Residential System Sizing Calculation

Summary

Project Title:
Model 1311

Lake City, FL 32025

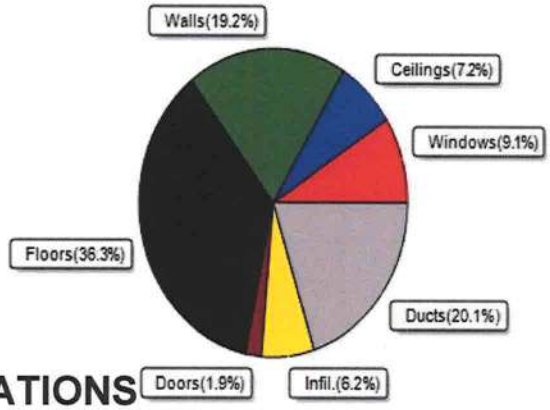
6/14/2022

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	**19367**	**Btuh**	**Total cooling load calculation**	**14662**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	100.0	19367	Sensible (SHR = 0.70)	87.6	10264
Heat Pump + Auxiliary(0.0kW)	100.0	19367	Latent	149.4	4399
			Total (Electric Heat Pump)	100.0	14662

WINTER CALCULATIONS

Winter Heating Load (for 1311 sqft)

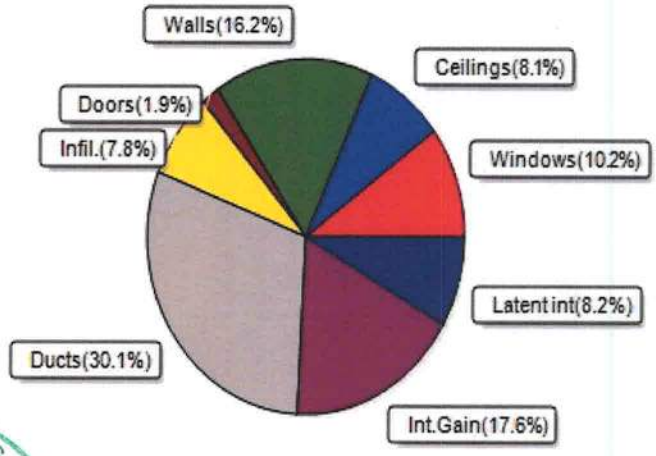
Load component			Load	
Window total	122	sqft	1757	Btuh
Wall total	1050	sqft	3728	Btuh
Door total	20	sqft	368	Btuh
Ceiling total	1376	sqft	1397	Btuh
Floor total	1311	sqft	7033	Btuh
Infiltration	27	cfm	1200	Btuh
Duct loss			3884	Btuh
Subtotal			**19367**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**19367**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1311 sqft)

Load component			Load	
Window total	122	sqft	1490	Btuh
Wall total	1050	sqft	2377	Btuh
Door total	20	sqft	276	Btuh
Ceiling total	1376	sqft	1187	Btuh
Floor total			0	Btuh
Infiltration	21	cfm	427	Btuh
Internal gain			2580	Btuh
Duct gain			3380	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**11718**	**Btuh**
Latent gain(ducts)			1035	Btuh
Latent gain(infiltration)			709	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**2944**	**Btuh**
TOTAL HEAT GAIN			**14662**	**Btuh**



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8th Edition

EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 6 / 14 / 2022

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Model 1311
Lake City, FL 32025 Building Type: User

6/14/2022

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	15.0	14.4	216 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	30.0	14.4	432 Btuh
3	2, NFRC 0.25	Vinyl	0.36	S	15.0	14.4	216 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	3.0	14.4	43 Btuh
5	2, NFRC 0.25	Vinyl	0.36	N	30.0	14.4	432 Btuh
6	2, NFRC 0.25	TIM	0.36	N	20.0	14.4	288 Btuh
7	2, NFRC 0.25	Vinyl	0.36	N	9.0	14.4	130 Btuh
	Window Total				122.0(sqft)		1757 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	77	3.55	273 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	114	3.55	405 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	97	3.55	344 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	225	3.55	799 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	309	3.55	1097 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	228	3.55	809 Btuh
	Wall Total				1050(sqft)		3728 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior, 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	1376	1.0	1397 Btuh
	Ceiling Total			1376(sqft)		1397Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	149.0 ft(perim.)	47.2	7033 Btuh
	Floor Total			1311 sqft		7033 Btuh

	Envelope Subtotal:	14282 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.16	10488	1.00	27.4	1200 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.251)	3884 Btuh
All Zones	**Sensible Subtotal All Zones**	**19367 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Model 1311
Lake City, FL 32025 Building Type: User

6/14/2022

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	19367 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	19367 Btuh

EQUIPMENT

1. Electric Heat Pump	#	19367 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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System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Model 1311

Lake City, FL 32025

6/14/2022

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	S	1.5ft.	0.5ft.	15.0	15.0	0.0	12	14	181	Btuh
2	2 NFRC	0.25, 0.36	No	No	S	7.5ft.	0.5ft.	30.0	30.0	0.0	12	14	363	Btuh
3	2 NFRC	0.25, 0.36	No	No	S	1.5ft.	0.5ft.	15.0	15.0	0.0	12	14	181	Btuh
4	2 NFRC	0.25, 0.36	No	No	E	1.5ft.	0.5ft.	3.0	2.2	0.8	12	31	51	Btuh
5	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	0.5ft.	30.0	0.0	30.0	12	12	363	Btuh
6	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	0.5ft.	20.0	0.0	20.0	12	12	242	Btuh
7	2 NFRC	0.25, 0.36	No	No	N	1.5ft.	0.5ft.	9.0	0.0	9.0	12	12	109	Btuh
	Window Total								122 (sqft)					1490 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	77.0	2.3	174 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	114.0	2.3	258 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	97.0	2.3	220 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	225.0	2.3	509 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	309.0	2.3	699 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	228.0	2.3	516 Btuh
	Wall Total			1050 (sqft)		2377 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	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	1376.0	0.86	1187 Btuh
	Ceiling Total			1376 (sqft)		1187 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1311 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1311.0 (sqft)		0 Btuh
			Envelope Subtotal:		5330 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	10488	1	20.6	427 Btuh

Internal gain	Occupants	Btuh/occupant		Appliance	Load
	6	X 230	+	1200	2580 Btuh
			Sensible Envelope Load:		8338 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)		(DGM of 0.405)		3380 Btuh
			Sensible Load All Zones		**11718 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Model 1311

Lake City, FL 32025

6/14/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**8338 Btuh**
	Sensible Duct Load	3380 Btuh
	Total Sensible Zone Loads	**11718 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**11718 Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	709 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1035 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**2944 Btuh**
	TOTAL GAIN	**14662 Btuh**

EQUIPMENT

1. Central Unit	#	14662 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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