Residential System Sizing Calculation

Summary

N/A

Project Title:
Lot 5 Amelia Landing

Lake City, FL 32025

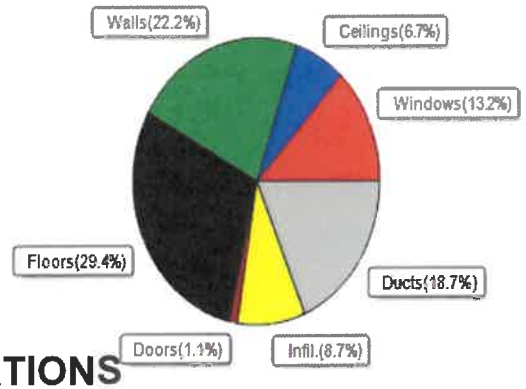
4/8/2021

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	**33559**	**Btuh**	**Total cooling load calculation**	**28261**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	117.1	39299	Sensible (SHR = 0.70)	92.4	22013
Heat Pump + Auxiliary(0.0kW)	117.1	39299	Latent	212.6	9434
			Total (Electric Heat Pump)	111.3	31447

WINTER CALCULATIONS

Winter Heating Load (for 2087 sqft)

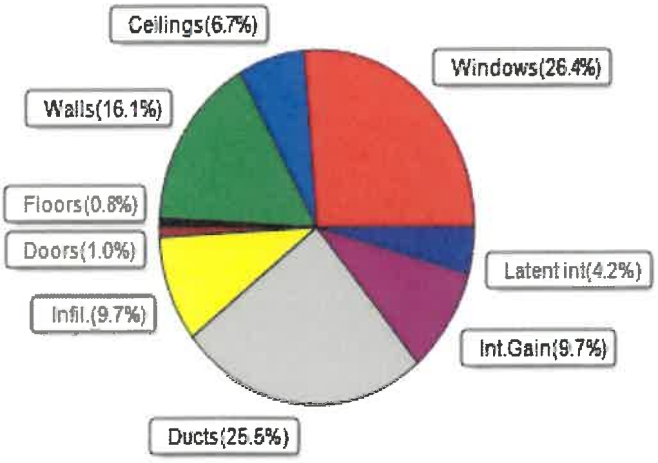
Load component			Load	
Window total	308	sqft	4429	Btuh
Wall total	2101	sqft	7458	Btuh
Door total	20	sqft	368	Btuh
Ceiling total	2207	sqft	2241	Btuh
Floor total	See detail report		9877	Btuh
Infiltration	66	cfm	2903	Btuh
Duct loss			6283	Btuh
Subtotal			**33559**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**33559**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 2087 sqft)

Load component			Load	
Window total	308	sqft	7448	Btuh
Wall total	2101	sqft	4537	Btuh
Door total	20	sqft	276	Btuh
Ceiling total	2207	sqft	1905	Btuh
Floor total			219	Btuh
Infiltration	50	cfm	1034	Btuh
Internal gain			2730	Btuh
Duct gain			5675	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**23824**	**Btuh**
Latent gain(ducts)			1521	Btuh
Latent gain(infiltration)			1716	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**4437**	**Btuh**
TOTAL HEAT GAIN			**28261**	**Btuh**



8th Edition

EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 4/8/2021

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

N/A

Project Title:
Lot 5 Amelia Landing

Lake City, FL 32025

Building Type: User

4/8/2021

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 0.25	Vinyl	0.36	E	24.0	14.4	346 Btuh
2	2, NFRC 0.25	TIM	0.36	E	20.0	14.4	288 Btuh
3	2, NFRC 0.25	Vinyl	0.36	E	25.0	14.4	360 Btuh
4	2, NFRC 0.25	Vinyl	0.36	N	30.0	14.4	432 Btuh
5	2, NFRC 0.25	Vinyl	0.36	N	3.0	14.4	43 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	12.0	14.4	173 Btuh
7	2, NFRC 0.25	Vinyl	0.36	N	20.0	14.4	288 Btuh
8	2, NFRC 0.25	Vinyl	0.36	W	30.0	14.4	432 Btuh
9	2, NFRC 0.25	Vinyl	0.36	W	20.0	14.4	288 Btuh
10	2, NFRC 0.25	Vinyl	0.36	W	25.0	14.4	360 Btuh
11	2, NFRC 0.25	Metal	0.36	W	60.0	14.4	864 Btuh
12	2, NFRC 0.25	TIM	0.36	S	33.3	14.4	480 Btuh
13	2, NFRC 0.25	Vinyl	0.36	E	5.3	14.4	76 Btuh
	Window Total				307.6(sqft)		4429 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	148	3.55	525 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	101	3.55	357 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	89	3.55	316 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	451	3.55	1601 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	189	3.55	671 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	63	3.55	224 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	45	3.55	160 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	30	3.55	105 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	156	3.55	554 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	108	3.55	383 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	114	3.55	403 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	91	3.55	322 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	211	3.55	748 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	96	3.55	341 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	211	3.55	748 Btuh
	Wall Total				2101(sqft)		7458 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Garage,	n	(0.460)	20	18.4	368 Btuh
	Door Total			20(sqft)		368Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.025)	38.0/0.0	1864	1.0	1892 Btuh
2	Vented Attic/L/Shing	(0.025)	38.0/0.0	343	1.0	348 Btuh
	Ceiling Total			2207(sqft)		2241Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	196.0 ft(perim.)	47.2	9251 Btuh
2	Raised Wood - Adj	(0.050)	19.0	312.0 sqft	2.0	626 Btuh
	Floor Total			2087 sqft		9877 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

N/A

Project Title:
Lot 5 Amelia Landing

Lake City, FL 32025

Building Type: User

4/8/2021

				Envelope Subtotal:			24373 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.22	18471	1.00	66.3	2903 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.230)		6283 Btuh
All Zones				**Sensible Subtotal All Zones**			**33559 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	33559 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	33559 Btuh

EQUIPMENT

1. Electric Heat Pump	#	39299 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

N/A

Project Title:
Lot 5 Amelia Landing

Lake City, FL 32025

4/8/2021

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.25, 0.36		No	No	E	7.5ft.	1.0ft.	24.0	24.0	0.0	12	31	290 Btuh
2	2 NFRC	0.25, 0.36		No	No	E	7.5ft.	1.0ft.	20.0	15.7	4.3	12	31	323 Btuh
3	2 NFRC	0.25, 0.36		No	No	E	1.0ft.	3.0ft.	25.0	0.0	25.0	12	31	774 Btuh
4	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	30.0	0.0	30.0	12	12	363 Btuh
5	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	3.0	0.0	3.0	12	12	36 Btuh
6	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	12.0	0.0	12.0	12	12	145 Btuh
7	2 NFRC	0.25, 0.36		No	No	N	1.5ft.	1.0ft.	20.0	0.0	20.0	12	12	242 Btuh
8	2 NFRC	0.25, 0.36		No	No	W	1.0ft.	4.0ft.	30.0	0.0	30.0	12	31	928 Btuh
9	2 NFRC	0.25, 0.36		No	No	W	1.0ft.	5.0ft.	20.0	0.0	20.0	12	31	619 Btuh
10	2 NFRC	0.25, 0.36		No	No	W	1.0ft.	6.0ft.	25.0	0.0	25.0	12	31	774 Btuh
11	2 NFRC	0.25, 0.36		No	No	W	8.5ft.	1.0ft.	60.0	54.5	5.5	12	31	830 Btuh
12	2 NFRC	0.25, 0.36		No	No	S	9.0ft.	1.0ft.	33.3	33.3	0.0	12	14	403 Btuh
13	2 NFRC	0.25, 0.36		No	No	E	1.0ft.	3.0ft.	5.3	0.0	5.3	12	31	162 Btuh
	Excursion													1558 Btuh
	Window Total								308 (sqft)					7448 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	148.0	2.3	335 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	100.5	2.3	227 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	89.0	2.3	201 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	451.0	2.3	1021 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	189.0	2.3	428 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	63.0	2.3	143 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	45.0	2.3	102 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	29.7	2.3	67 Btuh
9	Frame - Wood - Adj	0.09	13.0/0.0	156.0	1.7	263 Btuh
10	Frame - Wood - Adj	0.09	13.0/0.0	108.0	1.7	182 Btuh
11	Frame - Wood - Adj	0.09	13.0/0.0	113.5	1.7	191 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	90.8	2.3	205 Btuh
13	Frame - Wood - Ext	0.09	13.0/0.0	210.7	2.3	477 Btuh
14	Frame - Wood - Ext	0.09	13.0/0.0	96.0	2.3	217 Btuh
15	Frame - Wood - Ext	0.09	13.0/0.0	210.7	2.3	477 Btuh
	Wall Total			2101 (sqft)		4537 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Garage	20.0	13.8	276 Btuh
	Door Total	20 (sqft)		276 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	1864.0	0.86	1609 Btuh
2	Vented Attic/Light/Shingle/RB	0.025	38.0/0.0	343.0	0.86	296 Btuh
	Ceiling Total			2207 (sqft)		1905 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1775 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj	19.0	312 (sqft)	0.7	219 Btuh
	Floor Total		2087.0 (sqft)		219 Btuh

	Envelope Subtotal:	14384 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

N/A | Project Title: Lot 5 Amelia Landing | Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32025

4/8/2021

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio		CFM=		Load	
	Natural	0.16	18471	1		49.7		1034	Btuh
Internal gain		Occupants	Btuh/occupant			Appliance		Load	
		6	X 230	+		1350		2730	Btuh
					Sensible Envelope Load:			18148	Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.313)			5675	Btuh
					Sensible Load All Zones			**23824**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

N/A | Project Title: Lot 5 Amelia Landing | Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32025

4/8/2021

WHOLE HOUSE TOTALS

	Sensible Envelope Load All Zones	**18148 Btuh**
	Sensible Duct Load	5675 Btuh
	Total Sensible Zone Loads	**23824 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
Whole House	**Total sensible gain**	**23824 Btuh**
Totals for Cooling	Latent infiltration gain (for 51 gr. humidity difference)	1716 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1521 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**4437 Btuh**
	TOTAL GAIN	**28261 Btuh**

EQUIPMENT

1. Central Unit	#	31447 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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