

Residential System Sizing Calculation

Summary

Andrew Nettles

Project Title:
231515 Nettles

Lake City, FL

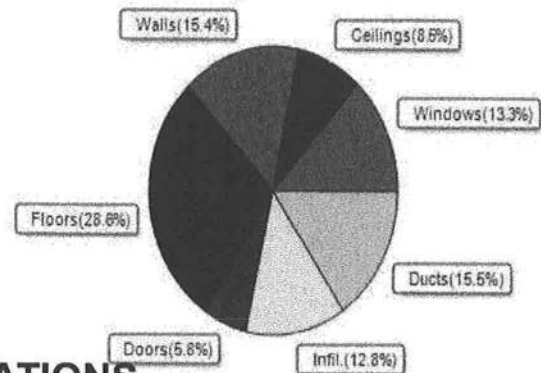
2024-01-03

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	40238	Btuh	Total cooling load calculation	33114	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.3	44000	Sensible (SHR = 0.75)	118.6	33000
Heat Pump + Auxiliary(0.0kW)	109.3	44000	Latent	207.7	11000
			Total (Electric Heat Pump)	132.9	44000

WINTER CALCULATIONS

Winter Heating Load (for 2514 sqft)

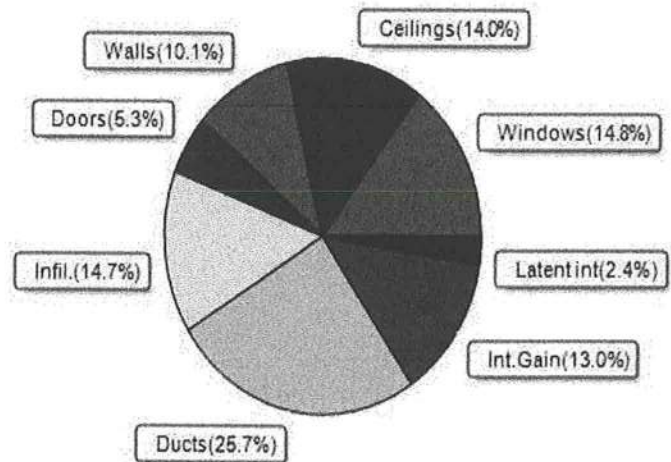
Load component		Load
Window total	420 sqft	5372 Btuh
Wall total	1989 sqft	6196 Btuh
Door total	147 sqft	2347 Btuh
Ceiling total	3377 sqft	3428 Btuh
Floor total	2514 sqft	11517 Btuh
Infiltration	117 cfm	5136 Btuh
Duct loss		6242 Btuh
Subtotal		40238 Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS		40238 Btuh



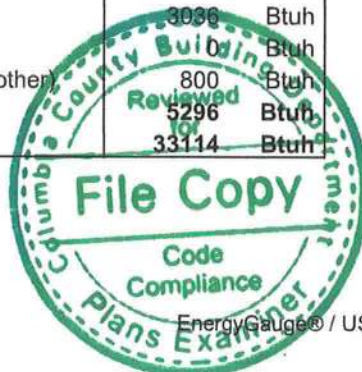
SUMMER CALCULATIONS

Summer Cooling Load (for 2514 sqft)

Load component		Load
Window total	420 sqft	4888 Btuh
Wall total	1989 sqft	3354 Btuh
Door total	147 sqft	1760 Btuh
Ceiling total	3377 sqft	4628 Btuh
Floor total		0 Btuh
Infiltration	88 cfm	1830 Btuh
Internal gain		4320 Btuh
Duct gain		7039 Btuh
Sens. Ventilation	Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		27818 Btuh
Latent gain(ducts)		1460 Btuh
Latent gain(infiltration)		3036 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		800 Btuh
Total latent gain		5296 Btuh
TOTAL HEAT GAIN		33114 Btuh



8th Edition



EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2024-01-03

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Andrew Nettles

Project Title:
231515 Nettles
Building Type: User

Lake City, FL

2024-01-03

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	Load
1	2, NFRC 0.22	Metal	0.32	N	36.0	12.8	461 Btuh
2	2, NFRC 0.22	Metal	0.32	N	4.5	12.8	58 Btuh
3	2, NFRC 0.22	Metal	0.32	E	10.7	12.8	137 Btuh
4	2, NFRC 0.22	Metal	0.32	N	96.0	12.8	1229 Btuh
5	2, NFRC 0.22	Metal	0.32	N	16.0	12.8	205 Btuh
6	2, NFRC 0.22	Metal	0.32	E	4.5	12.8	58 Btuh
7	2, NFRC 0.22	Metal	0.32	E	10.0	12.8	128 Btuh
8	2, NFRC 0.22	Metal	0.32	E	4.5	12.8	58 Btuh
9	2, NFRC 0.22	Metal	0.32	S	36.0	12.8	461 Btuh
10	2, NFRC 0.22	Metal	0.32	S	36.0	12.8	461 Btuh
11	2, NFRC 0.22	Metal	0.32	S	32.0	12.8	410 Btuh
12	2, NFRC 0.22	Metal	0.32	S	9.0	12.8	115 Btuh
13	2, NFRC 0.22	Metal	0.32	S	36.0	12.8	461 Btuh
14	2, NFRC 0.22	Metal	0.32	S	36.0	12.8	461 Btuh
15	2, NFRC 0.22	Metal	0.32	W	4.5	12.8	58 Btuh
16	2, NFRC 0.22	Metal	0.32	S	21.3	12.8	273 Btuh
17	2, NFRC 0.22	Metal	0.32	S	26.7	12.8	341 Btuh
Window Total					419.7(sqft)		5372 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	143	3.09	441 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	41	3.09	126 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	75	3.09	233 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	23	3.09	72 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	81	3.09	249 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	60	3.09	185 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	80	3.09	248 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	27	3.55	95 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	53	3.55	188 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	27	3.55	95 Btuh
11	Frame - Wood	- Ext	(0.077)	19.0/0.0	354	3.09	1095 Btuh
12	Frame - Wood	- Ext	(0.077)	19.0/0.0	107	3.09	332 Btuh
13	Frame - Wood	- Ext	(0.077)	19.0/0.0	48	3.09	148 Btuh
14	Frame - Wood	- Ext	(0.077)	19.0/0.0	131	3.09	404 Btuh
15	Frame - Wood	- Ext	(0.077)	19.0/0.0	10	3.09	31 Btuh
16	Frame - Wood	- Ext	(0.077)	19.0/0.0	16	3.09	50 Btuh
17	Frame - Wood	- Ext	(0.077)	19.0/0.0	10	3.09	31 Btuh
18	Frame - Wood	- Ext	(0.077)	19.0/0.0	131	3.09	404 Btuh
19	Frame - Wood	- Ext	(0.077)	19.0/0.0	60	3.09	185 Btuh
20	Frame - Wood	- Ext	(0.077)	19.0/0.0	124	3.09	383 Btuh
21	Frame - Wood	- Ext	(0.077)	19.0/0.0	332	3.09	1027 Btuh
22	Frame - Wood	- Ext	(0.077)	19.0/0.0	34	3.09	104 Btuh
23	Frame - Wood	- Ext	(0.077)	19.0/0.0	22	3.09	69 Btuh
Wall Total					1989(sqft)		6196 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Andrew Nettles

Project Title:
231515 Nettles
Building Type: User

Lake City, FL

2024-01-03

Doors	Type	Storm Ueff.		Area X	HTM=	Load	
	1	Insulated - Exterior, n	(0.400)	5	16.0	85 Btuh	
	2	Insulated - Exterior, n	(0.400)	32	16.0	512 Btuh	
	3	Insulated - Exterior, n	(0.400)	21	16.0	341 Btuh	
	4	Insulated - Exterior, n	(0.400)	48	16.0	768 Btuh	
	5	Insulated - Exterior, n	(0.400)	24	16.0	384 Btuh	
	6	Insulated - Exterior, n	(0.400)	16	16.0	256 Btuh	
	Door Total			147(sqft)		2347Btuh	
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load	
	1	Flat ceil/D/Shing	(0.025)	38.0/0.0	2514	1.0	2552 Btuh
	2	Knee wall/D/Shing	(0.025)	38.0/0.0	863	1.0	876 Btuh
	Ceiling Total			3377(sqft)		3428Btuh	
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load	
	1	Slab On Grade	(1.180)	0.0	244.0 ft(perim.)	47.2	11517 Btuh
	Floor Total			2514 sqft		11517 Btuh	
	Envelope Subtotal:					28860 Btuh	
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural	0.25	28031	1.00	117.1	5136 Btuh	
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.184)	6242 Btuh	
All Zones	Sensible Subtotal All Zones					40238 Btuh	

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss Total Heat Loss	(Ex:0 cfm; Sup:0 cfm)	40238 Btuh 0 Btuh 40238 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	44000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Andrew Nettles

Lake City, FL

Project Title:
231515 Nettles
Building Type: User

2024-01-03

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

Andrew Nettles

Project Title:
231515 Nettles

Lake City, FL

2024-01-03

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	0.22, 0.32	No	No	N		1.5ft	1.5ft	36.0	0.0	36.0	11	11	385 Btuh
2	2 NFRC	0.22, 0.32	No	No	N		1.5ft	1.5ft	4.5	0.0	4.5	11	11	48 Btuh
3	2 NFRC	0.22, 0.32	No	No	E		20.3f	0.0ft	10.7	10.7	0.0	11	27	114 Btuh
4	2 NFRC	0.22, 0.32	No	No	N		17.8f	1.0ft	96.0	0.0	96.0	11	11	1028 Btuh
5	2 NFRC	0.22, 0.32	No	No	N		15.5f	1.0ft	16.0	0.0	16.0	11	11	171 Btuh
6	2 NFRC	0.22, 0.32	No	No	E		1.5ft	3.3ft	4.5	0.0	4.5	11	27	123 Btuh
7	2 NFRC	0.22, 0.32	No	No	E		1.5ft	6.3ft	10.0	0.0	10.0	11	27	273 Btuh
8	2 NFRC	0.22, 0.32	No	No	E		1.5ft	10.3f	4.5	0.0	4.5	11	27	123 Btuh
9	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.5ft	36.0	36.0	0.0	11	12	385 Btuh
10	2 NFRC	0.22, 0.32	No	No	S		8.5ft	1.5ft	36.0	36.0	0.0	11	12	385 Btuh
11	2 NFRC	0.22, 0.32	No	No	S		9.5ft	1.5ft	32.0	32.0	0.0	11	12	343 Btuh
12	2 NFRC	0.22, 0.32	No	No	S		9.5ft	0.0ft	9.0	9.0	0.0	11	12	96 Btuh
13	2 NFRC	0.22, 0.32	No	No	S		8.5ft	1.0ft	36.0	36.0	0.0	11	12	385 Btuh
14	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.5ft	36.0	36.0	0.0	11	12	385 Btuh
15	2 NFRC	0.22, 0.32	No	No	W		1.5ft	11.0f	4.5	0.0	4.5	11	27	123 Btuh
16	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.0ft	21.3	21.3	0.0	11	12	228 Btuh
17	2 NFRC	0.22, 0.32	No	No	S		1.5ft	4.0ft	26.7	24.1	2.5	11	12	290 Btuh
Window Total									420 (sqft)					4888 Btuh
Walls	Type						U-Value	R-Value	Area(sqft)	HTM		Load		
							Cav/Sheath							
1	Frame - Wood - Ext						0.08	19.0/0.0	142.8	1.7		236 Btuh		
2	Frame - Wood - Ext						0.08	19.0/0.0	40.7	1.7		67 Btuh		
3	Frame - Wood - Ext						0.08	19.0/0.0	75.3	1.7		125 Btuh		
4	Frame - Wood - Ext						0.08	19.0/0.0	23.3	1.7		39 Btuh		
5	Frame - Wood - Ext						0.08	19.0/0.0	80.7	1.7		133 Btuh		
6	Frame - Wood - Ext						0.08	19.0/0.0	60.0	1.7		99 Btuh		
7	Frame - Wood - Ext						0.08	19.0/0.0	80.3	1.7		133 Btuh		
8	Frame - Wood - Ext						0.09	13.0/0.0	26.7	2.3		60 Btuh		
9	Frame - Wood - Ext						0.09	13.0/0.0	53.0	2.3		120 Btuh		
10	Frame - Wood - Ext						0.09	13.0/0.0	26.7	2.3		60 Btuh		
11	Frame - Wood - Ext						0.08	19.0/0.0	354.3	1.7		586 Btuh		
12	Frame - Wood - Ext						0.08	19.0/0.0	107.3	1.7		177 Btuh		
13	Frame - Wood - Ext						0.08	19.0/0.0	48.0	1.7		79 Btuh		
14	Frame - Wood - Ext						0.08	19.0/0.0	130.7	1.7		216 Btuh		
15	Frame - Wood - Ext						0.08	19.0/0.0	10.0	1.7		17 Btuh		
16	Frame - Wood - Ext						0.08	19.0/0.0	16.3	1.7		27 Btuh		
17	Frame - Wood - Ext						0.08	19.0/0.0	10.0	1.7		17 Btuh		
18	Frame - Wood - Ext						0.08	19.0/0.0	130.7	1.7		216 Btuh		
19	Frame - Wood - Ext						0.08	19.0/0.0	60.0	1.7		99 Btuh		
20	Frame - Wood - Ext						0.08	19.0/0.0	124.0	1.7		205 Btuh		
21	Frame - Wood - Ext						0.08	19.0/0.0	332.2	1.7		549 Btuh		
22	Frame - Wood - Ext						0.08	19.0/0.0	33.6	1.7		55 Btuh		
23	Frame - Wood - Ext						0.08	19.0/0.0	22.3	1.7		37 Btuh		
Wall Total									1989 (sqft)					3354 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Andrew Nettles

Project Title:
231515 Nettles

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2024-01-03

Doors	Type			Area (sqft)	HTM	Load
1	Insulated - Exterior			5.3	12.0	64 Btuh
2	Insulated - Exterior			32.0	12.0	384 Btuh
3	Insulated - Exterior			21.3	12.0	256 Btuh
4	Insulated - Exterior			48.0	12.0	576 Btuh
5	Insulated - Exterior			24.0	12.0	288 Btuh
6	Insulated - Exterior			16.0	12.0	192 Btuh
	Door Total			147 (sqft)		1760 Btuh
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.025	38.0/0.0	2514.0	1.37	3446 Btuh
2	Knee wall to attic/DarkShingle	0.025	38.0/0.0	863.0	1.37	1183 Btuh
	Ceiling Total			3377 (sqft)		4628 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	2514 (ft-perimeter)	0.0	0 Btuh
	Floor Total			2514.0 (sqft)		0 Btuh
	Envelope Subtotal:					14630 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.19	28031	1	87.8	1830 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		4	X 230	+	3400	4320 Btuh
	Sensible Envelope Load:					20779 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.339)		7039 Btuh
	Sensible Load All Zones					27818 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Andrew Nettles

Project Title:
231515 Nettles

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2024-01-03

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	20779 Btuh
	Sensible Duct Load	7039 Btuh
	Total Sensible Zone Loads	27818 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	27818 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	3036 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1460 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5296 Btuh
	TOTAL GAIN	33114 Btuh

EQUIPMENT

1. Central Unit	#	44000 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