

Residential System Sizing Calculation

Summary

Ed & Tristan Sullivan

Project Title:
241033 Sullivan Res

Lake City, FL

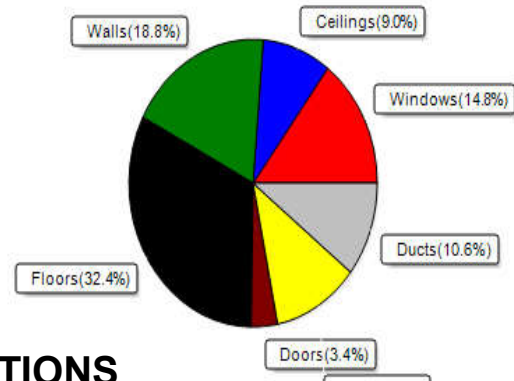
2024-09-24

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	35979 Btuh	Total cooling load calculation	28350 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	108.4 39000	Sensible (SHR = 0.75)	123.2 29250
Heat Pump + Auxiliary(0.0kW)	108.4 39000	Latent	211.8 9750
		Total (Electric Heat Pump)	137.6 39000

WINTER CALCULATIONS

Winter Heating Load (for 2531 sqft)

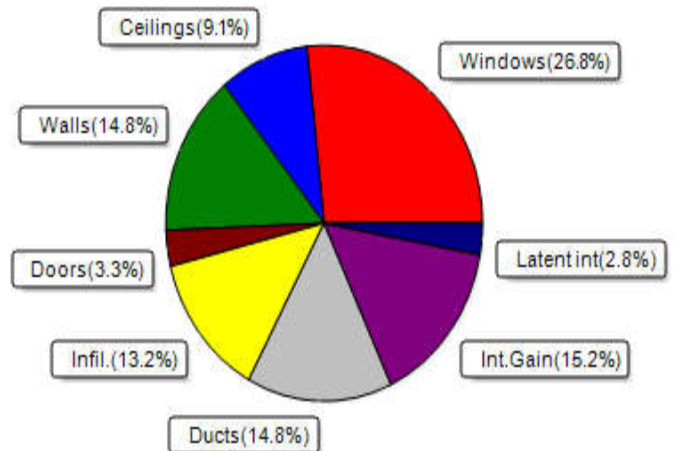
Load component	Load
Window total 380 sqft	5320 Btuh
Wall total 1904 sqft	6759 Btuh
Door total 77 sqft	1237 Btuh
Ceiling total 2676 sqft	3225 Btuh
Floor total 2531 sqft	11658 Btuh
Infiltration 90 cfm	3951 Btuh
Duct loss	3829 Btuh
Subtotal	35979 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	35979 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2531 sqft)

Load component	Load
Window total 380 sqft	7585 Btuh
Wall total 1904 sqft	4189 Btuh
Door total 77 sqft	928 Btuh
Ceiling total 2676 sqft	2580 Btuh
Floor total	0 Btuh
Infiltration 68 cfm	1407 Btuh
Internal gain	4320 Btuh
Duct gain	2738 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	23747 Btuh
Latent gain(ducts)	1467 Btuh
Latent gain(infiltration)	2335 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	800 Btuh
Total latent gain	4603 Btuh
TOTAL HEAT GAIN	28350 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2024-09-24

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Ed & Tristan Sullivan

Project Title:
241033 Sullivan Res
Building Type: User

Lake City, FL

2024-09-24

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.25	Metal	0.35	N	36.0		14.0	504 Btuh
2	2, NFRC 0.25	Metal	0.35	NE	16.0		14.0	224 Btuh
3	2, NFRC 0.25	Metal	0.35	N	54.0		14.0	756 Btuh
4	2, NFRC 0.25	Metal	0.35	E	36.0		14.0	504 Btuh
5	2, NFRC 0.25	Metal	0.35	N	72.0		14.0	1008 Btuh
6	2, NFRC 0.25	Metal	0.35	N	36.0		14.0	504 Btuh
7	2, NFRC 0.25	Metal	0.35	E	15.0		14.0	210 Btuh
8	2, NFRC 0.25	Metal	0.35	E	8.0		14.0	112 Btuh
9	2, NFRC 0.25	Metal	0.35	S	30.0		14.0	420 Btuh
10	2, NFRC 0.25	Metal	0.35	S	24.0		14.0	336 Btuh
11	2, NFRC 0.25	Metal	0.35	S	15.0		14.0	210 Btuh
12	2, NFRC 0.25	Metal	0.35	W	15.0		14.0	210 Btuh
13	2, NFRC 0.25	Metal	0.35	W	8.0		14.0	112 Btuh
14	2, NFRC 0.25	Metal	0.35	W	15.0		14.0	210 Btuh
Window Total					380.0(sqft)			5320 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	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	48		3.55	170 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	42		3.55	149 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	99		3.55	351 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	140		3.55	498 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	160 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	83		3.55	296 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	160 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	91		3.55	323 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	123		3.55	437 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	53		3.55	186 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	123		3.55	437 Btuh
17	Frame - Wood	- Adj	(0.089)	13.0/0.0	30		3.55	107 Btuh
18	Frame - Wood	- Adj	(0.089)	13.0/0.0	33		3.55	117 Btuh
19	Frame - Wood	- Adj	(0.089)	13.0/0.0	144		3.55	511 Btuh
20	Frame - Wood	- Ext	(0.089)	13.0/0.0	92		3.55	325 Btuh
21	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
22	Frame - Wood	- Ext	(0.089)	13.0/0.0	218		3.55	773 Btuh
23	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
24	Frame - Wood	- Ext	(0.089)	13.0/0.0	146		3.55	517 Btuh
Wall Total					1904(sqft)			6759 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Ed & Tristan Sullivan

Project Title:
241033 Sullivan Res
Building Type: User

Lake City, FL

2024-09-24

Doors	Type	Storm Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n (0.400)		5	16.0	85 Btuh
2	Insulated - Exterior,	n (0.400)		24	16.0	384 Btuh
3	Insulated - Exterior,	n (0.400)		24	16.0	384 Btuh
4	Insulated - Garage,	n (0.400)		24	16.0	384 Btuh
	Door Total			77(sqft)		1237Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/D/Shing	(0.241)	0.0/22.0	2531	1.2	3050 Btuh
2	Knee wall/D/Shing	(0.241)	0.0/22.0	145	1.2	175 Btuh
	Ceiling Total			2676(sqft)		3225Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	247.0 ft(perim.)	47.2	11658 Btuh
	Floor Total			2531 sqft		11658 Btuh
	Envelope Subtotal:					28199 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.23	23285	1.00	90.1	3951 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.119)					3829 Btuh
All Zones	Sensible Subtotal All Zones					35979 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	35979 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	35979 Btuh

EQUIPMENT

1. Electric Heat Pump	#	39000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Ed & Tristan Sullivan

Project Title:
241033 Sullivan Res
Building Type: User

Lake City, FL

2024-09-24

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

Ed & Tristan Sullivan

Project Title:
241033 Sullivan Res

Lake City, FL

2024-09-24

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

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, 0.35	No	No	N		1.5ft	1.0ft	36.0	1.5	34.5	12	31	1079	Btuh	
2	2 NFRC	0.25, 0.35	No	No	NE		15.0f	0.0ft	16.0	0.0	16.0	12	23	375	Btuh	
3	2 NFRC	0.25, 0.35	No	No	N		14.3f	0.5ft	54.0	54.0	0.0	12	31	643	Btuh	
4	2 NFRC	0.25, 0.35	No	No	E		30.3f	0.5ft	36.0	0.0	36.0	12	12	429	Btuh	
5	2 NFRC	0.25, 0.35	No	No	N		15.2f	0.0ft	72.0	72.0	0.0	12	31	857	Btuh	
6	2 NFRC	0.25, 0.35	No	No	N		12.5f	0.5ft	36.0	36.0	0.0	12	31	429	Btuh	
7	2 NFRC	0.25, 0.35	No	No	E		1.5ft	14.0f	15.0	0.0	15.0	12	12	179	Btuh	
8	2 NFRC	0.25, 0.35	No	No	E		1.5ft	5.0ft	8.0	0.0	8.0	12	12	95	Btuh	
9	2 NFRC	0.25, 0.35	No	No	S		1.5ft	1.0ft	30.0	1.2	28.8	12	31	899	Btuh	
10	2 NFRC	0.25, 0.35	No	No	S		10.8f	0.0ft	24.0	24.0	0.0	12	31	286	Btuh	
11	2 NFRC	0.25, 0.35	No	No	S		10.8f	0.5ft	15.0	15.0	0.0	12	31	179	Btuh	
12	2 NFRC	0.25, 0.35	No	No	W		1.5ft	5.0ft	15.0	10.6	4.4	12	14	187	Btuh	
13	2 NFRC	0.25, 0.35	No	No	W		1.5ft	1.0ft	8.0	8.0	0.0	12	14	95	Btuh	
14	2 NFRC	0.25, 0.35	No	No	W		1.5ft	1.0ft	15.0	15.0	0.0	12	14	179	Btuh	
Excursion														1673	Btuh	
Window Total									380 (sqft)						7585	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	13.9		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	48.0		2.3		109 Btuh			
6	Frame - Wood - Ext						0.09	13.0/0.0	42.0		2.3		95 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	99.0		2.3		224 Btuh			
9	Frame - Wood - Ext						0.09	13.0/0.0	140.3		2.3		317 Btuh			
10	Frame - Wood - Ext						0.09	13.0/0.0	45.0		2.3		102 Btuh			
11	Frame - Wood - Ext						0.09	13.0/0.0	83.3		2.3		188 Btuh			
12	Frame - Wood - Ext						0.09	13.0/0.0	45.0		2.3		102 Btuh			
13	Frame - Wood - Ext						0.09	13.0/0.0	91.0		2.3		206 Btuh			
14	Frame - Wood - Ext						0.09	13.0/0.0	123.0		2.3		278 Btuh			
15	Frame - Wood - Ext						0.09	13.0/0.0	52.5		2.3		119 Btuh			
16	Frame - Wood - Ext						0.09	13.0/0.0	123.0		2.3		278 Btuh			
17	Frame - Wood - Adj						0.09	13.0/0.0	30.0		1.7		51 Btuh			
18	Frame - Wood - Adj						0.09	13.0/0.0	33.0		1.7		56 Btuh			
19	Frame - Wood - Adj						0.09	13.0/0.0	144.0		1.7		243 Btuh			
20	Frame - Wood - Ext						0.09	13.0/0.0	91.5		2.3		207 Btuh			
21	Frame - Wood - Ext						0.09	13.0/0.0	36.0		2.3		81 Btuh			
22	Frame - Wood - Ext						0.09	13.0/0.0	217.8		2.3		493 Btuh			
23	Frame - Wood - Ext						0.09	13.0/0.0	36.0		2.3		81 Btuh			
24	Frame - Wood - Ext						0.09	13.0/0.0	145.5		2.3		329 Btuh			
Wall Total									1904 (sqft)				4189 Btuh			
Doors	Type								Area (sqft)		HTM		Load			
1	Insulated - Exterior								5.3		12.0		64 Btuh			
2	Insulated - Exterior								24.0		12.0		288 Btuh			
3	Insulated - Exterior								24.0		12.0		288 Btuh			
4	Insulated - Garage								24.0		12.0		288 Btuh			
Door Total									77 (sqft)				928 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Ed & Tristan Sullivan

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
241033 Sullivan Res

Lake City, FL

2024-09-24

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Unvented Attic/DarkShingle	0.241	0.0/22.0	2531.0	0.96	2440 Btuh
2	Knee wall to attic/DarkShingle	0.241	0.0/22.0	145.0	0.96	140 Btuh
	Ceiling Total			2676 (sqft)		2580 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	2531 (ft-perimeter)	0.0	0 Btuh
	Floor Total			2531.0 (sqft)		0 Btuh
	Envelope Subtotal:					15282 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	23285	1	67.5	1407 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		4	X 230	+	3400	4320 Btuh
	Sensible Envelope Load:					21009 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.130)	2738 Btuh
	Sensible Load All Zones					23747 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Ed & Tristan Sullivan

Project Title: 241033 Sullivan Res

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2024-09-24

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	21009 Btuh
	Sensible Duct Load	2738 Btuh
	Total Sensible Zone Loads	23747 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	23747 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2335 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1467 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4603 Btuh
	TOTAL GAIN	28350 Btuh

EQUIPMENT

1. Central Unit	#	39000 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