

Residential System Sizing Calculation

Summary

Elinskas Res

Project Title:
211423 Elinskas Res

Lake City, FL

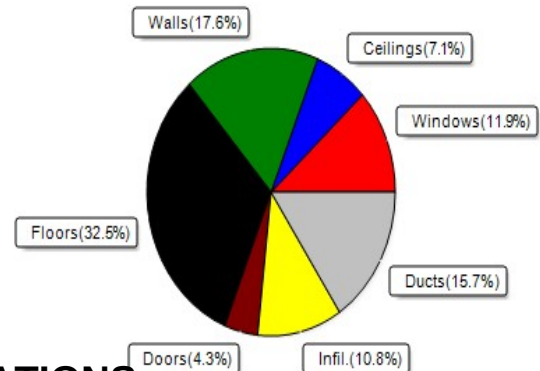
2021-10-19

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	33937 Btuh	Total cooling load calculation	29622 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.0 37000	Sensible (SHR = 0.75)	111.3 27750
Heat Pump + Auxiliary(0.0kW)	109.0 37000	Latent	197.1 9250
		Total (Electric Heat Pump)	124.9 37000

WINTER CALCULATIONS

Winter Heating Load (for 2253 sqft)

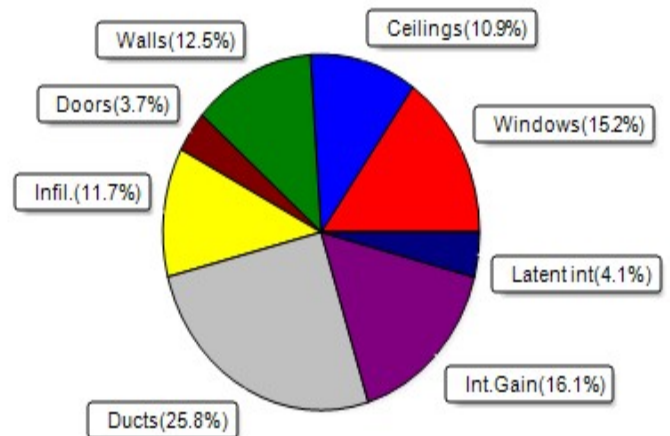
Load component		Load	
Window total	336 sqft	4028	Btuh
Wall total	1686 sqft	5985	Btuh
Door total	92 sqft	1472	Btuh
Ceiling total	2361 sqft	2397	Btuh
Floor total	2253 sqft	11045	Btuh
Infiltration	84 cfm	3672	Btuh
Duct loss		5338	Btuh
Subtotal		33937	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		33937	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2253 sqft)

Load component		Load	
Window total	336 sqft	4494	Btuh
Wall total	1686 sqft	3694	Btuh
Door total	92 sqft	1104	Btuh
Ceiling total	2361 sqft	3236	Btuh
Floor total		0	Btuh
Infiltration	63 cfm	1308	Btuh
Internal gain		4780	Btuh
Duct gain		6311	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		24928	Btuh
Latent gain(ducts)		1323	Btuh
Latent gain(infiltration)		2171	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		4694	Btuh
TOTAL HEAT GAIN		29622	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: **Evan Beamsley**
DATE: **2021-10-19**

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Elinskas Res
Lake City, FL

Project Title:
211423 Elinskas Res
Building Type: User

2021-10-19

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 0.22	Metal	0.30	N	36.0		12.0	432 Btuh
2	2, NFRC 0.22	Metal	0.30	NE	13.3		12.0	160 Btuh
3	2, NFRC 0.22	Metal	0.30	N	54.0		12.0	648 Btuh
4	2, NFRC 0.22	Metal	0.30	E	36.0		12.0	432 Btuh
5	2, NFRC 0.22	Metal	0.30	N	42.7		12.0	512 Btuh
6	2, NFRC 0.22	Metal	0.30	N	26.7		12.0	320 Btuh
7	2, NFRC 0.22	Metal	0.30	N	36.0		12.0	432 Btuh
8	2, NFRC 0.22	Metal	0.30	E	15.0		12.0	180 Btuh
9	2, NFRC 0.22	Metal	0.30	E	6.0		12.0	72 Btuh
10	2, NFRC 0.22	Metal	0.30	S	4.0		12.0	48 Btuh
11	2, NFRC 0.22	Metal	0.30	S	15.0		12.0	180 Btuh
12	2, NFRC 0.22	Metal	0.30	S	15.0		12.0	180 Btuh
13	2, NFRC 0.22	Metal	0.30	W	30.0		12.0	360 Btuh
14	2, NFRC 0.22	Metal	0.30	W	6.0		12.0	72 Btuh
Window Total					335.7(sqft)			4028 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	87		3.55	309 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	13		3.55	47 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	50		3.55	176 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	38		3.55	134 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	69 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	89		3.55	314 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	300		3.55	1065 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	130		3.55	460 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	41		3.55	144 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	101		3.55	357 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	34		3.55	121 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	33		3.55	117 Btuh
15	Frame - Wood	- Adj	(0.089)	13.0/0.0	144		3.55	511 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	456		3.55	1619 Btuh
Wall Total					1686(sqft)			5985 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)		48		16.0	768 Btuh
4	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
Door Total					92(sqft)			1472Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Elinskas Res
Lake City, FL

Project Title:
211423 Elinskas Res
Building Type: User

2021-10-19

Ceilings 1	Type/Color/Surface Vented Attic/D/Shing Ceiling Total	Ueff. (0.025)	R-Value 38.0/0.0	Area X 2361 2361(sqft)	HTM= 1.0	Load 2397 Btuh 2397Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 234.0 ft(perim.) 2253 sqft	HTM= 47.2	Load 11045 Btuh 11045 Btuh
Envelope Subtotal:						24927 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.24	Volume(cuft) 21404	Wall Ratio 1.00	CFM= 83.9	3672 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.187)					5338 Btuh
All Zones	Sensible Subtotal All Zones					33937 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	33937 Btuh 0 Btuh 33937 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	37000 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

Elinskas Res

Project Title:
211423 Elinskas Res

Lake City, FL

2021-10-19

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	0.22, 0.30	No	No	N		1.5ft	1.0ft	36.0	0.0	36.0	10	10	372	Btuh
2	2 NFRC	0.22, 0.30	No	No	NE		17.0f	1.0ft	13.3	0.0	13.3	10	20	273	Btuh
3	2 NFRC	0.22, 0.30	No	No	N		14.3f	1.0ft	54.0	0.0	54.0	10	10	558	Btuh
4	2 NFRC	0.22, 0.30	No	No	E		15.2f	1.0ft	36.0	36.0	0.0	10	27	372	Btuh
5	2 NFRC	0.22, 0.30	No	No	N		15.3f	1.0ft	42.7	0.0	42.7	10	10	441	Btuh
6	2 NFRC	0.22, 0.30	No	No	N		15.3f	1.0ft	26.7	0.0	26.7	10	10	275	Btuh
7	2 NFRC	0.22, 0.30	No	No	N		1.5ft	1.0ft	36.0	0.0	36.0	10	10	372	Btuh
8	2 NFRC	0.22, 0.30	No	No	E		1.5ft	1.0ft	15.0	0.7	14.3	10	27	391	Btuh
9	2 NFRC	0.22, 0.30	No	No	E		1.5ft	1.0ft	6.0	0.5	5.5	10	27	153	Btuh
10	2 NFRC	0.22, 0.30	No	No	S		1.5ft	1.0ft	4.0	4.0	0.0	10	12	41	Btuh
11	2 NFRC	0.22, 0.30	No	No	S		1.5ft	1.0ft	15.0	15.0	0.0	10	12	155	Btuh
12	2 NFRC	0.22, 0.30	No	No	S		11.5f	1.0ft	15.0	15.0	0.0	10	12	155	Btuh
13	2 NFRC	0.22, 0.30	No	No	W		1.5ft	1.0ft	30.0	1.5	28.5	10	27	783	Btuh
14	2 NFRC	0.22, 0.30	No	No	W		1.5ft	1.0ft	6.0	0.5	5.5	10	27	153	Btuh
	Window Total								336 (sqft)					4494 Btuh	
Walls	Type	U-Value					R-Value		Area(sqft)			HTM		Load	
							Cav/Sheath								
1	Frame - Wood - Ext	0.09					13.0/0.0		87.0			2.3		197 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		13.2			2.3		30 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		49.5			2.3		112 Btuh	
6	Frame - Wood - Ext	0.09					13.0/0.0		37.7			2.3		85 Btuh	
7	Frame - Wood - Ext	0.09					13.0/0.0		19.5			2.3		44 Btuh	
8	Frame - Wood - Ext	0.09					13.0/0.0		88.5			2.3		200 Btuh	
9	Frame - Wood - Ext	0.09					13.0/0.0		300.0			2.3		679 Btuh	
10	Frame - Wood - Ext	0.09					13.0/0.0		129.5			2.3		293 Btuh	
11	Frame - Wood - Ext	0.09					13.0/0.0		40.5			2.3		92 Btuh	
12	Frame - Wood - Ext	0.09					13.0/0.0		100.5			2.3		227 Btuh	
13	Frame - Wood - Adj	0.09					13.0/0.0		34.0			1.7		57 Btuh	
14	Frame - Wood - Adj	0.09					13.0/0.0		33.0			1.7		56 Btuh	
15	Frame - Wood - Adj	0.09					13.0/0.0		144.0			1.7		243 Btuh	
16	Frame - Wood - Ext	0.09					13.0/0.0		456.0			2.3		1032 Btuh	
	Wall Total								1686 (sqft)					3694 Btuh	
Doors	Type	U-Value					R-Value		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								48.0			12.0		576 Btuh	
4	Insulated - Garage								20.0			12.0		240 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		2361.0			1.37		3236 Btuh	
	Ceiling Total								2361 (sqft)					3236 Btuh	
Floors	Type	U-Value					R-Value		Size			HTM		Load	
1	Slab On Grade						0.0		2253 (ft-perimeter)			0.0		0 Btuh	
	Floor Total								2253.0 (sqft)					0 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Elinskas Res

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
211423 Elinskas Res

Lake City, FL

2021-10-19

	Envelope Subtotal:					12528 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.18	21404	1	62.9	1308 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	3400	4780 Btuh
	Sensible Envelope Load:					18616 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.339)					6311 Btuh
	Sensible Load All Zones					24928 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Elinskas Res
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
211423 Elinskas Res

2021-10-19

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18616 Btuh
	Sensible Duct Load	6311 Btuh
	Total Sensible Zone Loads	24928 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	24928 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2171 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1323 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4694 Btuh
	TOTAL GAIN	29622 Btuh

EQUIPMENT

1. Central Unit	#	37000 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