

Residential System Sizing Calculation

Summary

Gaber Res

Project Title:
201348 Gaber

Lake City, FL

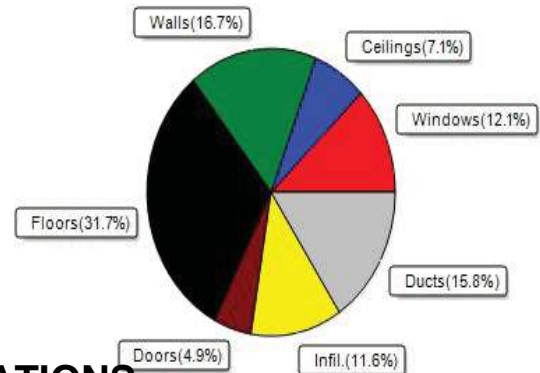
2020-12-15

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	32421 Btuh	Total cooling load calculation	32436 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	108.0 35000	Sensible (SHR = 0.75)	96.1 26250
Heat Pump + Auxiliary(0.0kW)	108.0 35000	Latent	171.1 8750
		Total (Electric Heat Pump)	107.9 35000

WINTER CALCULATIONS

Winter Heating Load (for 2156 sqft)

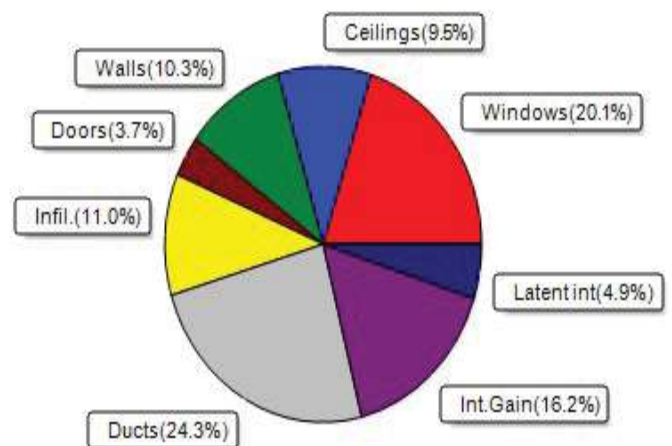
Load component		Load	
Window total	328 sqft	3936	Btuh
Wall total	1528 sqft	5425	Btuh
Door total	100 sqft	1600	Btuh
Ceiling total	2254 sqft	2288	Btuh
Floor total	2156 sqft	10290	Btuh
Infiltration	86 cfm	3771	Btuh
Duct loss		5112	Btuh
Subtotal		32421	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		32421	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2156 sqft)

Load component		Load	
Window total	328 sqft	6522	Btuh
Wall total	1528 sqft	3337	Btuh
Door total	100 sqft	1200	Btuh
Ceiling total	2254 sqft	3089	Btuh
Floor total		0	Btuh
Infiltration	65 cfm	1343	Btuh
Internal gain		5240	Btuh
Duct gain		6592	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		27323	Btuh
Latent gain(ducts)		1284	Btuh
Latent gain(infiltration)		2229	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		5113	Btuh
TOTAL HEAT GAIN		32436	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-12-15

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Gaber Res
Lake City, FL

Project Title:
201348 Gaber
Building Type: User

2020-12-15

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 225 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	SW	15.0		12.0	180 Btuh
2	2, NFRC 0.20	Metal	0.30	NW	15.0		12.0	180 Btuh
3	2, NFRC 0.20	Metal	0.30	SW	36.0		12.0	432 Btuh
4	2, NFRC 0.20	Metal	0.30	NW	48.0		12.0	576 Btuh
5	2, NFRC 0.20	Metal	0.30	SW	48.0		12.0	576 Btuh
6	2, NFRC 0.20	Metal	0.30	SW	32.0		12.0	384 Btuh
7	2, NFRC 0.20	Metal	0.30	NW	12.5		12.0	150 Btuh
8	2, NFRC 0.20	Metal	0.30	NW	6.0		12.0	72 Btuh
9	2, NFRC 0.20	Metal	0.30	NE	4.0		12.0	48 Btuh
10	2, NFRC 0.20	Metal	0.30	NE	12.0		12.0	144 Btuh
11	2, NFRC 0.20	Metal	0.30	NE	32.0		12.0	384 Btuh
12	2, NFRC 0.20	Metal	0.30	NE	36.0		12.0	432 Btuh
13	2, NFRC 0.20	Metal	0.30	SE	12.5		12.0	150 Btuh
14	2, NFRC 0.20	Metal	0.30	SE	15.0		12.0	180 Btuh
15	2, NFRC 0.20	Metal	0.30	SE	4.0		12.0	48 Btuh
Window Total					328.0(sqft)			3936 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	126		3.55	447 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	39		3.55	138 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.55	362 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	71 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	114		3.55	405 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	291		3.55	1031 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	116		3.55	412 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	9		3.55	30 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	56		3.55	197 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	18		3.55	64 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	33		3.55	117 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	160		3.55	568 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	203		3.55	719 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	27		3.55	96 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	180		3.55	639 Btuh
Wall Total					1528(sqft)			5425 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
2	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
3	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
4	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
5	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
Door Total					100(sqft)			1600Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Gaber Res
Lake City, FL

Project Title:
201348 Gaber
Building Type: User

2020-12-15

Ceilings 1	Type/Color/Surface Vented Attic/D/Shing Ceiling Total	Ueff. (0.025)	R-Value 38.0/0.0	Area X 2254 2254(sqft)	HTM= 1.0	Load 2288 Btuh 2288Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 218.0 ft(perim.) 2156 sqft	HTM= 47.2	Load 10290 Btuh 10290 Btuh
	Envelope Subtotal:					23539 Btuh
Infiltration	Type Natural	Wholehouse	ACH 0.26	Volume(cuft) 19835	Wall Ratio 1.00	CFM= 86.1 3771 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.187)					5112 Btuh
All Zones	Sensible Subtotal All Zones					32421 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	32421 Btuh 0 Btuh 32421 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	35000 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

Gaber Res

Project Title:
201348 Gaber

Lake City, FL

2020-12-15

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 225 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	SW	1.5ft	1.5ft	15.0	2.9	12.1	10	20	271	Btuh	
2	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	1.5ft	15.0	0.0	15.0	10	19	287	Btuh	
3	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.5ft	36.0	5.8	30.2	10	20	662	Btuh	
4	2 NFRC	0.20, 0.30	No	No	NW	27.5f	0.5ft	48.0	0.0	48.0	10	19	919	Btuh	
5	2 NFRC	0.20, 0.30	No	No	SW	10.8f	0.5ft	48.0	48.0	0.0	10	20	476	Btuh	
6	2 NFRC	0.20, 0.30	No	No	SW	10.8f	0.5ft	32.0	32.0	0.0	10	20	317	Btuh	
7	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	1.5ft	12.5	0.0	12.5	10	19	239	Btuh	
8	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	1.5ft	6.0	0.0	6.0	10	19	115	Btuh	
9	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.5ft	4.0	0.0	4.0	10	19	77	Btuh	
10	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.5ft	12.0	0.0	12.0	10	19	230	Btuh	
11	2 NFRC	0.20, 0.30	No	No	NE	8.8ft	1.0ft	32.0	0.0	32.0	10	19	612	Btuh	
12	2 NFRC	0.20, 0.30	No	No	NE	5.1ft	1.0ft	36.0	0.0	36.0	10	19	689	Btuh	
13	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	1.5ft	12.5	2.4	10.1	10	20	226	Btuh	
14	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	1.5ft	15.0	2.9	12.1	10	20	271	Btuh	
15	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	1.5ft	4.0	3.9	0.1	10	20	41	Btuh	
	Excursion												1090	Btuh	
	Window Total							328 (sqft)						6522	Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
					Cav/Sheath										
1	Frame - Wood - Ext		0.09		13.0/0.0		126.0		2.3		285	Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		39.0		2.3		88	Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.0		102.0		2.3		231	Btuh			
4	Frame - Wood - Ext		0.09		13.0/0.0		20.0		2.3		45	Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.0		114.0		2.3		258	Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.0		290.5		2.3		657	Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		116.0		2.3		263	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		8.5		2.3		19	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		55.5		2.3		126	Btuh			
12	Frame - Wood - Adj		0.09		13.0/0.0		18.0		1.7		30	Btuh			
13	Frame - Wood - Adj		0.09		13.0/0.0		33.0		1.7		56	Btuh			
14	Frame - Wood - Adj		0.09		13.0/0.0		160.0		1.7		270	Btuh			
15	Frame - Wood - Ext		0.09		13.0/0.0		202.5		2.3		458	Btuh			
16	Frame - Wood - Ext		0.09		13.0/0.0		27.0		2.3		61	Btuh			
17	Frame - Wood - Ext		0.09		13.0/0.0		180.0		2.3		407	Btuh			
	Wall Total							1528 (sqft)					3337	Btuh	
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior		16.0		12.0		192	Btuh							
2	Insulated - Exterior		24.0		12.0		288	Btuh							
3	Insulated - Exterior		16.0		12.0		192	Btuh							
4	Insulated - Exterior		24.0		12.0		288	Btuh							
5	Insulated - Garage		20.0		12.0		240	Btuh							
	Door Total						100 (sqft)			1200	Btuh				
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Vented Attic/DarkShingle		0.025		38.0/0.0		2254.0		1.37		3089	Btuh			
	Ceiling Total						2254 (sqft)				3089	Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Gaber Res
Lake City, FL

Project Title:
201348 Gaber

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-15

Floors 1	Type Slab On Grade Floor Total	R-Value 0.0	Size 2156 (ft-perimeter) 2156.0 (sqft)	HTM 0.0	Load 0 Btuh 0 Btuh
	Envelope Subtotal:				14147 Btuh
Infiltration	Type Natural	Average ACH 0.20	Volume(cuft) 19835	Wall Ratio 1	CFM= 64.6
Internal gain		Occupants 8	Btuh/occupant X 230	Appliance +	3400
	Sensible Envelope Load:				20731 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.318)				6592 Btuh
	Sensible Load All Zones				27323 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Gaber Res
Lake City, FL

Project Title:
201348 Gaber

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-15

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	20731 Btuh
	Sensible Duct Load	6592 Btuh
	Total Sensible Zone Loads	27323 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	27323 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2229 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1284 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5113 Btuh
	TOTAL GAIN	32436 Btuh

EQUIPMENT

1. Central Unit	#	35000 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