

Residential System Sizing Calculation

Summary

Philip & Katie Glover

Project Title:
221306 Glover Res

Lake City, FL

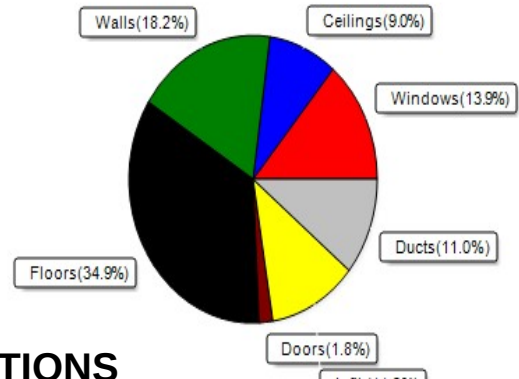
2022-11-09

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	35720 Btuh	Total cooling load calculation	27686 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.2 39000	Sensible (SHR = 0.75)	128.3 29250
Heat Pump + Auxiliary(0.0kW)	109.2 39000	Latent	199.2 9750
		Total (Electric Heat Pump)	140.9 39000

WINTER CALCULATIONS

Winter Heating Load (for 2548 sqft)

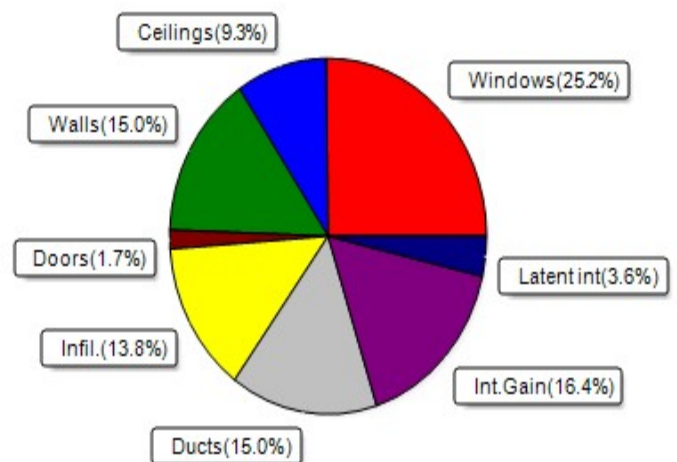
Load component		Load	
Window total	414 sqft	4968 Btuh	
Wall total	1830 sqft	6499 Btuh	
Door total	40 sqft	640 Btuh	
Ceiling total	2662 sqft	3208 Btuh	
Floor total	2548 sqft	12461 Btuh	
Infiltration	92 cfm	4031 Btuh	
Duct loss		3913 Btuh	
Subtotal		35720 Btuh	
Ventilation	0 cfm	0 Btuh	
TOTAL HEAT LOSS		35720 Btuh	



SUMMER CALCULATIONS

Summer Cooling Load (for 2548 sqft)

Load component		Load	
Window total	414 sqft	6975 Btuh	
Wall total	1830 sqft	4143 Btuh	
Door total	40 sqft	480 Btuh	
Ceiling total	2662 sqft	2566 Btuh	
Floor total		0 Btuh	
Infiltration	69 cfm	1436 Btuh	
Internal gain		4550 Btuh	
Duct gain		2641 Btuh	
Sens. Ventilation	0 cfm	0 Btuh	
Blower Load		0 Btuh	
Total sensible gain		22791 Btuh	
Latent gain(ducts)		1512 Btuh	
Latent gain(infiltration)		2383 Btuh	
Latent gain(ventilation)		0 Btuh	
Latent gain(internal/occupants/other)		1000 Btuh	
Total latent gain		4895 Btuh	
TOTAL HEAT GAIN		27686 Btuh	



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2022-11-09

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Philip & Katie Glover

Project Title:
221306 Glover Res
Building Type: User

Lake City, FL

2022-11-09

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 0.20	Metal	0.30	N	13.3		12.0	160 Btuh
2	2, NFRC 0.20	Metal	0.30	N	22.5		12.0	270 Btuh
3	2, NFRC 0.20	Metal	0.30	N	72.0		12.0	864 Btuh
4	2, NFRC 0.20	Metal	0.30	N	27.0		12.0	324 Btuh
5	2, NFRC 0.20	Metal	0.30	E	30.0		12.0	360 Btuh
6	2, NFRC 0.20	Metal	0.30	S	30.0		12.0	360 Btuh
7	2, NFRC 0.20	Metal	0.30	S	8.0		12.0	96 Btuh
8	2, NFRC 0.20	Metal	0.30	S	108.0		12.0	1296 Btuh
9	2, NFRC 0.20	Metal	0.30	S	26.7		12.0	320 Btuh
10	2, NFRC 0.20	Metal	0.30	S	9.0		12.0	108 Btuh
11	2, NFRC 0.20	Metal	0.30	S	30.0		12.0	360 Btuh
12	2, NFRC 0.20	Metal	0.30	W	30.0		12.0	360 Btuh
13	2, NFRC 0.20	Metal	0.30	W	7.5		12.0	90 Btuh
Window Total					414.0(sqft)			4968 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	202		3.55	717 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	23		3.55	80 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	187		3.55	664 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	95		3.55	336 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	123		3.55	437 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	291		3.55	1033 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	75		3.55	266 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	75		3.55	264 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	54		3.55	192 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	122		3.55	433 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	54		3.55	192 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	74		3.55	261 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	27		3.55	96 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.55	362 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	257		3.55	911 Btuh
Wall Total					1831(sqft)			6499 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior, n		(0.400)		13		16.0	213 Btuh
Door Total					40(sqft)			640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Unvent Attic/D/Shing		(0.241)	0.0/22.0	2662		1.2	3208 Btuh
Ceiling Total					2662(sqft)			3208Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Philip & Katie Glover

Project Title:
221306 Glover Res
Building Type: User

Lake City, FL

2022-11-09

Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 264.0 ft(perim.) 2548 sqft	HTM= 47.2	Load 12461 Btuh 12461 Btuh
	Envelope Subtotal:					27775 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.23	Volume(cuft) 23696	Wall Ratio 1.00	CFM= 92.1	4031 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.123)					3913 Btuh
All Zones	Sensible Subtotal All Zones					35720 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	35720 Btuh 0 Btuh 35720 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	39000 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

Philip & Katie Glover

Project Title:
221306 Glover Res

Lake City, FL

2022-11-09

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	0.20, 0.30	No	No	N		22.0ft	1.0ft	13.3	0.0	13.3	10	19	255	Btuh
2	2 NFRC	0.20, 0.30	No	No	N		9.7ft	1.0ft	22.5	0.0	22.5	10	19	431	Btuh
3	2 NFRC	0.20, 0.30	No	No	N		9.7ft	1.0ft	72.0	0.0	72.0	10	19	1378	Btuh
4	2 NFRC	0.20, 0.30	No	No	N		9.8ft	1.0ft	27.0	0.0	27.0	10	19	517	Btuh
5	2 NFRC	0.20, 0.30	No	No	E		1.5ft	1.5ft	30.0	0.0	30.0	10	19	574	Btuh
6	2 NFRC	0.20, 0.30	No	No	S		1.5ft	4.0ft	30.0	0.0	30.0	10	20	601	Btuh
7	2 NFRC	0.20, 0.30	No	No	S		1.5ft	1.5ft	8.0	1.9	6.1	10	20	141	Btuh
8	2 NFRC	0.20, 0.30	No	No	S		7.5ft	1.0ft	108.0	108.0	0.0	10	20	1070	Btuh
9	2 NFRC	0.20, 0.30	No	No	S		7.5ft	1.0ft	26.7	26.7	0.0	10	20	264	Btuh
10	2 NFRC	0.20, 0.30	No	No	S		1.5ft	1.5ft	9.0	1.9	7.1	10	20	161	Btuh
11	2 NFRC	0.20, 0.30	No	No	S		1.5ft	4.5ft	30.0	0.0	30.0	10	20	601	Btuh
12	2 NFRC	0.20, 0.30	No	No	W		1.5ft	1.5ft	30.0	5.8	24.2	10	20	542	Btuh
13	2 NFRC	0.20, 0.30	No	No	W		1.5ft	1.5ft	7.5	4.8	2.7	10	20	101	Btuh
	Excursion													340	Btuh
	Window Total								414 (sqft)					6975 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext		0.09		13.0/0.0		202.0		2.3		457	Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		22.5		2.3		51	Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.0		187.0		2.3		423	Btuh			
4	Frame - Wood - Ext		0.09		13.0/0.0		94.5		2.3		214	Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.0		123.0		2.3		278	Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.0		291.0		2.3		659	Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		75.0		2.3		170	Btuh			
8	Frame - Wood - Ext		0.09		13.0/0.0		72.0		2.3		163	Btuh			
9	Frame - Wood - Ext		0.09		13.0/0.0		74.5		2.3		169	Btuh			
10	Frame - Wood - Ext		0.09		13.0/0.0		54.0		2.3		122	Btuh			
11	Frame - Wood - Ext		0.09		13.0/0.0		122.0		2.3		276	Btuh			
12	Frame - Wood - Ext		0.09		13.0/0.0		54.0		2.3		122	Btuh			
13	Frame - Wood - Ext		0.09		13.0/0.0		73.5		2.3		166	Btuh			
14	Frame - Wood - Ext		0.09		13.0/0.0		27.0		2.3		61	Btuh			
15	Frame - Wood - Ext		0.09		13.0/0.0		102.0		2.3		231	Btuh			
16	Frame - Wood - Ext		0.09		13.0/0.0		256.5		2.3		581	Btuh			
	Wall Total								1830 (sqft)					4143 Btuh	
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior		6.7		12.0		80	Btuh							
2	Insulated - Exterior		20.0		12.0		240	Btuh							
3	Insulated - Exterior		13.3		12.0		160	Btuh							
	Door Total								40 (sqft)					480 Btuh	
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Unvented Attic/DarkShingle		0.241		0.0/22.0		2662.0		0.96		2566	Btuh			
	Ceiling Total								2662 (sqft)					2566 Btuh	
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade		0.0		2548 (ft-perimeter)		0.0		0		Btuh				
	Floor Total								2548.0 (sqft)					0 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Philip & Katie Glover

Project Title:
221306 Glover Res

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-11-09

	Envelope Subtotal:					14164 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	23696	1	69.0	1436 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		5	X 230	+	3400	4550 Btuh
	Sensible Envelope Load:					20150 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.131)					2641 Btuh
	Sensible Load All Zones					22791 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Philip & Katie Glover

Project Title: 221306 Glover Res

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-11-09

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	20150 Btuh
	Sensible Duct Load	2641 Btuh
	Total Sensible Zone Loads	22791 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	22791 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2383 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1512 Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4895 Btuh
	TOTAL GAIN	27686 Btuh

EQUIPMENT

1. Central Unit	#	39000 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