

Residential System Sizing Calculation

Summary

Project Title:
Montgomery Residence

Lake City, FL 32024

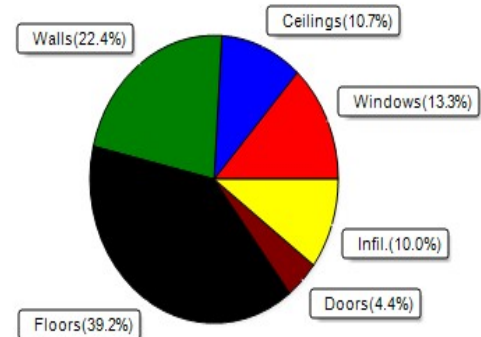
9/23/2020

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	28308 Btuh	Total cooling load calculation	21667 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	148.4 42000	Sensible (SHR = 0.85)	194.1 35700
Heat Pump + Auxiliary(0.0kW)	148.4 42000	Latent	192.6 6300
		Total (Electric Heat Pump)	193.8 42000

WINTER CALCULATIONS

Winter Heating Load (for 2386 sqft)

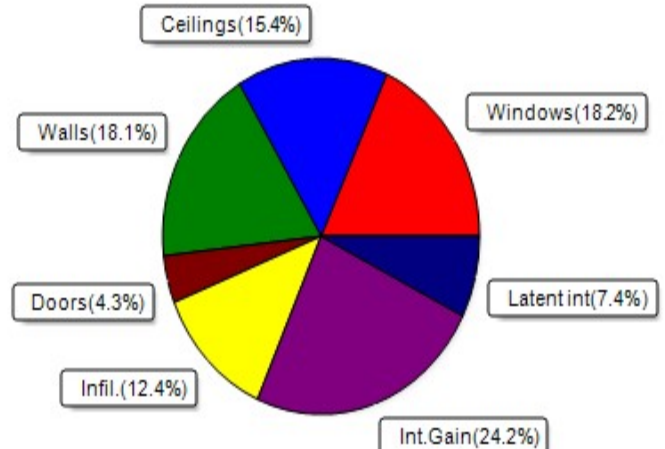
Load component	Load
Window total 286 sqft	3775 Btuh
Wall total 1783 sqft	6329 Btuh
Door total 78 sqft	1244 Btuh
Ceiling total 2386 sqft	3039 Btuh
Floor total 2386 sqft	11092 Btuh
Infiltration 65 cfm	2828 Btuh
Duct loss	0 Btuh
Subtotal	28308 Btuh
Ventilation 0 cfm	0 Btuh
TOTAL HEAT LOSS	28308 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2386 sqft)

Load component	Load
Window total 286 sqft	3946 Btuh
Wall total 1783 sqft	3925 Btuh
Door total 78 sqft	933 Btuh
Ceiling total 2386 sqft	3343 Btuh
Floor total	0 Btuh
Infiltration 48 cfm	1007 Btuh
Internal gain	5240 Btuh
Duct gain	0 Btuh
Sens. Ventilation 0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	18395 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	1672 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1600 Btuh
Total latent gain	3272 Btuh
TOTAL HEAT GAIN	21667 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

9-21-20

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Montgomery Residence

Lake City, FL 32024

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		1.5ft	1.3ft	15.0	0.0	15.0	11	11	163	Btuh
2	2 NFRC	0.22, 0.33	No	No	N		1.5ft	1.3ft	15.0	0.0	15.0	11	11	163	Btuh
3	2 NFRC	0.22, 0.33	No	No	N		11.5f	1.3ft	96.0	0.0	96.0	11	11	1046	Btuh
4	2 NFRC	0.22, 0.33	No	No	N		11.5f	1.3ft	30.0	0.0	30.0	11	11	327	Btuh
5	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	20.0	0.0	20.0	11	27	550	Btuh
6	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	3.0	0.0	3.0	11	27	82	Btuh
7	2 NFRC	0.22, 0.33	No	No	S		9.5ft	1.3ft	36.0	36.0	0.0	11	13	392	Btuh
8	2 NFRC	0.22, 0.33	No	No	S		9.5ft	1.3ft	36.0	36.0	0.0	11	13	392	Btuh
9	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	8.0	8.0	0.0	11	13	87	Btuh
10	2 NFRC	0.22, 0.33	No	No	W		1.5ft	1.3ft	9.0	0.0	9.0	11	27	247	Btuh
11	2 NFRC	0.22, 0.33	No	No	W		1.5ft	1.3ft	15.0	0.0	15.0	11	27	412	Btuh
12	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								286 (sqft)					3946 Btuh	
Walls	Type	U-Value				R-Value		Area(sqft)			HTM		Load		
						Cav/Sheath									
1	Frame - Wood - Ext					0.09		13.0/0.0		117.0		2.3		265	Btuh
2	Frame - Wood - Ext					0.09		13.0/0.0		24.0		2.3		54	Btuh
3	Frame - Wood - Ext					0.09		13.0/0.0		45.2		2.3		102	Btuh
4	Frame - Wood - Ext					0.09		13.0/0.0		24.0		2.3		54	Btuh
5	Frame - Wood - Ext					0.09		13.0/0.0		102.0		2.3		231	Btuh
6	Frame - Wood - Ext					0.09		13.0/0.0		117.0		2.3		265	Btuh
7	Frame - Wood - Ext					0.09		13.0/0.0		126.0		2.3		285	Btuh
8	Frame - Wood - Ext					0.09		13.0/0.0		286.0		2.3		647	Btuh
9	Frame - Wood - Ext					0.09		13.0/0.0		91.5		2.3		207	Btuh
10	Frame - Wood - Ext					0.09		13.0/0.0		42.0		2.3		95	Btuh
11	Frame - Wood - Ext					0.09		13.0/0.0		36.7		2.3		83	Btuh
12	Frame - Wood - Ext					0.09		13.0/0.0		46.7		2.3		106	Btuh
13	Frame - Wood - Ext					0.09		13.0/0.0		105.7		2.3		239	Btuh
14	Frame - Wood - Ext					0.09		13.0/0.0		53.3		2.3		121	Btuh
15	Frame - Wood - Ext					0.09		13.0/0.0		48.7		2.3		110	Btuh
16	Frame - Wood - Ext					0.09		13.0/0.0		327.0		2.3		740	Btuh
17	Frame - Wood - Adj					0.09		13.0/0.0		190.0		1.7		320	Btuh
	Wall Total								1783 (sqft)					3925 Btuh	
Doors	Type					Area (sqft)			HTM		Load				
1	Insulated - Exterior									17.8		12.0		213	Btuh
2	Insulated - Exterior									40.0		12.0		480	Btuh
3	Insulated - Garage									20.0		12.0		240	Btuh
	Door Total								78 (sqft)					933 Btuh	
Ceilings	Type/Color/Surface	U-Value				R-Value		Area(sqft)			HTM		Load		
1	Vented Attic/Light/Shingle					0.032		30.0/0.0		2386.0		1.40		3343	Btuh
	Ceiling Total								2386 (sqft)					3343 Btuh	
Floors	Type					R-Value			Size			HTM		Load	
1	Slab On Grade							0.0		2386 (ft-perimeter)		0.0		0	Btuh
	Floor Total								2386.0 (sqft)					0 Btuh	
	Envelope Subtotal:													12148 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Montgomery Residence

Lake City, FL 32024

9/23/2020

Infiltration	Type Natural	Average ACH 0.14	Volume(cuft) 21474	Wall Ratio 1	CFM= 48.4	Load 1007 Btuh
Internal gain		Occupants 8	Btuh/occupant X 230	Appliance +	3400	Load 5240 Btuh
	Sensible Envelope Load:					18395 Btuh
Duct load	Extremely sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					18395 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Montgomery Residence

Lake City, FL 32024

9/23/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18395 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	18395 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18395 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1672 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3272 Btuh
	TOTAL GAIN	21667 Btuh

EQUIPMENT

1. Central Unit	#	42000 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 32024

Project Title:
Montgomery 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	15.0		13.2	198 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	15.0		13.2	198 Btuh
3	2, NFRC 0.22	Vinyl	0.33	N	96.0		13.2	1267 Btuh
4	2, NFRC 0.22	Vinyl	0.33	N	30.0		13.2	396 Btuh
5	2, NFRC 0.22	Vinyl	0.33	E	20.0		13.2	264 Btuh
6	2, NFRC 0.22	Vinyl	0.33	E	3.0		13.2	40 Btuh
7	2, NFRC 0.22	Vinyl	0.33	S	36.0		13.2	475 Btuh
8	2, NFRC 0.22	Vinyl	0.33	S	36.0		13.2	475 Btuh
9	2, NFRC 0.22	Vinyl	0.33	S	8.0		13.2	106 Btuh
10	2, NFRC 0.22	Vinyl	0.33	W	9.0		13.2	119 Btuh
11	2, NFRC 0.22	Vinyl	0.33	W	15.0		13.2	198 Btuh
12	2, NFRC 0.22	Vinyl	0.33	W	3.0		13.2	40 Btuh
Window Total					286.0(sqft)			3775 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	117		3.55	415 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	161 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.55	362 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	117		3.55	415 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	126		3.55	447 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	286		3.55	1015 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	92		3.55	325 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	42		3.55	149 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	37		3.55	130 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	47		3.55	166 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	106		3.55	375 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	53		3.55	189 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	49		3.55	173 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	327		3.55	1161 Btuh
17	Frame - Wood	- Adj	(0.089)	13.0/0.0	190		3.55	675 Btuh
Wall Total					1783(sqft)			6329 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		18		16.0	284 Btuh
2	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
3	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
Door Total					78(sqft)			1244Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	2386		1.3	3039 Btuh
Ceiling Total					2386(sqft)			3039Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Lake City, FL 32024

Project Title:
Montgomery Residence
Building Type: User

9/23/2020

Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 235.0 ft(perim.) 2386 sqft	HTM= 47.2	Load 11092 Btuh 11092 Btuh
	Envelope Subtotal:					25480 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.18	Volume(cuft) 21474	Wall Ratio 1.00	CFM= 64.6	2828 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					28308 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	28308 Btuh 0 Btuh 28308 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	42000 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