

Residential System Sizing Calculation

Summary

Brian & Brittany Papka

Project Title:
Papka Residence_

Lake City, FL 32024

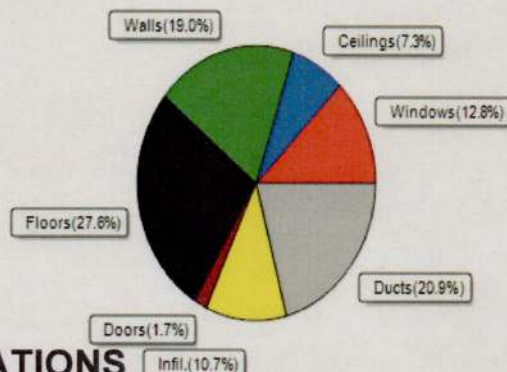
1/22/2021

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			50944	Btuh	
Total cooling load calculation			44667	Btuh	
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	100.0	50944	Sensible (SHR = 0.70)	85.5	31267
Heat Pump + Auxiliary(0.0kW)	100.0	50944	Latent	165.6	13400
			Total (Electric Heat Pump)	100.0	44667

WINTER CALCULATIONS

Winter Heating Load (for 3480 sqft)

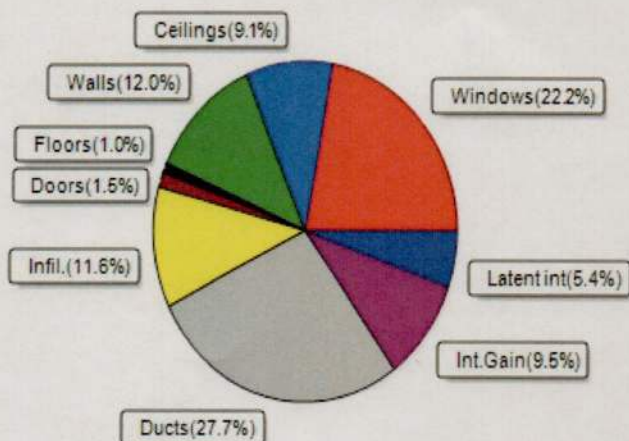
Load component			Load	
Window total	451	sqft	6498	Btuh
Wall total	2998	sqft	9692	Btuh
Door total	48	sqft	883	Btuh
Ceiling total	3654	sqft	3709	Btuh
Floor total	See detail report		14047	Btuh
Infiltration	125	cfm	5453	Btuh
Duct loss			10660	Btuh
Subtotal			50944	Btuh
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			50944	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3480 sqft)

Load component			Load	
Window total	451	sqft	9919	Btuh
Wall total	2998	sqft	5362	Btuh
Door total	48	sqft	662	Btuh
Ceiling total	3654	sqft	4080	Btuh
Floor total			445	Btuh
Infiltration	93	cfm	1943	Btuh
Internal gain			4260	Btuh
Duct gain			9904	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			36576	Btuh
Latent gain(ducts)			2468	Btuh
Latent gain(infiltration)			3224	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			2400	Btuh
Total latent gain			8092	Btuh
TOTAL HEAT GAIN			44667	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY:

DATE:

1/24/2021

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Brian & Brittany Papka

Project Title:
Papka Residence
Building Type: User

Lake City, FL 32024

1/22/2021

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	NW	20.0		14.4	288 Btuh
2	2, NFRC 0.25	TIM	0.36	NW	42.7		14.4	614 Btuh
3	2, NFRC 0.25	Vinyl	0.36	NW	48.0		14.4	691 Btuh
4	2, NFRC 0.25	Vinyl	0.36	NW	7.1		14.4	102 Btuh
5	2, NFRC 0.25	Vinyl	0.36	S	30.0		14.4	432 Btuh
6	2, NFRC 0.25	Vinyl	0.36	SW	20.0		14.4	288 Btuh
7	2, NFRC 0.25	Vinyl	0.36	SE	36.0		14.4	518 Btuh
8	2, NFRC 0.25	Vinyl	0.36	SE	15.0		14.4	216 Btuh
9	2, NFRC 0.25	Vinyl	0.36	SE	8.0		14.4	115 Btuh
10	2, NFRC 0.25	Vinyl	0.36	SE	56.0		14.4	806 Btuh
11	2, NFRC 0.25	TIM	0.36	NE	80.0		14.4	1152 Btuh
12	2, NFRC 0.25	TIM	0.36	SE	24.0		14.4	346 Btuh
13	2, NFRC 0.25	Vinyl	0.36	NE	12.0		14.4	173 Btuh
14	2, NFRC 0.25	Vinyl	0.36	W	15.0		14.4	216 Btuh
15	2, NFRC 0.25	Vinyl	0.36	NE	37.5		14.4	540 Btuh
Window Total					451.3(sqft)			6498 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	216		3.09	667 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	100		3.09	309 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	160		3.09	496 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	100		3.09	309 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	66		3.09	205 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	137		3.09	422 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	73		3.09	227 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	227		3.09	701 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	228		3.09	704 Btuh
10	Frame - Wood	- Ext	(0.077)	19.0/0.0	40		3.09	124 Btuh
11	Frame - Wood	- Ext	(0.077)	19.0/0.0	142		3.09	440 Btuh
12	Frame - Wood	- Ext	(0.077)	19.0/0.0	137		3.09	422 Btuh
13	Frame - Wood	- Ext	(0.077)	19.0/0.0	218		3.09	673 Btuh
14	Frame - Wood	- Ext	(0.077)	19.0/0.0	136		3.09	419 Btuh
15	Frame - Wood	- Adj	(0.089)	13.0/0.0	216		3.55	767 Btuh
16	Frame - Wood	- Adj	(0.089)	13.0/0.0	63		3.55	225 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	92		3.55	325 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	297		3.55	1056 Btuh
19	Frame - Wood	- Ext	(0.089)	13.0/0.0	260		3.55	922 Btuh
20	Frame - Wood	- Ext	(0.077)	19.0/0.0	45		3.09	140 Btuh
21	Frame - Wood	- Ext	(0.077)	19.0/0.0	45		3.09	140 Btuh
Wall Total					2998(sqft)			9692 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		24		18.4	442 Btuh
2	Insulated - Garage, n		(0.460)		24		18.4	442 Btuh
Door Total					48(sqft)			883 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Brian & Brittany Papka

Project Title:
Papka Residence
Building Type: User

Lake City, FL 32024

1/22/2021

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.025)	38.0/0.0	2988	1.0	3034 Btuh
2	Vented Attic/D/Shing	(0.025)	38.0/0.0	666	1.0	676 Btuh
	Ceiling Total			3654(sqft)		3709Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	270.7 ft(perim.)	47.2	12775 Btuh
2	Raised Wood - Adj	(0.050)	19.0	634.0 sqft	2.0	1272 Btuh
	Floor Total			3480 sqft		14047 Btuh
	Envelope Subtotal:					34830 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.22	33532	1.00	124.5	5453 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.265)					10660 Btuh
All Zones	Sensible Subtotal All Zones					50944 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	50944 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	50944 Btuh

EQUIPMENT

1. Electric Heat Pump	#	50944 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

Brian & Brittany Papka

Project Title:
Papka Residence_

Lake City, FL 32024

1/22/2021

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	0.25, 0.36	No	No	NW		11.5f	1.0ft.	20.0	0.0	20.0	12	24	473	Btuh
2	2 NFRC	0.25, 0.36	No	No	NW		11.5f	1.0ft.	42.7	0.0	42.7	12	24	1009	Btuh
3	2 NFRC	0.25, 0.36	No	No	NW		1.0ft.	4.0ft.	48.0	0.0	48.0	12	24	1135	Btuh
4	2 NFRC	0.25, 0.36	No	No	NW		1.5ft.	1.0ft.	7.1	0.0	7.1	12	24	168	Btuh
5	2 NFRC	0.25, 0.36	No	No	S		1.0ft.	3.0ft.	30.0	13.4	16.6	12	14	395	Btuh
6	2 NFRC	0.25, 0.36	No	No	SW		1.5ft.	1.0ft.	20.0	14.7	5.3	12	25	309	Btuh
7	2 NFRC	0.25, 0.36	No	No	SE		1.5ft.	1.0ft.	36.0	8.8	27.2	12	25	780	Btuh
8	2 NFRC	0.25, 0.36	No	No	SE		1.5ft.	1.0ft.	15.0	3.7	11.3	12	25	325	Btuh
9	2 NFRC	0.25, 0.36	No	No	SE		1.5ft.	1.0ft.	8.0	5.9	2.1	12	25	124	Btuh
10	2 NFRC	0.25, 0.36	No	No	SE		1.0ft.	3.0ft.	56.0	0.0	56.0	12	25	1386	Btuh
11	2 NFRC	0.25, 0.36	No	No	NE		6.0ft.	1.0ft.	80.0	0.0	80.0	12	24	1891	Btuh
12	2 NFRC	0.25, 0.36	No	No	SE		18.0f	1.0ft.	24.0	24.0	0.0	12	25	290	Btuh
13	2 NFRC	0.25, 0.36	No	No	NE		1.5ft.	1.0ft.	12.0	0.0	12.0	12	24	284	Btuh
14	2 NFRC	0.25, 0.36	No	No	W		1.0ft.	2.0ft.	15.0	0.0	15.0	12	31	464	Btuh
15	2 NFRC	0.25, 0.36	No	No	NE		1.0ft.	0.5ft.	37.5	0.0	37.5	12	24	886	Btuh
	Window Total								451 (sqft)					9919 Btuh	
Walls	Type	U-Value			R-Value		Area(sqft)			HTM		Load			
					Cav/Sheath										
1	Frame - Wood - Ext				0.08	19.0/0.0			215.7		1.7	357	Btuh		
2	Frame - Wood - Ext				0.08	19.0/0.0			100.0		1.7	165	Btuh		
3	Frame - Wood - Ext				0.08	19.0/0.0			160.3		1.7	265	Btuh		
4	Frame - Wood - Ext				0.08	19.0/0.0			100.0		1.7	165	Btuh		
5	Frame - Wood - Ext				0.08	19.0/0.0			66.2		1.7	110	Btuh		
6	Frame - Wood - Ext				0.08	19.0/0.0			136.7		1.7	226	Btuh		
7	Frame - Wood - Ext				0.08	19.0/0.0			73.3		1.7	121	Btuh		
8	Frame - Wood - Ext				0.08	19.0/0.0			226.7		1.7	375	Btuh		
9	Frame - Wood - Ext				0.08	19.0/0.0			227.7		1.7	376	Btuh		
10	Frame - Wood - Ext				0.08	19.0/0.0			40.0		1.7	66	Btuh		
11	Frame - Wood - Ext				0.08	19.0/0.0			142.3		1.7	235	Btuh		
12	Frame - Wood - Ext				0.08	19.0/0.0			136.7		1.7	226	Btuh		
13	Frame - Wood - Ext				0.08	19.0/0.0			217.7		1.7	360	Btuh		
14	Frame - Wood - Ext				0.08	19.0/0.0			135.7		1.7	224	Btuh		
15	Frame - Wood - Adj				0.09	13.0/0.0			216.0		1.7	364	Btuh		
16	Frame - Wood - Adj				0.09	13.0/0.0			63.3		1.7	107	Btuh		
17	Frame - Wood - Ext				0.09	13.0/0.0			91.7		2.3	207	Btuh		
18	Frame - Wood - Ext				0.09	13.0/0.0			297.3		2.3	673	Btuh		
19	Frame - Wood - Ext				0.09	13.0/0.0			259.8		2.3	588	Btuh		
20	Frame - Wood - Ext				0.08	19.0/0.0			45.3		1.7	75	Btuh		
21	Frame - Wood - Ext				0.08	19.0/0.0			45.3		1.7	75	Btuh		
	Wall Total								2998 (sqft)					5362 Btuh	
Doors	Type							Area (sqft)			HTM		Load		
1	Insulated - Exterior								24.0		13.8	331	Btuh		
2	Insulated - Garage								24.0		13.8	331	Btuh		
	Door Total								48 (sqft)					662 Btuh	
Ceilings	Type/Color/Surface	U-Value			R-Value		Area(sqft)			HTM		Load			
1	Vented Attic/DarkShingle/RB				0.025	38.0/0.0			2988.0		1.12	3337	Btuh		
2	Vented Attic/DarkShingle/RB				0.025	38.0/0.0			665.7		1.12	743	Btuh		
	Ceiling Total								3654 (sqft)					4080 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Brian & Brittany Papka

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Papka Residence_

Lake City, FL 32024

1/22/2021

Floors	Type	R-Value	Size	HTM	Load	
1	Slab On Grade	0.0	2846 (ft-perimeter)	0.0	0 Btuh	
2	Raised Wood - Adj	19.0	634 (sqft)	0.7	445 Btuh	
	Floor Total		3480.0 (sqft)		445 Btuh	
	Envelope Subtotal:				20469 Btuh	
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	33532	1	93.4	1943 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		12	X 230	+	1500	4260 Btuh
	Sensible Envelope Load:					26671 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.371)		9904 Btuh
	Sensible Load All Zones					36576 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Brian & Brittany Papka

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Papka Residence_

Lake City, FL 32024

1/22/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	26671 Btuh
	Sensible Duct Load	9904 Btuh
	Total Sensible Zone Loads	36576 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	36576 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	3224 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2468 Btuh
	Latent occupant gain (12.0 people @ 200 Btuh per person)	2400 Btuh
	Latent other gain	0 Btuh
	Latent total gain	8092 Btuh
	TOTAL GAIN	44667 Btuh

EQUIPMENT

1. Central Unit	#	44667 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