

Residential System Sizing Calculation

Summary

Melissa Roberts
Cooley Way
Lake City, FL

Project Title:
230943 Roberts Res

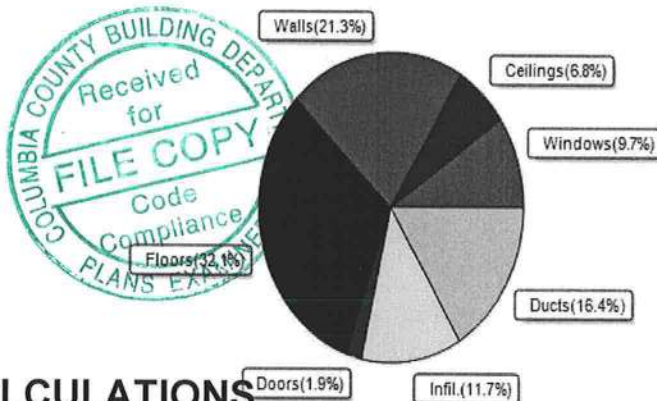
2023-07-31

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	37594	Btuh	Total cooling load calculation	30927	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.1	41000	Sensible (SHR = 0.75)	118.1	30750
Heat Pump + Auxiliary(0.0kW)	109.1	41000	Latent	209.9	10250
			Total (Electric Heat Pump)	132.6	41000

WINTER CALCULATIONS

Winter Heating Load (for 2518 sqft)

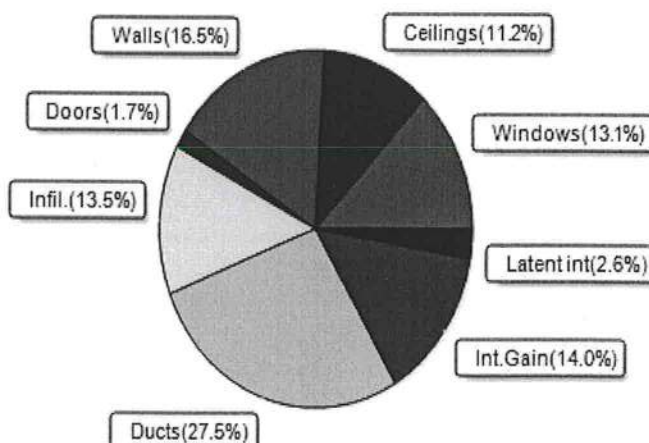
Load component		Load	
Window total	260 sqft	3640	Btuh
Wall total	2256 sqft	8010	Btuh
Door total	44 sqft	704	Btuh
Ceiling total	2518 sqft	2556	Btuh
Floor total	2518 sqft	12083	Btuh
Infiltration	101 cfm	4417	Btuh
Duct loss		6184	Btuh
Subtotal		37594	Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
TOTAL HEAT LOSS		37594	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2518 sqft)

Load component		Load	
Window total	260 sqft	4038	Btuh
Wall total	2256 sqft	5106	Btuh
Door total	44 sqft	528	Btuh
Ceiling total	2518 sqft	3451	Btuh
Floor total		0	Btuh
Infiltration	76 cfm	1574	Btuh
Internal gain		4320	Btuh
Duct gain		7028	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		26045	Btuh
Latent gain(ducts)		1471	Btuh
Latent gain(infiltration)		2611	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		800	Btuh
Total latent gain		4882	Btuh
TOTAL HEAT GAIN		30927	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-07-31

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Melissa Roberts
Cooley Way
Lake City, FL

Project Title:
230943 Roberts Res
Building Type: User

2023-07-31

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.25	Metal	0.35	N	26.7		14.0	373 Btuh
2	2, NFRC 0.25	Metal	0.35	N	30.0		14.0	420 Btuh
3	2, NFRC 0.25	Metal	0.35	W	13.3		14.0	187 Btuh
4	2, NFRC 0.25	Metal	0.35	N	12.0		14.0	168 Btuh
5	2, NFRC 0.25	Metal	0.35	N	30.0		14.0	420 Btuh
6	2, NFRC 0.25	Metal	0.35	E	6.7		14.0	93 Btuh
7	2, NFRC 0.25	Metal	0.35	S	30.0		14.0	420 Btuh
8	2, NFRC 0.25	Metal	0.35	S	15.0		14.0	210 Btuh
9	2, NFRC 0.25	Metal	0.35	S	15.0		14.0	210 Btuh
10	2, NFRC 0.25	Metal	0.35	S	5.3		14.0	75 Btuh
11	2, NFRC 0.25	Metal	0.35	S	16.0		14.0	224 Btuh
12	2, NFRC 0.25	Metal	0.35	S	30.0		14.0	420 Btuh
13	2, NFRC 0.25	Metal	0.35	W	30.0		14.0	420 Btuh
Window Total					260.0(sqft)			3640 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	100		3.55	355 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	270		3.55	959 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	120		3.55	426 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	148		3.55	525 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	140		3.55	497 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	170		3.55	604 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	333		3.55	1183 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	190		3.55	675 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	30		3.55	107 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	85		3.55	302 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.55	288 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	70		3.55	249 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	309		3.55	1096 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	210		3.55	746 Btuh
Wall Total					2256(sqft)			8010 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		13		16.0	213 Btuh
2	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
3	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
Door Total					44(sqft)			704Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Metal		(0.025)	38.0/0.0	2518		1.0	2556 Btuh
Ceiling Total					2518(sqft)			2556Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	256.0 ft(perim.)		47.2	12083 Btuh
Floor Total					2518 sqft			12083 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Mellissa Roberts
Cooley Way
Lake City, FL

Project Title:
230943 Roberts Res
Building Type: User

2023-07-31

	Envelope Subtotal:						26993 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.24	25180	1.00	100.7	4417 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.197)	6184 Btuh
All Zones	Sensible Subtotal All Zones						37594 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	37594 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	37594 Btuh

EQUIPMENT

1. Electric Heat Pump	#	41000 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

Mellissa Roberts
Cooley Way
Lake City, FL

Project Title:
230943 Roberts Res

2023-07-31

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

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	N	9.5ft	2.0ft	26.7	26.7	0.0	12	14	318 Btuh
2	2 NFRC	0.25, 0.35	No	No	N	1.5ft	3.0ft	30.0	30.0	0.0	12	14	357 Btuh
3	2 NFRC	0.25, 0.35	No	No	W	1.5ft	3.0ft	13.3	0.0	13.3	12	31	410 Btuh
4	2 NFRC	0.25, 0.35	No	No	N	1.5ft	5.0ft	12.0	12.0	0.0	12	14	143 Btuh
5	2 NFRC	0.25, 0.35	No	No	N	1.5ft	3.0ft	30.0	30.0	0.0	12	14	357 Btuh
6	2 NFRC	0.25, 0.35	No	No	E	1.5ft	6.0ft	6.7	0.0	6.7	12	31	205 Btuh
7	2 NFRC	0.25, 0.35	No	No	S	1.5ft	6.0ft	30.0	0.0	30.0	12	12	357 Btuh
8	2 NFRC	0.25, 0.35	No	No	S	1.5ft	3.0ft	15.0	0.0	15.0	12	12	179 Btuh
9	2 NFRC	0.25, 0.35	No	No	S	10.0f	2.0ft	15.0	0.0	15.0	12	12	179 Btuh
10	2 NFRC	0.25, 0.35	No	No	S	1.5ft	3.0ft	5.3	0.0	5.3	12	12	64 Btuh
11	2 NFRC	0.25, 0.35	No	No	S	1.5ft	3.0ft	16.0	0.0	16.0	12	12	191 Btuh
12	2 NFRC	0.25, 0.35	No	No	S	1.5ft	3.0ft	30.0	0.0	30.0	12	12	357 Btuh
13	2 NFRC	0.25, 0.35	No	No	W	1.5ft	3.0ft	30.0	0.0	30.0	12	31	923 Btuh
	Window Total					260 (sqft)							4038 Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load			
1	Frame - Wood - Ext		0.09		13.0/0.0		100.0		2.3		226 Btuh		
2	Frame - Wood - Ext		0.09		13.0/0.0		270.0		2.3		611 Btuh		
3	Frame - Wood - Ext		0.09		13.0/0.0		120.0		2.3		272 Btuh		
4	Frame - Wood - Ext		0.09		13.0/0.0		148.0		2.3		335 Btuh		
5	Frame - Wood - Ext		0.09		13.0/0.0		140.0		2.3		317 Btuh		
6	Frame - Wood - Ext		0.09		13.0/0.0		170.0		2.3		385 Btuh		
7	Frame - Wood - Ext		0.09		13.0/0.0		333.3		2.3		754 Btuh		
8	Frame - Wood - Ext		0.09		13.0/0.0		190.0		2.3		430 Btuh		
9	Frame - Wood - Ext		0.09		13.0/0.0		30.0		2.3		68 Btuh		
10	Frame - Wood - Ext		0.09		13.0/0.0		85.0		2.3		192 Btuh		
11	Frame - Wood - Ext		0.09		13.0/0.0		81.0		2.3		183 Btuh		
12	Frame - Wood - Ext		0.09		13.0/0.0		70.0		2.3		158 Btuh		
13	Frame - Wood - Ext		0.09		13.0/0.0		308.7		2.3		699 Btuh		
14	Frame - Wood - Ext		0.09		13.0/0.0		210.0		2.3		475 Btuh		
	Wall Total					2256 (sqft)					5106 Btuh		
Doors	Type	Area (sqft)		HTM		Load							
1	Insulated - Exterior		13.3		12.0	160 Btuh							
2	Insulated - Exterior		6.7		12.0	80 Btuh							
3	Insulated - Exterior		24.0		12.0	288 Btuh							
	Door Total					528 Btuh							
	44 (sqft)												
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load			
1	Vented Attic/DarkMetal		0.025		38.0/0.0		2518.0		1.37		3451 Btuh		
	Ceiling Total					2518 (sqft)					3451 Btuh		
Floors	Type	R-Value		Size		HTM		Load					
1	Slab On Grade		0.0		2518 (ft-perimeter)		0.0		0 Btuh				
	Floor Total					2518.0 (sqft)					0 Btuh		
	Envelope Subtotal:										13124 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Melissa Roberts
Cooley Way
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
230943 Roberts Res

2023-07-31

Infiltration	Type Natural	Average ACH 0.18	Volume(cuft) 25180	Wall Ratio 1	CFM= 75.5	Load 1574 Btuh
Internal gain		Occupants 4	Btuh/occupant X 230	Appliance +	3400	Load 4320 Btuh
					Sensible Envelope Load:	19017 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.370)	7028 Btuh
					Sensible Load All Zones	26045 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Melissa Roberts
Cooley Way
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
230943 Roberts Res

2023-07-31

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	19017 Btuh
	Sensible Duct Load	7028 Btuh
	Total Sensible Zone Loads	26045 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	26045 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2611 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1471 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4882 Btuh
	TOTAL GAIN	30927 Btuh

EQUIPMENT

1. Central Unit	#	41000 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

BACK UP MATERIAL

Prepared By:

Harry Moulton

TOTAL HEATING AND COOLING REQUIREMENTS

Page 2

For:

Name:

Melissa Roberts

Address:

220 NE DEB Gm

City:

LC FIA

(✓) Check Constr. Type	ITEM	AREA SQUARE FEET	DESIGN TEMPERATURE DIFFERENCE					DESIGN TEMP		COOLING MULT. (CIRCLE)	COOLING (BTUH GAIN)
			30°	35°	40°	45°	50°	90°	95°		
			HEATING MULTIPLIER (CIRCLE ONE)					HEATING (BTUH LOSS)			
	Gross Wall Area	<i>2526</i>									
	Glass Area (From page 1)	<i>202</i>						<i>11110</i>			<i>10085</i>
	Partitions, Frame										
	Finished 1 side, No Insulation		17	19	22	25	28		6.5	10.0	
	Finished 2 sides, No Insulation		9	11	12	14	16		4.5	6.0	
	Finished 2 sides, R-5		4	5	5.5	6	7		2.5	3.5	
	Finished 2 sides, R-11		2	3	3	4	4		2.0	2.5	
	Other										
	Doors (Excluding glass)										
	No weatherstripping		135	160	180	200	225		10.0	13.0	
	Weatherstripped	<i>72</i>	70	85	95	110	120	<i>6340</i>	10.0	13.0	<i>936</i>
	R-5 Insulation, No weatherstripping		123	144	164	185	205		4.3	5.5	
	R-5 Insulation, weatherstripping		68	79	90	101	113		4.0	5.0	
	Other										
	Net Exterior Walls										
	CBS Furred, No Insulation		9	10	12	13	14		4.5	6.0	
	CBS Furred, R-3 Insulation		5	6	7	8	8		3.0	4.2	
	CBS Furred, R-4 Insulation		4	5	6	6	7		2.7	3.8	
	CBS Furred, R-5 Insulation		4	5	5	6	6		2.5	3.5	
	Frame, No Insulation		8	9	10	11	13		5.5	7.0	
	Frame, R-11 Insulation	<i>2248</i>	2	2	3	3	4	<i>6744</i>	2.5	3.0	<i>6744</i>
	Frame, R-14 Insulation		1.5	1.7	2	2.5	3		2	2.8	
	Other										
	Ceiling under attic										
	No Insulation		18	21	24	27	30		9	7	10
	R-11 Insulation		2.4	2.8	3.2	3.5	3.9		2.5	2	3
	R-19 Insulation		1.5	1.7	1.9	2.2	2.4		1.5	1.5	2
	R-22 Insulation		1.2	1.5	1.7	1.9	2.1		1.5	1.0	1.5
	R-26 Insulation		1.1	1.3	1.4	1.6	1.8		1.3	1	1.5
	R-30 Insulation		1	1.1	1.3	1.4	1.6		1.1	.9	1.3
	Other	<i>2518</i>						<i>3273</i>			<i>3273</i>
	Floor, Concrete Slab										
	No Edge Insulation	Perimeter Ft.	35	40	40	45	45		0	0	
	Other										
	Subtotal							<i>27967</i>			<i>21038</i>
	People @ 300 & Appl. @ 1200										<i>7200</i>
	Sensible BTUH Gain										<i>28238</i>
	Duct BTUH Loss & Gain										
	2 In. Flex. or 1 In. Rigid										
	1 1/2 In. Rigid							<i>2797</i>	.10		<i>2824</i>
	Total BTUH Loss								.075		
	Subtotal BTUH Gain							<i>30764</i>			<i>31062</i>
	x 1.3 = Total BTUH Gain										<i>40387</i>



Calculated Heating Requirements

30764

Size of Unit Chosen

4 ton

% Oversized

% Undersized

BTUH

BTUH

Calculated Cooling Requirements

40387

Size of Unit Chosen

4 ton

% Oversized

% Undersized

BTUH

BTUH

2

HVAC WORKSHEET FOR WATT-WISE LIVING

DESIGN TEMPERATURE DIFFERENCE				
30°	35°	40°	45°	50°

[illegible]