

Residential System Sizing Calculation

Summary

Derrick & Kristi Hall

Project Title:

Derrick & Kristi Hall Residence

Lake City, FL 32055

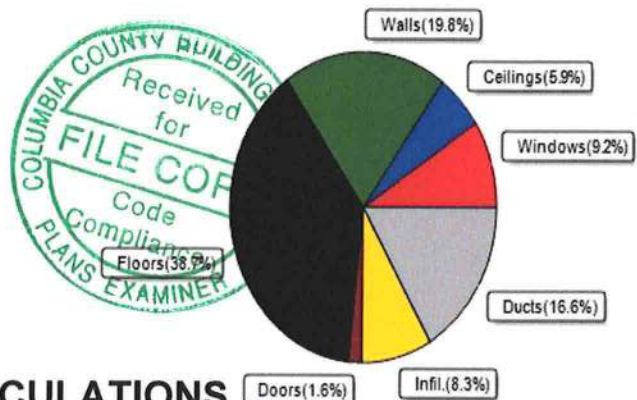
9/4/2020

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	45005	Btuh	Total cooling load calculation	30750	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	94.3	42443	Sensible (SHR = 0.70)	94.5	23815
Heat Pump + Auxiliary(0.0kW)	94.3	42443	Latent	183.9	10207
			Total (Electric Heat Pump)	110.6	34022

WINTER CALCULATIONS

Winter Heating Load (for 2478 sqft)

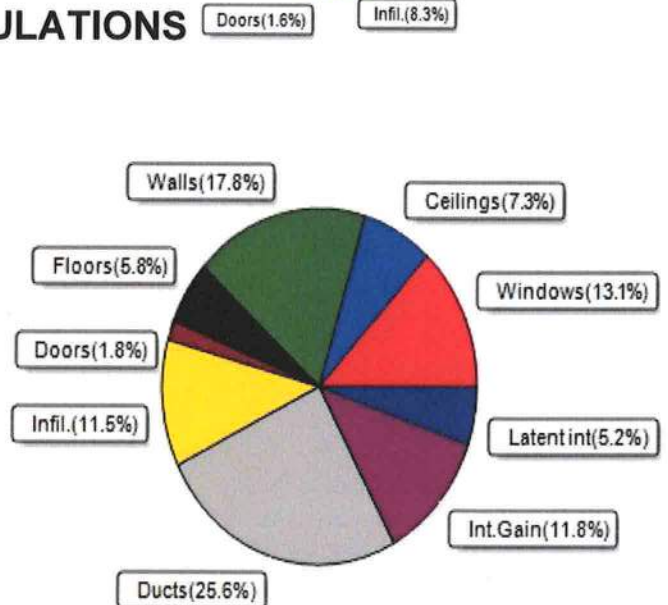
Load component		Load
Window total	286 sqft	4123 Btuh
Wall total	2504 sqft	8890 Btuh
Door total	40 sqft	736 Btuh
Ceiling total	2602 sqft	2642 Btuh
Floor total	See detail report	17396 Btuh
Infiltration	85 cfm	3739 Btuh
Duct loss		7479 Btuh
Subtotal		45005 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		45005 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2478 sqft)

Load component		Load
Window total	286 sqft	4040 Btuh
Wall total	2504 sqft	5475 Btuh
Door total	40 sqft	552 Btuh
Ceiling total	2602 sqft	2245 Btuh
Floor total		1777 Btuh
Infiltration	64 cfm	1332 Btuh
Internal gain		3640 Btuh
Duct gain		6138 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		25199 Btuh
Latent gain(ducts)		1741 Btuh
Latent gain(infiltration)		2210 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1600 Btuh
Total latent gain		5551 Btuh
TOTAL HEAT GAIN		30750 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

9/4/2020

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Derrick & Kristi Hall

Project Title:

Derrick & Kristi Hall Residence

Lake City, FL 32055

Building Type: User

9/4/2020

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	10.0		14.4	144 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	30.0		14.4	432 Btuh
3	2, NFRC 0.25	TIM	0.36	S	13.3		14.4	192 Btuh
4	2, NFRC 0.25	Vinyl	0.36	S	15.0		14.4	216 Btuh
5	2, NFRC 0.25	Vinyl	0.36	E	6.0		14.4	86 Btuh
6	2, NFRC 0.25	Vinyl	0.36	E	4.0		14.4	58 Btuh
7	2, NFRC 0.25	Vinyl	0.36	E	15.0		14.4	216 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
9	2, NFRC 0.25	Vinyl	0.36	N	45.0		14.4	648 Btuh
10	2, NFRC 0.25	TIM	0.36	E	40.0		14.4	576 Btuh
11	2, NFRC 0.25	Vinyl	0.36	N	30.0		14.4	432 Btuh
12	2, NFRC 0.25	Vinyl	0.36	N	30.0		14.4	432 Btuh
13	2, NFRC 0.25	Vinyl	0.36	N	10.0		14.4	144 Btuh
14	2, NFRC 0.25	Vinyl	0.36	W	8.0		14.4	115 Btuh
15	2, NFRC 0.25	Vinyl	0.36	S	15.0		14.4	216 Btuh
Window Total					286.3(sqft)			4123 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	70		3.55	247 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	123		3.55	436 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	105		3.55	373 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	353		3.55	1253 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	105		3.55	373 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	126		3.55	447 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	119		3.55	421 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	50		3.55	178 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 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	247		3.55	877 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	208		3.55	738 Btuh
15	Frame - Wood	- Adj	(0.089)	13.0/0.0	126		3.55	447 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	86		3.55	307 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	208		3.55	738 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	208		3.55	738 Btuh
Wall Total					2504(sqft)			8890 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		20		18.4	368 Btuh
2	Insulated - Garage, n		(0.460)		20		18.4	368 Btuh
Door Total					40(sqft)			736Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Derrick & Kristi Hall

Project Title:

Derrick & Kristi Hall Residence

Lake City, FL 32055

Building Type: User

9/4/2020

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.025)	38.0/0.0	2255	1.0	2289 Btuh
2	Vented Attic/L/Shing	(0.025)	38.0/0.0	347	1.0	352 Btuh
	Ceiling Total			2602(sqft)		2642Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	261.0 ft(perim.)	47.2	12319 Btuh
2	Raised Wood - Adj	(0.385)	0.0	330.0 sqft	15.4	5077 Btuh
	Floor Total			2478 sqft		17396 Btuh
Envelope Subtotal:						33787 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=
	Natural		0.23	21972	1.00	85.4
						3739 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.199)	7479 Btuh
All Zones	Sensible Subtotal All Zones					45005 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	45005 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	45005 Btuh

EQUIPMENT

1. Electric Heat Pump	#	42443 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

Derrick & Kristi Hall

Project Title:

Derrick & Kristi Hall Residence

Lake City, FL 32055

9/4/2020

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	1.5ft.	1.0ft.	10.0	10.0	0.0	12	14	121	Btuh	
2	2 NFRC	0.25, 0.36	No	No	S	7.5ft.	1.0ft.	30.0	30.0	0.0	12	14	363	Btuh	
3	2 NFRC	0.25, 0.36	No	No	S	7.5ft.	1.0ft.	13.3	13.3	0.0	12	14	161	Btuh	
4	2 NFRC	0.25, 0.36	No	No	S	1.5ft.	1.0ft.	15.0	15.0	0.0	12	14	181	Btuh	
5	2 NFRC	0.25, 0.36	No	No	E	1.5ft.	1.0ft.	6.0	0.5	5.5	12	31	176	Btuh	
6	2 NFRC	0.25, 0.36	No	No	E	1.5ft.	1.0ft.	4.0	1.0	3.0	12	31	105	Btuh	
7	2 NFRC	0.25, 0.36	No	No	E	1.5ft.	1.0ft.	15.0	0.7	14.3	12	31	450	Btuh	
8	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	1.0ft.	15.0	0.0	15.0	12	12	181	Btuh	
9	2 NFRC	0.25, 0.36	No	No	N	18.0f	1.0ft.	45.0	0.0	45.0	12	12	544	Btuh	
10	2 NFRC	0.25, 0.36	No	No	E	16.0f	1.0ft.	40.0	40.0	0.0	12	31	484	Btuh	
11	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	1.0ft.	30.0	0.0	30.0	12	12	363	Btuh	
12	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	1.0ft.	30.0	0.0	30.0	12	12	363	Btuh	
13	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	1.0ft.	10.0	0.0	10.0	12	12	121	Btuh	
14	2 NFRC	0.25, 0.36	No	No	W	1.5ft.	1.0ft.	8.0	1.0	7.0	12	31	229	Btuh	
15	2 NFRC	0.25, 0.36	No	No	S	1.0ft.	3.0ft.	15.0	8.0	7.0	12	14	195	Btuh	
	Window Total							286 (sqft)					4040 Btuh		
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext		0.09		13.0/0.0		69.5		2.3	157	Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.0		36.0		2.3	81	Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.0		122.7		2.3	278	Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.0		105.0		2.3	238	Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.0		353.0		2.3	799	Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.0		105.0		2.3	238	Btuh				
7	Frame - Wood - Ext		0.09		13.0/0.0		126.0		2.3	285	Btuh				
8	Frame - Wood - Ext		0.09		13.0/0.0		118.5		2.3	268	Btuh				
9	Frame - Wood - Ext		0.09		13.0/0.0		50.0		2.3	113	Btuh				
10	Frame - Wood - Ext		0.09		13.0/0.0		72.0		2.3	163	Btuh				
11	Frame - Wood - Ext		0.09		13.0/0.0		72.0		2.3	163	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		247.0		2.3	559	Btuh				
14	Frame - Wood - Adj		0.09		13.0/0.0		208.0		1.7	351	Btuh				
15	Frame - Wood - Adj		0.09		13.0/0.0		126.0		1.7	212	Btuh				
16	Frame - Wood - Ext		0.09		13.0/0.0		86.3		2.3	195	Btuh				
17	Frame - Wood - Ext		0.09		13.0/0.0		208.0		2.3	471	Btuh				
18	Frame - Wood - Ext		0.09		13.0/0.0		208.0		2.3	471	Btuh				
	Wall Total							2504 (sqft)			5475 Btuh				
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior		20.0		13.8	276	Btuh								
2	Insulated - Garage		20.0		13.8	276	Btuh								
	Door Total		40 (sqft)		552 Btuh										
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load									
1	Vented Attic/Light/Shingle/RB	0.025	38.0/0.0	2255.0	0.86	1946	Btuh								
2	Vented Attic/Light/Shingle/RB	0.025	38.0/0.0	347.0	0.86	299	Btuh								
	Ceiling Total			2602 (sqft)		2245 Btuh									
Floors	Type	R-Value		Size		Load									
1	Slab On Grade		0.0	2148 (ft-perimeter)		0.0	0 Btuh								
2	Raised Wood - Adj		0.0	330 (sqft)		5.4	1777 Btuh								
	Floor Total			2478.0 (sqft)		1777 Btuh									

Manual J Summer Calculations

Residential Load - Component Details (continued)

Derrick & Kristi Hall

Project Title:

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32055

Derrick & Kristi Hall Residence

9/4/2020

	Envelope Subtotal:					14089 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	21972	1	64.0	1332 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		8	X 230	+	1800	3640 Btuh
	Sensible Envelope Load:					19061 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.322)	6138 Btuh
	Sensible Load All Zones					25199 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Derrick & Kristi Hall

Project Title:

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32055

Derrick & Kristi Hall Residence

9/4/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	19061 Btuh
	Sensible Duct Load	6138 Btuh
	Total Sensible Zone Loads	25199 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	25199 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2210 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1741 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5551 Btuh
	TOTAL GAIN	30750 Btuh

EQUIPMENT

1. Central Unit	#	34022 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