

Residential System Sizing Calculation

Summary

Buchanan, Constance
Pinemount Road
Lake City, FL

Project Title:
201350 Buchanan

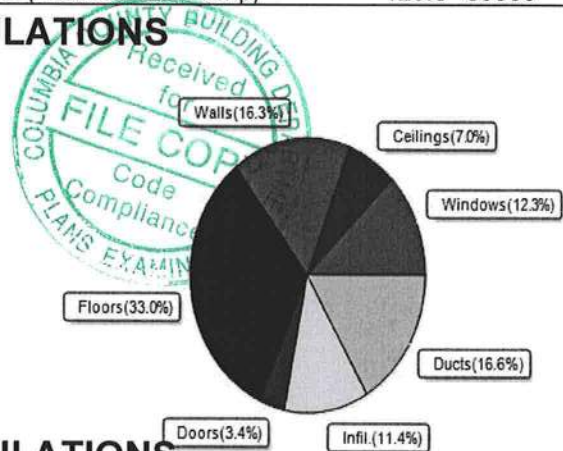
2020-12-16

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	35567 Btuh	Total cooling load calculation	31080 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.7 39000	Sensible (SHR = 0.75)	112.1 29250
Heat Pump + Auxiliary(0.0kW)	109.7 39000	Latent	195.3 9750
		Total (Electric Heat Pump)	125.5 39000

WINTER CALCULATIONS

Winter Heating Load (for 2436 sqft)

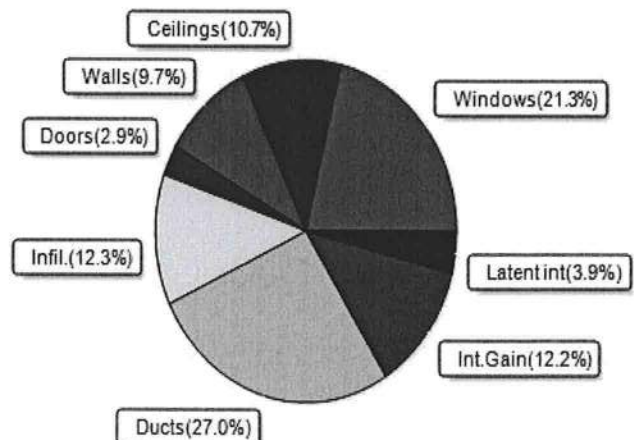
Load component		Load	
Window total	343 sqft	4384	Btuh
Wall total	1820 sqft	5808	Btuh
Door total	76 sqft	1216	Btuh
Ceiling total	2436 sqft	2473	Btuh
Floor total	2436 sqft	11753	Btuh
Infiltration	92 cfm	4042	Btuh
Duct loss		5891	Btuh
Subtotal		35567	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		35567	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2436 sqft)

Load component		Load	
Window total	343 sqft	6617	Btuh
Wall total	1820 sqft	3022	Btuh
Door total	76 sqft	912	Btuh
Ceiling total	2436 sqft	3339	Btuh
Floor total		0	Btuh
Infiltration	69 cfm	1440	Btuh
Internal gain		3780	Btuh
Duct gain		6978	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		26087	Btuh
Latent gain(ducts)		1404	Btuh
Latent gain(infiltration)		2389	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		4993	Btuh
TOTAL HEAT GAIN		31080	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-12-16

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Buchanan, Constance
Pinemount Road
Lake City, FL

Project Title:
201350 Buchanan
Building Type: User

2020-12-16

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	Metal	0.32	W	45.0		12.8	576 Btuh
2	2, NFRC 0.22	Metal	0.32	NW	16.0		12.8	205 Btuh
3	2, NFRC 0.22	Metal	0.32	W	54.0		12.8	691 Btuh
4	2, NFRC 0.22	Metal	0.32	S	16.0		12.8	205 Btuh
5	2, NFRC 0.22	Metal	0.32	W	54.0		12.8	691 Btuh
6	2, NFRC 0.22	Metal	0.32	N	15.0		12.8	192 Btuh
7	2, NFRC 0.22	Metal	0.32	E	45.0		12.8	576 Btuh
8	2, NFRC 0.22	Metal	0.32	S	13.5		12.8	173 Btuh
9	2, NFRC 0.22	Metal	0.32	S	60.0		12.8	768 Btuh
10	2, NFRC 0.22	Metal	0.32	S	8.0		12.8	102 Btuh
11	2, NFRC 0.22	Metal	0.32	S	16.0		12.8	205 Btuh
Window Total					342.5(sqft)			4384 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	90		3.09	278 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	32		3.09	97 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	12		3.09	37 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	98		3.09	301 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	60		3.09	185 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	90		3.09	278 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	375		3.09	1158 Btuh
8	Frame - Wood	- Adj	(0.089)	13.0/0.0	119		3.55	422 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	9		3.55	32 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	20		3.55	69 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	90		3.55	320 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	23		3.55	80 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	25		3.55	88 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	116		3.55	413 Btuh
15	Frame - Wood	- Ext	(0.077)	19.0/0.0	25		3.09	77 Btuh
16	Frame - Wood	- Ext	(0.077)	19.0/0.0	65		3.09	202 Btuh
17	Frame - Wood	- Ext	(0.077)	19.0/0.0	99		3.09	306 Btuh
18	Frame - Wood	- Ext	(0.077)	19.0/0.0	474		3.09	1465 Btuh
Wall Total					1820(sqft)			5808 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		8		16.0	128 Btuh
2	Insulated - Exterior,	n	(0.400)		8		16.0	128 Btuh
3	Insulated - Exterior,	n	(0.400)		20		16.0	320 Btuh
4	Insulated - Garage,	n	(0.400)		20		16.0	320 Btuh
5	Insulated - Exterior,	n	(0.400)		20		16.0	320 Btuh
Door Total					76(sqft)			1216Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Buchanan, Constance
Pinemount Road
Lake City, FL

Project Title:
201350 Buchanan
Building Type: User

2020-12-16

Ceilings 1	Type/Color/Surface Vented Attic/D/Metal Ceiling Total	Ueff. (0.025)	R-Value 38.0/0.0	Area X 2436 2436(sqft)	HTM= 1.0	Load 2473 Btuh 2473Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 249.0 ft(perim.) 2436 sqft	HTM= 47.2	Load 11753 Btuh 11753 Btuh
Envelope Subtotal:						25634 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.25	Volume(cuft) 21924	Wall Ratio 1.00	CFM= 92.3	4042 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.199)					5891 Btuh
All Zones	Sensible Subtotal All Zones					35567 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	35567 Btuh 0 Btuh 35567 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	39000 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

Buchanan, Constance
Pinemount Road
Lake City, FL

Project Title:
201350 Buchanan

2020-12-16

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, 0.32	No	No	W		1.5ft	1.0ft	45.0	2.2	42.8	11	27	1191	Btuh	
2	2 NFRC	0.22, 0.32	No	No	NW		19.0f	1.0ft	16.0	0.0	16.0	11	21	334	Btuh	
3	2 NFRC	0.22, 0.32	No	No	W		15.5f	1.0ft	54.0	54.0	0.0	11	27	578	Btuh	
4	2 NFRC	0.22, 0.32	No	No	S		22.1f	1.0ft	16.0	16.0	0.0	11	12	171	Btuh	
5	2 NFRC	0.22, 0.32	No	No	W		1.5ft	1.0ft	54.0	2.2	51.8	11	27	1437	Btuh	
6	2 NFRC	0.22, 0.32	No	No	N		1.5ft	1.0ft	15.0	0.0	15.0	11	11	161	Btuh	
7	2 NFRC	0.22, 0.32	No	No	E		1.5ft	1.0ft	45.0	1.8	43.2	11	27	1198	Btuh	
8	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.0ft	13.5	13.5	0.0	11	12	145	Btuh	
9	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.0ft	60.0	60.0	0.0	11	12	642	Btuh	
10	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.0ft	8.0	8.0	0.0	11	12	86	Btuh	
11	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.0ft	16.0	16.0	0.0	11	12	171	Btuh	
	Excursion													503	Btuh	
	Window Total									343 (sqft)					6617	Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load						
1	Frame - Wood - Ext		0.08		19.0/0.0		90.0		1.7		149	Btuh				
2	Frame - Wood - Ext		0.08		19.0/0.0		31.5		1.7		52	Btuh				
3	Frame - Wood - Ext		0.08		19.0/0.0		12.0		1.7		20	Btuh				
4	Frame - Wood - Ext		0.08		19.0/0.0		97.5		1.7		161	Btuh				
5	Frame - Wood - Ext		0.08		19.0/0.0		60.0		1.7		99	Btuh				
6	Frame - Wood - Ext		0.08		19.0/0.0		90.0		1.7		149	Btuh				
7	Frame - Wood - Ext		0.08		19.0/0.0		374.5		1.7		619	Btuh				
8	Frame - Wood - Adj		0.09		13.0/0.0		118.8		1.7		200	Btuh				
9	Frame - Wood - Adj		0.09		13.0/0.0		9.0		1.7		15	Btuh				
10	Frame - Wood - Adj		0.09		13.0/0.0		19.5		1.7		33	Btuh				
11	Frame - Wood - Adj		0.09		13.0/0.0		90.0		1.7		152	Btuh				
12	Frame - Wood - Adj		0.09		13.0/0.0		22.5		1.7		38	Btuh				
13	Frame - Wood - Adj		0.09		13.0/0.0		24.8		1.7		42	Btuh				
14	Frame - Wood - Adj		0.09		13.0/0.0		116.3		1.7		196	Btuh				
15	Frame - Wood - Ext		0.08		19.0/0.0		25.0		1.7		41	Btuh				
16	Frame - Wood - Ext		0.08		19.0/0.0		65.3		1.7		108	Btuh				
17	Frame - Wood - Ext		0.08		19.0/0.0		99.0		1.7		164	Btuh				
18	Frame - Wood - Ext		0.08		19.0/0.0		474.0		1.7		784	Btuh				
	Wall Total								1820 (sqft)					3022	Btuh	
Doors	Type	U-Value		R-Value		Area (sqft)		HTM		Load						
1	Insulated - Exterior						8.0		12.0		96	Btuh				
2	Insulated - Exterior						8.0		12.0		96	Btuh				
3	Insulated - Exterior						20.0		12.0		240	Btuh				
4	Insulated - Garage						20.0		12.0		240	Btuh				
5	Insulated - Exterior						20.0		12.0		240	Btuh				
	Door Total								76 (sqft)					912	Btuh	
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load						
1	Vented Attic/DarkMetal		0.025		38.0/0.0		2436.0		1.37		3339	Btuh				
	Ceiling Total								2436 (sqft)					3339	Btuh	
Floors	Type	U-Value		R-Value		Size		HTM		Load						
1	Slab On Grade				0.0		2436 (ft-perimeter)		0.0		0	Btuh				
	Floor Total								2436.0 (sqft)					0	Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Buchanan, Constance
Pinemount Road
Lake City, FL

Project Title:
201350 Buchanan

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-16

	Envelope Subtotal:					13890 Btuh
Infiltration	Type Natural	Average ACH 0.19	Volume(cuft) 21924	Wall Ratio 1	CFM= 69.2	Load 1440 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
	Sensible Envelope Load:					19110 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.365)	6978 Btuh
	Sensible Load All Zones					26087 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Buchanan, Constance
Pinemount Road
Lake City, FL

Project Title:
201350 Buchanan

Climate: FL_GAINESVILLE_REGIONAL_A

2020-12-16

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	19110 Btuh
	Sensible Duct Load	6978 Btuh
	Total Sensible Zone Loads	26087 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	26087 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2389 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1404 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4993 Btuh
	TOTAL GAIN	31080 Btuh

EQUIPMENT

1. Central Unit	#	39000 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