

Residential System Sizing Calculation

Summary

James & Lora David

Project Title:
2065 Model

Lake City, FL 32025

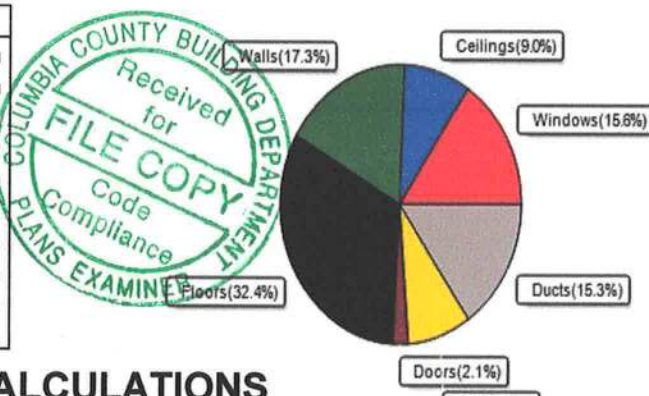
1/16/2020

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	29262	Btuh	Total cooling load calculation	21391	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	164.0	48000	Sensible (SHR = 0.85)	232.9	40800
Heat Pump + Auxiliary(0.0kW)	164.0	48000	Latent	186.1	7200
			Total (Electric Heat Pump)	224.4	48000

WINTER CALCULATIONS

Winter Heating Load (for 2065 sqft)

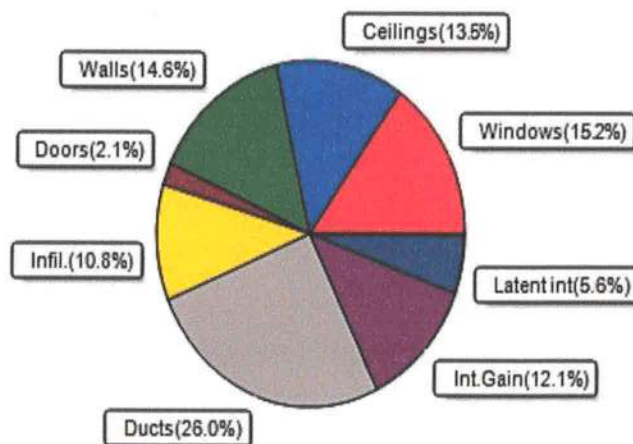
Load component		Load	
Window total	345 sqft	4553	Btuh
Wall total	1465 sqft	5071	Btuh
Door total	38 sqft	604	Btuh
Ceiling total	2065 sqft	2631	Btuh
Floor total	2065 sqft	9487	Btuh
Infiltration	56 cfm	2447	Btuh
Duct loss		4468	Btuh
Subtotal		29262	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		29262	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2065 sqft)

Load component		Load	
Window total	345 sqft	3244	Btuh
Wall total	1465 sqft	3131	Btuh
Door total	38 sqft	453	Btuh
Ceiling total	2065 sqft	2894	Btuh
Floor total		0	Btuh
Infiltration	42 cfm	872	Btuh
Internal gain		2580	Btuh
Duct gain		4348	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		17521	Btuh
Latent gain(ducts)		1223	Btuh
Latent gain(infiltration)		1447	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3870	Btuh
TOTAL HEAT GAIN		21391	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

James & Lora David

Project Title:
2065 Model

Lake City, FL 32025

1/16/2020

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	I-A	No	N	1.5ft	1.3ft	15.0	0.0	15.0	8	8	115	Btuh
2	2 NFRC	0.22, 0.33	I-A	No	N	9.5ft	1.3ft	96.0	0.0	96.0	8	8	736	Btuh
3	2 NFRC	0.22, 0.33	I-A	No	W	19.5f	1.3ft	18.0	18.0	0.0	8	15	138	Btuh
4	2 NFRC	0.22, 0.33	I-A	No	N	1.5ft	1.3ft	36.0	0.0	36.0	8	8	276	Btuh
5	2 NFRC	0.22, 0.33	I-A	No	N	1.5ft	1.3ft	30.0	0.0	30.0	8	8	230	Btuh
6	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	20.0	0.0	20.0	8	15	304	Btuh
7	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	12.0	0.0	12.0	8	15	182	Btuh
8	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	3.6	0.0	3.6	8	15	54	Btuh
9	2 NFRC	0.22, 0.33	I-A	No	S	6.5ft	1.3ft	24.0	24.0	0.0	8	9	184	Btuh
10	2 NFRC	0.22, 0.33	I-A	No	S	6.5ft	1.3ft	18.0	18.0	0.0	8	9	138	Btuh
11	2 NFRC	0.22, 0.33	I-A	No	S	6.5ft	1.3ft	13.3	13.3	0.0	8	9	102	Btuh
12	2 NFRC	0.22, 0.33	I-A	No	S	1.5ft	1.3ft	15.0	15.0	0.0	8	9	115	Btuh
13	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	40.0	0.0	40.0	8	15	608	Btuh
14	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	4.0	0.0	4.0	8	15	61	Btuh
Window Total								345 (sqft)					3244 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
				Cav/Sheath										
1	Frame - Wood - Ext	0.09		13.0/0.6		102.0		2.2		224 Btuh				
2	Frame - Wood - Ext	0.09		13.0/0.6		63.0		2.2		138 Btuh				
3	Frame - Wood - Ext	0.09		13.0/0.6		54.0		2.2		119 Btuh				
4	Frame - Wood - Ext	0.09		13.0/0.6		81.0		2.2		178 Btuh				
5	Frame - Wood - Ext	0.09		13.0/0.6		72.0		2.2		158 Btuh				
6	Frame - Wood - Ext	0.09		13.0/0.6		96.0		2.2		211 Btuh				
7	Frame - Wood - Ext	0.09		13.0/0.6		124.0		2.2		273 Btuh				
8	Frame - Wood - Ext	0.09		13.0/0.6		27.0		2.2		59 Btuh				
9	Frame - Wood - Ext	0.09		13.0/0.6		137.4		2.2		302 Btuh				
10	Frame - Wood - Ext	0.09		13.0/0.6		27.0		2.2		59 Btuh				
11	Frame - Wood - Ext	0.09		13.0/0.6		136.2		2.2		299 Btuh				
12	Frame - Wood - Ext	0.09		13.0/0.6		22.5		2.2		49 Btuh				
13	Frame - Wood - Ext	0.09		13.0/0.6		9.0		2.2		20 Btuh				
14	Frame - Wood - Ext	0.09		13.0/0.6		45.0		2.2		99 Btuh				
15	Frame - Wood - Ext	0.09		13.0/0.6		9.0		2.2		20 Btuh				
16	Frame - Wood - Ext	0.09		13.0/0.6		30.0		2.2		66 Btuh				
17	Frame - Wood - Ext	0.09		13.0/0.6		253.0		2.2		556 Btuh				
18	Frame - Wood - Adj	0.09		13.0/0.0		177.2		1.7		299 Btuh				
Wall Total						1465 (sqft)					3131 Btuh			
Doors	Type					Area (sqft)		HTM		Load				
1	Insulated - Exterior					20.0		12.0		240 Btuh				
2	Insulated - Garage					17.8		12.0		213 Btuh				
Door Total						38 (sqft)					453 Btuh			
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/Light/Shingle	0.032		30.0/0.0		2065.0		1.40		2894 Btuh				
Ceiling Total						2065 (sqft)					2894 Btuh			
Floors	Type			R-Value		Size		HTM		Load				
1	Slab On Grade			0.0		2065 (ft-perimeter)		0.0		0 Btuh				
Floor Total						2065.0 (sqft)					0 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

James & Lora David

Project Title:
2065 Model

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32025

1/16/2020

	Envelope Subtotal:					9721 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.14	18585	1	41.9	872 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	1200	2580 Btuh
	Sensible Envelope Load:					13173 Btuh
Duct load	Average sealed, Supply(R8.0-Attic), Return(R8.0-Attic)				(DGM of 0.330)	4348 Btuh
	Sensible Load All Zones					17521 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

James & Lora David

Project Title:
2065 Model

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32025

1/16/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	13173 Btuh
	Sensible Duct Load	4348 Btuh
	Total Sensible Zone Loads	17521 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17521 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1447 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1223 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3870 Btuh
	TOTAL GAIN	21391 Btuh

EQUIPMENT

1. Central Unit	#	48000 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

James & Lora David

Project Title:

2065 Model

Lake City, FL 32025

Building Type: User

1/16/2020

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	96.0		13.2	1267 Btuh
3	2, NFRC 0.22	Vinyl	0.33	W	18.0		13.2	238 Btuh
4	2, NFRC 0.22	Vinyl	0.33	N	36.0		13.2	475 Btuh
5	2, NFRC 0.22	Vinyl	0.33	N	30.0		13.2	396 Btuh
6	2, NFRC 0.22	Vinyl	0.33	E	20.0		13.2	264 Btuh
7	2, NFRC 0.22	Vinyl	0.33	E	12.0		13.2	158 Btuh
8	2, NFRC 0.22	Vinyl	0.33	E	3.6		13.2	47 Btuh
9	2, NFRC 0.22	Vinyl	0.33	S	24.0		13.2	317 Btuh
10	2, NFRC 0.22	Vinyl	0.33	S	18.0		13.2	238 Btuh
11	2, NFRC 0.22	Vinyl	0.33	S	13.3		13.2	176 Btuh
12	2, NFRC 0.22	Vinyl	0.33	S	15.0		13.2	198 Btuh
13	2, NFRC 0.22	Vinyl	0.33	E	40.0		13.2	528 Btuh
14	2, NFRC 0.22	Vinyl	0.33	E	4.0		13.2	53 Btuh
Window Total					344.9(sqft)			4553 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	102		3.45	352 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	63		3.45	217 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	54		3.45	186 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	81		3.45	279 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	72		3.45	248 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	96		3.45	331 Btuh
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	124		3.45	428 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	27		3.45	93 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	137		3.45	474 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	27		3.45	93 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	136		3.45	470 Btuh
12	Frame - Wood	- Ext	(0.086)	13.0/0.6	23		3.45	78 Btuh
13	Frame - Wood	- Ext	(0.086)	13.0/0.6	9		3.45	31 Btuh
14	Frame - Wood	- Ext	(0.086)	13.0/0.6	45		3.45	155 Btuh
15	Frame - Wood	- Ext	(0.086)	13.0/0.6	9		3.45	31 Btuh
16	Frame - Wood	- Ext	(0.086)	13.0/0.6	30		3.45	103 Btuh
17	Frame - Wood	- Ext	(0.086)	13.0/0.6	253		3.45	872 Btuh
18	Frame - Wood	- Adj	(0.089)	13.0/0.0	177		3.55	629 Btuh
Wall Total					1465(sqft)			5071 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		20		16.0	320 Btuh
2	Insulated - Garage,	n	(0.400)		18		16.0	284 Btuh
Door Total					38(sqft)			604Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

James & Lora David

Project Title:

2065 Model

Lake City, FL 32025

Building Type: User

1/16/2020

Ceilings 1	Type/Color/Surface Vented Attic/L/Shing Ceiling Total	Ueff. (0.032)	R-Value 30.0/0.0	Area X 2065 2065(sqft)	HTM= 1.3	Load 2631 Btuh 2631Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 201.0 ft(perim.) 2065 sqft	HTM= 47.2	Load 9487 Btuh 9487 Btuh
Envelope Subtotal:						22346 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.18	Volume(cuft) 18585	Wall Ratio 1.00	CFM= 55.9	2447 Btuh
Duct load	Average sealed, R8.0, Supply(Att), Return(Att) (DLM of 0.180)					4468 Btuh
All Zones	Sensible Subtotal All Zones					29262 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	29262 Btuh 0 Btuh 29262 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	48000 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