

Residential System Sizing Calculation

Summary

Fred Elfers
381 SW Brothers Lane
Lake City, FL

Project Title:
231141 Elfers Res

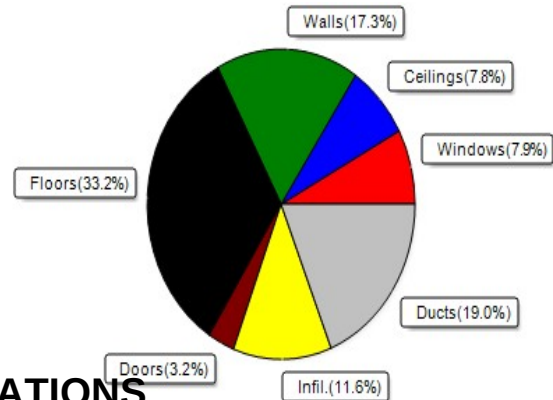
2023-09-15

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	35525 Btuh	Total cooling load calculation	28764 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.8 39000	Sensible (SHR = 0.75)	121.6 29250
Heat Pump + Auxiliary(0.0kW)	109.8 39000	Latent	207.4 9750
		Total (Electric Heat Pump)	135.6 39000

WINTER CALCULATIONS

Winter Heating Load (for 2732 sqft)

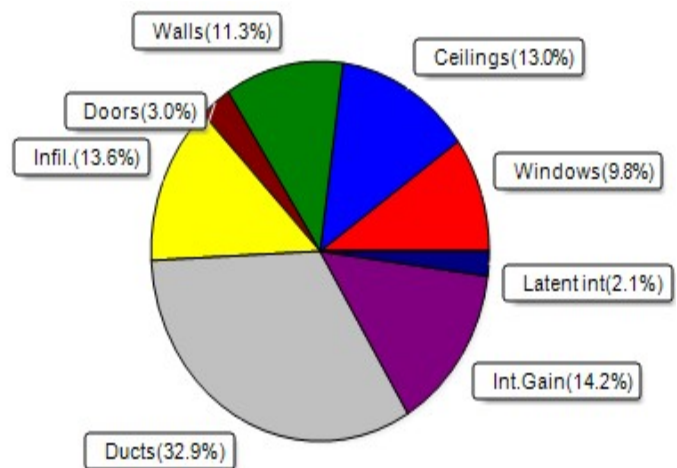
Load component	Load
Window total 233 sqft	2792 Btuh
Wall total 1948 sqft	6136 Btuh
Door total 72 sqft	1152 Btuh
Ceiling total 2732 sqft	2774 Btuh
Floor total 2732 sqft	11800 Btuh
Infiltration 94 cfm	4135 Btuh
Duct loss	6736 Btuh
Subtotal	35525 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	35525 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2732 sqft)

Load component	Load
Window total 233 sqft	2825 Btuh
Wall total 1948 sqft	3256 Btuh
Door total 72 sqft	864 Btuh
Ceiling total 2732 sqft	3744 Btuh
Floor total	0 Btuh
Infiltration 71 cfm	1473 Btuh
Internal gain	4090 Btuh
Duct gain	7810 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	24062 Btuh
Latent gain(ducts)	1657 Btuh
Latent gain(infiltration)	2444 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	600 Btuh
Total latent gain	4702 Btuh
TOTAL HEAT GAIN	28764 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-09-15

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Fred Elfers
381 SW Brothers Lane
Lake City, FL

Project Title:
231141 Elfers Res
Building Type: User

2023-09-15

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	HTM=	Load
1	2, NFRC 0.20	Metal	0.30	N	78.1		12.0	937 Btuh
2	2, NFRC 0.20	Metal	0.30	S	19.5		12.0	234 Btuh
3	2, NFRC 0.20	Metal	0.30	S	64.0		12.0	768 Btuh
4	2, NFRC 0.20	Metal	0.30	E	32.0		12.0	384 Btuh
5	2, NFRC 0.20	Metal	0.30	W	39.1		12.0	469 Btuh
	Window Total				232.7(sqft)			2792 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	480		3.09	1483 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	81		3.09	250 Btuh
3	Frame - Wood	- Adj	(0.089)	13.0/0.0	60		3.55	213 Btuh
4	Frame - Wood	- Adj	(0.089)	13.0/0.0	9		3.55	32 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	160 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	21		3.55	75 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	114		3.55	405 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	298		3.09	923 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	168		3.09	519 Btuh
10	Frame - Wood	- Ext	(0.077)	19.0/0.0	171		3.09	529 Btuh
11	Frame - Wood	- Ext	(0.077)	19.0/0.0	501		3.09	1548 Btuh
	Wall Total				1948(sqft)			6136 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
2	Insulated - Exterior, n		(0.400)		32		16.0	512 Btuh
3	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
	Door Total				72(sqft)			1152Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Shing		(0.025)	38.0/0.0	2732		1.0	2774 Btuh
	Ceiling Total				2732(sqft)			2774Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	250.0 ft(perim.)		47.2	11800 Btuh
	Floor Total				2732 sqft			11800 Btuh
	Envelope Subtotal:							24654 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.23	24588	1.00	94.3		4135 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)						(DLM of 0.234)	6736 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Fred Elfers
381 SW Brothers Lane
Lake City, FL

Project Title:
231141 Elfers Res
Building Type: User

2023-09-15

All Zones	Sensible Subtotal All Zones	35525 Btuh
-----------	-----------------------------	------------

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) Total Heat Loss	35525 Btuh 0 Btuh 35525 Btuh
--------------------	---	------------------------------------

EQUIPMENT

1. Electric Heat Pump	#	39000 Btuh
-----------------------	---	------------

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

Fred Elfers
381 SW Brothers Lane
Lake City, FL

Project Title:
231141 Elfers Res

2023-09-15

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	0.20, 0.30	No	No	N		1.5ft	0.5ft	78.1	0.0	78.1	10	10	774 Btuh
2	2 NFRC	0.20, 0.30	No	No	S		13.5f	0.0ft	19.5	19.5	0.0	10	11	193 Btuh
3	2 NFRC	0.20, 0.30	No	No	S		13.5f	0.0ft	64.0	64.0	0.0	10	11	634 Btuh
4	2 NFRC	0.20, 0.30	No	No	E		11.5f	0.0ft	32.0	32.0	0.0	10	25	317 Btuh
5	2 NFRC	0.20, 0.30	No	No	W		1.5ft	0.5ft	39.1	4.6	34.5	10	25	906 Btuh
	Window Total								233 (sqft)					2825 Btuh
Walls	Type					U-Value	R-Value		Area(sqft)		HTM		Load	
									Cav/Sheath					
1	Frame - Wood - Ext						0.08	19.0/0.0		479.9		1.7	794 Btuh	
2	Frame - Wood - Ext						0.08	19.0/0.0		81.0		1.7	134 Btuh	
3	Frame - Wood - Adj						0.09	13.0/0.0		60.0		1.7	101 Btuh	
4	Frame - Wood - Adj						0.09	13.0/0.0		9.0		1.7	15 Btuh	
5	Frame - Wood - Ext						0.09	13.0/0.0		45.0		2.3	102 Btuh	
6	Frame - Wood - Adj						0.09	13.0/0.0		21.0		1.7	35 Btuh	
7	Frame - Wood - Adj						0.09	13.0/0.0		114.0		1.7	192 Btuh	
8	Frame - Wood - Ext						0.08	19.0/0.0		298.5		1.7	494 Btuh	
9	Frame - Wood - Ext						0.08	19.0/0.0		168.0		1.7	278 Btuh	
10	Frame - Wood - Ext						0.08	19.0/0.0		171.0		1.7	283 Btuh	
11	Frame - Wood - Ext						0.08	19.0/0.0		500.9		1.7	828 Btuh	
	Wall Total								1948 (sqft)					3256 Btuh
Doors	Type								Area (sqft)		HTM		Load	
1	Insulated - Exterior								24.0		12.0		288 Btuh	
2	Insulated - Exterior								32.0		12.0		384 Btuh	
3	Insulated - Exterior								16.0		12.0		192 Btuh	
	Door Total								72 (sqft)					864 Btuh
Ceilings	Type/Color/Surface					U-Value	R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/DarkShingle						0.025	38.0/0.0		2732.0		1.37	3744 Btuh	
	Ceiling Total								2732 (sqft)					3744 Btuh
Floors	Type						R-Value		Size		HTM		Load	
1	Slab On Grade						0.0		2732 (ft-perimeter)		0.0		0 Btuh	
	Floor Total								2732.0 (sqft)					0 Btuh
	Envelope Subtotal:													10689 Btuh
Infiltration	Type					Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load
Natural							0.17		24588		1		70.7	1473 Btuh
Internal gain					Occupants		Btuh/occupant				Appliance		Load	
									3		X 230 + <td>3400</td> <td>4090 Btuh</td>		3400	4090 Btuh
	Sensible Envelope Load:													16252 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.481)													7810 Btuh
	Sensible Load All Zones													24062 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Fred Elfers
381 SW Brothers Lane
Lake City, FL

Project Title:
231141 Elfers Res

Climate:FL_GAINESVILLE_REGIONAL_A

2023-09-15

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16252 Btuh
	Sensible Duct Load	7810 Btuh
	Total Sensible Zone Loads	24062 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	24062 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2444 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1657 Btuh
	Latent occupant gain (3.0 people @ 200 Btuh per person)	600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4702 Btuh
	TOTAL GAIN	28764 Btuh

EQUIPMENT

1. Central Unit	#	39000 Btuh
-----------------	---	------------

*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