

Residential System Sizing Calculation

Summary

Jones, Everett Apelt & Jenni

Project Title:
210267 Jones

Lake City, FL

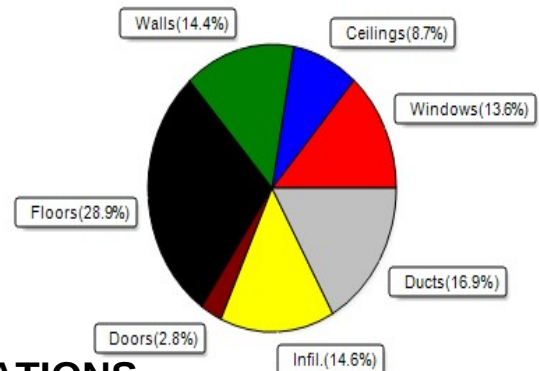
2021-02-17

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	52074 Btuh	Total cooling load calculation	48418 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.5 57000	Sensible (SHR = 0.75)	106.4 42750
Heat Pump + Auxiliary(0.0kW)	109.5 57000	Latent	173.1 14250
		Total (Electric Heat Pump)	117.7 57000

WINTER CALCULATIONS

Winter Heating Load (for 3667 sqft)

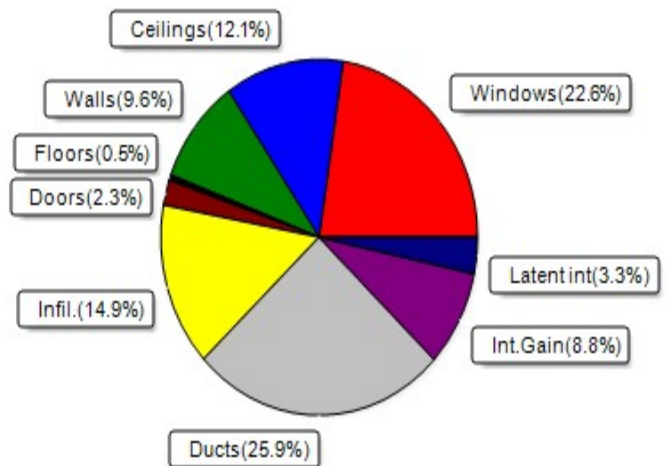
Load component		Load	
Window total	590 sqft	7076	Btuh
Wall total	2116 sqft	7512	Btuh
Door total	92 sqft	1472	Btuh
Ceiling total	4341 sqft	4527	Btuh
Floor total	See detail report	15063	Btuh
Infiltration	174 cfm	7614	Btuh
Duct loss		8810	Btuh
Subtotal		52074	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		52074	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3667 sqft)

Load component		Load	
Window total	590 sqft	10926	Btuh
Wall total	2116 sqft	4666	Btuh
Door total	92 sqft	1104	Btuh
Ceiling total	4341 sqft	5855	Btuh
Floor total		250	Btuh
Infiltration	130 cfm	2712	Btuh
Internal gain		4240	Btuh
Duct gain		10433	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		40186	Btuh
Latent gain(ducts)		2131	Btuh
Latent gain(infiltration)		4501	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		8232	Btuh
TOTAL HEAT GAIN		48418	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-02-17

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Jones, Everett Apelt & Jenni

Project Title:

210267 Jones

Lake City, FL

Building Type: User

2021-02-17

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.20	Metal	0.30	NW	36.0		12.0	432 Btuh
2	2, NFRC 0.20	Metal	0.30	NW	4.0		12.0	48 Btuh
3	2, NFRC 0.20	Metal	0.30	N	13.3		12.0	160 Btuh
4	2, NFRC 0.20	Metal	0.30	NW	54.0		12.0	648 Btuh
5	2, NFRC 0.20	Metal	0.30	NE	48.0		12.0	576 Btuh
6	2, NFRC 0.20	Metal	0.30	NW	72.0		12.0	864 Btuh
7	2, NFRC 0.20	Metal	0.30	NW	36.0		12.0	432 Btuh
8	2, NFRC 0.20	Metal	0.30	NE	15.0		12.0	180 Btuh
9	2, NFRC 0.20	Metal	0.30	NE	8.0		12.0	96 Btuh
10	2, NFRC 0.20	Metal	0.30	SE	25.0		12.0	300 Btuh
11	2, NFRC 0.20	Metal	0.30	SE	32.0		12.0	384 Btuh
12	2, NFRC 0.20	Metal	0.30	SE	12.0		12.0	144 Btuh
13	2, NFRC 0.20	Metal	0.30	SE	30.0		12.0	360 Btuh
14	2, NFRC 0.20	Metal	0.30	NE	16.0		12.0	192 Btuh
15	2, NFRC 0.20	Metal	0.30	SW	10.0		12.0	120 Btuh
16	2, NFRC 0.20	Metal	0.30	SE	32.0		12.0	384 Btuh
17	2, NFRC 0.20	Metal	0.30	SW	72.0		12.0	864 Btuh
18	2, NFRC 0.20	Metal	0.30	NW	13.3		12.0	160 Btuh
19	2, NFRC 0.20	Metal	0.30	NW	16.0		12.0	192 Btuh
20	2, NFRC 0.20	Metal	0.30	SW	30.0		12.0	360 Btuh
21	2, NFRC 0.20	Metal	0.30	NE	15.0		12.0	180 Btuh
Window Total					589.7(sqft)			7076 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	146		3.55	518 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	91		3.55	322 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	14		3.55	49 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	62		3.55	221 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	71 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	125		3.55	445 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	222		3.55	788 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	26		3.55	93 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	91		3.55	323 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	127		3.55	449 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	50		3.55	176 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	55		3.55	195 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	78		3.55	278 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	80		3.55	284 Btuh
18	Frame - Wood	- Adj	(0.089)	13.0/0.0	111		3.55	395 Btuh
19	Frame - Wood	- Adj	(0.089)	13.0/0.0	36		3.55	128 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Jones, Everett Apelt & Jenni

Project Title:

210267 Jones

Lake City, FL

Building Type: User

2021-02-17

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
20	Frame - Wood	- Adj	(0.089)	13.0/0.0	67	3.55	237 Btuh
21	Frame - Wood	- Ext	(0.089)	13.0/0.0	77	3.55	273 Btuh
22	Frame - Wood	- Ext	(0.089)	13.0/0.0	114	3.55	406 Btuh
23	Frame - Wood	- Ext	(0.089)	13.0/0.0	127	3.55	450 Btuh
24	Frame - Wood	- Ext	(0.089)	13.0/0.0	47	3.55	166 Btuh
25	Frame - Wood	- Ext	(0.089)	13.0/0.0	212	3.55	754 Btuh
26	Frame - Wood	- Ext	(0.089)	13.0/0.0	54	3.55	193 Btuh
	Wall Total				2116(sqft)		7512 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)		16	16.0	256 Btuh
3	Insulated - Exterior,	n	(0.400)		24	16.0	384 Btuh
4	Insulated - Exterior,	n	(0.400)		16	16.0	256 Btuh
5	Insulated - Garage,	n	(0.400)		20	16.0	320 Btuh
6	Insulated - Exterior,	n	(0.400)		8	16.0	128 Btuh
	Door Total				92(sqft)		1472Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	3311	1.0	3361 Btuh
2	Knee Wall/D/Shing		(0.025)	38.0/0.0	230	1.0	234 Btuh
3	Cathedral/D/Shing		(0.026)	38.0/0.0	356	1.0	366 Btuh
4	Knee Wall/D/Shing		(0.032)	30.0/0.0	444	1.3	566 Btuh
	Ceiling Total				4341(sqft)		4527Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	304.0 ft(perim.)	47.2	14349 Btuh
2	Raised Wood - Adj		(0.050)	19.0	356.0 sqft	2.0	714 Btuh
	Floor Total				3667 sqft		15063 Btuh
	Envelope Subtotal:						35650 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural		0.31	33971	1.00	173.9	7614 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.204)						8810 Btuh
All Zones	Sensible Subtotal All Zones						52074 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Jones, Everett Apelt & Jenni

Project Title:
210267 Jones
Building Type: User

Lake City, FL

2021-02-17

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	52074 Btuh 0 Btuh 52074 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	57000 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

Jones, Everett Apelt & Jenni

Project Title:
210267 Jones

Lake City, FL

2021-02-17

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 315 degrees.

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	0.20, 0.30	No	No	NW	1.5ft	1.0ft	36.0	0.0	36.0	10	19	689	Btuh
2	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	1.0ft	4.0	0.0	4.0	10	19	77	Btuh
3	2 NFRC	0.20, 0.30	No	No	N	17.5f	0.0ft	13.3	0.0	13.3	10	10	132	Btuh
4	2 NFRC	0.20, 0.30	No	No	NW	14.3f	0.5ft	54.0	0.0	54.0	10	19	1034	Btuh
5	2 NFRC	0.20, 0.30	No	No	NE	15.5f	0.0ft	48.0	0.0	48.0	10	19	919	Btuh
6	2 NFRC	0.20, 0.30	No	No	NW	15.2f	0.0ft	72.0	0.0	72.0	10	19	1378	Btuh
7	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	1.0ft	36.0	0.0	36.0	10	19	689	Btuh
8	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.0ft	15.0	0.0	15.0	10	19	287	Btuh
9	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.0ft	8.0	0.0	8.0	10	19	153	Btuh
10	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	1.0ft	25.0	7.3	17.7	10	20	426	Btuh
11	2 NFRC	0.20, 0.30	No	No	SE	8.5ft	3.0ft	32.0	32.0	0.0	10	20	317	Btuh
12	2 NFRC	0.20, 0.30	No	No	SE	8.5ft	0.7ft	12.0	12.0	0.0	10	20	119	Btuh
13	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	1.5ft	30.0	4.8	25.2	10	20	552	Btuh
14	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.0ft	16.0	0.0	16.0	10	19	306	Btuh
15	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.0ft	10.0	3.7	6.3	10	20	163	Btuh
16	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	1.0ft	32.0	7.8	24.2	10	20	562	Btuh
17	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.0ft	72.0	17.6	54.4	10	20	1264	Btuh
18	2 NFRC	0.20, 0.30	No	No	NW	6.5ft	0.5ft	13.3	0.0	13.3	10	19	255	Btuh
19	2 NFRC	0.20, 0.30	No	No	NW	6.5ft	0.0ft	16.0	0.0	16.0	10	19	306	Btuh
20	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.0ft	30.0	8.8	21.2	10	20	512	Btuh
21	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.0ft	15.0	0.0	15.0	10	19	287	Btuh
	Excursion												500	Btuh
	Window Total							590 (sqft)					10926	Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jones, Everett Apelt & Jenni

Project Title:
210267 Jones

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-02-17

Walls	Type	U-Value	R-Value	Area(sqft)	HTM	Load
			Cav/Sheath			
1	Frame - Wood - Ext	0.09	13.0/0.0	146.0	2.3	330 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	90.8	2.3	205 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	13.9	2.3	31 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	62.3	2.3	141 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	20.0	2.3	45 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.3	54 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.3	54 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	125.3	2.3	283 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	222.0	2.3	502 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	26.3	2.3	59 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	91.0	2.3	206 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	126.5	2.3	286 Btuh
13	Frame - Wood - Ext	0.09	13.0/0.0	49.5	2.3	112 Btuh
14	Frame - Wood - Ext	0.09	13.0/0.0	36.0	2.3	81 Btuh
15	Frame - Wood - Ext	0.09	13.0/0.0	55.0	2.3	124 Btuh
16	Frame - Wood - Ext	0.09	13.0/0.0	78.3	2.3	177 Btuh
17	Frame - Wood - Ext	0.09	13.0/0.0	80.0	2.3	181 Btuh
18	Frame - Wood - Adj	0.09	13.0/0.0	111.3	1.7	188 Btuh
19	Frame - Wood - Adj	0.09	13.0/0.0	36.0	1.7	61 Btuh
20	Frame - Wood - Adj	0.09	13.0/0.0	66.8	1.7	113 Btuh
21	Frame - Wood - Ext	0.09	13.0/0.0	77.0	2.3	174 Btuh
22	Frame - Wood - Ext	0.09	13.0/0.0	114.3	2.3	259 Btuh
23	Frame - Wood - Ext	0.09	13.0/0.0	126.8	2.3	287 Btuh
24	Frame - Wood - Ext	0.09	13.0/0.0	46.7	2.3	106 Btuh
25	Frame - Wood - Ext	0.09	13.0/0.0	212.3	2.3	480 Btuh
26	Frame - Wood - Ext	0.09	13.0/0.0	54.3	2.3	123 Btuh
	Wall Total			2116 (sqft)		4666 Btuh
Doors	Type			Area (sqft)	HTM	Load
1	Insulated - Exterior			8.0	12.0	96 Btuh
2	Insulated - Exterior			16.0	12.0	192 Btuh
3	Insulated - Exterior			24.0	12.0	288 Btuh
4	Insulated - Exterior			16.0	12.0	192 Btuh
5	Insulated - Garage			20.0	12.0	240 Btuh
6	Insulated - Exterior			8.0	12.0	96 Btuh
	Door Total			92 (sqft)		1104 Btuh
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.025	38.0/0.0	3311.0	1.37	4538 Btuh
2	Knee Wall/DarkShingle	0.025	38.0/0.0	230.0	1.37	315 Btuh
3	Cath/Sngl Assem/DarkShingle	0.026	38.0/0.0	356.0	0.67	238 Btuh
4	Knee Wall/DarkShingle	0.032	30.0/0.0	444.0	1.72	764 Btuh
	Ceiling Total			4341 (sqft)		5855 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	3311 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj		19.0	356 (sqft)	0.7	250 Btuh
	Floor Total			3667.0 (sqft)		250 Btuh
				Envelope Subtotal:		22801 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jones, Everett Apelt & Jenni

Project Title:
210267 Jones

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-02-17

Infiltration	Type Natural	Average ACH 0.23	Volume(cuft) 33971	Wall Ratio 1	CFM= 130.4	Load 2712 Btuh
Internal gain		Occupants 8	Btuh/occupant X 230	Appliance +	2400	Load 4240 Btuh
					Sensible Envelope Load:	29753 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.351)	10433 Btuh
					Sensible Load All Zones	40186 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jones, Everett Apelt & Jenni

Project Title:
210267 Jones

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-02-17

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	29753 Btuh
	Sensible Duct Load	10433 Btuh
	Total Sensible Zone Loads	40186 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	40186 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	4501 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2131 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	8232 Btuh
	TOTAL GAIN	48418 Btuh

EQUIPMENT

1. Central Unit	#	57000 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