

Residential System Sizing Calculation

Summary

Brad & Brandy Womble

Project Title:
Womble Residence

Lake City, FL 32055

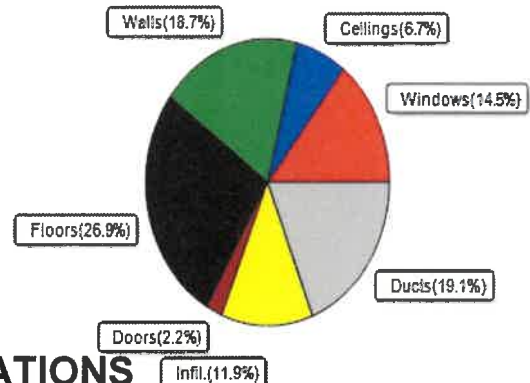
9/14/2020

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			61176	Btuh	
Total cooling load calculation			47405	Btuh	
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	50.5	30875	Sensible (SHR = 0.70)	40.8	15681
Heat Pump + Auxiliary(0.0kW)	50.5	30875	Latent	74.9	6720
			Total (Electric Heat Pump)	47.3	22401

WINTER CALCULATIONS

Winter Heating Load (for 3846 sqft)

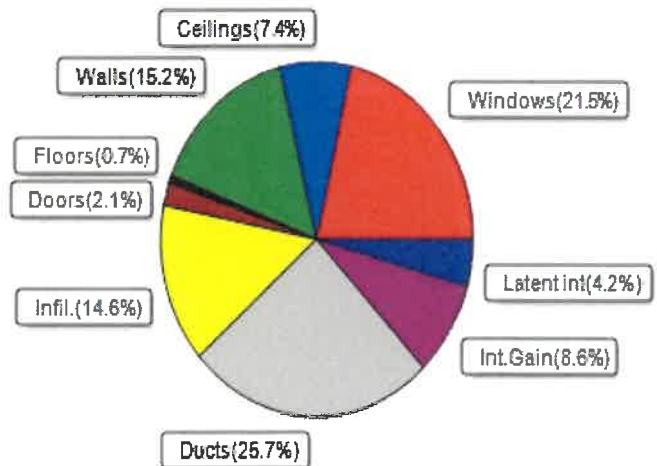
Load component		Load	
Window total	616 sqft	8874	Btuh
Wall total	3220 sqft	11434	Btuh
Door total	72 sqft	1325	Btuh
Ceiling total	4062 sqft	4124	Btuh
Floor total	See detail report	16466	Btuh
Infiltration	166 cfm	7286	Btuh
Duct loss		11668	Btuh
Subtotal		61176	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		61176	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3846 sqft)

Load component		Load	
Window total	616 sqft	10188	Btuh
Wall total	3220 sqft	7207	Btuh
Door total	72 sqft	994	Btuh
Ceiling total	4062 sqft	3505	Btuh
Floor total		339	Btuh
Infiltration	125 cfm	2596	Btuh
Internal gain		4100	Btuh
Duct gain		9509	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		38437	Btuh
Latent gain(ducts)		2661	Btuh
Latent gain(infiltration)		4307	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		2000	Btuh
Total latent gain		8968	Btuh
TOTAL HEAT GAIN		47405	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

Handwritten signature and date: 9/14/2020

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Brad & Brandy Womble

Project Title:
Womble Residence
Building Type: User

Lake City, FL 32055

9/14/2020

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 0.25	Vinyl	0.36	S	36.0		14.4	518 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	30.0		14.4	432 Btuh
3	2, NFRC 0.25	Vinyl	0.36	W	36.0		14.4	518 Btuh
4	2, NFRC 0.25	Vinyl	0.36	S	36.0		14.4	518 Btuh
5	2, NFRC 0.25	Vinyl	0.36	S	8.0		14.4	115 Btuh
6	2, NFRC 0.25	Vinyl	0.36	E	12.0		14.4	173 Btuh
7	2, NFRC 0.25	Vinyl	0.36	E	25.0		14.4	360 Btuh
8	2, NFRC 0.25	Vinyl	0.36	E	3.0		14.4	43 Btuh
9	2, NFRC 0.25	Vinyl	0.36	E	20.0		14.4	288 Btuh
10	2, NFRC 0.25	Vinyl	0.36	N	24.0		14.4	346 Btuh
11	2, NFRC 0.25	TIM	0.36	N	40.0		14.4	576 Btuh
12	2, NFRC 0.25	TIM	0.36	W	24.0		14.4	346 Btuh
13	2, NFRC 0.25	Vinyl	0.36	N	16.0		14.4	230 Btuh
14	2, NFRC 0.25	Metal	0.36	N	128.0		14.4	1843 Btuh
15	2, NFRC 0.25	TIM	0.36	E	24.0		14.4	346 Btuh
16	2, NFRC 0.25	Vinyl	0.36	E	18.0		14.4	259 Btuh
17	2, NFRC 0.25	Vinyl	0.36	N	54.0		14.4	778 Btuh
18	2, NFRC 0.25	Vinyl	0.36	W	36.0		14.4	518 Btuh
19	2, NFRC 0.25	Vinyl	0.36	W	12.0		14.4	173 Btuh
20	2, NFRC 0.25	Vinyl	0.36	S	8.0		14.4	115 Btuh
21	2, NFRC 0.25	Vinyl	0.36	W	26.3		14.4	378 Btuh
Window Total					616.3(sqft)			8874 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	53		3.55	189 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	60		3.55	213 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	97		3.55	346 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	113		3.55	402 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	103		3.55	365 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	77		3.55	275 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	144		3.55	512 Btuh
8	Frame - Wood	- Adj	(0.089)	13.0/0.0	143		3.55	507 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	441		3.55	1566 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	109		3.55	388 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	149		3.55	530 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	191		3.55	678 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	116		3.55	412 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	60		3.55	214 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	116		3.55	412 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	143		3.55	509 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	53		3.55	189 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	372		3.55	1321 Btuh
19	Frame - Wood	- Ext	(0.089)	13.0/0.0	96		3.55	341 Btuh
20	Frame - Wood	- Ext	(0.089)	13.0/0.0	304		3.55	1079 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Brad & Brandy Womble

Project Title:
Womble Residence
Building Type: User

Lake City, FL 32055

9/14/2020

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
21	Frame - Wood	- Ext	(0.089)	13.0/0.0	278	3.55	986 Btuh
	Wall Total				3220(sqft)		11434 Btuh
Doors	Type		Storm Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)		24	18.4	442 Btuh
2	Insulated - Garage,	n	(0.460)		24	18.4	442 Btuh
3	Insulated - Exterior,	n	(0.460)		24	18.4	442 Btuh
	Door Total				72(sqft)		1325Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	3531	1.0	3585 Btuh
2	Vented Attic/L/Shing		(0.025)	38.0/0.0	531	1.0	539 Btuh
	Ceiling Total				4062(sqft)		4124Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	328.3 ft(perim.)	47.2	15497 Btuh
2	Raised Wood - Adj		(0.050)	19.0	483.0 sqft	2.0	969 Btuh
	Floor Total				3846 sqft		16466 Btuh
	Envelope Subtotal:						42222 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural		0.27	37494	1.00	166.4	7286 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.236)						11668 Btuh
All Zones	Sensible Subtotal All Zones						61176 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	61176 Btuh 0 Btuh 61176 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	30875 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Brad & Brandy Womble

Project Title:
Womble Residence
Building Type: User

Lake City, FL 32055

9/14/2020

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

Brad & Brandy Womble

Project Title:
Womble Residence

Lake City, FL 32055

9/14/2020

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	0.25, 0.36	No	No	S		1.0ft.	6.0ft.	36.0	0.0	36.0	12	14	506	Btuh
2	2 NFRC	0.25, 0.36	No	No	S		12.0f	1.0ft.	30.0	30.0	0.0	12	14	363	Btuh
3	2 NFRC	0.25, 0.36	No	No	W		10.0f	1.0ft.	36.0	36.0	0.0	12	31	436	Btuh
4	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	36.0	36.0	0.0	12	14	436	Btuh
5	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	8.0	8.0	0.0	12	14	97	Btuh
6	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	12.0	2.0	10.0	12	31	334	Btuh
7	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	25.0	1.2	23.8	12	31	750	Btuh
8	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	3.0	0.7	2.3	12	31	79	Btuh
9	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	20.0	1.0	19.0	12	31	600	Btuh
10	2 NFRC	0.25, 0.36	No	No	N		10.0f	1.0ft.	24.0	0.0	24.0	12	12	290	Btuh
11	2 NFRC	0.25, 0.36	No	No	N		10.0f	1.0ft.	40.0	0.0	40.0	12	12	484	Btuh
12	2 NFRC	0.25, 0.36	No	No	W		14.0f	1.0ft.	24.0	24.0	0.0	12	31	290	Btuh
13	2 NFRC	0.25, 0.36	No	No	N		14.0f	1.0ft.	16.0	0.0	16.0	12	12	194	Btuh
14	2 NFRC	0.25, 0.36	No	No	N		14.0f	1.0ft.	128.0	0.0	128.0	12	12	1549	Btuh
15	2 NFRC	0.25, 0.36	No	No	E		14.0f	1.0ft.	24.0	24.0	0.0	12	31	290	Btuh
16	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	18.0	0.7	17.3	12	31	543	Btuh
17	2 NFRC	0.25, 0.36	No	No	N		1.0ft.	3.0ft.	54.0	0.0	54.0	12	12	653	Btuh
18	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	36.0	1.5	34.5	12	31	1086	Btuh
19	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	12.0	1.5	10.5	12	31	344	Btuh
20	2 NFRC	0.25, 0.36	No	No	S		1.0ft.	2.0ft.	8.0	7.4	0.6	12	14	98	Btuh
21	2 NFRC	0.25, 0.36	No	No	W		1.0ft.	0.5ft.	26.3	2.5	23.8	12	31	766	Btuh
Window Total									616 (sqft)					10188 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
					Cav/Sheath										
1	Frame - Wood - Ext		0.09		13.0/0.0		53.3		2.3		121 Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.0		60.0		2.3		136 Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.0		97.3		2.3		220 Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.0		113.3		2.3		257 Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.0		102.7		2.3		232 Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.0		77.3		2.3		175 Btuh				
7	Frame - Wood - Ext		0.09		13.0/0.0		144.3		2.3		327 Btuh				
8	Frame - Wood - Adj		0.09		13.0/0.0		142.7		1.7		241 Btuh				
9	Frame - Wood - Ext		0.09		13.0/0.0		441.0		2.3		998 Btuh				
10	Frame - Wood - Ext		0.09		13.0/0.0		109.3		2.3		247 Btuh				
11	Frame - Wood - Ext		0.09		13.0/0.0		149.3		2.3		338 Btuh				
12	Frame - Wood - Ext		0.09		13.0/0.0		191.0		2.3		432 Btuh				
13	Frame - Wood - Ext		0.09		13.0/0.0		116.0		2.3		263 Btuh				
14	Frame - Wood - Ext		0.09		13.0/0.0		60.3		2.3		137 Btuh				
15	Frame - Wood - Ext		0.09		13.0/0.0		116.0		2.3		263 Btuh				
16	Frame - Wood - Ext		0.09		13.0/0.0		143.3		2.3		324 Btuh				
17	Frame - Wood - Ext		0.09		13.0/0.0		53.3		2.3		121 Btuh				
18	Frame - Wood - Ext		0.09		13.0/0.0		372.0		2.3		842 Btuh				
19	Frame - Wood - Ext		0.09		13.0/0.0		96.0		2.3		217 Btuh				
20	Frame - Wood - Ext		0.09		13.0/0.0		304.0		2.3		688 Btuh				
21	Frame - Wood - Ext		0.09		13.0/0.0		277.8		2.3		629 Btuh				
Wall Total							3220 (sqft)					7207 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Brad & Brandy Womble

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Womble Residence

Lake City, FL 32055

9/14/2020

Doors	Type			Area (sqft)	HTM	Load
1	Insulated - Exterior			24.0	13.8	331 Btuh
2	Insulated - Garage			24.0	13.8	331 Btuh
3	Insulated - Exterior			24.0	13.8	331 Btuh
	Door Total			72 (sqft)		994 Btuh
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented AtticLight/Shingle/RB	0.025	38.0/0.0	3531.0	0.86	3047 Btuh
2	Vented AtticLight/Shingle/RB	0.025	38.0/0.0	531.0	0.86	458 Btuh
	Ceiling Total			4062 (sqft)		3505 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	3363 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj		19.0	483 (sqft)	0.7	339 Btuh
	Floor Total			3846.0 (sqft)		339 Btuh
	Envelope Subtotal:					22233 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.20	37494	1	124.8	2596 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		10	X 230	+	1800	4100 Btuh
	Sensible Envelope Load:					28928 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.329)	9509 Btuh
	Sensible Load All Zones					38437 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Brad & Brandy Womble

Project Title: Womble Residence

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32055

9/14/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	28928 Btuh
	Sensible Duct Load	9509 Btuh
	Total Sensible Zone Loads	38437 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	38437 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	4307 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2661 Btuh
	Latent occupant gain (10.0 people @ 200 Btuh per person)	2000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	8968 Btuh
	TOTAL GAIN	47405 Btuh

EQUIPMENT

1. Central Unit	#	22401 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