

Residential System Sizing Calculation

Summary

Douglas & Barbara Libby
 Cirrus Dr
 Lake City, FL

Project Title:
 Libby Res

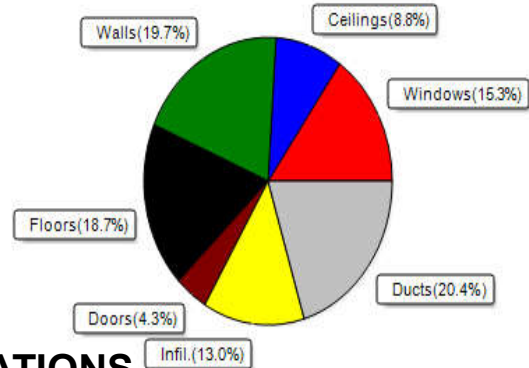
2024-01-19

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	25300	Btuh	Total cooling load calculation	28777	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	122.5	31000	Sensible (SHR = 0.75)	94.5	23250
Heat Pump + Auxiliary(0.0kW)	122.5	31000	Latent	185.5	7750
			Total (Electric Heat Pump)	107.7	31000

WINTER CALCULATIONS

Winter Heating Load (for 2101 sqft)

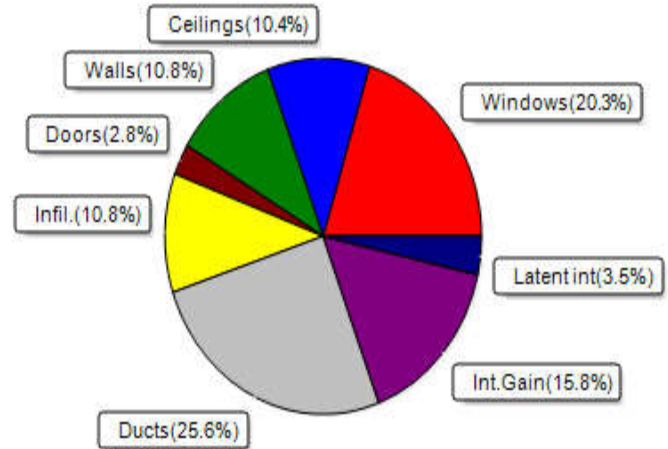
Load component	Load	
Window total	322 sqft	3860 Btuh
Wall total	1402 sqft	4978 Btuh
Door total	68 sqft	1088 Btuh
Ceiling total	2191 sqft	2224 Btuh
Floor total	2101 sqft	4720 Btuh
Infiltration	75 cfm	3279 Btuh
Duct loss		5151 Btuh
Subtotal		25300 Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS		25300 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2101 sqft)

Load component	Load	
Window total	322 sqft	5834 Btuh
Wall total	1402 sqft	3097 Btuh
Door total	68 sqft	816 Btuh
Ceiling total	2191 sqft	3003 Btuh
Floor total		0 Btuh
Infiltration	56 cfm	1168 Btuh
Internal gain		4550 Btuh
Duct gain		6131 Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		24599 Btuh
Latent gain(ducts)		1240 Btuh
Latent gain(infiltration)		1939 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1000 Btuh
Total latent gain		4178 Btuh
TOTAL HEAT GAIN		28777 Btuh



8th Edition

EnergyGauge® System Sizing
 PREPARED BY: Evan Beamsley
 DATE: 2024-01-19

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Douglas & Barbara Libby
 Cirrus Dr
 Lake City, FL

Project Title:
 Libby Res
 Building Type: User

2024-01-19

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 0.20	Vinyl	0.30	N	18.0		12.0	216 Btuh
2	2, NFRC 0.20	Vinyl	0.30	N	72.0		12.0	864 Btuh
3	2, NFRC 0.20	Vinyl	0.30	W	42.0		12.0	504 Btuh
4	2, NFRC 0.20	Vinyl	0.30	N	42.0		12.0	504 Btuh
5	2, NFRC 0.20	Vinyl	0.30	N	15.0		12.0	180 Btuh
6	2, NFRC 0.20	Vinyl	0.30	E	4.0		12.0	48 Btuh
7	2, NFRC 0.20	Vinyl	0.30	E	15.0		12.0	180 Btuh
8	2, NFRC 0.20	Vinyl	0.30	S	10.0		12.0	120 Btuh
9	2, NFRC 0.20	Vinyl	0.30	S	12.0		12.0	144 Btuh
10	2, NFRC 0.20	Vinyl	0.30	S	36.0		12.0	432 Btuh
11	2, NFRC 0.20	Vinyl	0.30	S	18.7		12.0	224 Btuh
12	2, NFRC 0.20	Vinyl	0.30	S	12.0		12.0	144 Btuh
13	2, NFRC 0.20	Vinyl	0.30	S	4.0		12.0	48 Btuh
14	2, NFRC 0.20	Vinyl	0.30	W	6.0		12.0	72 Btuh
15	2, NFRC 0.20	Vinyl	0.30	W	15.0		12.0	180 Btuh
	Window Total				321.7(sqft)			3860 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	120		3.55	426 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	42		3.55	149 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	195		3.55	692 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	221		3.55	785 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	133		3.55	472 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	152		3.55	540 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	77		3.55	274 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	22		3.55	78 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	116		3.55	412 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	288		3.55	1022 Btuh
	Wall Total				1402(sqft)			4978 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		24		16.0	384 Btuh
2	Insulated - Garage,	n	(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior,	n	(0.400)		24		16.0	384 Btuh
	Door Total				68(sqft)			1088Btuh
Ceilings	Type/Color/Surface	Ueff.	R-Value		Area	X	HTM=	Load
1	Flat ceil/D/Shing	(0.025)	38.0/0.0		2101		1.0	2133 Btuh
2	Knee wall/D/Shing	(0.025)	38.0/0.0		90		1.0	91 Btuh
	Ceiling Total				2191(sqft)			2224Btuh
Floors	Type	Ueff.	R-Value		Size	X	HTM=	Load
1	Slab On Grade	(1.180)	0.0		100.0 ft(perim.)		47.2	4720 Btuh
	Floor Total				2100 sqft			4720 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Douglas & Barbara Libby
 Cirrus Dr
 Lake City, FL

Project Title:
 Libby Res
 Building Type: User

2024-01-19

	Envelope Subtotal:					16870 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.23	19329	1.00	74.8	3279 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.256)	5151 Btuh
All Zones	Sensible Subtotal All Zones					25300 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss		25300 Btuh
	Ventilation Sens. Heat Loss	(Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss		25300 Btuh

EQUIPMENT

1. Electric Heat Pump	#	31000 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

Douglas & Barbara Libby
 Cirrus Dr
 Lake City, FL

Project Title:
 Libby Res

2024-01-19

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	0.20, 0.30	No	No	N	10.8f	0.5ft	18.0	0.0	18.0	10	19	345	Btuh	
2	2 NFRC	0.20, 0.30	No	No	N	10.8f	0.0ft	72.0	0.0	72.0	10	19	1378	Btuh	
3	2 NFRC	0.20, 0.30	No	No	W	27.5f	0.5ft	42.0	42.0	0.0	10	20	416	Btuh	
4	2 NFRC	0.20, 0.30	No	No	N	1.5ft	1.0ft	42.0	0.0	42.0	10	19	804	Btuh	
5	2 NFRC	0.20, 0.30	No	No	N	1.5ft	1.0ft	15.0	0.0	15.0	10	19	287	Btuh	
6	2 NFRC	0.20, 0.30	No	No	E	1.5ft	1.0ft	4.0	0.0	4.0	10	19	77	Btuh	
7	2 NFRC	0.20, 0.30	No	No	E	1.5ft	1.0ft	15.0	0.0	15.0	10	19	287	Btuh	
8	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.0ft	10.0	3.7	6.3	10	20	163	Btuh	
9	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.0ft	12.0	2.9	9.1	10	20	211	Btuh	
10	2 NFRC	0.20, 0.30	No	No	S	5.5ft	0.3ft	36.0	36.0	0.0	10	20	357	Btuh	
11	2 NFRC	0.20, 0.30	No	No	S	9.0ft	0.0ft	18.7	18.7	0.0	10	20	185	Btuh	
12	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.0ft	12.0	2.9	9.1	10	20	211	Btuh	
13	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.0ft	4.0	2.9	1.1	10	20	50	Btuh	
14	2 NFRC	0.20, 0.30	No	No	W	1.5ft	1.0ft	6.0	2.9	3.1	10	20	90	Btuh	
15	2 NFRC	0.20, 0.30	No	No	W	1.5ft	1.0ft	15.0	4.4	10.6	10	20	256	Btuh	
Excursion													718	Btuh	
Window Total								322 (sqft)						5834	Btuh
Walls	Type	U-Value	R-Value	Area(sqft)	HTM	Load									
			Cav/Sheath												
1	Frame - Wood - Ext	0.09	13.0/0.0	120.0	2.3	272	Btuh								
2	Frame - Wood - Ext	0.09	13.0/0.0	42.0	2.3	95	Btuh								
3	Frame - Wood - Ext	0.09	13.0/0.0	195.0	2.3	441	Btuh								
4	Frame - Wood - Ext	0.09	13.0/0.0	221.0	2.3	500	Btuh								
5	Frame - Wood - Adj	0.09	13.0/0.0	133.0	1.7	224	Btuh								
6	Frame - Wood - Ext	0.09	13.0/0.0	152.0	2.3	344	Btuh								
7	Frame - Wood - Ext	0.09	13.0/0.0	77.3	2.3	175	Btuh								
8	Frame - Wood - Ext	0.09	13.0/0.0	18.0	2.3	41	Btuh								
9	Frame - Wood - Ext	0.09	13.0/0.0	21.8	2.3	49	Btuh								
10	Frame - Wood - Ext	0.09	13.0/0.0	18.0	2.3	41	Btuh								
11	Frame - Wood - Ext	0.09	13.0/0.0	116.0	2.3	263	Btuh								
12	Frame - Wood - Ext	0.09	13.0/0.0	288.0	2.3	652	Btuh								
Wall Total				1402 (sqft)		3097	Btuh								
Doors	Type	U-Value	R-Value	Area (sqft)	HTM	Load									
1	Insulated - Exterior			24.0	12.0	288	Btuh								
2	Insulated - Garage			20.0	12.0	240	Btuh								
3	Insulated - Exterior			24.0	12.0	288	Btuh								
Door Total				68 (sqft)		816	Btuh								
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load									
1	Vented Attic/DarkShingle	0.025	38.0/0.0	2101.0	1.37	2880	Btuh								
2	Knee wall to attic/DarkShingle	0.025	38.0/0.0	90.0	1.37	123	Btuh								
Ceiling Total				2191 (sqft)		3003	Btuh								
Floors	Type	U-Value	R-Value	Size	HTM	Load									
1	Slab On Grade		0.0	2101 (ft-perimeter)	0.0	0	Btuh								
Floor Total				2101.0 (sqft)		0	Btuh								
Envelope Subtotal:						12750	Btuh								

Manual J Summer Calculations

Residential Load - Component Details (continued)

Douglas & Barbara Libby
 Cirrus Dr
 Lake City, FL

Project Title:
 Libby Res

Climate:FL_GAINESVILLE_REGIONAL_A

2024-01-19

Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 19329	Wall Ratio 1	CFM= 56.1	Load 1168 Btuh
Internal gain		Occupants 5	Btuh/occupant X 230	Appliance +	3400	Load 4550 Btuh
	Sensible Envelope Load:					18468 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.332)					6131 Btuh
	Sensible Load All Zones					24599 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Douglas & Barbara Libby
 Cirrus Dr
 Lake City, FL

Project Title:
 Libby Res

Climate:FL_GAINESVILLE_REGIONAL_A

2024-01-19

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18468 Btuh
	Sensible Duct Load	6131 Btuh
	Total Sensible Zone Loads	24599 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	24599 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1939 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1240 Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4178 Btuh
	TOTAL GAIN	28777 Btuh

EQUIPMENT

1. Central Unit	#	31000 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