Residential System Sizing Calculation

Summary

Snipes Res

Project Title:
211091 Snipes Res

, FL

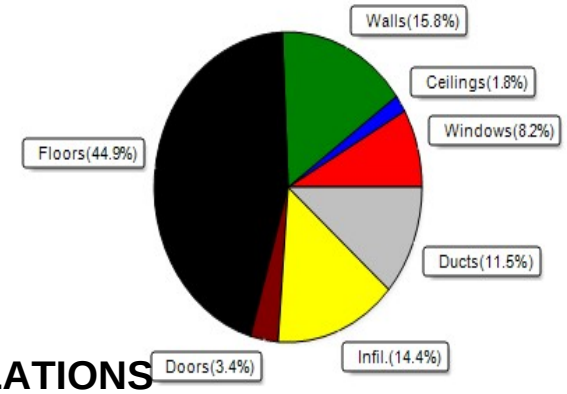
2021-08-03

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	**40119**	**Btuh**	**Total cooling load calculation**	**29790**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.7	44000	Sensible (SHR = 0.75)	143.2	33000
Heat Pump + Auxiliary(0.0kW)	109.7	44000	Latent	163.0	11000
			Total (Electric Heat Pump)	147.7	44000

WINTER CALCULATIONS

Winter Heating Load (for 2976 sqft)

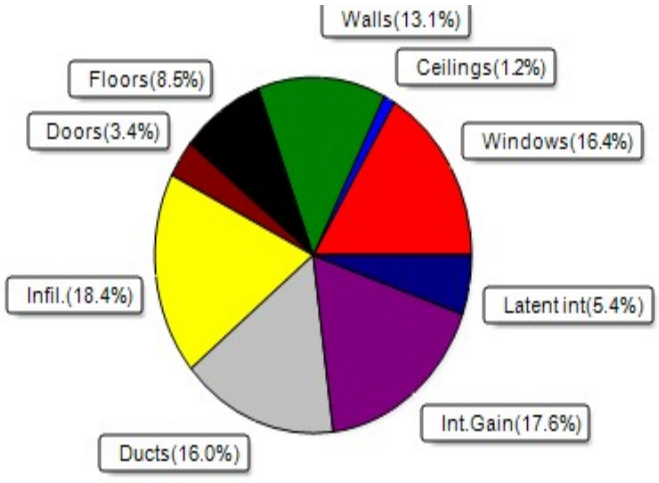
Load component			Load	
Window total	275	sqft	3296	Btuh
Wall total	1782	sqft	6326	Btuh
Door total	84	sqft	1344	Btuh
Ceiling total	3524	sqft	722	Btuh
Floor total	See detail report		18024	Btuh
Infiltration	132	cfm	5797	Btuh
Duct loss			4611	Btuh
Subtotal			**40119**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**40119**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 2976 sqft)

Load component			Load	
Window total	275	sqft	4891	Btuh
Wall total	1782	sqft	3890	Btuh
Door total	84	sqft	1008	Btuh
Ceiling total	3524	sqft	348	Btuh
Floor total			2542	Btuh
Infiltration	99	cfm	2065	Btuh
Internal gain			5240	Btuh
Duct gain			3058	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**23042**	**Btuh**
Latent gain(ducts)			1721	Btuh
Latent gain(infiltration)			3427	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1600	Btuh
Total latent gain			**6748**	**Btuh**
TOTAL HEAT GAIN			**29790**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-08-03

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Snipes Res
, FL

Project Title:
211091 Snipes Res
Building Type: User

2021-08-03

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 45 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.20	Vinyl	0.30	NE	48.0	12.0	576 Btuh
2	2, NFRC 0.20	Vinyl	0.30	NW	32.0	12.0	384 Btuh
3	2, NFRC 0.20	Vinyl	0.30	NE	45.0	12.0	540 Btuh
4	2, NFRC 0.20	Vinyl	0.30	NE	4.7	12.0	56 Btuh
5	2, NFRC 0.20	Vinyl	0.30	SE	30.0	12.0	360 Btuh
6	2, NFRC 0.20	Vinyl	0.30	SW	60.0	12.0	720 Btuh
7	2, NFRC 0.20	Vinyl	0.30	SW	32.0	12.0	384 Btuh
8	2, NFRC 0.20	Vinyl	0.30	NW	15.0	12.0	180 Btuh
9	2, NFRC 0.20	Vinyl	0.30	SW	8.0	12.0	96 Btuh
	Window Total				274.7(sqft)		3296 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	196	3.55	696 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	42	3.55	149 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	244	3.55	867 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	426	3.55	1512 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	156	3.55	554 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	19	3.55	67 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	72	3.55	256 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	234	3.55	831 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	273	3.55	969 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	33	3.55	117 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	87	3.55	307 Btuh
	Wall Total				1782(sqft)		6326 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	32	16.0	512 Btuh
2	Insulated - Exterior,	n	(0.400)	16	16.0	256 Btuh
3	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
4	Insulated - Exterior,	n	(0.400)	16	16.0	256 Btuh
	Door Total			84(sqft)		1344Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Unvent Attic/L/Shing	(0.025)	38.0/22.0	2632	0.1	334 Btuh
2	Unvent Attic/L/Shing	(0.025)	38.0/22.0	472	0.1	60 Btuh
3	Knee Wall/L/Shing	(0.020)	30.0/22.0	420	0.8	328 Btuh
	Ceiling Total			3524(sqft)		722Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	228.0 ft(perim.)	47.2	10762 Btuh
2	Raised Wood - Adj	(0.385)	0.0	472.0 sqft	15.4	7262 Btuh
	Floor Total			2976 sqft		18024 Btuh

	Envelope Subtotal:	29712 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Snipes Res
, FL

Project Title:
211091 Snipes Res
Building Type: User

2021-08-03

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.30	26341	1.00	132.4	5797 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.130)		4611 Btuh
All Zones	**Sensible Subtotal All Zones**						**40119 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	40119 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	40119 Btuh

EQUIPMENT

1. Electric Heat Pump	#	44000 Btuh

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)

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Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Snipes Res

Project Title:
211091 Snipes Res

, FL

2021-08-03

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.
This calculation is for Worst Case. The house has been rotated 45 degrees.

Component Loads for Whole House

	Type*					Overhang		Window Area(sqft)			HTM		Load	
Window	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
1	2 NFRC	0.20, 0.30		No	No	NE	11.5f	1.0ft	48.0	0.0	48.0	10	19	919	Btuh
2	2 NFRC	0.20, 0.30		No	No	NW	40.2f	1.0ft	32.0	0.0	32.0	10	19	612	Btuh
3	2 NFRC	0.20, 0.30		No	No	NE	1.5ft	1.0ft	45.0	0.0	45.0	10	19	861	Btuh
4	2 NFRC	0.20, 0.30		No	No	NE	1.5ft	1.0ft	4.7	0.0	4.7	10	19	89	Btuh
5	2 NFRC	0.20, 0.30		No	No	SE	1.5ft	1.0ft	30.0	7.3	22.7	10	20	527	Btuh
6	2 NFRC	0.20, 0.30		No	No	SW	9.5ft	1.0ft	60.0	60.0	0.0	10	20	594	Btuh
7	2 NFRC	0.20, 0.30		No	No	SW	9.5ft	1.0ft	32.0	32.0	0.0	10	20	317	Btuh
8	2 NFRC	0.20, 0.30		No	No	NW	9.5ft	1.0ft	15.0	0.0	15.0	10	19	287	Btuh
9	2 NFRC	0.20, 0.30		No	No	SW	1.5ft	4.0ft	8.0	0.0	8.0	10	20	160	Btuh
	Excursion													524	Btuh
	Window Total								275 (sqft)					4891	Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load	
1	Frame - Wood - Ext	0.09	13.0/0.0	196.0	2.3	444	Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	42.0	2.3	95	Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	244.3	2.3	553	Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	426.0	2.3	964	Btuh
5	Frame - Wood - Adj	0.09	13.0/0.0	156.0	1.7	263	Btuh
6	Frame - Wood - Adj	0.09	13.0/0.0	19.0	1.7	32	Btuh
7	Frame - Wood - Adj	0.09	13.0/0.0	72.0	1.7	121	Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	234.0	2.3	530	Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	273.0	2.3	618	Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	33.0	2.3	75	Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	86.5	2.3	196	Btuh
	Wall Total			1782 (sqft)		3890	Btuh

Doors	Type	Area (sqft)	HTM	Load	
1	Insulated - Exterior	32.0	12.0	384	Btuh
2	Insulated - Exterior	16.0	12.0	192	Btuh
3	Insulated - Garage	20.0	12.0	240	Btuh
4	Insulated - Exterior	16.0	12.0	192	Btuh
	Door Total	84 (sqft)		1008	Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load	
1	Unvented Attic/Light/Shingle	0.025	38.0/22.0	2632.0	0.10	267	Btuh
2	Unvented Attic/Light/Shingle	0.025	38.0/22.0	472.0	0.10	48	Btuh
3	Knee Wall/Light/Shingle	0.020	30.0/22.0	420.0	0.08	33	Btuh
	Ceiling Total			3524 (sqft)		348	Btuh

Floors	Type	R-Value	Size	HTM	Load	
1	Slab On Grade	0.0	2504 (ft-perimeter)	0.0	0	Btuh
2	Raised Wood - Adj	0.0	472 (sqft)	5.4	2542	Btuh
	Floor Total		2976.0 (sqft)		2542	Btuh

		Envelope Subtotal:	12679 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Snipes Res | Project Title: 211091 Snipes Res | Climate:FL_GAINESVILLE_REGIONAL_A

, FL

2021-08-03

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load	
	Natural	0.23	26341	1	99.3	2065	Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load	
		8	X 230	+	3400	5240	Btuh
				Sensible Envelope Load:		19984	Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.153)		3058	Btuh
				Sensible Load All Zones		**23042**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Snipes Res
, FL

Project Title: 211091 Snipes Res
Climate:FL_GAINESVILLE_REGIONAL_A

2021-08-03

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**19984**	**Btuh**
	Sensible Duct Load	3058	Btuh
	Total Sensible Zone Loads	**23042**	**Btuh**
	Sensible ventilation	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**23042**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	3427	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	1721	Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**6748**	**Btuh**
	TOTAL GAIN	**29790**	**Btuh**

EQUIPMENT

1. Central Unit	#	44000 Btuh

*Key: Window types (Panes - 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)

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