

Residential System Sizing Calculation

Summary

Spec House

Project Title:

Ivy Model

Lake City, FL 32024

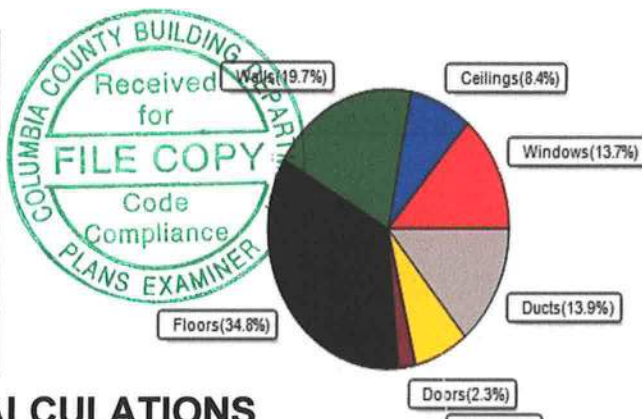
5/5/2021

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	27277 Btuh	Total cooling load calculation	23484 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	154.0 42000	Sensible (SHR = 0.80)	167.8 33600
Heat Pump + Auxiliary(0.0kW)	154.0 42000	Latent	242.9 8400
		Total (Electric Heat Pump)	178.8 42000

WINTER CALCULATIONS

Winter Heating Load (for 1807 sqft)

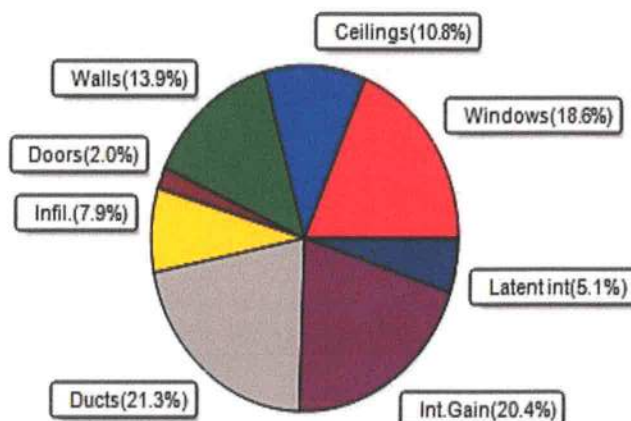
Load component		Load	
Window total	282 sqft	3727	Btuh
Wall total	1512 sqft	5368	Btuh
Door total	40 sqft	640	Btuh
Ceiling total	1807 sqft	2302	Btuh
Floor total	1807 sqft	9487	Btuh
Infiltration	45 cfm	1950	Btuh
Duct loss		3802	Btuh
Subtotal		27277	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		27277	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1807 sqft)

Load component		Load	
Window total	282 sqft	4372	Btuh
Wall total	1512 sqft	3261	Btuh
Door total	40 sqft	480	Btuh
Ceiling total	1807 sqft	2532	Btuh
Floor total		0	Btuh
Infiltration	33 cfm	695	Btuh
Internal gain		4780	Btuh
Duct gain		3904	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		20025	Btuh
Latent gain(ducts)		1106	Btuh
Latent gain(infiltration)		1153	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3459	Btuh
TOTAL HEAT GAIN		23484	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

5-5-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Spec House

Project Title:

Ivy Model

Lake City, FL 32024

5/5/2021

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	9.5ft	1.3ft	90.0	0.0	90.0	11	11	981 Btuh
2	2 NFRC	0.22, 0.33	No	No	N	9.5ft	1.3ft	24.0	0.0	24.0	11	11	262 Btuh
3	2 NFRC	0.22, 0.33	No	No	W	1.5ft	1.3ft	36.0	0.0	36.0	11	27	989 Btuh
4	2 NFRC	0.22, 0.33	No	No	N	1.5ft	1.3ft	24.0	0.0	24.0	11	11	262 Btuh
5	2 NFRC	0.22, 0.33	No	No	N	1.5ft	1.3ft	20.0	0.0	20.0	11	11	218 Btuh
6	2 NFRC	0.22, 0.33	No	No	N	1.5ft	1.3ft	12.0	0.0	12.0	11	11	131 Btuh
7	2 NFRC	0.22, 0.33	No	No	S	7.5ft	1.3ft	13.3	13.3	0.0	11	13	145 Btuh
8	2 NFRC	0.22, 0.33	No	No	S	1.5ft	1.3ft	36.0	36.0	0.0	11	13	392 Btuh
9	2 NFRC	0.22, 0.33	No	No	W	1.5ft	1.3ft	9.0	0.0	9.0	11	27	247 Btuh
10	2 NFRC	0.22, 0.33	No	No	W	1.5ft	1.3ft	18.0	0.0	18.0	11	27	495 Btuh
Excursion													251 Btuh
Window Total								282 (sqft)					4372 Btuh
Walls	Type	U-Value				R-Value		Area(sqft)		HTM		Load	
						Cav/Sheath							
1	Frame - Wood - Ext					0.09	13.0/0.0	142.5			2.3	323 Btuh	
2	Frame - Wood - Ext					0.09	13.0/0.0	15.0			2.3	34 Btuh	
3	Frame - Wood - Ext					0.09	13.0/0.0	73.0			2.3	165 Btuh	
4	Frame - Wood - Ext					0.09	13.0/0.0	348.0			2.3	788 Btuh	
5	Frame - Wood - Ext					0.09	13.0/0.0	40.0			2.3	91 Btuh	
6	Frame - Wood - Ext					0.09	13.0/0.0	76.5			2.3	173 Btuh	
7	Frame - Wood - Ext					0.09	13.0/0.0	97.5			2.3	221 Btuh	
8	Frame - Wood - Ext					0.09	13.0/0.0	441.0			2.3	998 Btuh	
9	Frame - Wood - Adj					0.09	13.0/0.0	278.5			1.7	470 Btuh	
Wall Total								1512 (sqft)					3261 Btuh
Doors	Type							Area (sqft)		HTM		Load	
1	Insulated - Exterior							20.0		12.0		240 Btuh	
2	Insulated - Garage							20.0		12.0		240 Btuh	
Door Total								40 (sqft)					480 Btuh
Ceilings	Type/Color/Surface	U-Value				R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/Light/Shingle	0.032				30.0/0.0		1807.0		1.40		2532 Btuh	
Ceiling Total								1807 (sqft)					2532 Btuh
Floors	Type					R-Value		Size		HTM		Load	
1	Slab On Grade					0.0		1807 (ft-perimeter)		0.0		0 Btuh	
Floor Total								1807.0 (sqft)					0 Btuh
Envelope Subtotal:												10646 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Spec House

Project Title:

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

Ivy Model

5/5/2021

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 16263	Wall Ratio 1	CFM= 33.4	Load 695 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
	Sensible Envelope Load:					16121 Btuh
Duct load	Average sealed, Supply(R8.0-Attic), Return(R8.0-Attic) (DGM of 0.242)					3904 Btuh
	Sensible Load All Zones					20025 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Spec House

Project Title:
Ivy Model

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

5/5/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16121 Btuh
	Sensible Duct Load	3904 Btuh
	Total Sensible Zone Loads	20025 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	20025 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1153 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1106 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3459 Btuh
	TOTAL GAIN	23484 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(½))
 (Ornt - compass orientation)



Version 8

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Spec House

Project Title:

Ivy Model

Lake City, FL 32024

Building Type: User

5/5/2021

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	90.0		13.2	1188 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	24.0		13.2	317 Btuh
3	2, NFRC 0.22	Vinyl	0.33	W	36.0		13.2	475 Btuh
4	2, NFRC 0.22	Vinyl	0.33	N	24.0		13.2	317 Btuh
5	2, NFRC 0.22	Vinyl	0.33	N	20.0		13.2	264 Btuh
6	2, NFRC 0.22	Vinyl	0.33	N	12.0		13.2	158 Btuh
7	2, NFRC 0.22	Vinyl	0.33	S	13.3		13.2	176 Btuh
8	2, NFRC 0.22	Vinyl	0.33	S	36.0		13.2	475 Btuh
9	2, NFRC 0.22	Vinyl	0.33	W	9.0		13.2	119 Btuh
10	2, NFRC 0.22	Vinyl	0.33	W	18.0		13.2	238 Btuh
Window Total					282.3(sqft)			3727 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	143		3.55	506 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	15		3.55	53 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	73		3.55	259 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	348		3.55	1236 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	40		3.55	142 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	77		3.55	272 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	98		3.55	346 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	441		3.55	1566 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	279		3.55	989 Btuh
Wall Total					1512(sqft)			5368 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)		20		16.0	320 Btuh
Door Total					40(sqft)			640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	1807		1.3	2302 Btuh
Ceiling Total					1807(sqft)			2302Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	201.0 ft(perim.)		47.2	9487 Btuh
Floor Total					1807 sqft			9487 Btuh
Envelope Subtotal:								21524 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.16	16263	1.00	44.5		1950 Btuh
Duct load	Average sealed, R8.0, Supply(Att), Return(Att) (DLM of 0.162)							3802 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Spec House

Project Title:

Ivy Model

Lake City, FL 32024

Building Type: User

5/5/2021

All Zones	Sensible Subtotal All Zones	27277 Btuh
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WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	27277 Btuh 0 Btuh 27277 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