

Residential System Sizing Calculation

Summary

Aaron Simque

Project Title

Aaron Simque Residence

Lake City, FL 32024-

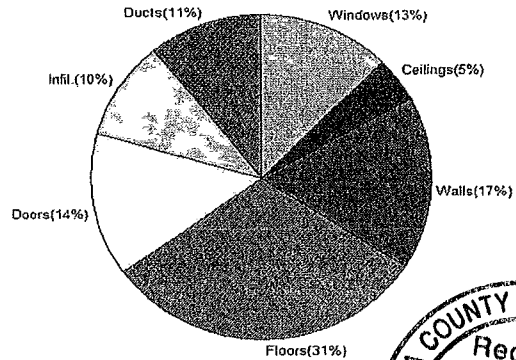
2/19/2014

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(54gr.)			
Winter design temperature(MJ8 99%)	33 F	Summer design temperature(MJ8 99%)	92 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	37 F	Summer temperature difference	17 F
Total heating load calculation		Total cooling load calculation	36430 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 48982	Sensible (SHR = 0.75)	87.5 27164
Heat Pump + Auxiliary(0.0kW)	100.0 48982	Latent	168.3 9055
		Total (Electric Heat Pump)	99.4 36219

WINTER CALCULATIONS

Winter Heating Load (for 2359 sqft)

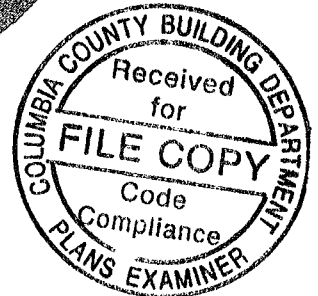
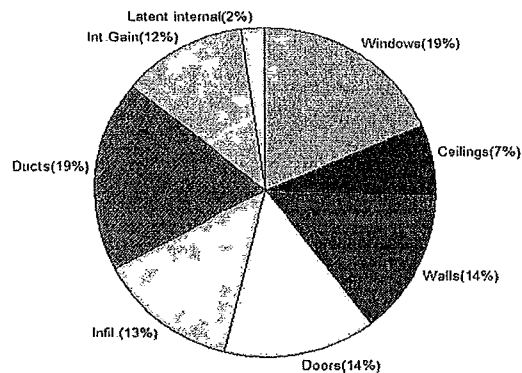
Load component		Load	
Window total	302 sqft	6148	Btuh
Wall total	2558 sqft	8401	Btuh
Door total	408 sqft	6944	Btuh
Ceiling total	2359 sqft	2215	Btuh
Floor total	2359 sqft	15194	Btuh
Infiltration	116 cfm	4709	Btuh
Duct loss		5370	Btuh
Subtotal		48982	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		48982	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2359 sqft)

Load component		Load	
Window total	302 sqft	6778	Btuh
Wall total	2558 sqft	5094	Btuh
Door total	408 sqft	5255	Btuh
Ceiling total	2359 sqft	2515	Btuh
Floor total		0	Btuh
Infiltration	87 cfm	1623	Btuh
Internal gain		4320	Btuh
Duct gain		5466	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		31051	Btuh
Latent gain(ducts)		1393	Btuh
Latent gain(infiltration)		3186	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		800	Btuh
Total latent gain		5379	Btuh
TOTAL HEAT GAIN		36430	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY

DATE: 2-19-2014

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Aaron Simque

Project Title:
Aaron Simque Residence
Building Type: User

Lake City, FL 32024-

2/19/2014

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 F (MJ8 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.50	Metal	0.55	S	18.0		20.4	366 Btuh
2	2, NFRC 0.50	Metal	0.55	S	15.1		20.4	308 Btuh
3	2, NFRC 0.50	Metal	0.55	S	36.0		20.4	733 Btuh
4	2, NFRC 0.50	Metal	0.55	E	72.0		20.4	1465 Btuh
5	2, NFRC 0.50	Metal	0.55	E	15.0		20.4	305 Btuh
6	2, NFRC 0.50	Metal	0.55	N	18.0		20.4	366 Btuh
7	2, NFRC 0.50	Metal	0.55	N	30.0		20.4	610 Btuh
8	2, NFRC 0.50	Metal	0.55	N	20.0		20.4	407 Btuh
9	2, NFRC 0.50	Metal	0.55	E	30.0		20.4	610 Btuh
10	2, NFRC 0.50	Metal	0.55	W	30.0		20.4	610 Btuh
11	2, NFRC 0.50	Metal	0.55	SW	18.0		20.4	366 Btuh
Window Total					302.1(sqft)			6148 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	19		3.28	61 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	162		3.28	531 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	63		3.28	208 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	104		3.28	342 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	443		3.28	1455 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	254		3.28	834 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	538		3.28	1767 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	250		3.28	821 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	145		3.28	476 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	127		3.28	417 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	240		3.28	788 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	179		3.28	587 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	35		3.28	115 Btuh
Wall Total					2558(sqft)			8401 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Wood - Exterior,	n	(0.460)		21		17.0	363 Btuh
2	Wood - Exterior,	n	(0.460)		45		17.0	772 Btuh
3	Wood - Exterior,	n	(0.460)		48		17.0	817 Btuh
4	Wood - Exterior,	n	(0.460)		48		17.0	817 Btuh
5	Wood - Exterior,	n	(0.460)		40		17.0	681 Btuh
6	Wood - Exterior,	n	(0.460)		40		17.0	681 Btuh
7	Wood - Exterior,	n	(0.460)		24		17.0	408 Btuh
8	Wood - Garage,	n	(0.460)		21		17.0	363 Btuh
9	Insulated - Exterior,	n	(0.460)		72		17.0	1225 Btuh
10	Insulated - Exterior,	n	(0.460)		48		17.0	817 Btuh
Door Total					408(sqft)			6944 Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value		Area	X	HTM=	Load
1	Vented Attic/L/Shing	(0.025)	38.0/0.0		2359		0.9	2215 Btuh
Ceiling Total					2359(sqft)			2215 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Aaron Simque

Lake City, FL 32024-

Project Title.
Aaron Simque Residence
Building Type: User

2/19/2014

Floors 1	Type Slab On Grade Floor Total	Ueff. (1 180)	R-Value 0.0	Size X 348.0 ft(perim.) 2359 sqft	HTM= 43.7	Load 15194 Btuh 15194 Btuh
Envelope Subtotal.						38902 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.37	Volume(cuft) 18872	Wall Ratio 1.00	CFM= 116.3	4709 Btuh
Duct load	Average sealed, R6 0, Supply(Att), Return(Att) (DLM of 0.123)					5370 Btuh
All Zones	Sensible Subtotal All Zones					48982 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	48982 Btuh 0 Btuh 48982 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	48982 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

Aaron Simque

Project Title.
Aaron Simque Residence

Lake City, FL 32024-

2/19/2014

Reference City: Gainesville, FL

Temperature Difference: 17 OF(MJ8 99%)

Humidity difference 54gr

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	0.50, 0.55	B-L	No	S		7.5ft	0.5ft	18.0	18.0	0.0	13	16	237 Btuh
2	2 NFRC	0.50, 0.55	B-L	No	S		7.5ft	0.5ft	15.1	15.1	0.0	13	16	199 Btuh
3	2 NFRC	0.50, 0.55	B-L	No	S		1.5ft	0.5ft	36.0	36.0	0.0	13	16	474 Btuh
4	2 NFRC	0.50, 0.55	B-L	No	E		1.5ft	0.5ft	72.0	8.9	63.1	13	34	2241 Btuh
5	2 NFRC	0.50, 0.55	B-L	No	E		1.5ft	0.5ft	15.0	2.2	12.8	13	34	459 Btuh
6	2 NFRC	0.50, 0.55	B-L	No	N		1.5ft	0.5ft	18.0	0.0	18.0	13	13	237 Btuh
7	2 NFRC	0.50, 0.55	B-L	No	N		1.5ft	0.5ft	30.0	0.0	30.0	13	13	395 Btuh
8	2 NFRC	0.50, 0.55	B-L	No	N		1.5ft	0.5ft	20.0	0.0	20.0	13	13	263 Btuh
9	2 NFRC	0.50, 0.55	B-L	No	E		1.5ft	0.5ft	30.0	3.7	26.3	13	34	934 Btuh
10	2 NFRC	0.50, 0.55	B-L	No	W		1.5ft	0.5ft	30.0	3.7	26.3	13	34	934 Btuh
11	2 NFRC	0.50, 0.55	B-L	No	SW		1.5ft	0.5ft	18.0	5.9	12.1	13	27	406 Btuh
	Window Total								302 (sqft)					6778 Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Frame - Wood - Ext		0.09		13.0/0.0		18.7		2.1		39 Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		161.6		2.1		337 Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.0		63.3		2.1		132 Btuh			
4	Frame - Wood - Ext		0.09		13.0/0.0		104.0		2.1		217 Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.0		443.0		2.1		924 Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.0		254.0		2.1		530 Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		538.0		2.1		1122 Btuh			
8	Frame - Wood - Ext		0.09		13.0/0.0		250.0		2.1		521 Btuh			
9	Frame - Wood - Ext		0.09		13.0/0.0		145.0		2.1		302 Btuh			
10	Frame - Wood - Ext		0.09		13.0/0.0		127.0		2.1		265 Btuh			
11	Frame - Wood - Adj		0.09		13.0/0.0		240.0		1.5		362 Btuh			
12	Frame - Wood - Adj		0.09		13.0/0.0		178.7		1.5		270 Btuh			
13	Frame - Wood - Ext		0.09		13.0/0.0		35.0		2.1		73 Btuh			
	Wall Total								2558 (sqft)			5094 Btuh		
Doors	Type	Area (sqft)		HTM		Load								
1	Wood - Exterior		21.3		12.9	275 Btuh								
2	Wood - Exterior		45.3		12.9	584 Btuh								
3	Wood - Exterior		48.0		12.9	618 Btuh								
4	Wood - Exterior		48.0		12.9	618 Btuh								
5	Wood - Exterior		40.0		12.9	515 Btuh								
6	Wood - Exterior		40.0		12.9	515 Btuh								
7	Wood - Exterior		24.0		12.9	309 Btuh								
8	Wood - Garage		21.3		12.9	275 Btuh								
9	Insulated - Exterior		72.0		12.9	927 Btuh								
10	Insulated - Exterior		48.0		12.9	618 Btuh								
	Door Total								408 (sqft)			5255 Btuh		
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/Light/Shingle		0.025		38.0/0.0		2359.0		1.07		2515 Btuh			
	Ceiling Total								2359 (sqft)			2515 Btuh		
Floors	Type	R-Value		Size		HTM		Load						
1	Slab On Grade		0.0		2359 (ft-perimeter)		0.0		0 Btuh					
	Floor Total								2359.0 (sqft)			0 Btuh		
	Envelope Subtotal											19642 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Aaron Simque

Project Title:

Climate FL_GAINESVILLE_REGIONAL_A

Aaron Simque Residence

Lake City, FL 32024-

2/19/2014

Infiltration	Type Natural	Average ACH 0.28	Volume(cuft) 18872	Wall Ratio 1	CFM= 87.2	Load 1623 Btuh
Internal gain		Occupants 4	Btuh/occupant X 230	Appliance +	3400	Load 4320 Btuh
					Sensible Envelope Load.	25585 Btuh
Duct load	Average sealed, Supply(R6 0-Attic), Return(R6 0-Attic)				(DGM of 0 214)	5466 Btuh
					Sensible Load All Zones	31051 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Aaron Simque

Project Title
Aaron Simque Residence

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024-

2/19/2014

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	25585 Btuh
	Sensible Duct Load	5466 Btuh
	Total Sensible Zone Loads	31051 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	31051 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	3186 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1393 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5379 Btuh
	TOTAL GAIN	36430 Btuh

EQUIPMENT

1. Central Unit	#	36219 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