

Residential System Sizing Calculation

Summary

Project Title:
Liberty

, FL

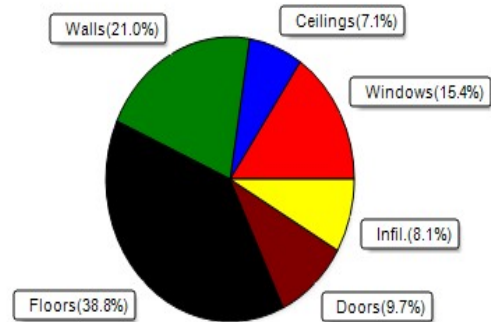
8/20/2021

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	35149	Btuh	Total cooling load calculation	22911	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	136.6	48000	Sensible (SHR = 0.85)	203.7	40800
Heat Pump + Auxiliary(0.0kW)	136.6	48000	Latent	249.8	7200
			Total (Electric Heat Pump)	209.5	48000

WINTER CALCULATIONS

Winter Heating Load (for 2679 sqft)

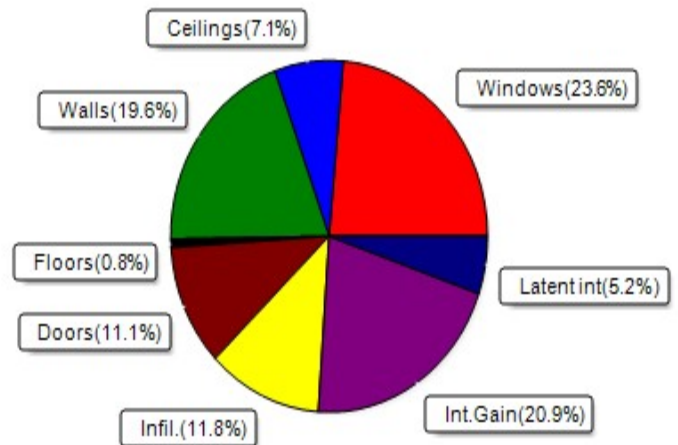
Load component	Load	
Window total	226 sqft	5412 Btuh
Wall total	2136 sqft	7365 Btuh
Door total	212 sqft	3392 Btuh
Ceiling total	2679 sqft	2498 Btuh
Floor total	See detail report	13637 Btuh
Infiltration	65 cfm	2845 Btuh
Duct loss		0 Btuh
Subtotal		35149 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		35149 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2679 sqft)

Load component	Load	
Window total	226 sqft	5398 Btuh
Wall total	2136 sqft	4489 Btuh
Door total	212 sqft	2544 Btuh
Ceiling total	2679 sqft	1624 Btuh
Floor total		181 Btuh
Infiltration	49 cfm	1014 Btuh
Internal gain		4780 Btuh
Duct gain		0 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		20029 Btuh
Latent gain(ducts)		0 Btuh
Latent gain(infiltration)		1682 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1200 Btuh
Total latent gain		2882 Btuh
TOTAL HEAT GAIN		22911 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

8-20-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Liberty

, FL

8/20/2021

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	0.27, 0.60	No	No	N	1.5ft.	2.3ft.	30.0	0.0	30.0	17	17	512	Btuh	
2	2 NFRC	0.27, 0.60	No	No	N	8.5ft.	2.3ft.	16.0	0.0	16.0	17	17	273	Btuh	
3	2 NFRC	0.27, 0.60	No	No	W	1.5ft.	2.3ft.	30.0	0.0	30.0	17	37	1123	Btuh	
4	2 NFRC	0.27, 0.60	No	No	N	1.5ft.	2.3ft.	30.0	0.0	30.0	17	17	512	Btuh	
5	2 NFRC	0.27, 0.60	No	No	E	1.5ft.	2.3ft.	24.0	0.0	24.0	17	37	898	Btuh	
6	2 NFRC	0.27, 0.60	No	No	E	1.5ft.	2.3ft.	12.0	0.0	12.0	17	37	449	Btuh	
7	2 NFRC	0.27, 0.60	No	No	S	1.5ft.	2.3ft.	7.5	7.5	0.0	17	19	128	Btuh	
8	2 NFRC	0.27, 0.60	No	No	S	7.8ft.	2.3ft.	36.0	36.0	0.0	17	19	615	Btuh	
9	2 NFRC	0.27, 0.60	No	No	S	1.5ft.	2.3ft.	30.0	30.0	0.0	17	19	512	Btuh	
10	2 NFRC	0.27, 0.60	No	No	W	1.5ft.	2.3ft.	10.0	0.0	10.0	17	37	374	Btuh	
Window Total									226 (sqft)					5398 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext	0.09	13.0/0.6	97.5	2.2	214	Btuh								
2	Frame - Wood - Ext	0.09	13.0/0.6	63.0	2.2	138	Btuh								
3	Frame - Wood - Ext	0.09	13.0/0.6	202.3	2.2	445	Btuh								
4	Frame - Wood - Ext	0.09	13.0/0.6	154.5	2.2	340	Btuh								
5	Frame - Wood - Ext	0.09	13.0/0.6	195.0	2.2	429	Btuh								
6	Frame - Wood - Ext	0.09	13.0/0.6	252.0	2.2	554	Btuh								
7	Frame - Wood - Adj	0.09	13.0/0.6	367.0	1.6	601	Btuh								
8	Frame - Wood - Ext	0.09	13.0/0.6	73.5	2.2	162	Btuh								
9	Frame - Wood - Ext	0.09	13.0/0.6	63.3	2.2	139	Btuh								
10	Frame - Wood - Ext	0.09	13.0/0.6	110.7	2.2	243	Btuh								
11	Frame - Wood - Ext	0.09	13.0/0.6	33.3	2.2	73	Btuh								
12	Frame - Wood - Ext	0.09	13.0/0.6	67.0	2.2	147	Btuh								
13	Frame - Wood - Ext	0.09	13.0/0.6	30.0	2.2	66	Btuh								
14	Frame - Wood - Ext	0.09	13.0/0.6	85.5	2.2	188	Btuh								
15	Frame - Wood - Ext	0.09	13.0/0.6	48.0	2.2	106	Btuh								
16	Frame - Wood - Ext	0.09	13.0/0.6	21.0	2.2	46	Btuh								
17	Frame - Wood - Ext	0.09	13.0/0.6	218.0	2.2	479	Btuh								
18	Frame - Wood - Ext	0.09	13.0/0.6	21.0	2.2	46	Btuh								
19	Frame - Wood - Ext	0.09	13.0/0.6	33.0	2.2	73	Btuh								
Wall Total									2136 (sqft)			4489 Btuh			
Doors	Type	U-Value		R-Value		Area (sqft)		HTM		Load					
1	Insulated - Exterior			40.0	12.0	480	Btuh								
2	Insulated - Exterior			40.0	12.0	480	Btuh								
3	Insulated - Exterior			40.0	12.0	480	Btuh								
4	Insulated - Exterior			24.0	12.0	288	Btuh								
5	Insulated - Exterior			48.0	12.0	576	Btuh								
6	Insulated - Garage			20.0	12.0	240	Btuh								
Door Total									212 (sqft)			2544 Btuh			
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Cath/Sngl Assem/DarkShingle	0.023	21.0/21.0	2402.0	0.61	1456	Btuh								
2	Cath/Sngl Assem/DarkShingle	0.023	21.0/21.0	277.0	0.61	168	Btuh								
Ceiling Total									2679 (sqft)			1624 Btuh			
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade	0.0	2402 (ft-perimeter)	0.0	0	Btuh									
2	Raised Wood - Adj	21.0	277 (sqft)	0.7	181	Btuh									
Floor Total									2679.0 (sqft)			181 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate: FL_GAINESVILLE_REGIONAL_A
Liberty

, FL

8/20/2021

	Envelope Subtotal:	14236 Btuh				
Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 23834	Wall Ratio 1	CFM= 48.7	Load 1014 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
		Sensible Envelope Load:				20029 Btuh
Duct load	Extremelysealed, Supply(R6.0-Cond), Return(R6.0-Condi)				(DGM of 0.000)	0 Btuh
		Sensible Load All Zones				20029 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Liberty

, FL

8/20/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	20029 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	20029 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	20029 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1682 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	2882 Btuh
	TOTAL GAIN	22911 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:
Liberty
Building Type: User

, FL

8/20/2021

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 0.27	Vinyl	0.60	N	30.0		24.0	720 Btuh
2	2, NFRC 0.27	Vinyl	0.60	N	16.0		24.0	384 Btuh
3	2, NFRC 0.27	Vinyl	0.60	W	30.0		24.0	720 Btuh
4	2, NFRC 0.27	Vinyl	0.60	N	30.0		24.0	720 Btuh
5	2, NFRC 0.27	Vinyl	0.60	E	24.0		24.0	576 Btuh
6	2, NFRC 0.27	Vinyl	0.60	E	12.0		24.0	288 Btuh
7	2, NFRC 0.27	Vinyl	0.60	S	7.5		24.0	180 Btuh
8	2, NFRC 0.27	Vinyl	0.60	S	36.0		24.0	864 Btuh
9	2, NFRC 0.27	Vinyl	0.60	S	30.0		24.0	720 Btuh
10	2, NFRC 0.27	Vinyl	0.60	W	10.0		24.0	240 Btuh
Window Total					225.5(sqft)			5412 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	98		3.45	336 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	63		3.45	217 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	202		3.45	698 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	155		3.45	533 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	195		3.45	672 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	252		3.45	869 Btuh
7	Frame - Wood	- Adj	(0.086)	13.0/0.6	367		3.45	1266 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	74		3.45	253 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	63		3.45	218 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	111		3.45	382 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	33		3.45	115 Btuh
12	Frame - Wood	- Ext	(0.086)	13.0/0.6	67		3.45	231 Btuh
13	Frame - Wood	- Ext	(0.086)	13.0/0.6	30		3.45	103 Btuh
14	Frame - Wood	- Ext	(0.086)	13.0/0.6	86		3.45	295 Btuh
15	Frame - Wood	- Ext	(0.086)	13.0/0.6	48		3.45	166 Btuh
16	Frame - Wood	- Ext	(0.086)	13.0/0.6	21		3.45	72 Btuh
17	Frame - Wood	- Ext	(0.086)	13.0/0.6	218		3.45	752 Btuh
18	Frame - Wood	- Ext	(0.086)	13.0/0.6	21		3.45	72 Btuh
19	Frame - Wood	- Ext	(0.086)	13.0/0.6	33		3.45	114 Btuh
Wall Total					2136(sqft)			7365 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
2	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
3	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
4	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
5	Insulated - Exterior, n		(0.400)		48		16.0	768 Btuh
6	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
Door Total					212(sqft)			3392Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Liberty
Building Type: User

, FL

8/20/2021

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Cathedral/D/Shing	(0.023)	21.0/21.0	2402	0.9	2240 Btuh
2	Cathedral/D/Shing	(0.023)	21.0/21.0	277	0.9	258 Btuh
	Ceiling Total			2679(sqft)		2498Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	278.0 ft(perim.)	47.2	13122 Btuh
2	Raised Wood - Adj	(0.047)	21.0	277.0 sqft	1.9	516 Btuh
	Floor Total			2679 sqft		13637 Btuh
Envelope Subtotal:						32304 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.16	23834	1.00	65.0	2845 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					35149 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	35149 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	35149 Btuh

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