

Residential System Sizing Calculation

Summary

Project Title:
Nickelson Residence

, FL

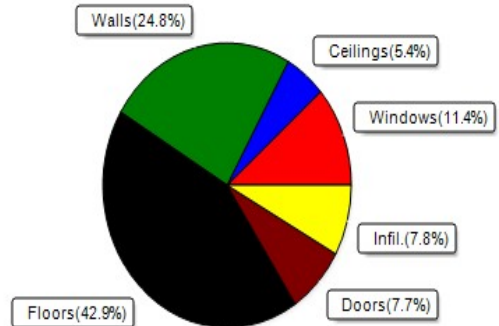
6/15/2023

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	29029 Btuh	Total cooling load calculation	19209 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	165.4 48000	Sensible (SHR = 0.85)	244.7 40800
Heat Pump + Auxiliary(0.0kW)	165.4 48000	Latent	283.8 7200
		Total (Electric Heat Pump)	249.9 48000

WINTER CALCULATIONS

Winter Heating Load (for 2212 sqft)

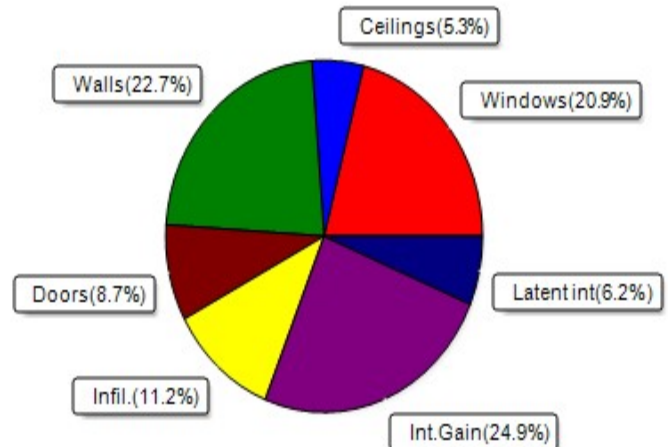
Load component	Load
Window total 317 sqft	3299 Btuh
Wall total 2028 sqft	7201 Btuh
Door total 140 sqft	2240 Btuh
Ceiling total 2212 sqft	1566 Btuh
Floor total 2212 sqft	12461 Btuh
Infiltration 52 cfm	2262 Btuh
Duct loss	0 Btuh
Subtotal	29029 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	29029 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2212 sqft)

Load component	Load
Window total 317 sqft	4024 Btuh
Wall total 2028 sqft	4364 Btuh
Door total 140 sqft	1680 Btuh
Ceiling total 2212 sqft	1018 Btuh
Floor total	0 Btuh
Infiltration 39 cfm	806 Btuh
Internal gain	4780 Btuh
Duct gain	0 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	16672 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	1337 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	2537 Btuh
TOTAL HEAT GAIN	19209 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Nickelson Residence

, FL

6/15/2023

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		1.5ft	2.3ft	36.0	0.0	36.0	9	9	329	Btuh
2	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	54.0	0.0	54.0	9	9	494	Btuh
3	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	16.0	0.0	16.0	9	9	146	Btuh
4	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	16.7	0.0	16.7	9	9	152	Btuh
5	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	18.0	0.0	18.0	9	24	436	Btuh
6	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	36.0	0.0	36.0	9	9	329	Btuh
7	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	20.0	0.0	20.0	9	24	484	Btuh
8	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	8.0	0.0	8.0	9	24	194	Btuh
9	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	6.0	0.0	6.0	9	24	145	Btuh
10	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	12.0	12.0	0.0	9	11	110	Btuh
11	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	36.0	36.0	0.0	9	11	329	Btuh
12	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	36.0	36.0	0.0	9	11	329	Btuh
13	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	18.0	0.0	18.0	9	24	436	Btuh
14	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	4.5	0.0	4.5	9	24	109	Btuh
	Window Total								317 (sqft)					4024 Btuh	
Walls	Type						U-Value	R-Value	Area(sqft)			HTM		Load	
							Cav/Sheath								
1	Frame - Wood - Ext						0.09	13.0/0.0	144.0			2.3		326 Btuh	
2	Frame - Wood - Ext						0.09	13.0/0.0	87.0			2.3		197 Btuh	
3	Frame - Wood - Ext						0.09	13.0/0.0	146.7			2.3		332 Btuh	
4	Frame - Wood - Ext						0.09	13.0/0.0	136.5			2.3		309 Btuh	
5	Frame - Wood - Ext						0.09	13.0/0.0	159.0			2.3		360 Btuh	
6	Frame - Wood - Ext						0.09	13.0/0.0	212.0			2.3		480 Btuh	
7	Frame - Wood - Adj						0.09	13.0/0.0	393.0			1.7		663 Btuh	
8	Frame - Wood - Ext						0.09	13.0/0.0	160.3			2.3		363 Btuh	
9	Frame - Wood - Ext						0.09	13.0/0.0	20.0			2.3		45 Btuh	
10	Frame - Wood - Ext						0.09	13.0/0.0	55.3			2.3		125 Btuh	
11	Frame - Wood - Ext						0.09	13.0/0.0	18.0			2.3		41 Btuh	
12	Frame - Wood - Ext						0.09	13.0/0.0	72.0			2.3		163 Btuh	
13	Frame - Wood - Ext						0.09	13.0/0.0	103.5			2.3		234 Btuh	
14	Frame - Wood - Ext						0.09	13.0/0.0	58.5			2.3		132 Btuh	
15	Frame - Wood - Ext						0.09	13.0/0.0	262.5			2.3		594 Btuh	
	Wall Total								2028 (sqft)					4364 Btuh	
Doors	Type						Area (sqft)			HTM		Load			
1	Insulated - Exterior						24.0			12.0		288 Btuh			
2	Insulated - Exterior						40.0			12.0		480 Btuh			
3	Insulated - Exterior						24.0			12.0		288 Btuh			
4	Insulated - Garage						24.0			12.0		288 Btuh			
5	Insulated - Exterior						28.0			12.0		336 Btuh			
	Door Total								140 (sqft)					1680 Btuh	
Ceilings	Type/Color/Surface						U-Value	R-Value	Area(sqft)			HTM		Load	
1	SnglAsmb no airsp/Med/Shingle						0.018	30.0/30.0	2212.0			0.46		1018 Btuh	
	Ceiling Total								2212 (sqft)					1018 Btuh	
Floors	Type						R-Value		Size			HTM		Load	
1	Slab On Grade						0.0		2212 (ft-perimeter)			0.0		0 Btuh	
	Floor Total								2212.0 (sqft)					0 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Nickelson Residence

, FL

6/15/2023

	Envelope Subtotal:					11086 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	19908	1	38.7	806 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	3400	4780 Btuh
	Sensible Envelope Load:					16672 Btuh
Duct load	Average sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					16672 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Nickelson Residence

, FL

6/15/2023

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16672 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	16672 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	16672 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1337 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2537 Btuh
	TOTAL GAIN	19209 Btuh

EQUIPMENT

1. Central Unit	#	48000 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:
Nickelson Residence
Building Type: User

, FL

6/15/2023

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	36.0		10.4	374 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	54.0		10.4	562 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	16.0		10.4	166 Btuh
4	2, NFRC 0.20	Vinyl	0.26	N	16.7		10.4	173 Btuh
5	2, NFRC 0.20	Vinyl	0.26	W	18.0		10.4	187 Btuh
6	2, NFRC 0.20	Vinyl	0.26	N	36.0		10.4	374 Btuh
7	2, NFRC 0.20	Vinyl	0.26	E	20.0		10.4	208 Btuh
8	2, NFRC 0.20	Vinyl	0.26	E	8.0		10.4	83 Btuh
9	2, NFRC 0.20	Vinyl	0.26	E	6.0		10.4	62 Btuh
10	2, NFRC 0.20	Vinyl	0.26	S	12.0		10.4	125 Btuh
11	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
12	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
13	2, NFRC 0.20	Vinyl	0.26	W	18.0		10.4	187 Btuh
14	2, NFRC 0.20	Vinyl	0.26	W	4.5		10.4	47 Btuh
Window Total					317.2(sqft)			3299 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	144		3.55	511 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	87		3.55	309 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	147		3.55	521 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	137		3.55	485 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	159		3.55	565 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	212		3.55	753 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	393		3.55	1395 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	160		3.55	569 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	71 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	55		3.55	196 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	104		3.55	367 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	59		3.55	208 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	263		3.55	932 Btuh
Wall Total					2028(sqft)			7201 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		24		16.0	384 Btuh
2	Insulated - Exterior,	n	(0.400)		40		16.0	640 Btuh
3	Insulated - Exterior,	n	(0.400)		24		16.0	384 Btuh
4	Insulated - Garage,	n	(0.400)		24		16.0	384 Btuh
5	Insulated - Exterior,	n	(0.400)		28		16.0	448 Btuh
Door Total					140(sqft)			2240Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Nickelson Residence
Building Type: User

, FL

6/15/2023

Ceilings 1	Type/Color/Surface Single as/M/Shing Ceiling Total	Ueff. (0.018)	R-Value 30.0/30.0	Area X 2212 2212(sqft)	HTM= 0.71	Load 1566 Btuh 1566Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 264.0 ft(perim.) 2212 sqft	HTM= 47.2	Load 12461 Btuh 12461 Btuh
Envelope Subtotal:						26767 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 19908	Wall Ratio 1.00	CFM= 51.6	2262 Btuh
Duct load	Average sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					29029 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss Total Heat Loss	(Ex:0 cfm; Sup:0 cfm)	29029 Btuh 0 Btuh 29029 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	48000 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