

Residential System Sizing Calculation

Summary

Siters Res
Wester Road
Lake City, FL

Project Title:
201311 Siters Res

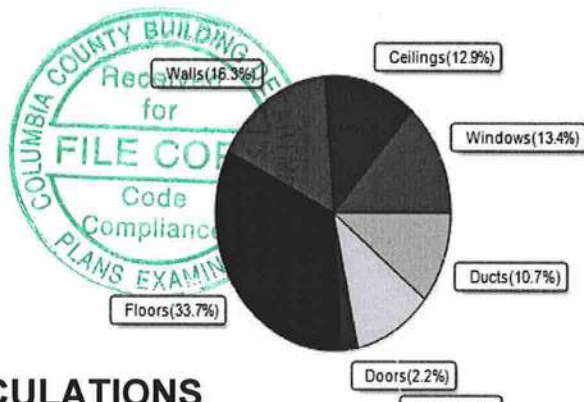
2020-12-01

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (79F) Humidity difference(54gr.)			
Winter design temperature(MJ8 99%)	32 F	Summer design temperature(MJ8 99%)	99 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	38 F	Summer temperature difference	24 F
Total heating load calculation	27436 Btuh	Total cooling load calculation	26302 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.3 30000	Sensible (SHR = 0.75)	102.4 22500
Heat Pump + Auxiliary(0.0kW)	109.3 30000	Latent	172.9 7500
		Total (Electric Heat Pump)	114.1 30000

WINTER CALCULATIONS

Winter Heating Load (for 1969 sqft)

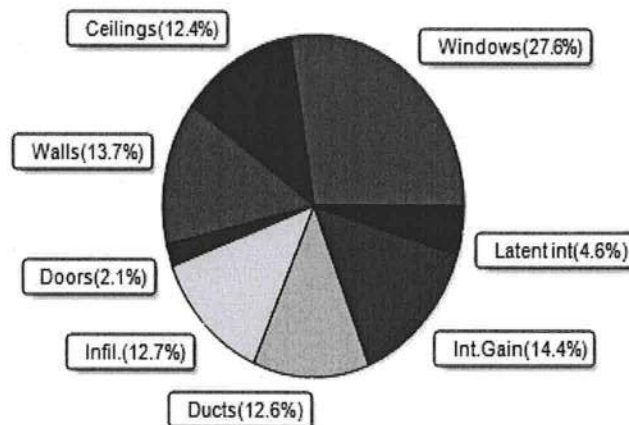
Load component			Load	
Window total	277	sqft	3678	Btuh
Wall total	1329	sqft	4482	Btuh
Door total	40	sqft	608	Btuh
Ceiling total	2137	sqft	3546	Btuh
Floor total	1969	sqft	9237	Btuh
Infiltration	71	cfm	2941	Btuh
Duct loss			2945	Btuh
Subtotal			27436	Btuh
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			27436	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1969 sqft)

Load component			Load	
Window total	277	sqft	7252	Btuh
Wall total	1329	sqft	3597	Btuh
Door total	40	sqft	560	Btuh
Ceiling total	2137	sqft	3266	Btuh
Floor total			0	Btuh
Infiltration	53	cfm	1393	Btuh
Internal gain			3780	Btuh
Duct gain			2115	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			21964	Btuh
Latent gain(ducts)			1200	Btuh
Latent gain(infiltration)			1937	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			4338	Btuh
TOTAL HEAT GAIN			26302	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-12-01

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Siters Res
Wester Road
Lake City, FL

Project Title:
201311 Siters Res
Building Type: User

2020-12-01

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 38.0 F (MJ8 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 0.30	Metal	0.35	NW	15.0		13.3	200 Btuh
2	2, NFRC 0.30	Metal	0.35	NE	15.0		13.3	200 Btuh
3	2, NFRC 0.30	Metal	0.35	NW	15.0		13.3	200 Btuh
4	2, NFRC 0.30	Metal	0.35	NW	13.3		13.3	177 Btuh
5	2, NFRC 0.30	Metal	0.35	NW	9.0		13.3	120 Btuh
6	2, NFRC 0.30	Metal	0.35	NW	22.2		13.3	296 Btuh
7	2, NFRC 0.30	Metal	0.35	NW	4.7		13.3	62 Btuh
8	2, NFRC 0.30	Metal	0.35	NE	30.0		13.3	399 Btuh
9	2, NFRC 0.30	Metal	0.35	SE	54.0		13.3	718 Btuh
10	2, NFRC 0.30	Metal	0.35	SE	13.3		13.3	177 Btuh
11	2, NFRC 0.30	Metal	0.35	SE	13.3		13.3	177 Btuh
12	2, NFRC 0.30	Metal	0.35	SE	13.3		13.3	177 Btuh
13	2, NFRC 0.30	Metal	0.35	SW	15.0		13.3	200 Btuh
14	2, NFRC 0.30	Metal	0.35	SE	15.0		13.3	200 Btuh
15	2, NFRC 0.30	Metal	0.35	SW	13.3		13.3	177 Btuh
16	2, NFRC 0.30	Metal	0.35	SW	15.0		13.3	200 Btuh
	Window Total				276.6(sqft)			3678 Btuh
Walls	Type	Omt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.37	273 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	49		3.37	165 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	237		3.37	800 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	95		3.37	319 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	218		3.37	735 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	302		3.37	1019 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.37	242 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	78		3.37	264 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	197		3.37	664 Btuh
	Wall Total				1329(sqft)			4482 Btuh
Doors	Type	Storm	Ueff.	R-Value	Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		7		15.2	101 Btuh
2	Insulated - Exterior, n		(0.400)		13		15.2	203 Btuh
3	Insulated - Exterior, n		(0.400)		7		15.2	101 Btuh
4	Insulated - Exterior, n		(0.400)		7		15.2	101 Btuh
5	Insulated - Exterior, n		(0.400)		7		15.2	101 Btuh
	Door Total				40(sqft)			608Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area	X	HTM=	Load	
1	Unvent Attic/D/Shing	(0.044)	0.0/22.0	2137		1.7	3546 Btuh	
	Ceiling Total				2137(sqft)			3546Btuh
Floors	Type	Ueff.	R-Value	Size	X	HTM=	Load	
1	Slab On Grade	(1.180)	0.0	206.0 ft(perim.)		44.8	9237 Btuh	
	Floor Total				1969 sqft			9237 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Siters Res
Wester Road
Lake City, FL

Project Title:
201311 Siters Res
Building Type: User

2020-12-01

	Envelope Subtotal:						21551 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.24	17327	1.00	70.7	2941 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.120)	2945 Btuh
All Zones	Sensible Subtotal All Zones						27436 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	27436 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	27436 Btuh

EQUIPMENT

1. Electric Heat Pump	#	30000 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

Siters Res
Wester Road
Lake City, FL

Project Title:
201311 Siters Res

2020-12-01

Reference City: Gainesville, FL Temperature Difference: 24.0F(MJ8 99%) Humidity difference: 54gr.
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	0.30, 0.35	No	No	NW		1.5ft	1.0ft	15.0	0.0	15.0	15	29		428 Btuh		
2	2 NFRC	0.30, 0.35	No	No	NE		39.6f	0.0ft	15.0	0.0	15.0	15	29		428 Btuh		
3	2 NFRC	0.30, 0.35	No	No	NW		11.5f	0.5ft	15.0	0.0	15.0	15	29		428 Btuh		
4	2 NFRC	0.30, 0.35	No	No	NW		11.5f	0.5ft	13.3	0.0	13.3	15	29		381 Btuh		
5	2 NFRC	0.30, 0.35	No	No	NW		11.5f	0.5ft	9.0	0.0	9.0	15	29		257 Btuh		
6	2 NFRC	0.30, 0.35	No	No	NW		11.5f	0.5ft	22.2	0.0	22.2	15	29		635 Btuh		
7	2 NFRC	0.30, 0.35	No	No	NW		1.5ft	1.0ft	4.7	0.0	4.7	15	29		133 Btuh		
8	2 NFRC	0.30, 0.35	No	No	NE		1.5ft	3.0ft	30.0	0.0	30.0	15	29		857 Btuh		
9	2 NFRC	0.30, 0.35	No	No	SE		9.5ft	0.5ft	54.0	54.0	0.0	15	30		794 Btuh		
10	2 NFRC	0.30, 0.35	No	No	SE		9.5ft	0.5ft	13.3	13.3	0.0	15	30		196 Btuh		
11	2 NFRC	0.30, 0.35	No	No	SE		9.5ft	0.5ft	13.3	13.3	0.0	15	30		196 Btuh		
12	2 NFRC	0.30, 0.35	No	No	SE		9.5ft	0.5ft	13.3	13.3	0.0	15	30		196 Btuh		
13	2 NFRC	0.30, 0.35	No	No	SW		1.5ft	2.0ft	15.0	1.4	13.6	15	30		427 Btuh		
14	2 NFRC	0.30, 0.35	No	No	SE		1.5ft	1.0ft	15.0	4.4	10.6	15	30		382 Btuh		
15	2 NFRC	0.30, 0.35	No	No	SW		1.5ft	3.0ft	13.3	0.0	13.3	15	30		399 Btuh		
16	2 NFRC	0.30, 0.35	No	No	SW		1.5ft	3.0ft	15.0	0.0	15.0	15	30		448 Btuh		
	Excursion														666 Btuh		
	Window Total								277 (sqft)						7252 Btuh		
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load		
									Cav/Sheath								
	1	Frame - Wood - Ext						0.09		13.0/0.0		81.0		2.7		219 Btuh	
	2	Frame - Wood - Ext						0.09		13.0/0.0		49.0		2.7		133 Btuh	
	3	Frame - Wood - Ext						0.09		13.0/0.0		237.1		2.7		642 Btuh	
	4	Frame - Wood - Ext						0.09		13.0/0.0		94.7		2.7		256 Btuh	
	5	Frame - Wood - Ext						0.09		13.0/0.0		218.0		2.7		590 Btuh	
	6	Frame - Wood - Ext						0.09		13.0/0.0		302.0		2.7		818 Btuh	
	7	Frame - Wood - Ext						0.09		13.0/0.0		71.7		2.7		194 Btuh	
	8	Frame - Wood - Ext						0.09		13.0/0.0		78.3		2.7		212 Btuh	
9	Frame - Wood - Ext						0.09		13.0/0.0		197.0		2.7		533 Btuh		
	Wall Total								1329 (sqft)						3597 Btuh		
Doors	Type								Area (sqft)			HTM		Load			
	1	Insulated - Exterior								6.7			14.0		93 Btuh		
	2	Insulated - Exterior								13.3			14.0		187 Btuh		
	3	Insulated - Exterior								6.7			14.0		93 Btuh		
	4	Insulated - Exterior								6.7			14.0		93 Btuh		
	5	Insulated - Exterior								6.7			14.0		93 Btuh		
	Door Total								40 (sqft)						560 Btuh		
Ceilings	Type/Color/Surface						U-Value		R-Value		Area(sqft)		HTM		Load		
	1	Unvented Attic/DarkShingle						0.044		0.0/22.0		2137.0		1.53		3266 Btuh	
		Ceiling Total								2137 (sqft)						3266 Btuh	
Floors	Type								R-Value		Size		HTM		Load		
	1	Slab On Grade								0.0		1969 (ft-perimeter)		0.0		0 Btuh	
		Floor Total								1969.0 (sqft)						0 Btuh	
	Envelope Subtotal:														14676 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Siters Res
Wester Road
Lake City, FL

Project Title:
201311 Siters Res

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-01

Infiltration	Type Natural	Average ACH 0.18	Volume(cuft) 17327	Wall Ratio 1	CFM= 53.0	Load 1393 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
					Sensible Envelope Load:	19849 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.107)	2115 Btuh
					Sensible Load All Zones	21964 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Siters Res
Wester Road
Lake City, FL

Project Title:
201311 Siters Res

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-01

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	19849 Btuh
	Sensible Duct Load	2115 Btuh
	Total Sensible Zone Loads	21964 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	21964 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	1937 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1200 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4338 Btuh
	TOTAL GAIN	26302 Btuh

EQUIPMENT

1. Central Unit	#	30000 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