	0.20, 0.33	No	No	NW		1.5ft	1.5ft	15.0	0.0	15.0	10	20	296	Btuh	
6	2 NFRC	0.20, 0.33	No	No	NE		1.5ft	1.0ft	3.0	0.0	3.0	10	20	59	Btuh	
7	2 NFRC	0.20, 0.33	No	No	SE		6.5ft	1.0ft	24.0	24.0	0.0	10	21	251	Btuh	
8	2 NFRC	0.20, 0.33	No	No	SE		1.5ft	4.0ft	24.0	0.0	24.0	10	21	494	Btuh	
9	2 NFRC	0.20, 0.33	No	No	SW		1.5ft	1.5ft	6.0	1.9	4.1	10	21	104	Btuh	
10	2 NFRC	0.20, 0.33	No	No	SW		1.5ft	1.5ft	36.0	5.8	30.2	10	21	683	Btuh	
	Excursion													396	Btuh	
	Window Total								222 (sqft)						4390	Btuh
Walls	Type	U-Value			R-Value			Area(sqft)			HTM		Load			
1	Frame - Wood - Ext				0.09	13.0/0.0		69.8			2.3		158	Btuh		
2	Frame - Wood - Ext				0.09	13.0/0.0		31.5			2.3		71	Btuh		
3	Frame - Wood - Ext				0.09	13.0/0.0		19.7			2.3		45	Btuh		
4	Frame - Wood - Ext				0.09	13.0/0.0		78.0			2.3		177	Btuh		
5	Frame - Wood - Ext				0.09	13.0/0.0		31.5			2.3		71	Btuh		
6	Frame - Wood - Ext				0.09	13.0/0.0		25.0			2.3		57	Btuh		
7	Frame - Wood - Ext				0.09	13.0/0.0		144.0			2.3		326	Btuh		
8	Frame - Wood - Ext				0.09	13.0/0.0		235.5			2.3		533	Btuh		
9	Frame - Wood - Adj				0.09	13.0/0.0		51.0			1.7		86	Btuh		
10	Frame - Wood - Adj				0.09	13.0/0.0		33.0			1.7		56	Btuh		
11	Frame - Wood - Adj				0.09	13.0/0.0		37.5			1.7		63	Btuh		
12	Frame - Wood - Adj				0.09	13.0/0.0		33.0			1.7		56	Btuh		
13	Frame - Wood - Adj				0.09	13.0/0.0		74.5			1.7		126	Btuh		
14	Frame - Wood - Adj				0.09	13.0/0.0		40.5			1.7		68	Btuh		
15	Frame - Wood - Ext				0.09	13.0/0.0		34.0			2.3		77	Btuh		
16	Frame - Wood - Ext				0.09	13.0/0.0		67.5			2.3		153	Btuh		
17	Frame - Wood - Ext				0.09	13.0/0.0		80.3			2.3		182	Btuh		
18	Frame - Wood - Ext				0.09	13.0/0.0		60.0			2.3		136	Btuh		
19	Frame - Wood - Ext				0.09	13.0/0.0		81.8			2.3		185	Btuh		
20	Frame - Wood - Ext				0.09	13.0/0.0		367.5			2.3		832	Btuh		
	Wall Total								1595 (sqft)					3456	Btuh	
Doors	Type	U-Value			R-Value			Area (sqft)			HTM		Load			
1	Insulated - Exterior							6.7			12.0		80	Btuh		
2	Insulated - Garage							20.0			12.0		240	Btuh		
3	Insulated - Exterior							20.0			12.0		240	Btuh		
	Door Total								47 (sqft)					560	Btuh	
Ceilings	Type/Color/Surface	U-Value			R-Value			Area(sqft)			HTM		Load			
1	Vented Attic/DarkShingle				0.025	38.0/0.0		1700.0			1.37		2330	Btuh		
	Ceiling Total								1700 (sqft)					2330	Btuh	
Floors	Type	U-Value			R-Value			Size			HTM		Load			
1	Slab On Grade					0.0		1603 (ft-perimeter)			0.0		0	Btuh		
	Floor Total								1603.0 (sqft)					0	Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Amaya Kellum

Project Title:
220603

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-05-19

	Envelope Subtotal:					10736 Btuh
Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 14908	Wall Ratio 1	CFM= 43.4	Load 903 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
	Sensible Envelope Load:					16419 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.287)					4706 Btuh
	Sensible Load All Zones					21125 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Amaya Kellum

Project Title:
220603

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-05-19

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16419 Btuh
	Sensible Duct Load	4706 Btuh
	Total Sensible Zone Loads	21125 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	21125 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1499 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	961 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3660 Btuh
	TOTAL GAIN	24785 Btuh

EQUIPMENT

1. Central Unit	#	29000 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