

Residential System Sizing Calculation

Summary

McCabe Res

Project Title:
230074 McCabe

Lake City, FL

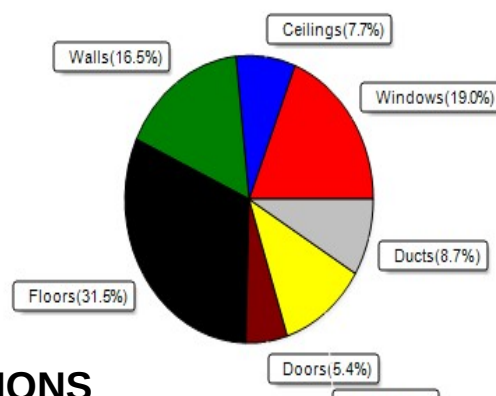
2023-01-25

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	49594	Btuh	Total cooling load calculation	44609	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	108.9	54000	Sensible (SHR = 0.75)	104.2	40500
Heat Pump + Auxiliary(0.0kW)	108.9	54000	Latent	235.2	13500
			Total (Electric Heat Pump)	121.1	54000

WINTER CALCULATIONS

Winter Heating Load (for 2835 sqft)

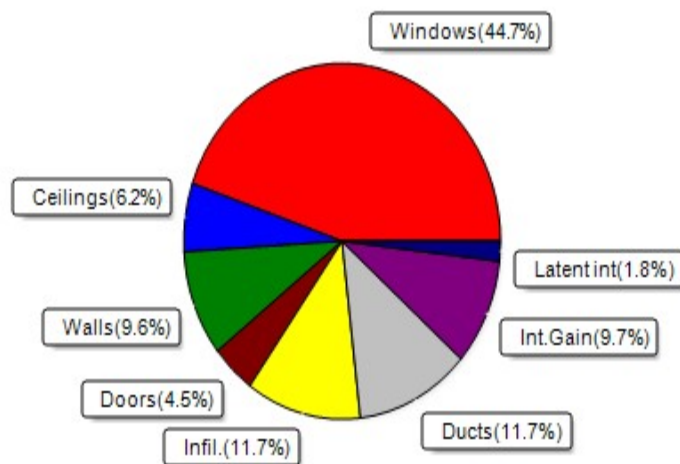
Load component		Load
Window total	674 sqft	9431 Btuh
Wall total	2586 sqft	8186 Btuh
Door total	168 sqft	2688 Btuh
Ceiling total	3060 sqft	3841 Btuh
Floor total	2835 sqft	15623 Btuh
Infiltration	126 cfm	5530 Btuh
Duct loss		4295 Btuh
Subtotal		49594 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		49594 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2835 sqft)

Load component		Load
Window total	674 sqft	19958 Btuh
Wall total	2586 sqft	4291 Btuh
Door total	168 sqft	2016 Btuh
Ceiling total	3060 sqft	2775 Btuh
Floor total		0 Btuh
Infiltration	95 cfm	1970 Btuh
Internal gain		4320 Btuh
Duct gain		3539 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		38870 Btuh
Latent gain(ducts)		1671 Btuh
Latent gain(infiltration)		3269 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		800 Btuh
Total latent gain		5739 Btuh
TOTAL HEAT GAIN		44609 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-01-25

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

McCabe Res

Project Title:
230074 McCabe
Building Type: User

Lake City, FL

2023-01-25

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 270 degrees.

Component Loads for Whole House								
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.25	Metal	0.35	W	37.3		14.0	523 Btuh
2	2, NFRC 0.25	Metal	0.35	W	31.5		14.0	441 Btuh
3	2, NFRC 0.25	Metal	0.35	W	220.0		14.0	3080 Btuh
4	2, NFRC 0.25	Metal	0.35	W	32.0		14.0	448 Btuh
5	2, NFRC 0.25	Metal	0.35	W	37.3		14.0	523 Btuh
6	2, NFRC 0.25	Metal	0.35	W	31.5		14.0	441 Btuh
7	2, NFRC 0.25	Metal	0.35	W	36.0		14.0	504 Btuh
8	2, NFRC 0.25	Metal	0.35	N	8.0		14.0	112 Btuh
9	2, NFRC 0.25	Metal	0.35	N	6.0		14.0	84 Btuh
10	2, NFRC 0.25	Metal	0.35	N	8.0		14.0	112 Btuh
11	2, NFRC 0.25	Metal	0.35	E	28.0		14.0	392 Btuh
12	2, NFRC 0.25	Metal	0.35	E	42.0		14.0	588 Btuh
13	2, NFRC 0.25	Metal	0.35	E	12.0		14.0	168 Btuh
14	2, NFRC 0.25	Metal	0.35	E	24.0		14.0	336 Btuh
15	2, NFRC 0.25	Metal	0.35	E	12.0		14.0	168 Btuh
16	2, NFRC 0.25	Metal	0.35	E	42.0		14.0	588 Btuh
17	2, NFRC 0.25	Metal	0.35	E	12.0		14.0	168 Btuh
18	2, NFRC 0.25	Metal	0.35	E	42.0		14.0	588 Btuh
19	2, NFRC 0.25	Metal	0.35	S	12.0		14.0	168 Btuh
	Window Total				673.7(sqft)			9431 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	105		3.09	323 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	120		3.09	371 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	143		3.09	442 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	140		3.09	433 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	95		3.09	294 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	172		3.09	531 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	169		3.09	523 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	50		3.09	155 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	99		3.09	305 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	202		3.55	716 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	59		3.55	208 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	43		3.55	154 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	113		3.55	402 Btuh
14	Frame - Wood	- Ext	(0.077)	19.0/0.0	30		3.09	94 Btuh
15	Frame - Wood	- Ext	(0.077)	19.0/0.0	42		3.09	129 Btuh
16	Frame - Wood	- Ext	(0.077)	19.0/0.0	156		3.09	481 Btuh
17	Frame - Wood	- Ext	(0.077)	19.0/0.0	47		3.09	146 Btuh
18	Frame - Wood	- Ext	(0.077)	19.0/0.0	65		3.09	200 Btuh
19	Frame - Wood	- Ext	(0.077)	19.0/0.0	47		3.09	146 Btuh
20	Frame - Wood	- Ext	(0.077)	19.0/0.0	129		3.09	399 Btuh
21	Frame - Wood	- Ext	(0.077)	19.0/0.0	42		3.09	129 Btuh
22	Frame - Wood	- Ext	(0.077)	19.0/0.0	131		3.09	406 Btuh
23	Frame - Wood	- Ext	(0.077)	19.0/0.0	388		3.09	1199 Btuh
	Wall Total				2586(sqft)			8186 Btuh

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Manual J Winter Calculations

Residential Load - Component Details (continued)

McCabe Res
Lake City, FL

Project Title:
230074 McCabe
Building Type: User

2023-01-25

Doors	Type	Storm Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n (0.400)		80		16.0	1280 Btuh
2	Insulated - Exterior,	n (0.400)		16		16.0	256 Btuh
3	Insulated - Garage,	n (0.400)		24		16.0	384 Btuh
4	Insulated - Garage,	n (0.400)		24		16.0	384 Btuh
5	Insulated - Exterior,	n (0.400)		24		16.0	384 Btuh
	Door Total			168(sqft)			2688Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area	X	HTM=	Load
1	Unvent Attic/D/Shing	(0.241)	0.0/22.0	2835		1.2	3416 Btuh
2	Knee Wall/D/Shing	(0.047)	0.0/22.0	225		1.9	425 Btuh
	Ceiling Total			3060(sqft)			3841Btuh
Floors	Type	Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	331.0 ft(perim.)		47.2	15623 Btuh
	Floor Total			2835 sqft			15623 Btuh
	Envelope Subtotal:						39769 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.25	30618	1.00	126.3	5530 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.095)	4295 Btuh
All Zones	Sensible Subtotal All Zones						49594 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	49594 Btuh 0 Btuh 49594 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	54000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

McCabe Res

Project Title:
230074 McCabe
Building Type: User

Lake City, FL

2023-01-25

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

McCabe Res

Project Title:
230074 McCabe

Lake City, FL

2023-01-25

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.
This calculation is for Worst Case. The house has been rotated 270 degrees.

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	0.25, 0.35	No	No	W	1.5ft	1.5ft	37.3	0.0	37.3	12	31	1148	Btuh
2	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	31.5	0.0	31.5	12	31	969	Btuh
3	2 NFRC	0.25, 0.35	No	No	W	15.5f	1.5ft	220.0	220.0	0.0	12	31	2620	Btuh
4	2 NFRC	0.25, 0.35	No	No	W	15.5f	3.5ft	32.0	32.0	0.0	12	31	381	Btuh
5	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	37.3	0.0	37.3	12	31	1148	Btuh
6	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	31.5	0.0	31.5	12	31	969	Btuh
7	2 NFRC	0.25, 0.35	No	No	W	1.5ft	1.5ft	36.0	0.0	36.0	12	31	1107	Btuh
8	2 NFRC	0.25, 0.35	No	No	N	1.5ft	1.5ft	8.0	0.0	8.0	12	12	95	Btuh
9	2 NFRC	0.25, 0.35	No	No	N	1.5ft	1.5ft	6.0	0.0	6.0	12	12	71	Btuh
10	2 NFRC	0.25, 0.35	No	No	N	1.5ft	1.5ft	8.0	0.0	8.0	12	12	95	Btuh
11	2 NFRC	0.25, 0.35	No	No	E	1.5ft	1.5ft	28.0	0.0	28.0	12	31	861	Btuh
12	2 NFRC	0.25, 0.35	No	No	E	9.2ft	4.0ft	42.0	21.6	20.4	12	31	884	Btuh
13	2 NFRC	0.25, 0.35	No	No	E	9.2ft	2.0ft	12.0	12.0	0.0	12	31	143	Btuh
14	2 NFRC	0.25, 0.35	No	No	E	7.3ft	4.0ft	24.0	6.3	17.7	12	31	620	Btuh
15	2 NFRC	0.25, 0.35	No	No	E	7.3ft	1.0ft	12.0	12.0	0.0	12	31	143	Btuh
16	2 NFRC	0.25, 0.35	No	No	E	9.2ft	4.0ft	42.0	21.6	20.4	12	31	884	Btuh
17	2 NFRC	0.25, 0.35	No	No	E	9.2ft	2.0ft	12.0	12.0	0.0	12	31	143	Btuh
18	2 NFRC	0.25, 0.35	No	No	E	1.5ft	1.5ft	42.0	0.0	42.0	12	31	1292	Btuh
19	2 NFRC	0.25, 0.35	No	No	S	1.5ft	1.5ft	12.0	12.0	0.0	12	14	143	Btuh
	Excursion												6243	Btuh
	Window Total							674 (sqft)					19958 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
					Cav/Sheath									
1	Frame - Wood - Ext	0.08	19.0/0.0	104.5	1.7	173	Btuh							
2	Frame - Wood - Ext	0.08	19.0/0.0	120.0	1.7	198	Btuh							
3	Frame - Wood - Ext	0.08	19.0/0.0	143.1	1.7	237	Btuh							
4	Frame - Wood - Ext	0.08	19.0/0.0	140.0	1.7	232	Btuh							
5	Frame - Wood - Ext	0.08	19.0/0.0	95.0	1.7	157	Btuh							
6	Frame - Wood - Ext	0.08	19.0/0.0	171.8	1.7	284	Btuh							
7	Frame - Wood - Ext	0.08	19.0/0.0	169.3	1.7	280	Btuh							
8	Frame - Wood - Ext	0.08	19.0/0.0	50.0	1.7	83	Btuh							
9	Frame - Wood - Ext	0.08	19.0/0.0	98.7	1.7	163	Btuh							
10	Frame - Wood - Adj	0.09	13.0/0.0	201.7	1.7	340	Btuh							
11	Frame - Wood - Adj	0.09	13.0/0.0	58.7	1.7	99	Btuh							
12	Frame - Wood - Adj	0.09	13.0/0.0	43.3	1.7	73	Btuh							
13	Frame - Wood - Adj	0.09	13.0/0.0	113.3	1.7	191	Btuh							
14	Frame - Wood - Ext	0.08	19.0/0.0	30.3	1.7	50	Btuh							
15	Frame - Wood - Ext	0.08	19.0/0.0	41.7	1.7	69	Btuh							
16	Frame - Wood - Ext	0.08	19.0/0.0	155.7	1.7	257	Btuh							
17	Frame - Wood - Ext	0.08	19.0/0.0	47.2	1.7	78	Btuh							
18	Frame - Wood - Ext	0.08	19.0/0.0	64.7	1.7	107	Btuh							
19	Frame - Wood - Ext	0.08	19.0/0.0	47.2	1.7	78	Btuh							
20	Frame - Wood - Ext	0.08	19.0/0.0	129.2	1.7	214	Btuh							
21	Frame - Wood - Ext	0.08	19.0/0.0	41.7	1.7	69	Btuh							
22	Frame - Wood - Ext	0.08	19.0/0.0	131.3	1.7	217	Btuh							
23	Frame - Wood - Ext	0.08	19.0/0.0	388.0	1.7	642	Btuh							
	Wall Total		2586 (sqft)		4291 Btuh									

Manual J Summer Calculations

Residential Load - Component Details (continued)

McCabe Res

Project Title:
230074 McCabe

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2023-01-25

Doors	Type			Area (sqft)	HTM	Load	
	1	Insulated - Exterior		80.0	12.0	960	Btuh
	2	Insulated - Exterior		16.0	12.0	192	Btuh
	3	Insulated - Garage		24.0	12.0	288	Btuh
	4	Insulated - Garage		24.0	12.0	288	Btuh
	5	Insulated - Exterior		24.0	12.0	288	Btuh
	Door Total			168 (sqft)		2016 Btuh	
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load	
	1	Unvented Attic/DarkShingle	0.241	0.0/22.0	2835.0	0.96	2733 Btuh
	2	Knee Wall/DarkShingle	0.047	0.0/22.0	225.0	0.19	42 Btuh
		Ceiling Total			3060 (sqft)		2775 Btuh
Floors	Type		R-Value	Size	HTM	Load	
	1	Slab On Grade		0.0	2835 (ft-perimeter)	0.0	0 Btuh
		Floor Total			2835.0 (sqft)		0 Btuh
	Envelope Subtotal:					29040 Btuh	
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load	
	Natural	0.19	30618	1	94.7	1970	Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load	
		4	X 230	+	3400	4320	Btuh
	Sensible Envelope Load:					35330 Btuh	
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.100)	3539 Btuh	
	Sensible Load All Zones					38870 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

McCabe Res

Project Title:
230074 McCabe

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2023-01-25

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	35330 Btuh
	Sensible Duct Load	3539 Btuh
	Total Sensible Zone Loads	38870 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	38870 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	3269 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1671 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5739 Btuh
	TOTAL GAIN	44609 Btuh

EQUIPMENT

1. Central Unit	#	54000 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($\frac{1}{2}$))

(Ornt - compass orientation)



Version 8