

Residential System Sizing Calculation

Summary

Nelson Santiago

Project Title:
Santiago Residence

Lake City, FL 32055

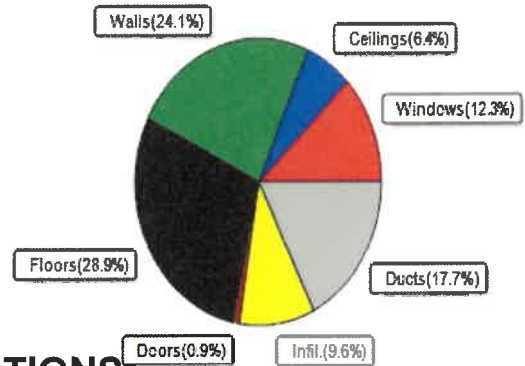
3/23/2021

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	46762 Btuh	Total cooling load calculation	38464 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	68.2 31881	Sensible (SHR = 0.70)	46.3 14723
Heat Pump + Auxiliary(0.0kW)	68.2 31881	Latent	94.4 6310
		Total (Electric Heat Pump)	54.7 21034

WINTER CALCULATIONS

Winter Heating Load (for 2797 sqft)

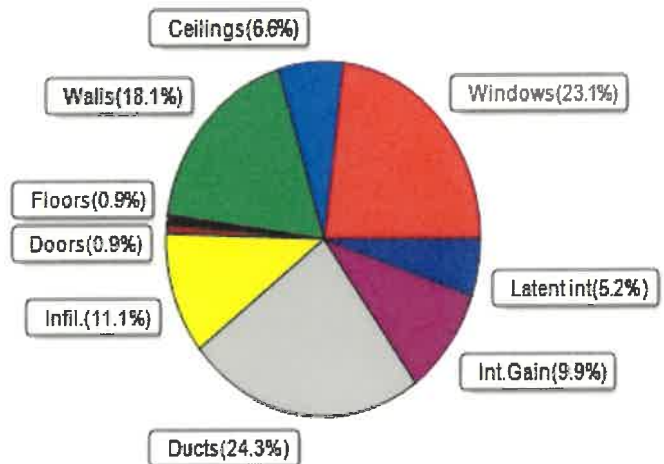
Load component		Load	
Window total	398 sqft	5731	Btuh
Wall total	3177 sqft	11278	Btuh
Door total	24 sqft	442	Btuh
Ceiling total	2937 sqft	2982	Btuh
Floor total	See detail report	13529	Btuh
Infiltration	103 cfm	4509	Btuh
Duct loss		8291	Btuh
Subtotal		46762	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		46762	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2797 sqft)

Load component		Load	
Window total	398 sqft	8897	Btuh
Wall total	3177 sqft	6944	Btuh
Door total	24 sqft	331	Btuh
Ceiling total	2937 sqft	2534	Btuh
Floor total		327	Btuh
Infiltration	77 cfm	1606	Btuh
Internal gain		3800	Btuh
Duct gain		7338	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		31778	Btuh
Latent gain(ducts)		2020	Btuh
Latent gain(infiltration)		2666	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		2000	Btuh
Total latent gain		6686	Btuh
TOTAL HEAT GAIN		38464	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

[Signature]
3/23/2021

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Nelson Santiago
Lake City, FL 32055

Project Title:
Santiago Residence
Building Type: User

3/23/2021

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	E	60.0		14.4	864 Btuh
2	2, NFRC 0.25	TIM	0.36	E	24.0		14.4	346 Btuh
3	2, NFRC 0.25	Vinyl	0.36	E	36.0		14.4	518 Btuh
4	2, NFRC 0.25	Vinyl	0.36	N	4.0		14.4	58 Btuh
5	2, NFRC 0.25	Vinyl	0.36	W	54.0		14.4	778 Btuh
6	2, NFRC 0.25	TIM	0.36	W	40.0		14.4	576 Btuh
7	2, NFRC 0.25	Vinyl	0.36	W	36.0		14.4	518 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	12.0		14.4	173 Btuh
9	2, NFRC 0.25	Vinyl	0.36	W	36.0		14.4	518 Btuh
10	2, NFRC 0.25	Vinyl	0.36	W	12.0		14.4	173 Btuh
11	2, NFRC 0.25	Vinyl	0.36	S	20.0		14.4	288 Btuh
12	2, NFRC 0.25	Vinyl	0.36	E	32.0		14.4	461 Btuh
13	2, NFRC 0.25	Vinyl	0.36	S	32.0		14.4	461 Btuh
Window Total					398.0(sqft)			5731 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	196		3.55	696 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	142		3.55	503 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	106		3.55	375 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	142		3.55	503 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	40		3.55	142 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	239		3.55	850 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	238		3.55	844 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	130		3.55	462 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	94		3.55	334 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	146		3.55	517 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	192		3.55	682 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	305		3.55	1083 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	82		3.55	291 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	315		3.55	1118 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	51		3.55	181 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	76		3.55	270 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	51		3.55	181 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	207		3.55	735 Btuh
19	Frame - Wood	- Adj	(0.089)	13.0/0.0	216		3.55	767 Btuh
20	Frame - Wood	- Adj	(0.089)	13.0/0.0	210		3.55	746 Btuh
Wall Total					3177(sqft)			11278 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Garage,	n	(0.460)		24		18.4	442 Btuh
Door Total					24(sqft)			442Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Nelson Santiago
Lake City, FL 32055

Project Title:
Santiago Residence
Building Type: User

3/23/2021

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.025)	38.0/0.0	2448	1.0	2485 Btuh
2	Vented Attic/L/Shing	(0.025)	38.0/0.0	489	1.0	496 Btuh
	Ceiling Total			2937(sqft)		2982Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	266.8 ft(perim.)	47.2	12595 Btuh
2	Raised Wood - Adj	(0.050)	19.0	466.0 sqft	2.0	935 Btuh
	Floor Total			2797 sqft		13529 Btuh
	Envelope Subtotal:					33961 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=
	Natural		0.22	27504	1.00	103.0
						4509 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.216)					8291 Btuh
All Zones	Sensible Subtotal All Zones					46762 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	46762 Btuh 0 Btuh 46762 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	31881 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

Nelson Santiago

Project Title:
Santiago Residence

Lake City, FL 32055

3/23/2021

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	E		9.5ft.	1.0ft.	60.0	60.0	0.0	12	31	726	Btuh
2	2 NFRC	0.25, 0.36	No	No	E		9.5ft.	1.0ft.	24.0	20.7	3.3	12	31	353	Btuh
3	2 NFRC	0.25, 0.36	No	No	E		1.0ft.	1.0ft.	36.0	0.0	36.0	12	31	1114	Btuh
4	2 NFRC	0.25, 0.36	No	No	N		1.0ft.	3.0ft.	4.0	0.0	4.0	12	12	48	Btuh
5	2 NFRC	0.25, 0.36	No	No	W		14.5f	1.0ft.	54.0	54.0	0.0	12	31	653	Btuh
6	2 NFRC	0.25, 0.36	No	No	W		14.5f	1.0ft.	40.0	40.0	0.0	12	31	484	Btuh
7	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	36.0	1.5	34.5	12	31	1086	Btuh
8	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	12.0	0.0	12.0	12	12	145	Btuh
9	2 NFRC	0.25, 0.36	No	No	W		1.0ft.	8.0ft.	36.0	0.0	36.0	12	31	1114	Btuh
10	2 NFRC	0.25, 0.36	No	No	W		1.0ft.	8.0ft.	12.0	0.0	12.0	12	31	371	Btuh
11	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	4.0ft.	20.0	18.1	1.9	12	14	246	Btuh
12	2 NFRC	0.25, 0.36	No	No	E		1.0ft.	3.0ft.	32.0	0.0	32.0	12	31	990	Btuh
13	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	32.0	32.0	0.0	12	14	387	Btuh
	Excursion													1179	Btuh
	Window Total								398 (sqft)					8897 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext		0.09		13.0/0.0		196.0		2.3		444 Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.0		141.7		2.3		321 Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.0		105.7		2.3		239 Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.0		141.7		2.3		321 Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.0		40.0		2.3		91 Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.0		239.3		2.3		542 Btuh				
7	Frame - Wood - Ext		0.09		13.0/0.0		237.7		2.3		538 Btuh				
8	Frame - Wood - Ext		0.09		13.0/0.0		130.0		2.3		294 Btuh				
9	Frame - Wood - Ext		0.09		13.0/0.0		94.0		2.3		213 Btuh				
10	Frame - Wood - Ext		0.09		13.0/0.0		145.5		2.3		329 Btuh				
11	Frame - Wood - Ext		0.09		13.0/0.0		192.0		2.3		435 Btuh				
12	Frame - Wood - Ext		0.09		13.0/0.0		305.0		2.3		690 Btuh				
13	Frame - Wood - Ext		0.09		13.0/0.0		82.0		2.3		186 Btuh				
14	Frame - Wood - Ext		0.09		13.0/0.0		315.0		2.3		713 Btuh				
15	Frame - Wood - Ext		0.09		13.0/0.0		51.0		2.3		115 Btuh				
16	Frame - Wood - Ext		0.09		13.0/0.0		76.0		2.3		172 Btuh				
17	Frame - Wood - Ext		0.09		13.0/0.0		51.0		2.3		115 Btuh				
18	Frame - Wood - Ext		0.09		13.0/0.0		207.0		2.3		469 Btuh				
19	Frame - Wood - Adj		0.09		13.0/0.0		216.0		1.7		364 Btuh				
20	Frame - Wood - Adj		0.09		13.0/0.0		210.0		1.7		354 Btuh				
	Wall Total								3177 (sqft)					6944 Btuh	
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Garage		24.0		13.8	331 Btuh									
	Door Total				24 (sqft)	331 Btuh									
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Vented AtticLight/Shingle/RB		0.025		38.0/0.0		2448.0		0.86		2112 Btuh				
2	Vented AtticLight/Shingle/RB		0.025		38.0/0.0		489.0		0.86		422 Btuh				
	Ceiling Total								2937 (sqft)					2534 Btuh	
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade		0.0		2331 (ft-perimeter)		0.0		0 Btuh						
2	Raised Wood - Adj		19.0		466 (sqft)		0.7		327 Btuh						
	Floor Total								2797.0 (sqft)					327 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Nelson Santiago

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Santiago Residence

Lake City, FL 32055

3/23/2021

	Envelope Subtotal:					19034 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	27504	1	77.2	1606 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		10	X 230	+	1500	3800 Btuh
	Sensible Envelope Load:					24440 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.300)					7338 Btuh
	Sensible Load All Zones					31778 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Nelson Santiago

Project Title: Santiago Residence

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32055

3/23/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	24440 Btuh
	Sensible Duct Load	7338 Btuh
	Total Sensible Zone Loads	31778 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	31778 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2666 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2020 Btuh
	Latent occupant gain (10.0 people @ 200 Btuh per person)	2000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	6686 Btuh
	TOTAL GAIN	38464 Btuh

EQUIPMENT

1. Central Unit	#	21034 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