

Residential System Sizing Calculation

Summary

Project Title:
McKenzie Residence

Lake City, FL

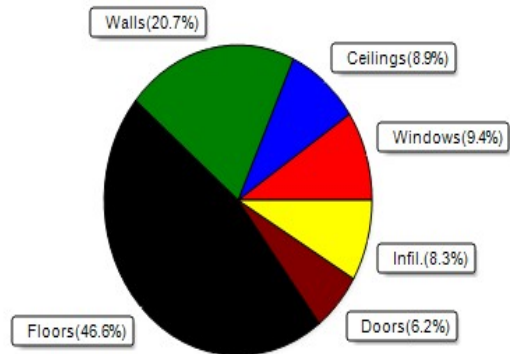
9/23/2020

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	28988 Btuh	Total cooling load calculation	18946 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	124.2 36000	Sensible (SHR = 0.85)	187.4 30600
Heat Pump + Auxiliary(0.0kW)	124.2 36000	Latent	206.2 5400
		Total (Electric Heat Pump)	190.0 36000

WINTER CALCULATIONS

Winter Heating Load (for 2025 sqft)

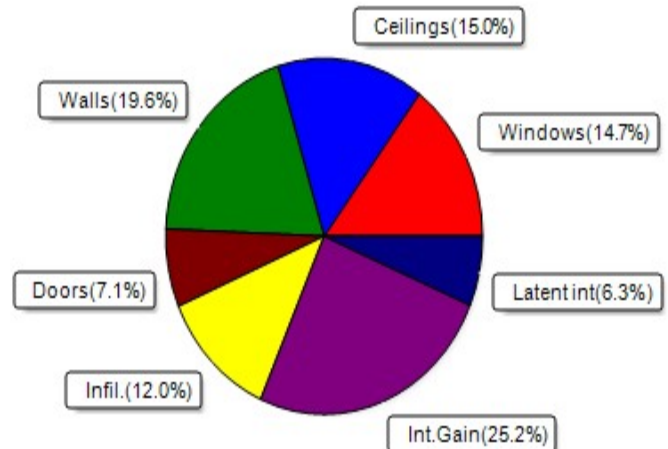
Load component	Load
Window total 206 sqft	2719 Btuh
Wall total 1690 sqft	5998 Btuh
Door total 112 sqft	1792 Btuh
Ceiling total 2025 sqft	2580 Btuh
Floor total 2025 sqft	13499 Btuh
Infiltration 55 cfm	2400 Btuh
Duct loss	0 Btuh
Subtotal	28988 Btuh
Ventilation 0 cfm	0 Btuh
TOTAL HEAT LOSS	28988 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2025 sqft)

Load component	Load
Window total 206 sqft	2792 Btuh
Wall total 1690 sqft	3718 Btuh
Door total 112 sqft	1344 Btuh
Ceiling total 2025 sqft	2838 Btuh
Floor total	0 Btuh
Infiltration 41 cfm	855 Btuh
Internal gain	4780 Btuh
Duct gain	0 Btuh
Sens. Ventilation 0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	16327 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	1419 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	2619 Btuh
TOTAL HEAT GAIN	18946 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

9-21-20

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
McKenzie Residence

Lake City, FL

9/23/2020

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, 0.33	No	No	N		11.5f	1.3ft	16.0	0.0	16.0	11	11	174 Btuh	
2	2 NFRC	0.22, 0.33	No	No	N		11.5f	1.3ft	36.0	0.0	36.0	11	11	392 Btuh	
3	2 NFRC	0.22, 0.33	No	No	N		1.5ft	1.3ft	15.0	0.0	15.0	11	11	163 Btuh	
4	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	6.0	0.0	6.0	11	27	165 Btuh	
5	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	8.0	0.0	8.0	11	27	220 Btuh	
6	2 NFRC	0.22, 0.33	No	No	S		8.5ft	1.3ft	60.0	60.0	0.0	11	13	654 Btuh	
7	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	6.0	6.0	0.0	11	13	65 Btuh	
8	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	30.0	30.0	0.0	11	13	327 Btuh	
9	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	10.0	10.0	0.0	11	13	109 Btuh	
10	2 NFRC	0.22, 0.33	No	No	W		1.5ft	1.3ft	16.0	0.0	16.0	11	27	440 Btuh	
11	2 NFRC	0.22, 0.33	No	No	W		1.5ft	1.3ft	3.0	0.0	3.0	11	27	82 Btuh	
	Window Total									206 (sqft)					2792 Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext	0.09		13.0/0.0		193.3		2.3		438 Btuh					
2	Frame - Wood - Ext	0.09		13.0/0.0		99.0		2.3		224 Btuh					
3	Frame - Wood - Ext	0.09		13.0/0.0		97.5		2.3		221 Btuh					
4	Frame - Wood - Ext	0.09		13.0/0.0		364.0		2.3		824 Btuh					
5	Frame - Wood - Ext	0.09		13.0/0.0		231.7		2.3		524 Btuh					
6	Frame - Wood - Ext	0.09		13.0/0.0		40.0		2.3		91 Btuh					
7	Frame - Wood - Ext	0.09		13.0/0.0		72.0		2.3		163 Btuh					
8	Frame - Wood - Ext	0.09		13.0/0.0		36.0		2.3		81 Btuh					
9	Frame - Wood - Ext	0.09		13.0/0.0		96.0		2.3		217 Btuh					
10	Frame - Wood - Ext	0.09		13.0/0.0		27.0		2.3		61 Btuh					
11	Frame - Wood - Ext	0.09		13.0/0.0		71.0		2.3		161 Btuh					
12	Frame - Wood - Ext	0.09		13.0/0.0		179.0		2.3		405 Btuh					
13	Frame - Wood - Adj	0.09		13.0/0.0		183.0		1.7		309 Btuh					
	Wall Total									1690 (sqft)					3718 Btuh
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior	48.0		12.0		576 Btuh									
2	Insulated - Exterior	40.0		12.0		480 Btuh									
3	Insulated - Garage	24.0		12.0		288 Btuh									
	Door Total									1344 Btuh					
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Vented Attic/Light/Shingle	0.032		30.0/0.0		2025.0		1.40		2838 Btuh					
	Ceiling Total									2025 (sqft)					2838 Btuh
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade	0.0		2025 (ft-perimeter)		0.0		0 Btuh							
	Floor Total									2025.0 (sqft)					0 Btuh
	Envelope Subtotal:												10692 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
McKenzie Residence

Lake City, FL

9/23/2020

Infiltration	Type Natural	Average ACH 0.14	Volume(cuft) 18225	Wall Ratio 1	CFM= 41.1	Load 855 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
	Sensible Envelope Load:					16327 Btuh
Duct load	Extremely sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					16327 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
McKenzie Residence

Lake City, FL

9/23/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16327 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	16327 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	16327 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1419 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	2619 Btuh
	TOTAL GAIN	18946 Btuh

EQUIPMENT

1. Central Unit	#	36000 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(1/2))

(Ornt - compass orientation)



Version 8

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Lake City, FL

Project Title:
McKenzie Residence
Building Type: User

9/23/2020

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	Vinyl	0.33	N	16.0		13.2	211 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	36.0		13.2	475 Btuh
3	2, NFRC 0.22	Vinyl	0.33	N	15.0		13.2	198 Btuh
4	2, NFRC 0.22	Vinyl	0.33	E	6.0		13.2	79 Btuh
5	2, NFRC 0.22	Vinyl	0.33	E	8.0		13.2	106 Btuh
6	2, NFRC 0.22	Vinyl	0.33	S	60.0		13.2	792 Btuh
7	2, NFRC 0.22	Vinyl	0.33	S	6.0		13.2	79 Btuh
8	2, NFRC 0.22	Vinyl	0.33	S	30.0		13.2	396 Btuh
9	2, NFRC 0.22	Vinyl	0.33	S	10.0		13.2	132 Btuh
10	2, NFRC 0.22	Vinyl	0.33	W	16.0		13.2	211 Btuh
11	2, NFRC 0.22	Vinyl	0.33	W	3.0		13.2	40 Btuh
Window Total					206.0(sqft)			2719 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	193		3.55	686 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	99		3.55	351 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	98		3.55	346 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	364		3.55	1292 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	232		3.55	822 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	40		3.55	142 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	96		3.55	341 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	27		3.55	96 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	71		3.55	252 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	179		3.55	636 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	183		3.55	650 Btuh
Wall Total					1690(sqft)			5998 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		48		16.0	768 Btuh
2	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
3	Insulated - Garage, n		(0.400)		24		16.0	384 Btuh
Door Total					112(sqft)			1792Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	2025		1.3	2580 Btuh
Ceiling Total					2025(sqft)			2580Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	286.0 ft(perim.)		47.2	13499 Btuh
Floor Total					2025 sqft			13499 Btuh
Envelope Subtotal:								26588 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Lake City, FL

Project Title:
McKenzie Residence
Building Type: User

9/23/2020

Infiltration	Type Natural	Wholehouse ACH 0.18	Volume(cuft) 18225	Wall Ratio 1.00	CFM= 54.8	2400 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					28988 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	28988 Btuh 0 Btuh 28988 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	36000 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