

Residential System Sizing Calculation

Summary

Samantha Freeman

Project Title:
220790 Freeman Res

Lake City, FL

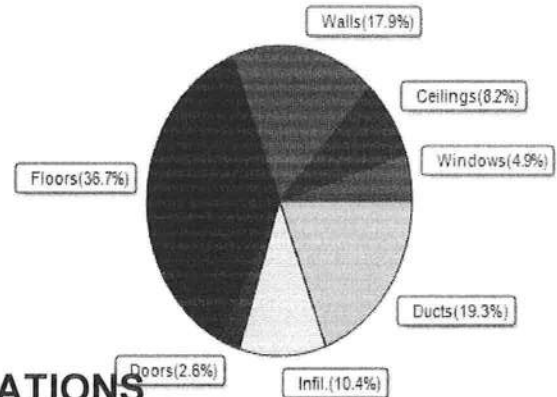


Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)			
Winter design temperature(TMY3 99%)	30 F	Summer design temperature(TMY3 99%)	94 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	40 F	Summer temperature difference	19 F
Total heating load calculation	28302 Btuh	Total cooling load calculation	23063 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.5 31000	Sensible (SHR = 0.75)	124.2 23250
Heat Pump + Auxiliary(0.0kW)	109.5 31000	Latent	178.7 7750
		Total (Electric Heat Pump)	134.4 31000

WINTER CALCULATIONS

Winter Heating Load (for 2288 sqft)

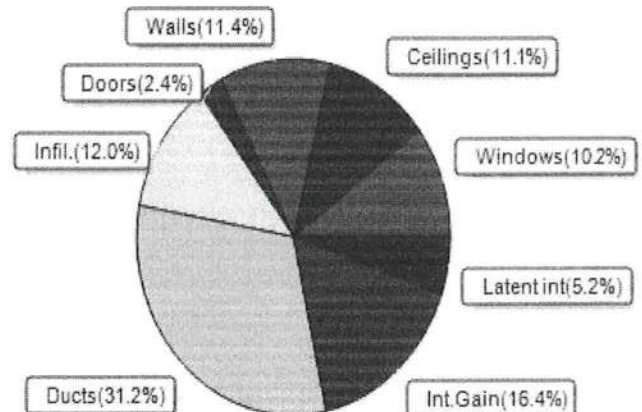
Load component		Load	
Window total	109 sqft	1399	Btuh
Wall total	1604 sqft	5056	Btuh
Door total	47 sqft	747	Btuh
Ceiling total	2288 sqft	2323	Btuh
Floor total	2288 sqft	10384	Btuh
Infiltration	67 cfm	2932	Btuh
Duct loss		5462	Btuh
Subtotal		28302	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		28302	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2288 sqft)

Load component		Load	
Window total	109 sqft	2358	Btuh
Wall total	1604 sqft	2628	Btuh
Door total	47 sqft	560	Btuh
Ceiling total	2288 sqft	2555	Btuh
Floor total		0	Btuh
Infiltration	50 cfm	1044	Btuh
Internal gain		3780	Btuh
Duct gain		5800	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		18727	Btuh
Latent gain(ducts)		1403	Btuh
Latent gain(infiltration)		1733	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		4336	Btuh
TOTAL HEAT GAIN		23063	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2022-10-26

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Samantha Freeman

Project Title:
220790 Freeman Res
Building Type: User

Lake City, FL

2022-10-26

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 0.22	Metal	0.32	N	45.0		12.8	576 Btuh
2	2, NFRC 0.22	Metal	0.32	N	13.3		12.8	171 Btuh
3	2, NFRC 0.22	Metal	0.32	S	36.0		12.8	461 Btuh
4	2, NFRC 0.22	Metal	0.32	S	15.0		12.8	192 Btuh
	Window Total				109.3(sqft)			1399 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	463		3.09	1431 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	184		3.09	569 Btuh
3	Frame - Wood	- Adj	(0.089)	13.0/0.0	213		3.55	757 Btuh
4	Frame - Wood	- Adj	(0.077)	19.0/0.0	168		3.09	519 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	112		3.09	346 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	112		3.09	345 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	352		3.09	1088 Btuh
	Wall Total				1604(sqft)			5056 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
2	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
	Door Total				47(sqft)			747Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Metal		(0.025)	38.0/0.0	2288		1.0	2323 Btuh
	Ceiling Total				2288(sqft)			2323Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	220.0 ft(perim.)		47.2	10384 Btuh
	Floor Total				2288 sqft			10384 Btuh
	Envelope Subtotal:							19909 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.22	18304	1.00	66.9		2932 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.239)							5462 Btuh
All Zones	Sensible Subtotal All Zones							28302 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Samantha Freeman

Project Title:

220790 Freeman Res

Lake City, FL

Building Type: User

2022-10-26

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	28302 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	28302 Btuh

EQUIPMENT

1. Electric Heat Pump	#	31000 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

Samantha Freeman

Project Title:
220790 Freeman Res

Lake City, FL

2022-10-26

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	0.22, 0.32	No	No	N		2.0ft	0.5ft	45.0	10.4	34.6	11	27	1055	Btuh	
2	2 NFRC	0.22, 0.32	No	No	N		2.0ft	0.5ft	13.3	2.3	11.0	11	27	325	Btuh	
3	2 NFRC	0.22, 0.32	No	No	S		8.0ft	0.5ft	36.0	36.0	0.0	11	27	385	Btuh	
4	2 NFRC	0.22, 0.32	No	No	S		2.0ft	0.5ft	15.0	3.5	11.5	11	27	352	Btuh	
	Excursion													241	Btuh	
	Window Total								109 (sqft)					2358 Btuh		
Walls	Type						U-Value	R-Value	Area(sqft)			HTM		Load		
								Cav/Sheath								
1	Frame - Wood - Ext						0.08	19.0/0.0	463.0			1.7		766	Btuh	
2	Frame - Wood - Ext						0.08	19.0/0.0	184.0			1.7		304	Btuh	
3	Frame - Wood - Adj						0.09	13.0/0.0	213.3			1.7		360	Btuh	
4	Frame - Wood - Adj						0.08	19.0/0.0	168.0			1.5		247	Btuh	
5	Frame - Wood - Ext						0.08	19.0/0.0	112.0			1.7		185	Btuh	
6	Frame - Wood - Ext						0.08	19.0/0.0	111.7			1.7		185	Btuh	
7	Frame - Wood - Ext						0.08	19.0/0.0	352.0			1.7		582	Btuh	
	Wall Total								1604 (sqft)					2628 Btuh		
Doors	Type						Area (sqft)			HTM		Load				
1	Insulated - Exterior						6.7			12.0		80	Btuh			
2	Insulated - Garage						20.0			12.0		240	Btuh			
3	Insulated - Exterior						20.0			12.0		240	Btuh			
	Door Total						47 (sqft)					560 Btuh				
Ceilings	Type/Color/Surface						U-Value	R-Value	Area(sqft)			HTM		Load		
1	Vented Attic/Light/Metal						0.025	38.0/0.0	2288.0			1.12		2555	Btuh	
	Ceiling Total								2288 (sqft)					2555 Btuh		
Floors	Type						R-Value			Size			HTM		Load	
1	Slab On Grade						0.0			2288 (ft-perimeter)			0.0		0	Btuh
	Floor Total									2288.0 (sqft)					0 Btuh	
	Envelope Subtotal:													8102 Btuh		
Infiltration	Type						Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural						0.16		18304		1		50.2		1044 Btuh	
Internal gain							Occupants		Btuh/occupant		Appliance		Load			
							6		X 230		+		2400		3780 Btuh	
	Sensible Envelope Load:													12926 Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)										(DGM of 0.449)			5800 Btuh		
	Sensible Load All Zones													18727 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Samantha Freeman

Project Title:
220790 Freeman Res

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-10-26

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	12926 Btuh
	Sensible Duct Load	5800 Btuh
	Total Sensible Zone Loads	18727 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18727 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1733 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1403 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4336 Btuh
	TOTAL GAIN	23063 Btuh

EQUIPMENT

1. Central Unit	#	31000 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